



# **COPING WITH MULTIPLE CHRONIC CONDITIONS: A MIXED METHODS STUDY**

**Cheng Cheng**

**BMed (Qiqihar), MSc (Växjö)**

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School of Nursing and Midwifery

Faculty of Health and Medicine

The University of Newcastle, Australia

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# Abstract

Multiple chronic conditions (MCCs) pose a significant burden on individuals' health and present challenges for healthcare providers and systems. How people cope with chronic conditions is an important factor that influences their health. However, little research has been undertaken in this area, especially in Asian populations.

Informed by the transactional theory of stress and coping (TTSC), this research aimed to explore coping in people with MCCs in China, where the population is ageing faster than almost any other country in modern history. More specifically, the current research aims were to: (1) validate the Brief Coping Orientation to Problems Experienced (COPE) inventory among Chinese people with MCCs, (2) examine the relationship between coping strategies, illness perceptions, socio-demographic characteristics, MCC-related characteristics, and quality of life (QoL) among Chinese people with MCCs, (3) investigate the experiences of coping with MCCs in Chinese people, and (4) identify the cultural effects on coping among this population.

This research was conducted in a university-affiliated hospital based in north Anhui, China, from December 2017 to October 2018 following Human Research Ethics Committee approval of the University of Newcastle, Australia and the participating hospital. An explanatory, sequential, mixed methods design with a three-phase approach was employed: Phase (1) a validation phase of the Brief COPE inventory administered in 290 participants; Phase (2) a quantitative cross-sectional survey involving 351 participants examining associations between coping strategies, illness perceptions, QoL, and socio-demographic and clinical characteristics; and Phase (3) a qualitative face-to-face, semi-structured interviews study undertaken among 14 participants to explore people's experiences of coping with MCCs.

Results from the quantitative and qualitative phases were integrated into the final analysis. The key findings were:

1. A psychometrically sound, Chinese version of the Brief COPE inventory with five sub-scales was developed.
2. Participants reported high illness concerns over MCCs, duration of MCCs, and control of MCCs. They prioritised their chronic conditions for management.
3. Most participants used positive adaptation to cope with their chronic conditions with both problem-focused and emotional-focused strategies.
4. Seeking alternative treatments, changing lifestyles, and coping at the family level and social level were critical coping strategies, which were influenced by the Chinese culture.
5. People with MCCs had impaired QoL in physical and mental domains compared to the general population in China. Rural participants reported worse QoL than their urban peers.
6. Older age, lower educational level, and more chronic conditions were significantly associated with worse QoL among people with MCCs.
7. Psychological distress was common in older adults with MCCs and might account for poorer QoL scores.
8. Greater concerns about perceived illness consequences and timelines were associated with worse QoL. Frequent use of coping by denial and disengagement was related to worse QoL. Strong faith about perceived treatment control was linked with improved QoL.

These findings serve as a basis for further psychometric research on coping in the Chinese population, as well as a reference for cross-culture coping research. Perceptions and coping strategies found in this study, especially the coping taxonomy ascertained, play a unique role in explaining QoL among people with MCCs. This work echoed Lazarus's theory, there was a strong link between coping and individuals' health. The current research provided evidence to support clinical practice in people with MCCs. Coping-based interventions that foster positive coping and alter negative illness perceptions of MCCs should be implemented. Cultural impact is a key factor in healthcare delivery in different social contexts. More attention should be primarily addressed to those in rural areas, those with lower educational backgrounds, and those having a greater number of chronic conditions.

## Keywords

Coping	An individual's changing cognitive and behavioural efforts to manage a stressful situation that exceeds one's capacity.
Mixed methods research	A research design that collects, analyses and integrates both quantitative and qualitative research and methods in a single study.
Multiple chronic conditions	Concurrent chronic health conditions (more than one) that usually last over a year and require continuous healthcare and/or limitation of daily activities.
Quality of life	Personal perspectives regarding life in the context of a particular culture and value system; the perspectives are associated with personal goals, expectations, standards, and concerns.
Illness perception	An individual's cognitive representations/perspectives/views/beliefs related to their illness.

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# List of Published Peer-Reviewed Papers from this Thesis

Cheng, C., Inder, K. and Chan, S. W. (2020), Coping with multiple chronic conditions: An integrative review. *Nursing & Health Science*.  
doi:10.1111/nhs.12695

Citations: 0; Altmetric score: 0; Impact factor: 1.321

ISI Journal Citation Reports © Ranking: 2018: 57/120 (Nursing) 55/118 (Nursing (Social Science))

Cheng, C., Inder, K., & Chan, S. W. (2019). Patients' experiences of coping with multiple chronic conditions: A meta-ethnography of qualitative work. *International Journal of Mental Health Nursing*, 28(1), 54–70.  
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Citations: 1; Altmetric score: 14; Impact factor: 2.433

ISI Journal Citation Reports © Ranking: 2018: 10/120 (Nursing) 10/118 (Nursing (Social Science)) 72/146 (Psychiatry) 53/142 (Psychiatry (Social Science))

Cheng, C., Yang, C. Y., Inder, K., and Chan, S. W. (2020). Illness perceptions, coping strategies, and quality of life in people with multiple chronic conditions. *Journal of Nursing Scholarship*, 52(2), 145–154. doi:10.1111/jnu.12540

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ISI Journal Citation Reports @ Ranking: 2018: 3/118 (Nursing)

Cheng, C., Yang, C. Y., Inder, K., & Chan, S. W. (2019). Urban-rural differences in mental health among Chinese patients with multiple chronic conditions.

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Cheng, C., Bai, J., Yang, C. Y., Li, M., Inder, K., & Chan, S. W. (2019). Patients' experiences of coping with multiple chronic conditions: A qualitative descriptive study. *Journal of Clinical Nursing*, 28(23/24), 4400–4411.

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# List of Manuscripts Submitted for Publication from this Thesis

Cheng, C., Yang, C. Y., Inder, K., and Chan, S. W. (2020). *Psychometric properties of the Brief COPE in people with multiple chronic conditions*. Revised manuscript under review in the International Journal of Nursing Practice. Submitted on April 16, 2020.

Cheng, C., Inder, K., and Chan, S. W. (2020). *The relationship between coping strategies and psychological distress in Chinese older adults with multiple chronic conditions*. Manuscript under review in the Australasian Journal on Ageing. Submitted on March 1, 2020.

Cheng, C., Inder, K., and Chan, S. W. (2020). *To understand coping, illness perception and quality of life among Chinese people with multiple chronic conditions: An explanatory sequential mixed methods study*. Unpublished manuscript submitted for publication. Submitted on July 12, 2020.

## List of Conference Presentations from this Thesis

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Poster presented at the 4th Australian Nursing and Midwifery Conference, Newcastle, Australia.

**Cheng, C.,** Bai, J., Yang, C. Y., Li, M., Inder, K., & Chan, S. W. (2019, August).

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**Cheng, C.,** Inder, K., and Chan, S. W. (2019, August). *Coping with multiple chronic*

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**Cheng, C.,** Yang, C. Y., Inder, K., and Chan, S. W. (2018, August). *Psychometric*

*properties of the Brief COPE in people with multiple chronic conditions.* Slides presented at the 2018 Annual Research Program of School of Nursing and Midwifery, the University of Newcastle, Callaghan, Australia.

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# List of Abbreviations

Brief COPE	Brief Coping Orientation to Problems Experienced
Brief IPQ	Brief Illness Perception Questionnaire
COREQ	Consolidated Criteria for Reporting Qualitative Studies
HADS	Hospital Anxiety and Depression Scale
HREC	Human Research Ethics Committee
MCCs	Multiple Chronic Conditions
MCS	Mental Composite Scale
PCS	Physical Composite Scale
PRISMA	Preferred Reporting Items for Systematic Reviews and Meta-Analyses
QoL	Quality of Life
SF-12v2	Short Form-12 version 2
STROBE	Strengthening the Reporting of Observational Studies in Epidemiology
TTSC	Transactional Theory of Stress and Coping
US	United States
UK	United Kingdom

# Statement of Originality

I hereby certify that the work embodied in the thesis is my own work, conducted under normal supervision. The thesis contains no material which has been accepted, or is being examined, for the award of any other degree or diploma in any university or other tertiary institution and, to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference has been made. I give consent to the final version of my thesis being made available worldwide when deposited in the University's Digital Repository, subject to the provisions of the Copyright Act 1968 and any approved embargo.

Name	Cheng Cheng
Signature	_____
Date	Dec 10, 2019
	_____

# Statement of Authorship

I hereby certify that this thesis is in the form of a series of papers. I have included as part of the thesis a written declaration from each co-author, endorsed in writing by the Faculty Assistant Dean (Research Training), attesting to my contribution to any jointly authored papers.

Name                      Cheng Cheng

Signature

Date                      Dec 10, 2019

## **Declaration from Co-authors regarding the Candidate's Contribution**

By signing below, I, Professor Sally Chan confirm that Cheng Cheng contributed to the study design, ethical approval, data collection and management, data analysis and interpretation, and writing of the following published and submitted papers:

Cheng, C., Inder, K. and Chan, S. W. (2020), Coping with multiple chronic conditions: An integrative review. *Nursing & Health Science*.  
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Cheng, C., Inder, K., & Chan, S. W. (2019). Patients' experiences of coping with multiple chronic conditions: A meta-ethnography of qualitative work. *International Journal of Mental Health Nursing*, 28(1), 54–70.  
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Cheng, C., Yang, C. Y., Inder, K., and Chan, S. W. (2020). Illness perceptions, coping strategies, and quality of life in people with multiple chronic conditions. *Journal of Nursing Scholarship*, 52(2), 145–154. doi:10.1111/jnu.12540

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Cheng, C., Bai, J., Yang, C. Y., Li, M., Inder, K., & Chan, S. W. (2019). Patients' experiences of coping with multiple chronic conditions: A qualitative descriptive study. *Journal of Clinical Nursing*, 28(23/24), 4400–4411.  
doi:10.1111/jocn.15022

Cheng, C., Yang, C. Y., Inder, K., and Chan, S. W. (2020). *Psychometric properties of the Brief COPE in people with multiple chronic conditions*. Revised

manuscript under review in the International Journal of Nursing Practice.

Submitted on April 16, 2020.

Cheng, C., Inder, K., and Chan, S. W. (2020). *The relationship between coping strategies and psychological distress in Chinese older adults with multiple chronic conditions*. Manuscript under review in the Australasian Journal on Ageing. Submitted on March 1, 2020.

Cheng, C., Inder, K., and Chan, S. W. (2020). *To understand coping, illness perception and quality of life among Chinese people with multiple chronic conditions: An explanatory sequential mixed methods study*. Unpublished manuscript submitted for publication. Submitted on July 12, 2020.

Name	Cheng Cheng	Name	Professor Sally Chan
Signature	_____	Signature	_____
Date	Dec 7, 2019	Date	Dec 13, 2019
	_____		_____

Name	Associate Professor Lesley MacDonald-Wicks
Signature	_____
Date	18-12-2019
	_____

By signing below, I, Associate Professor Kerry Inder confirm that Cheng Cheng contributed to the study design, ethical approval, data collection and management, data analysis and interpretation, and writing of the following published and submitted papers:

Cheng, C., Inder, K. and Chan, S. W. (2020), Coping with multiple chronic conditions: An integrative review. *Nursing & Health Science*.  
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Cheng, C., Inder, K., & Chan, S. W. (2019). Patients' experiences of coping with multiple chronic conditions: A meta-ethnography of qualitative work. *International Journal of Mental Health Nursing*, 28(1), 54–70.  
doi:10.1111/inm.12544

Cheng, C., Yang, C. Y., Inder, K., and Chan, S. W. (2020). Illness perceptions, coping strategies, and quality of life in people with multiple chronic conditions. *Journal of Nursing Scholarship*, 52(2), 145–154. doi:10.1111/jnu.12540

Cheng, C., Yang, C. Y., Inder, K., & Chan, S. W. (2019). Urban-rural differences in mental health among Chinese patients with multiple chronic conditions. *International Journal of Mental Health Nursing*, 29(2), 224–234.  
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Cheng, C., Bai, J., Yang, C. Y., Li, M., Inder, K., & Chan, S. W. (2019). Patients' experiences of coping with multiple chronic conditions: A qualitative descriptive study. *Journal of Clinical Nursing*, 28(23/24), 4400–4411.  
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Cheng, C., Inder, K., and Chan, S. W. (2020). *The relationship between coping strategies and psychological distress in Chinese older adults with multiple chronic conditions*. Manuscript under review in the Australasian Journal on Ageing. Submitted on March 1, 2020.

Cheng, C., Inder, K., and Chan, S. W. (2020). *To understand coping, illness perception and quality of life among Chinese people with multiple chronic conditions: An explanatory sequential mixed methods study*. Unpublished manuscript submitted for publication. Submitted on July 12, 2020.

Name	Cheng Cheng	Name	Associate Professor Kerry Inder
Signature	_____	Signature	_____
Date	Dec 7, 2019	Date	Dec 16, 2019
	_____		_____

Name	Associate Professor Lesley MacDonald-Wicks
Signature	_____
Date	18-12-2019
	_____

By signing below, I, Congyan Yang confirm that Cheng Cheng contributed to the study design, ethical approval, data collection and management, data analysis and interpretation, and writing of the following published and submitted papers:

Cheng, C., Yang, C. Y., Inder, K., and Chan, S. W. (2020). Illness perceptions, coping strategies, and quality of life in people with multiple chronic conditions. *Journal of Nursing Scholarship*, 52(2), 145–154. doi:10.1111/jnu.12540

Cheng, C., Yang, C. Y., Inder, K., & Chan, S. W. (2019). Urban-rural differences in mental health among Chinese patients with multiple chronic conditions. *International Journal of Mental Health Nursing*, 29(2), 224–234. doi:10.1111/inm.12666

Cheng, C., Bai, J., Yang, C. Y., Li, M., Inder, K., & Chan, S. W. (2019). Patients' experiences of coping with multiple chronic conditions: A qualitative descriptive study. *Journal of Clinical Nursing*, 28(23/24), 4400–4411. doi:10.1111/jocn.15022

Cheng, C., Yang, C. Y., Inder, K., and Chan, S. W. (2020). *Psychometric properties of the Brief COPE in people with multiple chronic conditions*. Revised manuscript under review in the International Journal of Nursing Practice. Submitted on April 16, 2020.

Name	Cheng Cheng	Name	Congyan Yang
Signature	_____	Signature	_____
Date	Dec 7, 2019	Date	Dec. 10, 2019
	_____		_____

Name      Associate Professor Lesley MacDonald-Wicks

Signature

Date      18-12-2019

By signing below, I, Ming Li confirm that Cheng Cheng contributed to the study design, ethical approval, data collection and management, data analysis and interpretation, and writing of the following publication:

Cheng, C., Bai, J., Yang, C. Y., Li, M., Inder, K., & Chan, S. W. (2019). Patients' experiences of coping with multiple chronic conditions: A qualitative descriptive study. *Journal of Clinical Nursing*, 28(23/24), 4400–4411.  
doi:10.1111/jocn.15022

Name	Cheng Cheng	Name	Ming Li
Signature	_____	Signature	_____
Date	Dec 7, 2019	Date	Dec 10, 2019
	_____		_____

Name	Associate Professor Lesley MacDonald-Wicks
Signature	_____
Date	18-12-2019
	_____

By signing below, I, Jie Bai confirm that Cheng Cheng contributed to the study design, ethical approval, data collection and management, data analysis and interpretation, and writing of the following publication:

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doi:10.1111/jocn.15022

Name	Cheng Cheng	Name	Jie Bai
Signature	_____	Signature	_____
Date	Dec 7, 2019	Date	Dec 10, 2019
	_____		_____

Name	Associate Professor Lesley MacDonald-Wicks
Signature	_____
Date	18-12-2019
	_____

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Date	Dec 10, 2019
	_____

# Dedication

For those who have contributed to this work.

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# Chapter 1: Introduction

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This chapter includes an overview of multiple chronic conditions (MCCs) (Sections 1.1–1.3), coping in the context of MCCs (Sections 1.4–1.6), and the necessity for conducting this research (Section 1.7). Section 1.8 describes the aims of this research, and Section 1.9 outlines the remaining chapters of the thesis. The last section is a biography of the candidate.

## 1.1 DEFINITION OF MULTIPLE CHRONIC CONDITIONS

MCCs are coexisting chronic health conditions (Wallace et al., 2015). However, there is no universal consensus about the best way to define and assess MCCs (Almirall & Fortin, 2013). Different operational definitions regarding MCCs are found in the literature, including morbidity, multimorbidity, and MCCs. Most definitions of MCCs address two components: (1) the number of the relevant conditions and (2) which conditions are to be involved (Academy of Medical Sciences, 2018). The present research considers MCCs as two or more chronic conditions that generally last more than a year and need continuous healthcare and/or impair an individual's daily activities (Parekh, Goodman, Gordon, Koh, & Interagency Workgroup on Multiple Chronic Conditions, 2011). MCCs include both physical conditions, such as asthma, chronic respiratory conditions, arthritis and hypertension, as well as mental and cognitive disorders, such as anxiety, addictive behaviour and dementia (United States [US] Department of Health and Human Services, 2010).

## 1.2 EPIDEMIOLOGY OF MULTIPLE CHRONIC CONDITIONS

MCCs affect people from all regions of the world; for example, in 2014, more than 25 per cent of adults from the United States (US) reported having more than two

chronic conditions (Ward, Schiller & Goodman, 2014). In 2015, about 50 per cent of Australians had a chronic condition, of which around 20 percent reported having at least two chronic conditions (Australian Institute of Health and Welfare, 2015). A retrospective cohort study in the United Kingdom (UK) indicated that nearly one-third of participants reported having MCCs (Cassell et al., 2018). A multinational investigation of European people aged 50 years and over showed that over one-third of participants had MCCs, ranging from 25 per cent in Switzerland to 51 per cent in Hungary (Palladino, Tayu Lee, Ashworth, Triassi & Millett, 2016).

Research shows a strong association between the prevalence of MCCs and age (Marengoni et al., 2011). For example, a Canadian longitudinal study found that the prevalence of MCCs increased from 30 per cent among participants aged between 45 and 49 years to 52 per cent among those aged 60 to 64 years (Sakib, Shooshtari, St John, & Menec, 2019). Given that the population of older adults is set to increase significantly, people with MCCs are expected to become more prevalent (Divo, Martinez, & Mannino, 2014).

### **1.3 EFFECTS OF MULTIPLE CHRONIC CONDITIONS**

MCCs pose a substantial health problem to the population affected (Vogeli et al., 2007). Research has shown strong associations between MCCs and poor health outcomes, such as poor perceived quality of life (QoL) (Kanesarajah, Waller, Whitty, & Mishra, 2018), disability (Su et al., 2016), mortality (Nunes, Flores, Mielke, Thume, & Facchini, 2016) and psychological distress (Read, Sharpe, Modini, & Dear, 2017). People with MCCs also have a higher risk of adverse drug reactions due to polypharmacy (Hanlon et al., 2018) and reported a cumulative burden of treatment (Rosbach & Andersen, 2017). Given the complex and multiple needs of people with MCCs, caring for them is a great challenge for healthcare professionals.

A systematic literature review synthesised four domains of difficulty specific to the caring of people with MCCs: fragmented healthcare plans, inappropriate clinical guidelines, difficulties in providing patient-centred care, and barriers to shared decision-making (Sinnott, Mc Hugh, Browne, & Bradley, 2013). Additionally, having MCCs is associated with an increased likelihood of multiple physician visits and emergency visits (Mondor et al., 2017), resulting in potentially costly healthcare and long-term care spending. In the US, it is estimated that more than three-fifths of healthcare expenditure is by people with more than two chronic conditions, and around two-thirds of medical care expenditure by people with more than five chronic conditions (Anderson, 2010). A qualitative study indicated that people with MCCs generally experience a cascade of more complex disease-associated threats, including negative emotions, family conflict, economic burden and adherence to treatment in their everyday life (Loeb, Penrod, Falkenstern, Gueldner & Poon, 2003).

#### **1.4 COPING IN THE TRANSACTIONAL THEORY OF STRESS AND COPING**

Lazarus and Folkman (1984) developed the transactional theory of stress and coping (TTSC) that connected people's stress-related variables with their health outcomes (Lazarus & Folkman, 1984). This theory proposes that health outcomes are 'adaptive' and are conceptualised as either long-term or short-term (Lyon, 2012). Both long-term and short-term outcomes consist of social functioning, life satisfaction, and somatic health (Lyon, 2012). In this theory, stress is considered a series of phenomena comprising cognitive appraisals, stressful feelings, responses, and reappraisals (Lazarus & Folkman, 1984). Stress is experienced when an individual finds it is difficult to manage a situation using their own resources, or when an individual detects some type of harm. The level of stress experienced, including opinions, feelings and

reactions depends on the individual's appraisals of the situation (Lazarus & Folkman, 1984).

The TTSC is a framework that helps to formulate and understand the relationship between stress and people's physical and mental health and depicts a process through which an individual makes continuous appraisals of a situation, resulting in the process of coping (Lazarus & Folkman, 1984). There are three types of appraisal identified in this theory: primary, secondary and reappraisal. Primary appraisal refers to an individual's perceptions regarding a situation. The individual may consider the situation as (1) a threat (a situation with potential harm), (2) a harm (a situation with actual harm) or (3) a challenge (a situation with potential benefit). An individual makes a secondary appraisal if a threat is perceived. Secondary appraisal refers to a process through which an individual adopts specific strategies to deal with the threat and examines the effectiveness of the strategies. Lazarus and Folkman (1984) indicated that primary and secondary appraisals usually occur together and influence each other. Reappraisal refers to a process of assessing and changing primary and secondary appraisals according to each situation.

In Lazarus's TTSC, coping is defined as 'consistently changing cognitive and behavioural effort to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person' (Lazarus & Folkman, 1984, p. 181). The theory suggests that people normally cope with stress using either problem-focused coping or emotional-focused coping strategies (Lazarus & Folkman, 1984). Strategies using problem-focused coping refers to reducing the source of the stress, whereas emotional-focused coping is aimed at managing the emotions that come with the perception of stress (Lazarus & Folkman, 1984). More precisely, individuals use problem-focused coping strategies to reduce the cause of the stressor,

such as tackling problems, medication and obtaining social support. Individuals try to diminish harmful emotional responses caused by stress, such as fear, anxiety, depression and frustration using emotion-focused coping strategies, which may include distraction, prayer and emotion releasing (Aldwin & Yancura, 2004).

## **1.5 COPING AND HEALTH**

Lazarus's TTSC framework conceptualises coping to explain the process of stress amelioration and management. The theory helps to build a relationship between coping and health-related outcomes. Three types of health outcomes were proposed: (1) social functioning, such as work, family and other social activities, (2) life satisfaction, such as emotions and feelings, and (3) somatic health, such as physical ability and psychological wellbeing (Lazarus & Folkman, 1984). A review of coping studies identified four major types of health outcomes, consisting of self-reported health outcomes, biomedical outcomes, illness outcomes and intervention research outcomes (Aldwin & Yancura, 2004). By reviewing the evidence investigating QoL and coping strategies in stroke patients, Lo Buono, Corallo, Bramanti and Marino (2017) found that patients who used more accommodative or active coping strategies reported a better QoL compared with those who used more assimilative coping strategies. Allman, Berry and Nasir (2009) summarised research into depression and coping in heart failure patients and found that patients who used more adaptive coping strategies (e.g., active coping) had less depression, while those who used more maladaptive coping strategies (i.e., denial and disengagement) had more depression. Schaub et al. (2016) conducted a randomised controlled trial to compare the effectiveness between a coping-oriented program and an intensive supportive therapy program in a group of patients with schizophrenia. They found that patients in the coping-oriented program mastered more knowledge about psychosis, had greater

improvements in overall symptoms and reported less psychological distress over the treatment and follow-up period than did patients in the supportive therapy program. Together, since the promise of the construct of coping has been that it moderates the effect of stress on health. The above research has addressed the influences of coping on physical function and psychological well-being, often in the context of chronic health conditions. More specifically, many studies have illustrated that differential use of coping strategies is linked with psychological adjustment with various health-related stressors.

## **1.6 COPING WITH MULTIPLE CHRONIC CONDITIONS**

Chronic conditions not only affect an individual's health, such as loss in their physical, mental and social functioning, but can also result in economic burden involving medication and treatment costs, consultation fees and indirect income loss due to health status (Bauer, Briss, Goodman & Bowman, 2014). For people with MCCs, the cost of healthcare may result in the sale of personal assets and increased debt if spending exceeds their capacity, particularly in low- and middle-income countries (GBD 2015 Disease and Injury Incidence and Prevalence Collaborators, 2016). Living with a chronic condition is potentially a life-threatening problem across the lifespan.

As previously stated, those with MCCs have a higher risk of premature death, more frequent hospitalisations, progressive failure of function, psychological distress and substantial healthcare costs, particularly as co-occurring conditions increase (Fortin et al., 2006; Parekh et al., 2011; Ward et al., 2014). The medication management of MCCs can be problematic; for example, individuals with MCCs may experience adverse drug events caused by polypharmacy (Guthrie et al., 2011). Individuals with MCCs may face treatment burden from attending numerous

appointments, handling different medical regimes and understanding and effectively managing coexisting conditions (Rosbach & Andersen, 2017; van Merode, van de Ven & van den Akker, 2018).

Living with MCCs is a stressful journey full of complexity (Cottrell & Yardley, 2015), requiring an individual to deal with stressors, such as the relationships between multiple conditions, chronic symptoms and negative emotions, and to cope with these stressors at physical, mental and social levels (Löffler et al., 2012). The high prevalence of MCCs along with stressful situations, which are commonly experienced by individuals with MCCs after diagnosis and treatment, underscore the importance of developing interventions to help them cope with these stressful situations and emotions. The availability and accessibility of coping resources significantly affect how those with MCCs manage their chronic conditions (Löffler et al., 2012; Yuen & Vogtle, 2016). Moreover, the physical and psychosocial conditions of individuals with MCCs may vary, in that physical conditions alone may not explain fully the consequences of emotional and physical discomfort and functional impairment. Thus, how individuals appraise and cope with the stress resulting from their MCCs may affect the way they manage their conditions.

As an important determinant in explaining the relationship between stress and health, coping has been studied in a great deal of the literature within the context of chronic conditions, such as dementia (Gilhooly et al., 2016), cancer (Richardson, Schuz, Sanderson, Scott & Schuz, 2017), cardiovascular disease (Trump & Mendenhall, 2017) and diabetes (Duangdao & Roesch, 2008). These studies suggest that knowledge of effective ways of coping with chronic health conditions is important to help individuals with these conditions maintain the best possible physical and mental wellbeing. Further, these studies indicate the feasibility and applicability of

designing a coping-oriented intervention to promote health in populations with MCCs. However, current studies on coping with MCCs usually extrapolate studies on coping with a single chronic condition and there is a paucity of research linking coping to MCCs.

### **1.7 REASONS TO CONDUCT RESEARCH ABOUT MULTIPLE CHRONIC CONDITIONS IN CHINA**

Chronic diseases are a major disease burden in China (Wang, Kong, Wu, Bai, & Burton, 2005), specifically cerebrovascular disease, diabetes, chronic obstructive pulmonary disease and lung cancer (Langenbrunner, Marquez, & Wang, 2011). There were over 260 million people with chronic diseases in China in 2012, and chronic diseases caused 7 million deaths (National Bureau of Statistics of China, 2013). Rates of death caused by chronic diseases in middle aged people were higher in China than in some high-income countries (Strong, Mathers, Leeder, & Beaglehole, 2005). At present, there are no national statistics available for the prevalence of MCCs among the general population in China. A population-based study in southern China reported that more than 11 per cent of people of all ages had MCCs (Wang et al., 2014). Another cross-sectional study of elderly people (54.4% female) in China found that the prevalence of MCCs was 43.6 per cent, with asthma, stroke, heart attack and six other chronic conditions being the main chronic conditions (Zhang, Lu, Shi, Zhang, & Chang, 2019). With the rapidly ageing population in China, MCCs will pose an enormous societal cost because of growing mortality rates and growing healthcare use (Lee, Hamid, Pati, Atun, & Millett, 2015).

As there is no cure for MCCs, one of the greatest challenges for healthcare professionals is how to adapt present clinical guidelines of single chronic disease to MCCs and address compounding needs and demands from individuals with MCCs by

delivering effective healthcare (Guthrie, Payne, Alderson, McMurdo & Mercer, 2012; Wallace et al., 2015). A consensus for treating MCCs in the primary care setting is to implement patient-centred care, including regular reviews of patients' complex problems and developing individualised management plans based on patients' preferences (US Department of Health and Human Services, 2010). The components in the implementation of patient-centred care include consistent inclusive reviews of patients' health problems, a focus on the improvement of QoL, developing and agreeing on an individualized treatment plan, reducing treatment burden such as multiple medications, promoting self-management, and sharing decisions-making with patients (Salisbury et al., 2018). Also, healthcare professionals' team should be multi-disciplinary and the responsibility for coordinating care should be clarified (Salisbury et al., 2018).

The biggest challenge for people with MCCs is how to manage their chronic health conditions effectively. Based on Lazarus's TTSC, facilitating coping-based interventions to foster coping strategies could help individuals with MCCs reduce their distress and tackle their problems. Some studies found that coping-based interventions have provided a promising means of improving coping and reducing the negative consequences of illness among people with other chronic health conditions (Broderick et al., 2014; Douglas et al., 2019). However, to date, existing research into coping in the context of MCCs has predominantly focused on Western population groups. There is an absence of such data from China, highlighting a vital research gap given the fast increase in MCCs in China. Further, as a developing country, China has different chronic conditions profiles (World Health Organization, 2014) and healthcare delivery models for chronic conditions (Lall, Engel, Devadasan, Horstman & Criel, 2018). For

example, people with MCCs in China are regularly treated by different medical specialists in hospitals for each chronic condition (Yip & Hsiao, 2008).

Culture shapes the way of coping (Revenson & Lepore, 2012), and individuals adopt personal strategies in the context of their culture to cope with life-threatening situations (Lam & Zane, 2004). Culture also offers a unique context for the types of stressors that individuals are likely to experience. For example, culture may affect the appraisal process of the stressor, further influencing coping strategy choices (Chun, Moos & Cronkite 2006). Crucially, culture provides various forms of coping resources. Existing studies of stress and coping in chronic conditions are mainly conducted in Western countries using Caucasian populations. There is a paucity of research into how culture may influence coping with MCCs, especially in Asian settings (Chun et al., 2006). Existing coping studies involving Chinese cohorts generally used quantitative designs (e.g., a cross-sectional survey) to identify coping styles and coping strategies (He et al., 2019; Hong, Wei & Wang, 2015; Lam, Ng, Pan & Young, 2015; Zou, Hu & McCoy, 2014), while the experiences of coping and probable cultural effects were ignored along with the theoretical and clinical implications among people with MCCs.

## **1.8 RESEARCH AIMS**

The present research was to investigate coping among Chinese people with MCCs. This research had the following aims:

1. To evaluate the reliability and validity of the Brief Coping Orientation to Problems Experienced (COPE) inventory in identifying the coping strategies of Chinese people with MCCs;

2. To identify coping strategies and socio-demographic characteristics, MCC-related characteristics, illness perception, and QoL among Chinese people with MCCs and examine the relationship between these variables;
3. To describe the experiences of coping with MCCs in Chinese people;
4. To explore the cultural effects on coping among Chinese people with MCCs.

## **1.9 THESIS OUTLINE**

The present thesis comprises eight chapters. Chapter 1 introduces chronic conditions, MCCs, coping, and this research. Chapters 2 critically reviews the literature relating to coping and MCCs. Part 1 is an integrative literature review that summarises the current evidence of coping in people with MCCs with an emphasis on the role of culture. Part 2 is a meta-ethnography review of patients' experiences of coping with MCCs. The findings of Chapter 2 were used to inform the quantitative and qualitative phases of this research, and the findings from the meta-ethnography informed the qualitative phase of this research.

Chapter 3 describes the methodology and methods of this research. This chapter starts with a discussion of paradigm considerations, then justifies using a mixed methods design before ending by detailing each phase conducted. Chapter 4 addresses aim 1 and presents the validation phase of this research. This chapter reports the findings of a validation study on the Chinese version of the Brief COPE inventory among people with MCCs.

Chapters 5 is based on the quantitative phase of this research for the research aim 2. Part 1 outlines the findings regarding the relationship between illness perceptions, coping, and QoL in Chinese adults with MCCs. The remaining parts are two secondary analysis papers of the quantitative data, one of which highlights the

varied mental health between urban and rural populations with MCCs and shows that rural participants' mental health is worse. The other paper reports the association between socio-demographic variables, clinical variables, physical function and coping strategies for levels of anxiety and depression in Chinese older adults with MCCs.

Chapter 6 reports the qualitative phase of this research and addresses the research aims 3 and 4. The paper included in this chapter used a qualitative method to provide a detailed description of the experiences of coping with MCCs, including illness perspectives, coping strategies and encountered challenges.

Chapter 7 integrates the quantitative and qualitative findings, serving as a general discussion of the project and drawing implications for further research directions and clinical practice. Chapter 8 delivers a succinct summary of this thesis.

Table 1.1 provides an abridged summary of chapters involving publications or manuscripts submitted for publication.

Most chapters in this thesis contain contents that have been published or are submitted for publication. Papers involving in each chapter adhere to the journal's instructions. All published papers are reprinted with the permission of John Wiley & Sons, Inc.

Table 1.1

*Contents in each chapter of this thesis*

Chapter	Publication/manuscript included
Chapter 2: Literature review	<p>Cheng, C., Inder, K. and Chan, S. W. (2020), Coping with multiple chronic conditions: An integrative review. <i>Nursing &amp; Health Science</i>. doi:10.1111/nhs.12695</p> <p>Cheng, C., Inder, K., &amp; Chan, S. W. (2019). Patients' experiences of coping with multiple chronic conditions: A meta-ethnography of qualitative work. <i>International Journal of Mental Health Nursing</i>, 28(1), 54–70. doi:10.1111/inm.12544</p>
Chapter 4: The validation study	Cheng, C., Yang, C. Y., Inder, K., and Chan, S. W. (2020). <i>Psychometric properties of the Brief COPE in people with multiple chronic conditions</i> . Revised manuscript under review in the International Journal of Nursing Practice. Submitted on April 16, 2020.
Chapter 5: The cross-sectional study	Cheng, C., Yang, C. Y., Inder, K., and Chan, S. W. (2020). Illness perceptions, coping strategies, and quality of life in people with multiple chronic conditions. <i>Journal of Nursing Scholarship</i> , 52(2), 145–154. doi:10.1111/jnu.12540

Chapter	Publication/manuscript included
	<p>Cheng, C., Yang, C. Y., Inder, K., &amp; Chan, S. W. (2019). Urban-rural differences in mental health among Chinese patients with multiple chronic conditions. <i>International Journal of Mental Health Nursing</i>, 29(2), 224–234. doi:10.1111/inm.12666</p> <p>Cheng, C., Inder, K., and Chan, S. W. (2020). <i>The relationship between coping strategies and psychological distress in Chinese older adults with multiple chronic conditions</i>. Manuscript under review in the Australasian Journal on Ageing. Submitted on March 1, 2020.</p>
Chapter 6: The qualitative study	<p>Cheng, C., Bai, J., Yang, C. Y., Li, M., Inder, K., &amp; Chan, S. W. (2019). Patients' experiences of coping with multiple chronic conditions: A qualitative descriptive study. <i>Journal of Clinical Nursing</i>, 28(23/24), 4400–4411. doi:10.1111/jocn.15022</p>
Chapter 7: Integration of quantitative and qualitative data and discussion	<p>Cheng, C., Inder, K., and Chan, S. W. (2020). <i>To understand coping, illness perception and quality of life among Chinese people with multiple chronic conditions: An explanatory sequential mixed methods study</i>. Unpublished manuscript submitted for publication. Submitted on July 12, 2020.</p>

## **1.10 CANDIDATE'S BIOGRAPHY**

The candidate is a former lecturer in the Department of Nursing at Bengbu Medical College, Bengbu, China. He has an MSc from the Faculty of Health and Life Sciences at Linnaeus University, Vaxjo, Sweden and a BMed from Qiqihar Medical College, Qiqihar, China.

The candidate's interests focus on the improvement of physical function and quality of life among people with chronic diseases through health promotion programs. In particular, he is interested in the role of coping in explaining health among people with multiple chronic conditions, which is a significant area of research, but under-researched currently.

## 1.11 REFERENCES

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Allman, E., Berry, D. & Nasir, L. (2009). Depression and coping in heart failure patients: A review of the literature. *Journal of Cardiovascular Nursing*, 24(2), 106–117. doi:10.1097/JCN.0b013e318197a985

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# Chapter 2: Literature review

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## 2.1 INTRODUCTION

Chapter 2 consists of two reviews that aim to present the findings of current published evidence about coping in the context of MCCs and help to identify gaps in the current knowledge to guide future research. The first is an integrative literature review and the other is a meta-ethnography of qualitative research. The rationale for the second review is that there is a majority of the included studies adopted a qualitative design based on the results of the integrative review. Hence, a synthesis on those qualitative studies could provide more insights on this topic and might inform further research.

### **1. An integrative literature review**

Given the chronic nature of MCCs, the coping style of affected individuals may influence their health outcomes. Comparatively few reviews have been conducted on coping and MCCs. Informed by TTSC, a comprehensive integrative review was conducted based on the published literature on how people with MCCs cope with their chronic conditions.

### **2. A meta-ethnography of qualitative research**

The number of people affected by MCCs is increasing and is straining healthcare systems worldwide. Observational research has indicated that having MCCs is associated with negative health outcomes. The lived experiences of patients coping with MCCs are likely to be imperative to self-management, and such insights can be used to tailor healthcare provisions to the needs of this population. This review sought

to understand the lived experiences of coping with MCCs based on a review of qualitative studies.

## **2.2 OUTPUT OF THIS CHAPTER**

This chapter was disseminated in the papers as:

Cheng, C., Inder, K. and Chan, S. W. (2020), Coping with multiple chronic conditions: An integrative review. *Nursing & Health Science*.  
doi:10.1111/nhs.12695

Cheng, C., Inder, K., & Chan, S. W. (2019). Patients' experiences of coping with multiple chronic conditions: A meta-ethnography of qualitative work. *International Journal of Mental Health Nursing*, 28(1), 54–70.  
doi:10.1111/inm.12544

## **2.3 SIGNIFICANCE AND CONTRIBUTION TO THE RESEARCH**

These literature reviews helped to gain an in-depth understanding of the existing research and debates relevant to coping with MCCs, and presented that knowledge in a structured way. Based on these reviews, knowledge gaps were identified, and research directions of the current research were refined and elucidated.

# Part 1 Coping with multiple chronic conditions: An integrative review

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## **ABSTRACT**

There is a paucity of summarized evidence concerning coping with multiple chronic conditions. An integrative review approach was employed to synthesize current evidence on: (1) coping in forms of perceptions and strategies, (2) relationship between coping and health-related outcomes, and (3) factors related to coping. Five electronic databases were searched without time limitation. Thirty-two studies met inclusion criteria and were included for full-text review: 24 qualitative, seven quantitative, and one mixed methods study. Studies were assessed for quality using an appraisal system of rigour and relevance. A constant comparison method was used to synthesize findings from eligible studies. This review synthesized perceptions of multiple chronic conditions involving negative moods and physical limitations, and strategies of coping with multiple chronic conditions including problem-focused and emotion-focused strategies. Findings suggested that coping is a promising path to manage multiple chronic conditions and emphasized that appropriate coping might have positive impacts on health-related outcomes. Five impact factors including age, gender, clusters of multiple chronic conditions, social support, and ethnicity and culture were associated with people's coping. Future healthcare plans should address the physical and psychological needs of people with multiple chronic conditions and highlight the importance of modifying their illness perceptions and enhancing appropriate coping strategies.

**Keywords:** Adaptation, coping, multiple chronic conditions, multimorbidity

## INTRODUCTION

### **Multiple chronic conditions**

Most people with chronic health conditions have more than one condition. Multiple chronic conditions (MCCs) are defined as two or more coexisting chronic conditions in the same person (Benjamin, 2010). MCCs represent physical conditions such as asthma, diabetes, and hypertension, as well as mental and cognitive disorders such as anxiety, addictive behaviour, and dementia (Parekh, Goodman, Gordon, & Koh, 2011).

MCCs are becoming increasingly prevalent worldwide. More than 25% of adults in the United States (US) reported having more than two chronic health conditions (Ward, Schiller, & Goodman, 2014). The Australia National Health Survey (2014–2015) showed that about 50% of Australians had a chronic condition, of which around 20% of respondents reported at least two chronic conditions (Australian Institute of Health and Welfare, 2016). MCCs are more common in the older population compared with the general population. A systematic review indicated the prevalence of MCCs ranged from 20% to 30% for the whole population and from 55% to 98% for populations older than 65 years (Marengoni et al., 2011). The high prevalence of MCCs is mostly attributed to the increasing prevalence of chronic conditions and increasing life expectancy (Vancampfort et al., 2017). This high prevalence of MCCs is one of the most crucial public health concerns faced by the healthcare system worldwide (Salisbury, 2012).

People with MCCs may be overwhelmed by many challenges posed by their chronic conditions. These challenges can be triggers of significant stress and are affected by stress in other areas of individuals' lives. People with MCCs may experience physical, psychosocial, and spiritual challenges that lead to deterioration

of their health status. A literature review synthesized seven common challenges experienced by people with MCCs, which included fragmented healthcare, multiple medications, adherence to treatment, psychological distress, loss of function, decreased quality of life (QoL), and increased healthcare utilization (Wallace et al., 2015). Caregivers may also be adversely affected by the burden of providing health and social care for their care recipients with MCCs (Andersson, Ekwall, Hallberg, & Edberg, 2010).

### **The transactional theory of stress and coping**

Managing stress such as MCCs requires individuals to resolve a stressful situation and deal with any emotional reactions triggered by the situation—that is, individuals with MCCs need to learn how to cope with their chronic health conditions. The transactional theory of stress and coping developed by Lazarus and Folkman (1984) is a framework that focuses on individuals' appraisals to assess stress (primary appraisal), which leads to the process of coping (secondary appraisal). According to Lazarus and Folkman (1984), the primary appraisal is a process of assessing how stressful an event is for a person, whereas secondary appraisal is a dynamic process with cognitive appraising and behaviour tailoring: an individual's active adjustment to internal and/or external changes (stress).

The secondary appraisal, known as coping, is referred to as an individual's changing cognitive and behavioural efforts to manage a stressful situation that exceeds one's capacity according to the transactional theory of stress and coping (Lazarus, 1966; Lazarus & Folkman, 1984). The transactional theory proposes that individuals normally cope with stress using problem-focused coping strategies and emotion-focused coping strategies (Lazarus & Folkman, 1984). Problem-focused coping represents strategies to reduce the source of the stress, whereas emotion-focused

coping is aimed at managing the emotions that come with the perception of stress (Lazarus & Folkman, 1984). More precisely, people use problem-focused coping strategies to manage the cause of the stressor, including tackling problems, taking medication for health conditions, and obtaining social support. On the other hand, people manage the harmful emotional responses caused by stress (such as fear, distress, and frustration), by using emotion-focused coping strategies (such as distraction, prayer, and emotion releasing). Individuals usually deal with stress by adopting both problem-focused and emotion-focused coping strategies.

Both theoretical and empirical literature shows a strong link between coping and people's physical and psychological health. For example, Li and Shun (2016) conducted a systematic review and found that emotion-focused coping with acceptance, and disavowal together with problem-focused coping might promote self-care activities among people with chronic heart failure. Self-management programs informed by coping theories have been designed to facilitate coping in people with chronic health conditions. Examples include, helping to improve the understanding of diseases and their treatment (Nahlén Bose et al., 2016), fostering coping strategies for dealing with stress (such as emphasizing the roles of cognitive appraisal and coping strategies to keep a positive attitude and respond to stressful situations in a more positive way) (Ye, Yu, Zhu, Chen, & Lin, 2018), and managing symptoms (such as developing a behaviour-tailoring plan to increase access to psychological treatment) (Bennell et al., 2016).

### **The present review**

Existing evidence supports the significant role of coping in explaining physical health and psychological well-being among people with chronic conditions. However, most studies investigated one single chronic condition because most clinical practice

guidelines were designed for the management of individual conditions (Millar, Dowell, Lawrenson, Mangin, & Sarfati, 2018). Even though the coping theory has been applied in research on chronic health conditions in different ways, evidence about coping in the context of MCCs is limited. Given the prevalence of MCCs globally, a review of the current evidence on how people cope with MCCs is necessary to better understand the process of adaptation to MCCs and to advise further research on MCCs. Moreover, past reviews on coping and chronic health conditions mainly investigated the associations between the use of coping strategies and health but lacked a focus on the primary appraisals in people's coping (Graven & Grant, 2013). As a result, informed by Lazarus's coping theory, the present review intended to underscore the importance of two core components in the framework of coping and stress: primary appraisals and coping; and identify the influence of coping on health-related outcomes in people with MCCs and factors that may impact individuals' coping.

In this review, primary appraisals were conceptualized as an individual's perceptions that assess whether what is happening could be stressful, harmful, or threatening, and coping refers to strategies that people adopt to manage feelings and behaviour encountered during various stages of managing MCCs. Health-related outcomes include quantity of life (e.g. mortality), process-based health outcomes (e.g. readmission rates), QoL includes physical, mental, and social dimensions, and satisfaction with healthcare services (Sansoni, 2016). Factors relevant to coping include socio-demographic factors (e.g. age and gender), characteristics of MCCs (e.g. stage of disease), and available support and information, self-efficiency, and empowerment (Gage, 1992).

## **METHODS**

An integrative review approach was chosen because it allows the inclusion of both empirical and theoretical studies to explore the phenomenon of coping with MCCs using diverse methodologies and perspectives (Whittemore & Knafl, 2005). A five-step procedure proposed by Whittemore and Knafl (2005) was followed: (1) identifying the research questions, (2) conducting a comprehensive literature search, (3) examining the collected data, (4) synthesizing the extracted data, and (5) reporting the findings.

### **Review questions**

The review questions were: (1) What are perceptions of chronic health conditions among people with MCCs? (2) What strategies are adopted by people with MCCs to cope with their chronic health conditions? (3) What are the associations between coping and health-related outcomes among people with MCCs? and (4) What are the potential impact factors regarding coping in this population?

### **Search methods**

The search strategy developed by a prior integrative review on coping and health outcomes in people with chronic diseases (Graven & Grant, 2013) guided this review. An electronic search was conducted in five electronic databases: PubMed, CINAHL, EMBASE, Cochrane Library, and PsycINFO. No restrictions were applied to the publication period. Keywords used were: ‘appraisal-focused’, ‘problem-focused’, ‘emotion-focused’, ‘occupation-focused’, ‘meaning-focused’, ‘coping’, ‘coping behaviour’, ‘coping strategy’, ‘coping style’, ‘coping model’, and ‘coping pattern’. Combined keywords used were: ‘multiple chronic conditions’, ‘multiple chronic diseases’, ‘multiple chronic illnesses’, ‘comorbidity’, ‘multimorbidity’, ‘chronic conditions’, ‘chronic diseases’, and ‘chronic illness’. Reference lists of selected

literature were searched to identify potential studies and an additional search of a relevant journal (Journal of Comorbidity) was undertaken to minimize missing relevant literature.

An example of a search in the PubMed database was given:

#1: search ('adaptation, psychological' [MeSH Terms] OR coping [Text Word])

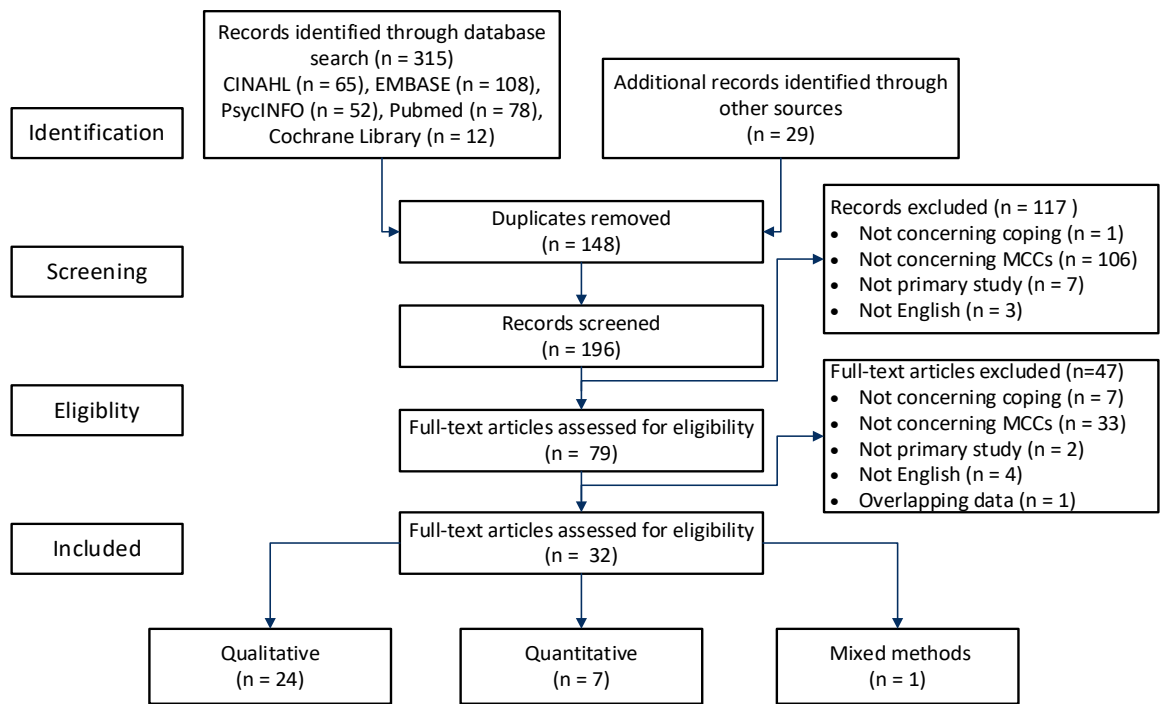
#2: search (((((chronic disease\*) OR chronic illness\*) OR chronic conditions) OR ('comorbidity' [MeSH Terms] OR comorbidity [Text Word])) OR ('comorbidity' [MeSH Terms] OR multimorbidity [Text Word])) OR ('multiple chronic conditions' [MeSH Terms] OR multiple chronic conditions [Text Word])

#3: #1 and #2

Studies that met the following criteria were eligible: (1) investigated aspects of coping and MCCs, (2) focused on adult patients aged 18 years and older, (3) published in English, and (4) based on original research. Published editorials, discussions, commentaries, opinions, views, or textbooks, unpublished manuscripts (abstract, poster, and conference oral report), and papers that focused on patients under 18 years old were excluded. The candidate read titles and abstracts of each paper and made the decision to include papers in the review according to the above criteria. The supervisors checked the accuracy of the inclusion. All disagreements were resolved by regular meetings with all authors.

The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) diagram (Moher, Liberati, Tetzlaff, Altman, & Group, 2009) is presented to show the study selection process (see Figure 1). A checklist guided the screening process to determine study eligibility (see Screening checklists). The initial search identified 315 references: CINAHL (n = 65), EMBASE (n = 108), PsycINFO (n = 52),

PubMed (n = 78), and Cochrane Library (n = 12). The additional search of reference lists identified 29 studies. Following the removal of duplicates (n = 148), the titles, abstracts, and keywords of 196 studies were screened for relevance. Studies that did not meet the inclusion criteria were removed (n = 117). The remaining studies (n = 79) were retrieved in full-text and checked for eligibility, with additional studies (n = 47) removed as they were not eligible. Thirty-two studies remained for the final analytical stage.



*Figure 2.1* Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flow diagram for search strategy on multiple chronic conditions (MCCs) and coping (Moher, Liberati, Tetzlaff, Altman, & Group, 2009)

### **Data examination**

This review examined eligible studies using a two-criterion scale of research quality (high, moderate, or low) and data relevance (yes or no), which is suggested by Whitemore and Knafl (2005). For research rigour, a quality scoring system was adapted from a past integrative review (Loureiro, Figueiredo, & Charepe, 2019) supplemented by new items including ethical issues, rigour of data collection, and analysis, interpretation, and research implications (see Table 2.1). Quality scores ranged from 0 to 7 ('Yes' = 1 and 'Unclear/No' = 0) and were summarized into three categories: low quality (0–3); moderate quality (4–5); and high quality (6–7). Data relevance was checked by three questions about whether the study focused on: (1) coping by adults with MCCs, (2) potential associations between coping strategies and health-related outcomes, and (3) potential factors related to coping. A study was considered relevant if at least one of the three questions was assigned a 'yes'. A high score indicates a high quality of research and strong evidence contributing to the current review. Studies with low quality (0–3) or irrelevant data would be excluded. However, no study was excluded from this review. Eligibility was checked and any discrepancy was deliberated until consensus was reached.

Table 2.1

*Critical appraisal forms for eligible studies in integrative review about multiple chronic conditions (MCCs) and coping\**

No	Citation	Methodological rigour							Total scores	Data relevance
		Research aims	Sample	Ethics considerations	Data collection	Data analysis	Interpretation of outcomes	Research implications		
1	Al-Amer et al. (2015)	1	1	1	1	0	1	1	6	Yes
2	Assari (2014)	1	1	1	0	1	1	1	6	Yes
3	Boeckxstaens et al. (2012)	1	1	1	1	1	1	1	7	Yes
4	Coventry et al. (2014)	1	1	1	1	1	1	1	7	Yes
5	Di Benedetto et al. (2014)	1	1	1	1	1	1	1	7	Yes
6	Eckerblad et al. (2015)	1	1	1	1	1	1	1	7	Yes
7	Elliott et al. (2007)	1	1	1	0	1	1	1	6	Yes
8	Fix et al. (2014)	1	1	1	1	1	1	1	7	Yes
9	Hillege et al. (2008)	1	1	1	1	0	1	1	6	Yes
10	Holloway et al. (2018)	1	1	1	1	1	1	1	7	Yes
11	Kristofferzon et al. (2018)	1	1	1	1	1	1	1	7	Yes
12	Lekas et al. (2011)	1	1	1	1	1	1	1	7	Yes
13	Lind et al. (2015)	1	1	1	0	1	1	1	6	Yes
14	Loeb et al. (2003)	1	1	1	1	1	1	1	7	Yes
15	Löffler et al. (2012)	1	1	1	1	1	1	1	7	Yes
16	Molefe and Duma (2009)	1	1	1	1	1	1	1	7	Yes
17	Morris et al. (2011)	1	1	1	1	0	1	1	6	Yes
18	Naganathan et al. (2016)	1	1	1	1	1	1	1	7	Yes

No	Citation	Methodological rigour							Total scores	Data relevance
		Research aims	Sample	Ethics considerations	Data collection	Data analysis	Interpretation of outcomes	Research implications		
19	Nyhlin (1990)	1	1	1	1	1	1	1	7	Yes
20	Ridgeway et al. (2014)	1	1	1	1	1	1	1	7	Yes
21	Roberto et al. (2005)	1	1	1	1	1	1	1	7	Yes
22	Safa et al. (2014)	1	1	1	0	0	1	0	4	Yes
23	Sells et al. (2009)	1	1	1	1	1	1	1	7	Yes
24	Smith et al. (2009)	1	1	1	1	1	1	1	7	Yes
25	Stanners et al. (2014)	1	1	1	1	0	1	1	6	Yes
26	Townsend et al. (2006)	1	1	1	1	1	1	1	7	Yes
27	Van Wissen et al. (2017)	1	1	1	1	1	1	1	7	Yes
28	Ward (2011)	1	1	1	1	1	1	1	7	Yes
29	Warren-Jeanpiere et al. (2014)	1	1	1	1	1	1	1	7	Yes
30	White et al. (2016)	1	1	1	1	1	1	1	7	Yes
31	Whiting et al. (2006)	1	1	1	1	0	1	1	6	Yes
32	Yorgason et al. (2010)	1	1	1	1	1	1	1	7	Yes

\* In alphabetical order by name of the first author.

### **Data extraction and synthesis**

Data were extracted from the included studies to describe their characteristics and key findings into a comprehensive matrix. The candidate did the initial extraction, and the others checked the accuracy. Extracted data included information on the citation, place of study, design, aim, sample, MCCs clusters, data collection/measures, and key findings.

A constant comparison method was used to order, code, and summarize the primary data from the included literature. This method is a data-analytic procedure where each finding is compared with existing findings (Lewis-Beck, 2004). The collected data is broken down into distinct ‘units’ and those ‘units’ are then coded into categories. The present review adhered to a four-step process: *(1) comparing incidents applicable to each category, (2) integrating categories and their properties, (3) delimiting the theory, and (4) writing the theory* (Miles & Huberman, 1994). The candidate coded every incident in eligible studies that aligned with the formulated research questions into categories. Each incident in a category was compared with prior incidents in the same categories and possible differences between incidents were noted. Generated categories were refined by repeating coding several times and the relationship between categories were explored. Finally, categories were integrated and presented in a logical way as per the research aims. Irrelevant categories (e.g. not covered by research questions) were excluded.

### **Findings presentation**

This last step of the review procedure was to present the findings, addressing the topics that contribute to answering the research questions.

## RESULTS

### Study characteristics

There were 32 eligible studies: 24 qualitative studies, seven quantitative studies, and one mixed-methods study. Studies originated from: US (n = 12), Australia (n = 5), Sweden (n = 4), United Kingdom (n = 4), Belgium (n = 1), Botswana (n = 1), Canada (n = 1), Germany (n = 1), Iran (n = 1), Jordan (n = 1), and New Zealand (n = 1). The publication period ranged from 1990 to 2018. Data matrices were prepared to present core data and data quality from each study (see Table 2.2).

Table 2.2

*Summary of included studies in integrative review about multiple chronic conditions (MCCs) and coping\**

No	Citation, place of study	Design	Aims	Sample and ethnicity	Clusters of MCCs	Data collection / measures	Key findings
1	Al-Amer et al. (2015), Jordan	Qualitative component in a mixed methods design	To describe reactions to diagnosis of T2DM among Jordanian people with co-existing depression.	15 patients (female n = 10), aged 36-73 years. Ethnicity not stated.	Type 2 diabetes and depression	Interviews	Patients had negative mental reactions to MCCs and religious coping helped adapt to having MCCs.
2	Assari (2014), US	Cross-sectional	To find out the main and buffering effects of positive religious coping on the association between the number of chronic medical conditions and major depressive disorder among African Americans, Caribbean Blacks and Non-Hispanic Whites.	3570 African Americans (56% female, age $42.3 \pm 14.5$ ), 1438 Caribbean Blacks (51% female, age $40.3 \pm 5.8$ ), 891 Non-Hispanic Whites (53% female, age $45.0 \pm 31.1$ )	Physical chronic health conditions such as cancer, hypertension, and diabetes and depression	Socio-demographic characteristics, number of chronic medical conditions, positive religious coping, mental health outcome	Interactions were significant between physical conditions and mental conditions among MCCs patients. Religious coping could buffer the association between major depressive disorder and physical chronic conditions among Caribbean Blacks.
3	Boeckxstaens et al. (2012), Belgium	Qualitative design	To explore perspectives of patients with COPD and comorbidities in primary care.	7 patients (3 female), age not stated. Ethnicity not stated.	COPD with comorbidities	Interviews	Patients with MCCs cope actively focusing on their health status. Knowledge about MCCs was insufficient and locus of control was reported. To deal with MCCs, several coping strategies were developed.

No	Citation, place of study	Design	Aims	Sample and ethnicity	Clusters of MCCs	Data collection / measures	Key findings
4	Coventry et al. (2014), UK	Phenomenology	To explore the lived experience of people with mental-physical MCCs.	32 patients (17 female), aged 32-82 years. Ethnicity not stated.	Physical chronic health conditions and depression	In-depth, semi-structured interviews	MCCs had negative impacts on patients' perceptions of time and space, which may result in uncertainty and poor well-being.
5	Di Benedetto et al. (2014), Australia	Cross-sectional	To evaluate the role of coping resources, depression, diet and exercise on mental and physical health status.	113 patients (50% female, n = 59), mean age $59.4 \pm 10.5$ years. Ethnicity not stated.	Physical chronic conditions and depression	Socio-demographic and lifestyle behaviour, HADS, CRI, and SF-36	Higher coping resources were related to better mental health and had an indirect effect through depression levels on mental health. Higher levels of coping resources predicted less depression and were linked with higher exercise levels.
6	Eckerblad et al. (2015), Sweden	Qualitative descriptive design	To explore the experiences of living with symptom burden from people with MCCs.	20 patients (16 female), mean age $84 \pm 2.9$ years. Ethnicity not stated.	Physical chronic conditions	Semi-structured interviews	Patients experienced a substantial disease burden from MCCs. Major theme 'to adjust and endure' showed that patients had to deal with MCCs without other options. Three subthemes described the incapacity of managing MCCs, feeling of isolation, and loss of control.

No	Citation, place of study	Design	Aims	Sample and ethnicity	Clusters of MCCs	Data collection / measures	Key findings
7	Elliott et al. (2007), US	Qualitative design	To explore how older adults with MCCs make choices about medicines.	20 patients (12 female), mean age 67 years. Ethnicity not stated.	Physical-mental chronic health conditions	Semi-structured interviews	Effectiveness of medicine and risks of MCCs make patients prioritize their medicines. Factors leading to non-adherence were costs and side effects. Choices were usually affected by one factor, and patients rarely reported making choices between different factors.
8	Fix et al. (2014), US	Qualitative design	To explore the barriers to self-management among people with hypertension and comorbidities.	48 patients (5 female), mean age $60 \pm 10.3$ years. Ethnicity not stated.	Hypertension with other physical-mental chronic health conditions	Semi-structured interviews	Four influencing factors interfered with MCCs management: (1) interdependence, (2) low priority, (3) conflicts, and (4) multiple medications.
9	Hillege et al. (2008), Australia	Case study analysis	To describe the perspectives of people with the chronic conditions of type 1 diabetes and eating disorders.	4 female patients, aged 18-30 years. Ethnicity not stated.	Type 1 diabetes and eating disorder	In-depth, semi-structured interviews	Managing the complexity of chronic conditions interacted with physical, emotional, social dimensions, and personal relationships.

No	Citation, place of study	Design	Aims	Sample and ethnicity	Clusters of MCCs	Data collection / measures	Key findings
10	Holloway et al. (2018), Australia	Single group, pre and post-intervention	To examine the feasibility and effectiveness of Problem-Solving Treatment for Primary Care (PST-PC) in patients with low-vision rehabilitation (LVR) and depressive symptoms.	62 patients (73% female, n = 40), mean age 62.2 ± 17.6 years. Ethnicity not stated.	Vision impairment and physical chronic health conditions	Feasibility was examined by participant acceptance and intervention retention. Effectiveness was examined by PHQ-9, AQoL-7D, and CSE.	Participant recruitment and retention rates were 71% and 40%, respectively. Seventy percent of LVR practitioners completed training in PST-PC and showed satisfactory levels of fidelity and competency. After the intervention, participants showed a 53% improvement in depressive symptoms ( $p < .001$ ), a 23% improvement in QoL ( $p = .001$ ), and an 18% improvement in confidence using problem-focused coping strategies ( $p = .001$ ).
11	Kristofferzon et al. (2018), Sweden	Cross-sectional	To examine relationships between sense of coherence, emotion-focused coping, problem-focused coping, coping efficiency, and mental quality of life in patients with chronic conditions.	347 participants (345 with MCCs), 36.5 % female (n = 127), mean age 69.1 ± 12.5 years. Ethnicity not stated.	Physical chronic health conditions	SOC, JCS-60, MCS, and coping efficiency in managing physical, psychological, social, and existential aspects of daily life.	Coping strategies used and the effectiveness of coping could mediate the relationship between sense of coherence and mental health in patients with chronic conditions.

No	Citation, place of study	Design	Aims	Sample and ethnicity	Clusters of MCCs	Data collection / measures	Key findings
12	Lekas et al. (2011), US	Qualitative design	To explore the experience of stigma among former and current injecting drug users with both HIV and HCV.	132 patients (31% female), aged 30-69 years. African-American and Puerto Rican.	HIV and HCV	Interviews	Patients compared the stigmas from the two diseases, prioritized them and perceived their HIV as more stigmatizing than their HCV.
13	Lind et al. (2015), Sweden	Cross-sectional	To identify the relationships between the use of different coping strategies and perceived social support in patients with asthma and allergy.	Phase 1: low severity group (n = 124, 62.9% female, mean age 42.5 ± 14.8), high severity (n = 63, 66.7% female, mean age 45.5 ± 17.4) Phase 2: low severity group (n = 57, 59.6% female, mean age 44.1 ± 16.0), high severity (n = 37, 64.9% female, mean age 44.6 ± 16.7). Ethnicity not stated.	Asthma and allergy	Frequency of asthma and allergy symptom exacerbation, previous used coping instrument, questions regarding social support.	Phase 1: Avoiding negative environments and accepting one's situation were most commonly used coping strategies. Coping strategies did not differ by severity. Phase 2: Participants perceived more emotional than instrumental and informative support. Findings in phase 2 were not relevant to coping.

No	Citation, place of study	Design	Aims	Sample and ethnicity	Clusters of MCCs	Data collection / measures	Key findings
14	Loeb et al. (2003), US	Qualitative design	To explore the coping strategies of managing daily life in older adults in with MCCs.	37 patients (70% female), aged 55-88 years. Caucasian.	MCCs	Focus group interview	Coping strategies identified: (1) assistance of health care staff, (2) medication, (3) exercise, (4) modifying dietary habits; (5) seeking information, (6) manage psychological well-being, (7) focusing on life, and (8) social networks.
15	Löffler et al. (2012), Germany	Qualitative design	To explore the coping strategies of patients with MCCs.	19 patients (13 female), mean age 75 years. Ethnicity not stated.	MCCs, at least one musculoskeletal condition	In-depth interviews	Older patients with MCCs had positive views of their lives. Coping strategies were identified at the social, emotional, and practical levels.
16	Molefe and Duma (2009), Botswana	Qualitative design with a phenomenology approach	To explore the experience of living with both HIV/AIDS and cervical cancer.	6 female patients, age (unclear). Ethnicity not stated.	HIV and cancer	Semi-structured interviews and field notes	MCCs increased chronic emotional pain. Reactions to diagnoses included pain, fear or intense sadness. Coping strategies included acceptance, hope, support from others and positive reframing. Support was from children, family members, informal or formal groups and health professionals.

No	Citation, place of study	Design	Aims	Sample and ethnicity	Clusters of MCCs	Data collection / measures	Key findings
17	Morris et al. (2011), UK	longitudinal qualitative design	To explore how people experience MCCs.	21 patients (10 female), aged 36-84 years. Ethnicity not stated.	Physical chronic conditions	Semi-structured interview	Patients reported a dynamic process of prioritizing MCCs reflected in relationships with health professionals and how patients framed illness and lifestyle changes. Medication management was a major strategy for managing MCCs.
18	Naganathan et al. (2016), Canada	Qualitative design	To explore the value of informal and formal supports for older adults with multi-morbidity.	27 patients (43% female), mean age 82.3 $\pm$ 7.7. Ethnicity not stated.	MCCs	Semi-structured interviews	Informal and formal support for patients with MCCs might promote independence and decrease caregivers' burden. Patients with MCCs might more rely on informal support.
19	Nyhlin (1990), Sweden	Qualitative design with a grounded theory approach	To obtain an understanding of coping strategies used by diabetic patients facing long-term complications.	14 patients (8 female), aged 26-62 years. Ethnicity not stated.	Type 1 diabetes and other chronic health conditions	Unstructured interview	Three themes including coming to terms, keeping going, and making sense constitute the framework of the coping process for MCCs.

No	Citation, place of study	Design	Aims	Sample and ethnicity	Clusters of MCCs	Data collection / measures	Key findings
20	Ridgeway et al. (2014), US	Qualitative design	To explore views of treatment burden of patients with multi-morbidity and its impacts.	50 patients (29 female), aged 25-85 years. White and African-American.	Physical-mental chronic health conditions	Semi-structured interview and focused groups	Five main coping strategies lessened the burden of MCCs: (1) problem-focused strategies, (2) emotion-focused coping strategies, (3) adaptation, (4) social support, and (5) keep independent.
21	Roberto et al. (2005), US	Qualitative design	To explore how women with MCCs perceive various chronic conditions and how they manage their daily lives.	17 female patients, aged 69-84 years. Caucasian.	Heart disease, diabetes, and osteoporosis	Closed-and open-ended questions for in-depth data	Patients were active in coping with MCCs. Pain and reduced energy were major issues. Reducing the pace of activities and maintaining independence and autonomy were ways of coping. Support from family members was considered important.
22	Safa et al. (2014), Iran	Cross-sectional	To investigate the association of coping strategies with suicidal behaviour between substance abusers and non-substance abusers with asthma and COPD.	100 patients (42% female), mean age $40 \pm 14$ . Ethnicity not stated.	Asthma and COPD	WOCQ and SBQ-R	More than half of participants (62%) used problem-focused coping, and the rest (38%) used emotion-focused coping. Male, substance abusers, and participants who used emotion-focused coping strategies reported a higher suicide tendency.

No	Citation, place of study	Design	Aims	Sample and ethnicity	Clusters of MCCs	Data collection / measures	Key findings
23	Sells et al. (2009), US	Qualitative design	To describe people's responses to the onset, accrual, and influence of MCCs and to social support.	33 patients (23 female), mean age 50.5 years. Caucasian, African-American, and Hispanic.	Physical-mental chronic health conditions	Semi-structured interview	The onset of MCCs involved medical, emotional and social hardships. Patients adapted to these hardships through personal resilience and social support. Patterns of adaptation and providing care to others were reported.
24	Smith et al. (2009), US	Cross-sectional	To explore the relationship of coping style and self-efficacy to functional impairment in patients with chronic pain and chronic fatigue, and possible mediating role of psychiatric diagnosis.	138 patients (83% female), aged 17-68 years. White, African-American, Native American, Asian.	Pain and fatigue	SF-36, Billings & Moos coping responses scale, DSM-IV	Emotional coping strategies were positively related to functional impairments caused by pain, inversely related to functional impairments caused by fatigue.
25	Stanners et al. (2014), Australia	Qualitative design	To explore the experiences of people with depression and multi-morbidities.	12 patients (7 female), aged 46-86 years. Ethnicity not stated.	MCCs	Semi-structured interviews	Findings identified three themes regarding depression in MCCs patients: (1) development of depression, (2) diagnosis of depression, and (3) strategies of dealing with depression including taking medication, self-efficacy, and coping.

No	Citation, place of study	Design	Aims	Sample and ethnicity	Clusters of MCCs	Data collection / measures	Key findings
26	Townsend et al. (2006), UK	Qualitative component of a survey	To explore how people negotiate multiple chronic illness and everyday life.	23 patients (gender unclear), aged early 50s. Ethnicity not stated.	Physical and mental chronic health conditions	Semi-structured interview and diaries	Patients reported using various strategies to manage symptoms. Maintaining social roles and coherent identities and maintaining a normal life were prioritized.
27	Van Wissen et al. (2017), New Zealand	Qualitative descriptive	To explore how patients live with cardiovascular disease and prediabetes.	23 patients (6 females), aged 43-85 years. Most were European New Zealanders.	Physical and mental chronic health conditions	Interviews	Patients expressed difficulties in developing a complete understanding of MCCs. A major theme was 'invisible disequilibrium', indicating a process of how patients viewed becoming ill.
28	Ward (2011), US	Qualitative, descriptive, phenomenological design	To explore the lived experience of adults with bipolar disorder and substance use disorder.	12 patients (11 female), aged 33-52 years. African-American, Caucasian, and Asian.	Bipolar disorder and substance use	In-depth interviews	Six themes were identified describing the complexities of living with MCCs relating to life struggles, feeling the effects, escaping from MCCs, spiritual support, being pushed, and negative views.

No	Citation, place of study	Design	Aims	Sample and ethnicity	Clusters of MCCs	Data collection / measures	Key findings
29	Warren-Jeanpiere et al. (2014), US	Qualitative focus group study	To describe how age, identity, co-morbidities, social responsibilities, and relationship status of older women with HIV impact their self-management.	23 patients (23 female), mean age 57 years. African-American.	HIV and physical-mental chronic health conditions	Semi-structured interviews in focus groups	Diabetes and hypertension were considered more difficult to manage compared with HIV. Social responsibilities and inflexible work impacted self-management of MCCs. Daily difficulties were identified.
30	White et al. (2016), Australia	Grounded theory	To explore how people with MCCs experience their conditions.	16 patients (11 female), aged 20-67 years. Ethnicity not stated.	Physical-mental chronic health conditions	Interviews	Patients described living with MCCs as an ongoing process with four components: (1) knowing something is not right, (2) dealing with what is wrong, (3) keeping things under control, and (4) maintaining routine life.
31	Whiting et al. (2006), UK	Mixed methods but only qualitative phase included	To examine the associations of diabetes with depression and stress, and to examine these factors in relation to self-care.	16 patients, gender and age not stated. White British, Black, Asian, and Chinese.	Diabetes and depression	Interviews	Findings showed that patients experienced stigma and isolation. Lack of support from primary healthcare was identified.

No	Citation, place of study	Design	Aims	Sample and ethnicity	Clusters of MCCs	Data collection / measures	Key findings
32	Yorgason et al. (2010), US	Qualitative component from a mixed methods study	To explore illness perceptions and coping activities about disease management and resilience in couples.	28 married couples, aged 58-85 years. Ethnicity not stated.	Diabetes and osteoarthritis	Semi-structured interviews and field notes	Couples had both positive and negative perceptions regarding MCCs. Coping strategies involving a variety of life lessons experienced by individual and couples were identified.

\*In alphabetical order by name of the first author.

AQoL-7D: Vision-related Assessment of the Quality of Life; COPD: Chronic Obstructive Pulmonary Disease; CRI: Coping Resource Inventory; CSE: Coping Self-Efficacy scale; DSM-IV: Diagnostic and Statistical Manual of Mental disorders, 4th Edition; HADS: Hospital Anxiety and Depression Scale; HCV: Hepatitis C Virus; HIV: Human Immunodeficiency Virus; MCCs: Multiple Chronic Conditions; JCS-60: Jalowiec Coping Scale; MCS: Mental Component Score; PHQ-9: Patient Health Questionnaire; QoL: Quality of Life; SBQ-R: Suicide Behaviour Questionnaire-Revised; SF-36: Short-Form 36; SOC: Sense of Coherence; T2DM: Type 2 Diabetes Mellitus; WOCQ: Ways of Coping Questionnaire.

There were 24 qualitative studies included in this review: of 18 studies used a descriptive qualitative approach, three used a phenomenological approach, two adopted a grounded theory approach, and one was a case analytical study. The majority used semi-structured interviews, field notes, and diaries to collect data with sample sizes ranging from six to 48. Included studies focused on different stages of MCCs from diagnosis to long-term experiences.

Of the seven quantitative studies included, six adopted a cross-sectional design and one adopted a single group pre/post-intervention design. The sample size ranged from 62 to 3570. Five focused on outcomes of coping among people with MCCs (Assari, 2014; Di Benedetto et al., 2014; Kristofferzon, Engstrom, & Nilsson, 2018; Safa, Boroujerdi, Talischi, & Masjedi, 2014; Smith, Strachan, & Buchwald, 2009), one investigated the status of adopting different coping strategies (Lind et al., 2015), and one was a coping-based intervention pilot study (Holloway et al., 2018).

One study adopted a mixed-methods design, although only the qualitative phase described coping (Whiting, Scammell, Gray, Schepers, & Bifulco, 2006). A questionnaire survey was administered to 389 participants with type 2 diabetes and examined depression, life-threatening experiences, and self-care and activities.

An illustration can provide a visual explanation of a text and work as a starting point for the interpretation of an integrative review (Whittemore & Knafl, 2005). A figure was developed to assist in the visualization of relationship within and across the constructs of coping and MCCs (see Figure 2.2). This figure showed the content of primary and secondary appraisals in the context of MCCs and presented their links with health-related outcomes and the potential impact factors.

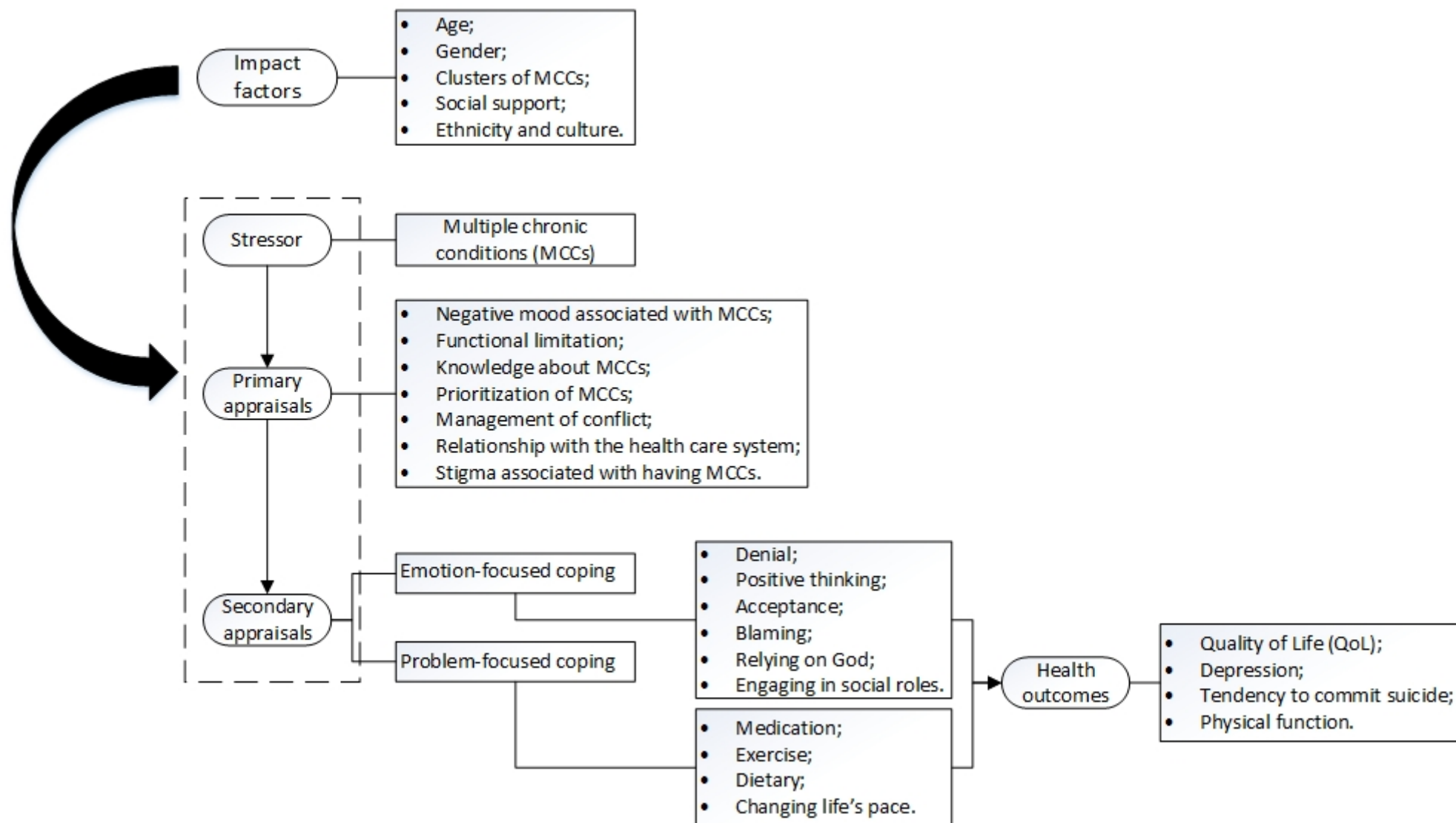


Figure 2.2 Illustration of coping with MCCs

### **Perceptions regarding MCCs**

Negative mood associated with MCCs was the most reported theme in 12 studies. Negative mood included frustration (Al-Amer, Ramjan, Glew, & Salamonson, 2015), fear (Molefe & Duma, 2009), feelings of uncertainty (Coventry, Dickens, & Todd, 2014; Nyhlin, 1990), loss (Boeckxstaens et al., 2012; Coventry et al., 2014; Eckerblad, Theander, Ekdahl, Jaarsma, & Hellstrom, 2015; Stanners, Barton, Shakib, & Winefield, 2014), and lack of control (Eckerblad et al., 2015; Fix et al., 2014; Nyhlin, 1990; Van Wissen et al., 2017).

Functional limitation was an important consequence perceived by people with MCCs in eight studies (Boeckxstaens et al., 2012; Coventry et al., 2014; Fix et al., 2014; Hillege, Beale, & McMaster, 2008; Roberto, Gigliotti, & Husser, 2005; Van Wissen et al., 2017; Ward, 2011; Warren-Jeanpiere, Dillaway, Hamilton, Young, & Goparaju, 2014).

Other themes reported were knowledge about MCCs (Fix et al., 2014; Morris, Sanders, Kennedy, & Rogers, 2011; Warren-Jeanpiere et al., 2014), prioritization of MCCs (Fix et al., 2014; Morris et al., 2011; Roberto et al., 2005), management of conflict (Elliott, Ross-Degnan, Adams, Safran, & Soumerai, 2007; Fix et al., 2014; Hillege et al., 2008; Morris et al., 2011), relationship with the health care system (Loeb, Penrod, Falkenstern, Gueldner, & Poon, 2003; Morris et al., 2011; Nyhlin, 1990; Ridgeway et al., 2014), and stigma associated with having MCCs (Lekas, Siegel, & Leider, 2011; Ward, 2011).

### **Coping strategies reported by people with MCCs**

When a situation is considered ‘stressful’, individuals make efforts to manage a stressful situation. In this review, strategies used for coping with MCCs consisted of two major patterns: emotion-focused coping and problem-focused.

Emotion-focused coping refers to efforts to manage emotions resulting from MCCs. Subthemes identified consisted of denial (Al-Amer et al., 2015; Stanners et al., 2014; Ward, 2011), positive thinking (Molefe & Duma, 2009; Nyhlin, 1990; Ridgeway et al., 2014; Stanners et al., 2014; Yorgason et al., 2010), acceptance (Al-Amer et al., 2015; Boeckxstaens et al., 2012; Fix et al., 2014; Molefe & Duma, 2009; Nyhlin, 1990; Stanners et al., 2014; White, Lentin, & Farnworth, 2016), blaming (Molefe & Duma, 2009), relying on God (Loeb et al., 2003; Molefe & Duma, 2009; Sells et al., 2009; Ward, 2011; Warren-Jeanpiere et al., 2014), and engaging in social roles (Loeb et al., 2003; Sells et al., 2009; Townsend, Wyke, & Hunt, 2006; Warren-Jeanpiere et al., 2014).

Problem-focused coping refers to efforts to manage MCCs. Emerged subthemes included medication (Elliott et al., 2007; Fix et al., 2014; Loeb et al., 2003; Ridgeway et al., 2014; White et al., 2016; Yorgason et al., 2010), exercise (Fix et al., 2014; Loeb et al., 2003; Morris et al., 2011; Sells et al., 2009; Yorgason et al., 2010), dietary (Loeb et al., 2003; Morris et al., 2011; Yorgason et al., 2010), and changing life's pace (Boeckxstaens et al., 2012; Coventry et al., 2014; Ridgeway et al., 2014; Yorgason et al., 2010).

Quantitative studies reporting the full version of the following coping inventories: Di Benedetto et al. (2014) used the Coping Resources Inventory to assess individual's coping resources in five aspects (cognitive, social, physical, emotional and spiritual); Kristofferzon et al. (2018) used the Jalowiec coping scale to evaluate eight coping strategies: evasive, fatalistic, emotive, palliative, confrontative, optimistic, supportive, and self-reliant. The first four were categorized into emotion-focused coping and the rest were problem-focused coping; Safa et al. (2014) used Ways of Coping Questionnaire to measure problem-focused coping and emotion-

focused coping strategies; Smith et al. (2009) adopted the Billings & Moos coping responses scale to identify problem-focused and emotion-focused coping strategies. Two studies used personal statements to ascertain strategies of coping: Assari (2014) followed indicators based on past studies to measure religious coping and Lind et al. (2015) used an identified list from a study on coping in chemical intolerance to investigate problem-focused coping strategies.

### **Relationship between coping strategies and health-related outcomes among people with MCCs**

Four studies used a cross-sectional design and examined the relationship between utilization of coping strategies and mental health outcomes among people with MCCs. Assari (2014) found that higher levels of religious coping buffered the effect of MCCs on depressive disorders and were related to the reduced depressive symptoms. Di Benedetto et al. (2014) found higher levels of coping resources (mixed strategies including cognitive, social, physical, emotional, and spiritual) were associated with better mental health, and higher levels of coping resources were associated with lower levels of depression. Safa et al. (2014) found that the tendency to commit suicide was greater among people with MCCs who chose emotion-focused coping strategies. Kristofferzon et al. (2018) showed a significant direct and indirect effect of sense of coherence on the mental component of QoL through emotion-focused coping, problem-focused coping, and efficiency of coping. In a single group pre/post-intervention study, Holloway et al. (2018) designed a problem-focused coping intervention to examine improvement in QoL, depressive symptoms, and the ability of problem coping in 18 people with vision-impairment and depression. Results showed a 53% improvement in depression, 23% increase in QoL, and 53% increase in confidence when using problem-focused coping strategies.

Only one study focused on associations between coping and people's physical health outcomes. Smith et al. (2009) developed two chronic-condition models (pain and fatigue) to examine associations of coping strategies and self-efficacy with functional impairment among people with chronic pain and chronic fatigue. Findings suggested that emotional coping strategies were positively related to the functional impairment caused by pain and inversely related to the functional impairment caused by fatigue.

### **Factors with relevance to coping among people with MCCs**

Five major factors were associated with coping for people with MCCs in the studies reviewed: age, gender, clusters of MCCs (the combination of chronic health conditions), social support, and ethnicity, and culture.

#### ***Age***

Clinical characteristics included the number, duration, and type of chronic health conditions. Six studies investigated coping among older adults using a qualitative design (Eckerblad et al., 2015; Elliott et al., 2007; Loeb et al., 2003; Löffler et al., 2012; Naganathan et al., 2016; Warren-Jeanpiere et al., 2014). Older adults living with MCCs demonstrated their coping experience was embedded in family and healthcare supportive networks. For example, participants expressed how they adhere to a physician's suggestions about lifestyle and knowledge of prescribed medications (Löffler et al., 2012).

#### ***Gender***

Three qualitative studies examined women's coping in the context of MCCs (Loeb et al., 2003; Molefe & Duma, 2009; Roberto et al., 2005) describing the challenges of living with MCCs and ways women dealt with those challenges. Female participants used more emotion-focused coping strategies such as positive reappraisal,

accepting reality, and blaming. Warren-Jeanpiere et al. (2014) found that women with HIV (Human Immunodeficiency Virus) and other chronic health conditions expressed their desire for companionship and looked forward to the future.

### ***Clusters of MCCs***

Lind et al. (2015) found that commonly adopted coping strategies in people with asthma and allergy were avoiding certain environments and accepting their situation. People with contagious chronic conditions, such as HIV and Hepatitis C reported more stigmatizing behaviour (Lekas et al., 2011). Molefe and Duma (2009) found that participants reported frequent use of blaming after HIV diagnosis. Another study indicated that people with HIV and other chronic health conditions experienced stigma including prejudice and negative attitudes. Patients might choose to only focus on certain chronic health conditions (e.g. patients and the public viewed HIV as more deadly than HCV) (Lekas et al., 2011).

### ***Social support***

Social support, referring to the psychological and material resources from a social network to help people manage MCCs (Thoits, 1986), also emerged from this review. Social support can be obtained from formal sources such as health care professionals (Loeb et al., 2003; Morris et al., 2011; Naganathan et al., 2016; Nyhlin, 1990; White et al., 2016) and informal sources such as family members (Loeb et al., 2003; Molefe & Duma, 2009; Naganathan et al., 2016; Sells et al., 2009; Yorgason et al., 2010) and significant others (e.g. friends) (Loeb et al., 2003; Sells et al., 2009). One study investigated perceptions of social support from patients, informal caregivers, and health care professionals and indicated that patients with MCCs differentiated health professionals from their care-givers (Naganathan et al., 2016).

They overvalued the capacity of their caregivers and over-relied on their support (Naganathan et al., 2016).

### ***Ethnicity and culture***

Assari (2014) identified the role of ethnicity in shaping the relationship between MCCs, religious coping, and health outcomes across various populations. Positive religious coping was found to relieve the impacts of MCCs on depressive disorders in Caribbean Blacks compared to African Americans or non-Hispanic Whites.

Three qualitative studies discussed the impact of culture on people's coping (Al-Amer et al., 2015; Lekas et al., 2011; Whiting et al., 2006). Although samples varied involving Arabic, Asian, and African-American peoples, a shared experience was that participants talked about how culture affects their understanding of MCCs and their behaviour for dealing with health conditions. Arabic people believed having MCCs was a judgment by God, therefore, accepting the reality was regarded as a connection with God (Al-Amer et al., 2015).

## **DISCUSSION**

### **Methodological considerations**

This integrative review of 32 studies explored what is known regarding coping among people with MCCs. Most included studies were of good methodological rigor. Most reviewed studies used a qualitative design, suggesting a potential gap of knowledge around quantitative research. Not all qualitative studies justified how they reached theoretical saturation of data, which decreases confidence in stated claims. For quantitative studies using a cross-sectional design, justification of sample size or power lacked except for two population-based studies (Assari, 2014; Lind et al., 2015). Convenience samples without a size calculation were common in those quantitative studies.

Most of the included studies were conducted between 2000 and 2018 and more than half after 2010. This may be related to two factors: the attention on MCCs is rising as it is becoming more prevalent; and the definition of MCCs is relatively new, initially proposed in 2010. Research into chronic conditions before 2010 was limited to single chronic conditions suggesting that routine healthcare provided to patients might have an emphasis on single condition rather than using an integrated approach to care (Moffat & Mercer, 2015).

There were inconsistent definitions of coping across the included studies and the absence of theoretical frameworks in most studies. Twelve studies defined ‘coping’ and eight studies used a consistent definition. Only a few studies adopted a theoretical framework of coping, with Lazarus’ coping theory the most cited. Theoretical frameworks can help to refine research design, organize related constructs; and disseminate results whereas a poor or missing framework may fail to justify the importance of the study (Lederman & Lederman, 2015). Coping inventories used in the quantitative studies contained various domains with seven different coping measures used in the seven studies reviewed. Two studies used participants’ responses to identify coping strategies instead of adopting validated scales (Assari, 2014; Lind et al., 2015). One study used two questions to examine participants’ religious coping ‘*How important is prayer when you deal with a stressful situation? How much do you look to God for strength, support, and guidance?*’ (Assari, 2014). This might impair the reliability and credibility of the findings in these studies.

### **Coping in people with MCCs**

To understand how people cope with MCCs within the framework of Lazarus’s transactional theory, coping has been further conceptualised to encompass two main components including perceptions regarding MCCs and strategies of coping with

MCCs. People with MCCs may develop different perceptions about their illnesses from people with a single chronic condition due to the impacts of MCCs (Bower et al., 2012). First of all, the identified perceptions regarding MCCs showed the complexity of having MCCs in everyday life. This review identified that negative mood and impaired functioning were most commonly reported by people with MCCs, implying that psychological distress and physical consequences of MCCs might be the two key health burdens among this population. These findings were consistent with a quantitative study in which MCCs gave rise to a higher risk of loss of functional independence (Wang et al., 2017), as well as a large cross-sectional survey that showed a close association between depression and MCCs (Smith et al., 2014). Due to the nature of MCCs, specific disease combinations and clusters of diseases result in complex healthcare needs among people with MCCs. Thus, being able to assist people with MCCs might start with offering appropriate healthcare that addresses issues that they are most concerned about rather than general approaches to MCCs.

The myriad combinations of coping strategies identified in this review indicated people's efforts to cope with their MCCs. However, the adoption of strategies that merged in this review may be different from people's coping when confronted with stress in the actual situations because their selection of problem-focused and/or emotion-focused strategies mainly depends on the stressor. More importantly, this review did not aim to find out which coping strategy is more effective than another but provide a plethora of strategies that people used to cope with MCCs. This work provides an insight into the development of a specific coping measurement for people with MCCs. As the effectiveness of a coping strategy is influenced by contextual factors, personality traits, and circumstances, an understanding of people's subjective

perceptions of MCCs and their inclination for certain coping strategies, may offer an element of an organized intervention program for this population.

### **Coping and health**

Illness perceptions and coping have an important role to play in the explanation of health-related outcomes among people with physical illness (Dempster, Howell, & McCorry, 2015). However, no research has been conducted to determine the relationship between illness perceptions and health-related outcomes in the context of MCCs. The finding that appropriate coping strategies may help to relieve psychological distress, improve QoL, and change health behaviour among people with MCCs is encouraging. However, it is difficult to draw conclusions regarding the positive impacts of specific coping strategies on health-related outcomes in this population because of the variation in research samples and coping inventories used. Included studies recruited participants with large variations in histological typing, stages, and healthcare plans and different definitions of MCCs were used (Johnston, Crilly, Black, Prescott, & Mercer, 2019). Terms such as multiple chronic conditions, comorbidity, and multimorbidity were used interchangeably and varied measurements for MCCs were used (Xu, Mishra, & Jones, 2017).

Interactions between coping, stress, and health are complex. Studies that explored the direct associations between coping and health outcomes while the interlinkage between stressor and coping might be ignored. Research has shown that the effects of coping on health-related outcomes are mediated and/or moderated in the context of a chronic condition (Grech et al., 2016). Thus, the role of coping may be more complicated in the context of MCCs because of the increased number of conditions. These findings suggest implementing empirically-based coping interventions to lessen, reduce, and prevent stress and to facilitate optimizing physical

and mental health outcomes in people with MCCs. For example, interventions that enhance cognitive, social, and emotional coping strategies may mitigate depression and promote mental health in people with MCCs. However, such relationship requires validation in future quantitative and qualitative research. Examining the coping process over longer durations in patients with MCCs to determine strategies consistently used over time based on the nature of chronic conditions is required.

### **Impact factors concerning coping**

This review showed that clusters of chronic conditions might present different stressors, which might trigger specific coping strategies among people with MCCs. For example, people with contagious chronic conditions such as HIV or HCV (Lekas et al., 2011) and people with substance abuse (Ward, 2011) experienced more stigma than those with other conditions. Past quantitative studies revealed that variation in health-related outcomes exists in different clusters of MCCs. Two large cross-sectional studies from Korea and Australia indicated that a particular cluster of chronic conditions, such as musculoskeletal conditions, has a relatively large impact on patients' QoL when compared with other conditions (González-Chica et al., 2017; Park et al., 2018). This finding might imply that categorizing stressors (chronic conditions) could be a better way to capture people's coping and associated health-related outcomes.

Different cultures and living contexts reflect differences in coping. Hobfoll (2001) suggested that most studies about stress and coping have been shaped by a monocultural viewpoint rooted in western countries, particularly in the US, where most studies were undertaken. In the present review, more studies were undertaken in North America, Europe, and Oceania, with limited studies in Asia or Africa, suggesting little attention has been paid to the discussion of coping theories in those

areas. Few studies mentioned how culture might shape personal coping among people with MCCs. Most studies did not clarify the ethnicity of participants, nor report whether mixed cultures existed. Sells et al. (2009) identified participants were Caucasian, African-American, and Hispanic but did not analyse potential distinctions in coping between groups.

This review identified that social support was a significant and independent coping resource rather than overlapping with either problem-focused coping or emotion-focused coping. According to Folkman and Lazarus (1988), social support could be an effective way of dealing with stress and relieving long-term stress. Appropriate social support may promote healthy behaviour that improves one's adaptation to stress (Sippel, Pietrzak, Charney, Mayes, & Southwick, 2015). Consequently, there is a need to improve the current nomenclature of coping to have better applicability in chronic health conditions (Thomsen, Rydahl-Hansen, & Wagner, 2010).

### **Limitations**

Limitations include that only peer-review journal articles published in English were reviewed, which may result in publication bias and omit important studies published in other languages. Most of the included studies of this review were conducted in English-speaking countries and the findings are largely US-focused which may generate a skewed opinion.

Although this review contains wide-ranging literature, it was not possible to have conclusive findings due to different methodological and theoretical approaches, and the various nomenclatures and instruments to measure coping. Although broad search terms were used, there may be potential limitations in the search process related to the various terms used to describe MCCs. The construct of coping is also multifaceted.

Hence, the classification of coping strategies into categories might result in different statements by scholars with a varied background.

In the current review, the strategies of coping were categorized into problem-focused and emotion-based under Lazarus's theory. However, there were some other types of coping proposed by a number of theorists such as active versus passive coping (Billings & Moos, 1981). The current understanding of coping may be more substantiated and explained in greater depth if analysed from different angles.

### **Knowledge gaps and future research directions**

The new knowledge that is uncovered in this integrative review includes: (1) more research is needed for investigating the role of coping components such as illness perceptions and coping strategies in coping with MCCs, (2) there is a paucity of quantitative research in this research area, (3) current research methods need improvement and research samples (e.g. characteristics of MCCs) are unclear, and (4) cross cultural understanding of coping in people with MCCs is lacking.

In considering the role of illness perceptions in explaining health-related outcomes, it is worth taking illness perceptions as a component of coping when investigating coping in people with MCCs. Further research should focus on the relationship between coping and its constructs and health-related outcomes.

Given the multifaceted and interlinked nature of MCCs, more advanced, innovative statistical approaches might be helpful to understand the relationship among coping strategies by people with MCCs, socio-demographical factors, clinical factors, and health-related outcomes. For example, exploration of multiple mediator effects using bootstrap methods (Preacher & Hayes, 2008) would help to examine whether a certain coping strategy worked as mediator or as a covariate. Using a structural equation modelling analysis (Blunch, 2008) would allow the simultaneous

evaluation of various variables and clarify the role of each variable investigated and may further the understanding of theory-driven mechanisms of coping.

Most studies investigated coping with MCCs using qualitative designs with a dearth of quantitative research in this area. The integration of quantitative measurements and qualitative interpretations is needed to gain a deeper, broader understanding of perceptions about coping, coping strategies, and health. Prior research has supported applying mixed methods approaches to contribute to a broader understanding of stress and coping (Drageset, Eide, & Hauge, 2016). Thus, it is expected that a mixed-methods design may offer a more holistic view and may help to gain a better understanding of coping among people with MCCs.

Further research should clarify the definition(s) and measure(s) of MCCs. Inclusion and exclusion criteria for chronic conditions should be explicit and rigorous sampling would ensure data representativeness and reduce bias for future research. All reviewed studies collected data at a one-time point. More longitudinal research is needed to examine the effectiveness of coping strategies on health-related outcomes over time among the MCCs population. Such research may help healthcare practitioners develop and implement appropriate and timely interventions to improve coping.

Most of the included studies did not compare or discuss their findings between racial/ethnic populations. As coping, illness perceptions, and treatment of MCCs are shaped by culture and socio-economic environments. Thus, research in diverse cultures is needed, especially in Asian regions where the prevalence of MCCs is growing substantially (Chen, Cheng, Zhuang, & Broad, 2018).

### **Implications for healthcare practice**

Illness perceptions are a vital predictor of individuals' health outcomes (Petrie et al., 2008) and have a strong association with patients' coping and self-management of MCCs. Knowledge generated from this review may help healthcare professionals to develop psychosocial interventions to improve patient's coping. For example, interventions that improve perceptions regarding the controllability of MCCs might lessen psychological distress and improve QoL among people with MCCs (Richardson et al., 2017). Hence, the implementation of an effective healthcare plan highlighting modifications to illness perceptions and components of coping strategies may be beneficial.

Present healthcare for people with MCCs focuses on single chronic conditions (Harris et al., 2013). Patients have difficulty obtaining care for different health conditions and the care is fragmented increasing disease burden and expenditure (Wallace et al., 2015). Healthcare should be integrated taking into account patients' holistic needs. Treatment goals and priorities, self-management interventions, and guidelines for health service utilization should be developed and integrated based on actual conditions. Collaborative care programs involving nurses and healthcare team members offering integrative management of physical and psychological diseases and implementation of guideline-based healthcare could significantly improve the control of chronic conditions among this population (Katon et al., 2010).

Every age group is affected by MCCs despite the prevalence of MCCs increasing with age. A national survey in the US presented that younger adults with MCCs (less than 65 years old) have a higher prevalence of asthma, cognitive impairment, and psychological distress, reported more health risks such as smoking, obesity, poorer access to health care, and worse QoL, in contrast to older adults with MCCs (aged 65

or above) (Adams, 2017). There is a need for age-specific healthcare planning taking into account individual needs in managing chronic health conditions.

## **CONCLUSION**

This integrative review presents an overview of coping in the context of MCCs by involving studies with different designs, providing an understanding of this phenomenon. In-depth understanding of perceptions and coping strategies and significant linkage between coping and health outcomes have the potential to become a solution, targeted either at particular clusters of chronic health conditions or at health problems of people with MCCs, serving as a base to provide appropriate, holistic healthcare for people with MCCs. In addition, this review identified five impact factors including age, gender, clusters of multiple chronic conditions, social support, and ethnicity, and culture to be associated with people's coping. The increasing prevalence of MCCs internationally, requires studies, preferably with mixed-methods designs and using rigorous methods, particularly in cross-cultural settings. For clinical practice, the potential for interventions to modify coping is supported by some evidence proposing that altering coping could lead to improvements in the management and experience of stress among people with MCCs.

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# Supporting information\_Screening checklists

1	Title Screening
	<p>1. Does this article relate to MCCs? a. Yes b. No c. Unclear</p> <p>2. Does this article relate to coping? a. Yes b. No c. Unclear</p>
2	Abstract Screening
	<p>1. Does this article relate to MCCs? a. Yes b. No c. Unclear</p> <p>2. Does this article relate to coping? a. Yes b. No c. Unclear</p> <p>3. Does this article represent primary research or a review? (ie, no letters to the editor, book reviews). Published study designs or trial protocols to be included. a. Yes b. No c. Unclear</p> <p>4. Is the text in English? a. Yes b. No c. Unclear</p>
3	Full-Text Screening
	<p>1. Does this article represent primary research or a review? (ie, no letters to the editor, book reviews). Published study designs or trial protocols to be included. a. Yes b. No c. Unclear</p> <p>2. Is this article available as a full-length journal article? (ie, not an abstract) a. Yes b. No</p> <p>3. Is the text in English? a. Yes b. No c. Unclear</p> <p>4. What is the study methodology of this article? a. Quantitative b. Qualitative c. Mixed d. Unclear</p>

## Part 2 Patients' experiences of coping with multiple chronic conditions: A meta-ethnography of qualitative work

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## **ABSTRACT**

Multiple chronic conditions (MCCs) pose a major and growing burden on individuals' health. The ways in which people cope with their stresses related to their chronic conditions are significant to their health outcomes. This review sought to understand the lived experiences of coping with MCCs by a meta-ethnography of qualitative studies. Twenty-six studies were identified in four electronic databases including PUBMED, PsycINFO, EMBASE, and CINAHL that were searched from 1966 to 2017. A seven-step analytic method was used after a quality evaluation based on Joanna Briggs Institute Qualitative Assessment and Review Instrument (JBI-QARI). The findings illustrated that experiences of coping with MCCs were interacted with: (1) appraisals of MCCs, (2) strategies to maintain a normal life, (3) strategies to keep the spirits up, and (4) coping in the social context. To sum up, this review provided a collection of narratives on coping with MCCs. The findings would help to recognize the high complexity experienced by these patients, also potentially offered a foundation for the design of a feasible intervention to more optimally highlight the demands of managing MCCs.

Keywords: coping, coping strategies, chronic diseases, meta-ethnography, multiple chronic conditions.

## **INTRODUCTION**

People with multiple chronic conditions (MCCs) refer to those suffering from two or more chronic conditions that normally last more than a year, these conditions include physical and mental health conditions (e.g. diabetes, heart diseases, and depression), continuing conditions (e.g. learning disability), chronic symptoms (e.g. back pain), and alcohol and substance abuse (Farmer et al., 2016). The National Health

Interview Survey (NHIS) indicated that more than 25% of American adults reported having more than two chronic conditions (Ward, 2014). An Australia study involving 9156 patients estimated the prevalence of MCCs to be 37% with more than half of surveyed patients suffering from three or more conditions, and 33% from four or more (Britt et al., 2008).

People with MCCs commonly experience a high disease burden of living with a certain number of chronic conditions and the combined treatments (Gallacher et al., 2011). The presence of MCCs is associated with lower quality of life (Fortin et al., 2004), decrement in physical and/or cognitive functioning (Bayliss et al., 2004), and increasing health care costs (Rezaee and Pollock, 2015). Qualitative research describes that living with MCCs is ‘a virtual cascade of medical, emotional and social hardships’ (Sells et al., 2009). In addition, psychological distress is prevalent among people with MCCs (Fortin et al., 2006). The current principle of caring for people with MCCs is to improve their quality of life by reducing disease burden, adverse events, and inadequate care (Farmer et al., 2016).

Coping is seen as ways of responding to illness and as a potential intervention for chronic conditions (Martz et al., 2007). According to the stress appraisal and coping model, in which coping is defined as ‘*consistently changing cognitive and behavioral effort to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person*’ (Lazarus and Folkman, 1984) (P.141). This model proposes that people commonly cope with stressors via problem-focused coping strategies and/or emotional-focused coping strategies (Lazarus and Folkman, 1984). Problem-focused coping refers to the strategies of reducing the source of the stress, whereas emotional-focused coping aims at managing the emotions that come with the perception of stress (Lazarus and Folkman, 1984). Besides, there are some

other classifications of coping in the literature such as active coping, avoidance coping, assimilative coping, and accommodative coping (Brandtstädter, 2015, Christen et al., 1986, Roth and Cohen, 1986). The utilization of a type of coping strategy largely depends on the individual's personality and personal perception of the stressor (Ferguson, 2001).

Although it is unnecessary to distinguish good coping from bad coping (Lazarus, 2000), the accessibility of coping resources shape the ways that patients manage their chronic conditions, then possibly affect their health outcomes (Trump and Mendenhall, 2017, Yorgason et al., 2010, Löffler et al., 2012). Evidence shows that appropriate coping strategies are positively associated with health-related quality of life and psychological well-being (Aldwin and Yancura, 2004). A meta-analysis by Duangdao and Roesch (2008) suggested that coping strategies consisting of approach-avoidance, problem-focused, and emotion-focused were related to the psychological health of people with diabetes. Allman et al. (2009) demonstrated that greater use of adaptive coping was associated with less depression whereas greater use of maladaptive coping was associated with more depression in heart failure patients. Lo Buono et al. (2017) addressed that the patients who were inclined to use active/accommodative coping strategies usually reported a better quality of life after stroke compared with patients who preferred assimilative coping strategies. Nevertheless, previous studies mainly investigate the coping and health in people with one single chronic disease, research on coping with MCCs is lack.

Qualitative research is a way of providing a combination of opinions, thoughts, and perspectives of coping and contributing to a common understanding of a focused whole (Creswell and Creswell, 2017). There are several qualitative reviews existing with reference to experiences of people with MCCs: Rosbach and Andersen (2017)

highlighted that the complexity of burden of treatment and sum up some factors such as workload of demands, patients' capacity, and the social context influenced patients' coping. Cottrell and Yardley (2015) summarized the lived experiences of MCCs from different perspectives including patients, general practitioners, and trainees. Another study involving MCCs and some other particular chronic diseases offered an overview of patient's capacity and its interacted factors including the processes of living with chronic conditions, available resources, social environment, and medical treatment (Boehmer et al., 2016). These qualitative studies into the lived experiences have added some useful knowledge of the people with MCCs and have demonstrated the research field regarding MCCs is extensive. However, few attempts have been conducted to look at the experiences relevant to MCCs in a coping context.

## **AIM**

The present study aimed to undertake an in-depth exploration of the lived experiences about how patients cope with MCCs by synthesizing the existed qualitative research as the qualitative findings could explicate nuanced meanings of living with MCCs. This study would be valuable to make qualitative findings more accessible for application in practice related to MCCs.

## **DESIGN**

We adopted the meta-ethnography approach (Noblit and Hare, 1988) to synthesize qualitative data in this review. The meta-ethnography is a broad and combined review approach, which presents, appraises and synthesizes the findings from qualitative studies in a systematic and logical way (Jensen and Allen, 1996). It can identify shared themes and compare differences on a particular topic, provide deeper insights into the topic than a single study, and generate meanings through an interpretative process (Erwin et al., 2011). What is more, the benefits of using meta-

ethnography and the practical steps have been supported by the past studies (Britten et al., 2002, Noblit and Hare, 1988), which can contribute to our current work.

## **METHODS**

The seven steps of meta-ethnography described by Noblit and Hare (1988) and developed further by Walsh and Downe (2005) were followed.

Step 1 was to frame a meta-ethnography study. A literature search concerning coping and MCCs was undertaken with the help of a librarian at the university library, and the research aim was formulated.

Step 2 was to search and identify the included studies. Studies were identified using systematic database searches of PUBMED (provided by National Center for Biotechnology Information, U.S. National Library of Medicine), PsycINFO (provided by Ovid), EMBASE (provided by Ovid), and CINAHL (provided by EBSCOhost) from the year 1966 when the preliminary conception of coping was described by Lazarus (1966) till Nov 2017. The search terms identified in the article title, abstract and keywords included ‘coping’, ‘multiple chronic conditions/diseases/illnesses’, ‘multifactorial chronic /diseases/illnesses’, ‘comorbidity’, ‘multi-morbidity’ and ‘qualitative’. For instance, the search in PUBMED was built of three components:

1. Search (‘Qualitative Research’[Mesh] OR qualitative [Text Word])
2. Search (‘adaptation, psychological’[MeSH Terms] OR coping[Text Word])
3. Search (((((chronic disease\*) OR chronic illness\*) OR chronic conditions) OR (‘comorbidity’[MeSH Terms] OR comorbidity[Text Word])) OR (‘comorbidity’[MeSH Terms] OR multimorbidity[Text Word])) OR (‘multiple chronic conditions’[MeSH Terms] OR multiple chronic conditions[Text Word])

In this step, two reviewers independently screened studies for eligibility against the inclusion/exclusion criteria, according to the title and abstract. Full-texts of all possibly related articles were retrieved for a further check. Two reviewers will designate the full-text papers, independently. The third reviewer resolved the possible conflicts concerning eligibility.

Inclusion criteria were:

1. Studies that employ a qualitative methodology or a mixed methodology with qualitative data description.
2. Studies that focus on adults (over 18 years) with MCCs.
3. Studies that include a description of the experience of coping with MCCs.

Exclusion criteria were:

1. Studies published in languages other than English.
2. Studies that focus on people with a single chronic condition/disease/illness.
3. Studies that focus on children and/or adolescents.
4. Studies that focus on the experiences of people such as caregivers, health professionals, and social workers.
5. Dissertations, secondary research (e.g. summary of existing research), opinions, conference abstracts, protocols, and reports.

Step 3 was to assess the quality of the included studies. For this study, peer reviewed articles were used to eliminate scientifically unsound studies. The Joanna Briggs Institute Qualitative Assessment and Review Instrument (JBI-QARI) was adopted comprising ten questions about the congruity between the essential parts in different studies (Porritt et al., 2014) (see Table 2.3). Each question was answered with

a 'yes', 'no', 'unclear' or 'not applicable' response. 'Yes' was scored '+1' and '0' for others. The final scores were computed and classified as follows: low (0-4 scores), moderate (5-7 scores) and high (8-10 scores), respectively. Studies with a 'low' quality rating would be excluded. Two reviewers undertook the quality assessments independently. The discrepancies were recorded, compared, and discussed between the two reviewers until consensus was reached. The third reviewer was approached in cases where consensus was not reached.

Table 2.3

*Joanna Briggs Institute Qualitative Assessment and Review Instrument (JBI-QARI) critical appraisal checklist*

Questions in the checklist
1. Is there a congruity between the stated philosophical perspective and the research methodology?
2. Is there a congruity between the research methodology and the research question or objectives?
3. Is there a congruity between the research methodology and the methods used to collect the data?
4. Is there a congruity between the research methodology and the representation and analysis of data?
5. Is there a congruity between the research methodology and the interpretation of results?
6. Is there a statement locating the researcher culturally or theoretically?
7. Is the influence of the researcher on the research, and vice versa addressed?
8. Are participants, and their voices, adequately represented?
9. Is the research ethical according to current criteria or, for recent studies, is there evidence of ethical approval by an appropriate body?
10. Do the conclusions drawn in the research report flow from the analysis, or interpretation, of the data?

Step 4 was to extract and present key data from the included studies. The characteristics involved the following headlines: author & year, country, title, objective, description of MCCs, duration of MCCs, sample, data collection, and data analysis methods.

Step 5 was to determine the relations among the included studies. Included studies were read and re-read in order to be familiar with the whole contexts. First order constructs were noted (views of the patients) and looked into the second constructs (interpretations of the authors). A table was created to present the first and second-order constructs in two columns.

Step 6 was to translate the studies into one another. Noblit and Hare (1988) identified three types of synthesis including reciprocal approach, reputational approach, and line of argument approach. In this step, each paper was included in chronological order. Reading off the grid, each column was checked. The first and second-order constructs were compared from the first study to the first and second-order constructs from the second study and identified specific and common interpretations. After that, findings were repeatedly compared to the first and second-order constructs from the third study and so on.

Step 7 was to synthesize translations. Each study has offered a different view of coping experiences depending on the time point at which the patients were interviewed. Key and crucial themes found were consolidated into a line of argument (third-order analysis). Therefore, the third order interpretations based on the 1st and 2nd order interpretations were developed and a line of argument was made.

## FINDINGS

### Study inclusion

An initial search identified 1515 studies and removed 250 duplicate studies. After checking the title and reading the abstract, 1186 studies were excluded based on inclusion and exclusion criteria. Seventy-nine studies were retrieved from electronic databases in full and 26 studies were included in the review. In addition, a bibliographic searching was carried out manually in the most relevant systematic reviews (de Bruin et al., 2012, Smith et al., 2012) plus the reference lists of the included studies. No further relevant articles were identified based on the inclusion/exclusion criteria. The PRISMA flow diagram (Moher et al., 2009) that illustrates the search process is presented in Figure 2.3.

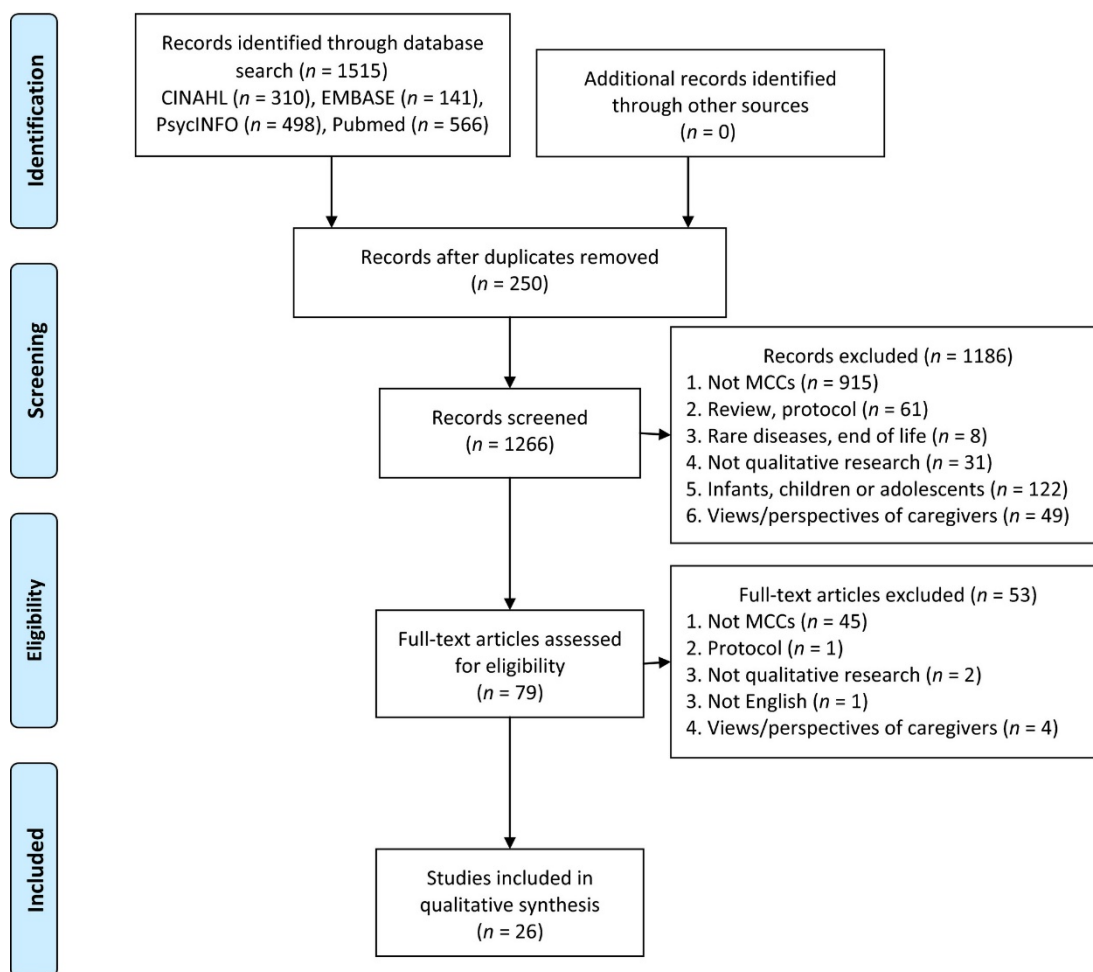


Figure 2.3 Preferred Reporting Items for Systematic Reviews and Meta-Analyses

(PRISMA) flow diagram for the identification process of included studies (Moher, Liberati, Tetzlaff, Altman, & Group, 2009)

### **Methodological quality**

As the results appeared in Table 2.4, the majority of these studies described a clear aim, utilized an appropriate method, and offered meaningful interpretations. All included studies did well in the quality appraisal and no studies were excluded.

Table 2.4

*Joanna Briggs Institute Qualitative Assessment and Review Instrument (JBI-QARI) critical appraisal checklist for selected papers\**

Selected papers		JBI QARI criteria from Table 2.3									
		[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
1.	Nyhlin (1990)	Y	Y	Y	Y	Y	Y	Y	Y	U	Y
2.	Loeb, Penrod, Falkenstein, Gueldner, and Poon (2003)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
3.	Roberto, Gigliotti, and Husser (2005)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
4.	Townsend, Wyke, and Hunt (2006)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
5.	Whiting, Scammell, Gray, Schepers, and Bifulco (2006)	Y	Y	Y	U	Y	Y	N	Y	Y	Y
6.	Elliott, Ross-Degnan, Adams, Safran, and Soumerai (2007)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
7.	Hillege, Beale, and McMaster (2008)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
8.	Molefe and Duma (2009)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
9.	Sells et al. (2009)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
10.	Lekas, Siegel, and Leider (2011)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
11.	Morris, Sanders, Kennedy, and Rogers (2011)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
12.	Townsend (2011)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
13.	Ward (2011)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
14.	Boeckxstaens, Deregt, Vandesype, Willems, Brusselle, and Sutter (2012)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
15.	Dysch, Chung, and Fox (2012)	Y	Y	Y	Y	Y	Y	N	Y	Y	Y
16.	Löffler et al. (2012)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
17.	Coventry, Dickens, and Todd (2014)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
18.	Fix et al. (2014)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
19.	Ridgeway et al. (2014)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
20.	Stanners, Barton, Shakib, and Winefield (2014)	Y	Y	Y	Y	Y	Y	N	Y	Y	Y
21.	Warren-Jeanpiere, Dillaway, Hamilton, Young, and Goparaju (2014)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
22.	Al-Amer, Ramjan, Glew, and Salamonson (2015)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
23.	Eckerblad, Theander, Ekdahl, Jaarsma, and Hellstrom (2015)	Y	Y	Y	Y	Y	Y	N	Y	Y	Y
24.	Naganathan et al. (2016)	Y	Y	Y	Y	Y	Y	N	Y	Y	Y
25.	White, Lentin, and Farnworth (2016)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
26.	Wissen et al. (2017)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

\*In chronological order.

### **Characteristics of included studies**

Data display matrices were prepared to present the core data from each study (See Table 2.5). There were 654 participants in the 26 reviewed studies, which published between 1990 and 2017. The included studies were undertaken in the US (n = 9), UK (n = 6), Australia (n = 3), Sweden (n = 2), New Zealand (n = 1), Germany (n = 1), Belgium (n = 1), Canada (n = 1), Batswana (n = 1), and Jordan (n = 1). The qualitative data were mainly collected by interviews, only one study used personal dairies as a supplementary (Townsend et al., 2006). The three most common analytical methods were grounded theory (n = 5), thematic analysis (n = 4), and phenomenological descriptive approach (n = 3). Due to the variations in patients, two columns were created to present the type and the duration of MCCs. However, most of the studies did not give a detailed description of MCCs, nor the duration of chronic conditions.

Table 2.5

*Characteristics of included studies for meta-synthesis\**

Author (Year) & Country	Objective	Description of MCCs	Duration of MCCs	Sample	Data collection	Data analysis
Nyhlin (1990), Sweden	Obtain an understanding of coping strategies used by diabetic patients facing long-term complications	Type 1 diabetes and long-term complications (retinopathy, nephropathy, neuropathy); MCCs	20-54 years	14 patients (8 females), age 26-62 years	Unstructured interview	Grounded theory
Loeb et al. (2003), US	Explore the coping strategies of managing daily life in older adults in with MCCs		Unclear	37 patients (70% females), age 55-88 years	Focus group interview	Thematic and content analyses
Roberto et al. (2005), US	Explore how women with MCCs perceive various chronic conditions and how they manage their daily lives	Heart disease, diabetes, and osteoporosis	Unclear	17 female patients, 69-84 years	Closed- and open-ended questions	Open-coding procedures method
Townsend et al. (2006), UK	Explore how people negotiate multiple chronic illness, and everyday life	MCCs	Unclear	23 patients (gender unclear), age early 50s	Semi-structured interview and diary	Constant-comparison method
Whiting et al. (2006), UK	Identify the connections between diabetes and depression & stress, and the factors about self-care	Type 2 diabetes and depression	Unclear	16 patients, age (unclear), gender (unclear)	In-depth interview	Thematic analysis
Elliott et al. (2007), US	Explore how older adults with MCCs make choices about medicines.	MCCs (3-9 comorbidities such as hypertension, hypercholesterolemia, and ischemic heart disease.	Unclear	20 patients (12 females), mean age 67 years	Semi-structured interviews	Constant comparison

Author (Year) & Country	Objective	Description of MCCs	Duration of MCCs	Sample	Data collection	Data analysis
Hillege et al. (2008), Australia	Describe the perspectives of people with the chronic conditions of both type 1 diabetes and eating disorders.	Type 1 diabetes and eating disorders	Unclear	4 female patients, between 18-30 years	Semi-structured interviews	Grounded theory
Molefe and Duma (2009), Batswana	Explore the experience of living with both HIV/AIDS and cervical cancer.	HIV/AIDS and cervical cancer.	Unclear	6 female patients, age (unclear)	Semi-structured interviews	Phenomenological descriptive approach
Sells et al. (2009), US	Describe people's responses to the onset, accrual and influence of MCCs and to social support.	MCCs	Unclear	33 patients (23 females), mean age 50.5 years	Semi-structured interview	Phenomenological descriptive approach
Lekas et al. (2011), US	Explore the experience of stigma among former and current injecting drug users with both HIV and HCV.	HIV and HCV	Unclear	132 patients (31% females), age 30-69 years	In-depth interview	Qualitative analysis
Morris et al. (2011), UK	Explore how individuals experience MCCs	MCCs	Unclear	21 patients (10 females), age 36-84 years	Semi-structured interview	Narrative analysis
Townsend (2011), UK	Explore lived experience of people with MCCs	MCCs	Unclear	23 patients (gender unclear), age early 50s	In-depth interview	Narrative approach
Ward (2011), US	Explore lived experience of adults with bipolar disorder and substance use disorder	Bipolar disorder and substance use disorder	Bipolar disorder 1-35 years (mean = 10 years). Substance use 3-27 years	12 patients (11 females), age 33-52 years	In-depth interview	Phenomenological descriptive approach

Author (Year) & Country	Objective	Description of MCCs	Duration of MCCs	Sample	Data collection	Data analysis
Boeckxstaens, Deregt, Vandesype, Willems, Brusselle, and De Sutter (2012), Belgium	Explore opinion of patients with COPD and comorbidities in primary care.	COPD and commodities	Unclear	7 patients (3 females), age unclear	Open interviews	Thematic analysis
Dysch et al. (2012), UK	Explore lived experience of people with people with intellectual disabilities and diabetes	Intellectual disabilities and diabetes	Unclear	4 patients (2 females), age 30-43 years	Semi-structured interviews	Interpretative phenomenological analysis
Löffler et al. (2012), Germany	Explore coping strategies of people with multi-morbidities	MCCs	Unclear	19 patients (13 females), mean age 75 years	In-depth interviews	Grounded theory
Coventry et al. (2014), UK	Explore the lived experience of people with mental-physical multimorbidity	Mental-physical multimorbidity	Unclear	32 patients (17 females), age 32-82 years	In-depth, semi-structured interviews	Interpretative phenomenological analysis
Fix et al. (2014), US	Explore the barriers to the self-management among people with hypertension and comorbidities	Hypertension and comorbidities	Unclear	48 patients (5 females), mean age 60 years	Semi-structured interviews	Grounded theory
Ridgeway et al. (2014), US	Explore views of treatment burden of patients with Multi-morbidity and its impacts	MCCs	Unclear	Phase 1: 50 patients (29 females), 25-85 years Phase 2: 25 patients (11 females), 52-87 years	Semi-structured interview, focus group interview	Framework analysis
Stanners et al. (2014), Australia	Explore experiences of people with depression multi-morbidities	Depression and multi-morbidities	Unclear	12 patients (7 females), age 46-86 years	Semi-structured interviews	Inductive thematic analysis

Author (Year) & Country	Objective	Description of MCCs	Duration of MCCs	Sample	Data collection	Data analysis
Warren-Jeanpiere et al. (2014), US	Describe how age identity, co-morbidities, social responsibilities, and relationship status of older women with HIV impact their self-management.	HIV and co-morbidities	Unclear	23 patients (23 females), mean age 57 years	Semi-structured interview	Constant comparison
Al-Amer et al. (2015), Jordan	Explore emotional reflections of Jordanian people with co-existing depression and diabetes.	Diabetes and depression	Unclear	15 patients (10 females), 36-73 years	Semi-structured interviews	Thematic analysis
Eckerblad et al. (2015), Sweden	Explore the experience of living with a high symptom burden from people with MCCs	MCCs	Unclear	20 patients (16 females), mean age 84 years	Semi-structured interviews	Content analysis
Naganathan et al. (2016), Canada	Explore the value of informal and formal supports for older adults with multi-morbidity	MCCs	Unclear	27 patients (43% females), mean age 82.3 years	Semi-structured interviews	General inductive approach
White et al. (2016), Australia	Explore how people with MCCs experience their conditions	MCCs	1-27 years	16 patients (11 females), age 20-67 years	Interview	Grounded theory
Wissen et al. (2017), New Zealand	Explore how patients live with cardiovascular disease and prediabetes	Cardiovascular disease and prediabetes	Unclear	23 patients (6 females), age 43-85 years	Interview	Interpretive description

\*In chronological order.

### **An outline of synthesized results**

Generally, MCCs patients ‘appraise MCCs’ by identifying ‘relations among multiple conditions’, experiencing ‘problematic symptoms’, and perceiving ‘negative emotions’. Coping with MCCs is a multi-level process within the context of the patient’s everyday life. At the first level, the patients use strategies including ‘taking medication’, ‘exercise & dietary’, and ‘seek information by themselves’ to ‘maintain a normal life’. The second level is about psychological adaptation, strategies of ‘adapt to changes’ and ‘rely on spiritual support’ are used to ‘keep a positive mental attitude’. At the level of ‘coping in the social context’, MCC patients rely on ‘engage in social roles’ and ‘social support’. The summary of the analysis and synthesis is shown in Table 2.6.

Table 2.6

*Summary of analysis and synthesis*

Identified main themes	Interpretations	Identified sub-themes	Contribution of each study (see table 2.4)
Appraise MCCs	People with MCCs perceive the burdensome conditions and occasions following illness onset and accrual.	Relations among multiple conditions	3,5,7,8,10,11,12,13,15,18,20,21,23,25,26
		Problematic symptoms	1,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,20,21,22,23,25,26
		Negative emotions	1,5,7,8,9,10,12,13,14,16,17,20,22,23,26,
Maintain a normal life	People with MCCs manage to alter or eliminate the sources of treatment burden.	Taking medication	1,2,4,6,7,11,13,14,16,18,19,20,21,25
		Exercise & Dietary	2,3,4,6,7,11,15,17,18,20
		Seek information by themselves	2,11,16,19
Keep a positive mental attitude	People with MCCs manage and control negative emotions associated with treatment burden.	Adapt to the changes	1,3,4,8,9,13,14,16,17,19,20,22,23,25
Coping in social context	People with MCCs maintain control over their social roles and receive external help.	Rely on the spirituality	2,3,6,8,9,13,19,21,22
		Engage in social roles	1,2,3,4,6,9,16,19
		Support and assistance from the others	1,2,3,4,5,6,8,9,11,15,18,19,21,24

## **Appraise MCCs**

The main theme ‘appraise MCCs’ described the stressful conditions and occasions that people with MCCs perceived in their daily life. The ‘appraise MCCs’ comprised three sub-themes, namely ‘relations among multiple conditions’, ‘problematic symptoms’, and ‘negative emotions’.

‘Relations among multiple conditions’ refers to patients find specific connections and comparisons among their multiple health conditions (Roberto et al., 2005, Whiting et al., 2006, Hillege et al., 2008, Molefe and Duma, 2009, Lekas et al., 2011, Morris et al., 2011, Townsend, 2011, Ward, 2011, Dysch et al., 2012, Fix et al., 2014, Stanners et al., 2014, Warren-Jeanpiere et al., 2014, Eckerblad et al., 2015, White et al., 2016, Wissen et al., 2017). Patients compared the symptoms and conditions caused by each disease and perceived the hierarchical ordering between their chronic conditions. For example, the patients described how they re-prioritize health conditions, and repeatedly have to focus on one condition more than another one.

*Q: What is kind of, your main priority at the moment with [G.P]?*

*A: Probably blood pressure, probably and cholesterol... so I am more worried about those because they are more serious things. IBS did not kill anybody, you know, but blood pressure is serious and cholesterol is serious so IBS has gone into the background, you know. pp.155 (Morris et al., 2011)*

‘Problematic symptoms’ refers to burdensome symptoms caused by MCCs, which are frequently reported in the most of studies (Nyhlin, 1990, Roberto et al., 2005, Townsend et al., 2006, Whiting et al., 2006, Elliott et al., 2007, Hillege et al., 2008, Molefe and Duma, 2009, Sells et al., 2009, Lekas et al., 2011, Morris et al., 2011, Townsend, 2011, Ward, 2011, Boeckxstaens et al., 2012, Dysch et al., 2012, Löffler

et al., 2012, Coventry et al., 2014, Fix et al., 2014, Stanners et al., 2014, Warren-Jeanpiere et al., 2014, Al-Amer et al., 2015, Eckerblad et al., 2015, White et al., 2016, Wissen et al., 2017). For example:

*'Then I started to get attacks [angina] during the night for no reason, I was losing sleep because the pain was that intense...then I had three attacks one evening, each one more severe than the other...It was so intense I was screaming and I lost control-emotions, everything.'* pp. 4 (Wissen et al., 2017)

'Negative emotions' were apparent in the response to the diagnosis of MCCs and the daily life along with MCCs (Nyhlin, 1990, Whiting et al., 2006, Hillege et al., 2008, Molefe and Duma, 2009, Sells et al., 2009, Lekas et al., 2011, Townsend, 2011, Ward, 2011, Boeckxstaens et al., 2012, Löffler et al., 2012, Coventry et al., 2014, Stanners et al., 2014, Al-Amer et al., 2015, Eckerblad et al., 2015, Wissen et al., 2017). A patient described the mixed negative feelings:

*'I felt down ... got really upset ... I got frustrated ... felt down...'* pp. 235 (Al-Amer et al., 2015)

The cultural contexts and social stigma attached to their chronic conditions were suggested to be stressful, and may increase the undesirable feelings (Whiting et al., 2006, Molefe and Duma, 2009, Lekas et al., 2011, Stanners et al., 2014, Warren-Jeanpiere et al., 2014, Al-Amer et al., 2015, Ward, 2011). Two studies illustrated that the patients from Asian and the middle east experienced this problem (Al-Amer et al., 2015, Whiting et al., 2006).

*'I never [consulted a GP about depression], you know I think it's a, it's a cultural thing where you say it's taboo to think about...'* pp. 181 (Whiting et al., 2006)

Besides, for patients with contagious diseases such as HIV (human immunodeficiency virus) and HCV (hepatitis C virus) (Molefe and Duma, 2009, Lekas

et al., 2011, Warren-Jeanpiere et al., 2014) and the patients with a history of substance use (Ward, 2011), their narratives showed that they were living in the shadow of stigma.

*‘They [uninfected people] might think it’s dirty [an HIV+ person]. . . . I guess the same thing [for HCV]. Dirty. Foul [an HCV+ person].’* pp. 16 (Lekas et al., 2011)

### **Maintain a normal life**

Once people develop MCCs, there could be a broad range of barriers to life such as physical restrictions, insufficient knowledge, lack of emotional support, and financial burden in managing their diseases (Bayliss et al., 2009). ‘Maintain a normal life’ refers to people with MCCs how to manage the various chronic conditions and their impacts on everyday life. Three sub-themes were merged: ‘taking medication’, ‘exercise & dietary’, and ‘seek information by themselves’.

‘Taking medication’ was a common way of managing MCCs. This sub-theme was frequently reported in more than half of the studies (Nyhlin, 1990, Loeb et al., 2003, Townsend et al., 2006, Elliott et al., 2007, Hillege et al., 2008, Morris et al., 2011, Ward, 2011, Boeckxstaens et al., 2012, Löffler et al., 2012, Fix et al., 2014, Ridgeway et al., 2014, Stanners et al., 2014, Warren-Jeanpiere et al., 2014, White et al., 2016).

*‘I take 21 prescriptions a day, this morning I did my weekly [pill organizer]...’* pp. 14 (Loeb et al., 2003)

The problems of managing multiple medications, the financial burden of medical costs, and adherence to prescriptions were reported (Elliott et al., 2007, Fix et al., 2014). For instance, some patients reported the difficulties with schedules and worries about the adverse effects.

*'I get nervous if I have to take a couple different medications at the same time, because mind over matter, I guess. I think that when you take too many medications, it does something to you.'* pp. 10 (Fix et al., 2014)

The sub-theme of 'dietary and exercise' was quoted in ten studies (Loeb et al., 2003, Roberto et al., 2005, Townsend et al., 2006, Elliott et al., 2007, Hillege et al., 2008, Morris et al., 2011, Dysch et al., 2012, Coventry et al., 2014, Fix et al., 2014, Stanners et al., 2014). The patients described that they maintained a healthy lifestyle such as controlling sugar intake, consuming low-calories foods, and eating special foods in their everyday lives. Another important category of coping strategies was exercise. Patients reported performing physical activities such as walking, yoga, and some other fitness programs, and these activities will give them a sense of relief.

*'It's physical activity that gets your mind going.'* pp. 15 (Loeb et al., 2003)

'Seek information by themselves' refers to the patients' actions to obtain information to have a better understanding of their conditions and disease management. They sought information from newspapers, magazines, online courses, and education programs (Loeb et al., 2003, Morris et al., 2011, Löffler et al., 2012, Ridgeway et al., 2014). A patient described a way of gaining information about migraines:

*'I read a lot of magazines and newspapers and quite often they included reports about a migraine and I know 100% certain how I need to react.'* pp. 5 (Löffler et al., 2012)

Although many information resources were supportive, a study reported that the mixed information led to a confusion among MCCs patients (Loeb et al., 2003).

### **Keep a positive mental attitude**

People with MCCs is a vulnerable population due to the unpredictability in everyday life. Beyond the management of physical symptoms, the theme 'keep a

positive mental attitude’ represents ways of dealing with negative emotions and staying positive. This main theme comprised two sub-themes: ‘adapt to changes’ and ‘rely on spiritual support’.

‘Adapt to the changes’ refers to trying to accept stressful situations resulted from MCCs. It was seen as a ‘never-ending struggle’ where patients had to learn how to adopt chronic conditions. The patients reported various strategies of adaptation and emphasized the importance of a positive self-concept (Nyhlin, 1990, Roberto et al., 2005, Townsend et al., 2006, Molefe and Duma, 2009, Sells et al., 2009, Ward, 2011, Boeckxstaens et al., 2012, Löffler et al., 2012, Coventry et al., 2014, Ridgeway et al., 2014, Stanners et al., 2014, Al-Amer et al., 2015, Eckerblad et al., 2015, White et al., 2016). Some patients reported that comparing oneself to other patients could enable them to believe that their situations were not particularly bad (Stanners et al., 2014, Ridgeway et al., 2014, Roberto et al., 2005). Some negotiated life changes by lowering their life expectations (Löffler et al., 2012). Also, distractions (e.g. hobbies and daily activities) were used to take their mind off their current situations (Roberto et al., 2005). For example:

*‘No, this is how it is now and there is nothing I can do. Maybe I can choose one of the things I want to do and just push the other things aside. But that makes you feel bad about yourself. However, you know there are so many ailments hindering me.*

pp. 6 (Eckerblad et al., 2015)

‘Rely on spiritual support’ refers to the faith own by the patients to manage their conditions. Faith could influence patients’ perceptions about their lives (Arcury et al., 2000). MCCs patients viewed their relationship with God as a spiritual support when they need help. Nine studies cited strategies regarding faith and religion that the participants used to manage chronic conditions (Loeb et al., 2003, Roberto et al., 2005,

Elliott et al., 2007, Molefe and Duma, 2009, Sells et al., 2009, Ward, 2011, Ridgeway et al., 2014, Warren-Jeanpiere et al., 2014, Al-Amer et al., 2015). A patient described the important role of God in every life:

*'I pray a lot. God is everything. He is everything. I pray a lot. I thank Him for waking me up in the morning and I pray every morning. I have suffered a lot; God erases it from my life'* pp. 25 (Ward, 2011)

### **Coping in the social context**

In the theme of coping in the social context, patients' narratives show that their coping is a mixed interplay of the personal and social circumstances. Two encompassed sub-themes were: 'engage in social roles' and 'social support'.

Eight studies reported the findings of 'engage in social roles' (Nyhlin, 1990, Loeb et al., 2003, Roberto et al., 2005, Townsend et al., 2006, Elliott et al., 2007, Sells et al., 2009, Löffler et al., 2012, Ridgeway et al., 2014). The MCCs patients tried to fulfill their social roles as a way of coping and talked about the importance of 'being in a certain role', which was beneficial for personal identification of living with MCCs (Townsend et al., 2006). In addition, they expressed the needs of keeping up appearances and emphasizing their health through some normal activities (e.g. doing some housework). For example, people with MCCs tried to be 'a regular worker' as before:

*'People ... they say that I work too much ... but it's not like that at all, it's completely different from that. If I did not have that [work] what, what would I be, just sitting here and that's it.'* pp. 190 (Townsend et al., 2006)

'Social support' is a common way of coping with stress (Skinner et al., 2003). For people with MCCs, the availability and accessibility of external coping resources such as health system, family member, friends, and other social systems were key

facilitators in managing their chronic conditions (Koch et al., 2015). Five studies noted the support of the health care system and beneficial connections with healthcare providers (Whiting et al., 2006, Ridgeway et al., 2014, Morris et al., 2011, Loeb et al., 2003, Löffler et al., 2012). A patient described the views on a well-constructed health care system:

*‘This is a good hospital system because I have all of my doctors all in one network, so that makes it easier.’* pp. 345 (Ridgeway et al., 2014)

A good relationship between healthcare staff and patients impacted the quality of health care delivery and the quality of life of the patient (Goold and Lipkin, 1999). Some patients considered that they had a ‘coexisting’ relationship with their health professionals (Roberto et al., 2005). The majority of patients said they had approached their health care providers to discuss the chronic conditions and had received useful advice, which could make them feel respected and comfortable (Loeb et al., 2003, Löffler et al., 2012, Naganathan et al., 2016, Whiting et al., 2006).

This review found six studies describing the role of the family members and the significant others (Yorgason et al., 2010, Ridgeway et al., 2014, Al-Amer et al., 2015, Loeb et al., 2003, Löffler et al., 2012, Roberto et al., 2005). The family is a crucial source of social support for patients with chronic diseases (Boise et al., 1996, Gallant, 2003). The family provided various types of assistance such as emotional support, health information, and health evaluation support (Ridgeway et al., 2014). Along with the family support, some patients also described the companion support from their friends (Ridgeway et al., 2014). However, two studies reported patients’ conflicts with family members (Löffler et al., 2012, Roberto et al., 2005). A patient described an occasion of failure to understand:

*'The oldest one [daughter] doesn't understand that you have to eat at a regular time. The one that lives here with me, she knows what is going to happen if you don't, but the others are just kind of blank.'* pp. 687 (Roberto et al., 2005)

## **DISCUSSION**

The aim of this review was to identify, compare and synthesize published qualitative evidence concerning the experiences of coping with MCCs. This study was of value for three relevant reasons. First of all, by following a structured approach (Noblit and Hare, 1988), four themes related to coping with MCCs were merged: 'appraise MCCs', 'maintain a normal life', 'keep a positive mental attitude', and 'coping in the social context' and offered a line of argument regarding coping with MCCs. The synthesized findings presented a general perception of MCCs from the patient's side and located a variety of coping strategies to manage MCCs. Next, although the qualitative studies do not require representative samples or external validity, the included studies involved a more homogenous subset of people with MCCs. Moreover, a JBI tool was adopted to evaluate the quality of the included studies and the evaluation results were satisfactory. This allowed us to provide reliable and authentic findings.

MCCs patients had various perspectives on their compound health conditions by appraising their situations, and these perceptions developed by MCCs patients may differ from those developed by patients with a single chronic condition (Bower et al., 2012). This study confirmed the complexities they faced. More specific, when they described the perceptions, they presented a holistic view of MCCs itself with reference to the disease burden and priorities of different conditions. This finding reiterated the difficulties of managing a certain number of chronic conditions. What is more, research suggests that the illness perceptions affect the way in which people make

sense of their conditions and the consequent management (Leventhal et al., 1980), and these personal perceptions may or may not be in line with the perspectives of health professionals (Naganathan et al., 2016). The current study did not compare the difference in perceptions between the patients and providers but it is necessary to pay attention to this area because understanding illness perceptions are significant as they are capable of predicting a patient's behaviour (Hagger and Orbell, 2003).

Altered perspectives reintegrated by constructions about MCCs and new information resulted in a shift of patients' responses to diseases, and these perspectives characterized the ways of coping. This study illustrated that people with MCCs used many strategies to cope with the difficulties of MCCs. The two major themes ('maintain a normal life' and 'keep a positive mental attitude') that were similar to problem-focused and emotional-focused coping (Folkman and Lazarus, 1984). The finding showed that people with MCCs adopted problem-focused coping strategies to resolve their health problems and kept their dignity and independence in order to maintain a normal life. These strategies included taking medication, changing lifestyle, and seeking information. Besides, this study showed that people with MCCs experienced mixed feelings about their chronic conditions, this supported a previous study: Löffler et al. (2012) showed that people with MCCs experienced multiple emotions including both an interplay of negative emotions such as depression, anxiety, and sadness on one side and happiness on the other side in their coping process. It was also presented that MCC patients tried to stay positive with emotional coping strategies such as pray, distraction, and humor. An interesting finding was that the medicating behaviour and personal adaptation were identified as the most common coping strategies among people with MCCs. This indicated the importance of these two strategies and gave us some hints of promoting healthcare such as facilitating an

optimized medication management plan and implementing recommendations for medication for the MCCs patients.

Coping with MCCs is not an isolated process, but an environment-related process (Lazarus and Folkman, 1984). This study showed that living with chronic conditions was a journey that was combined with professional and other social networks. The finding of 'coping at the social level' indicated the significance of support from the social aspects, which echoed a past study by Kosciulek (2007). However, due to the complexity of MCCs, the supporting information from family and friends might be fragmented, and conflicting (Stange, 2009, Tinetti and Fried, 2004, Weiner et al., 2010). These conflicts between demands and provisions were consistent with a past study (Ploeg et al., 2017), which revealed the disconnected communication and interactions between MCCs patients and their caregivers. Similarly, one of the difficult areas of managing MCCs found in some past studies involved the conflicts concerning targets of health care between the providers and people with MCCs (Sinnott et al., 2013, Junius-Walker et al., 2012). As a result, more attention should focus on how to provide accurate health information to patients and identify reliable sources of information.

### **Implications for further research**

The studies included in this review were mostly conducted in western countries, with only one from an Arab country. The majority of the concepts of coping and research about coping have been developed and conducted in western countries (Hobfoll, 2001). This was criticized by some scholars (Folkman and Moskowitz, 2004) as it fails to take cultural influences into consideration (Chun et al., 2006). Culture has not been adequately studied within the current coping literature, and related research

outside of western countries is still rare (Heppner et al., 2006). Thus, it is needed to conduct studies in various cultures to identify the role of culture in coping with MCCs.

Older patients have a higher prevalence of chronic disease and comorbidity (Kennedy et al., 2014). This study identified that most of the studies focused on elderly people with MCCs. However, chronic diseases may strike any age groups, and coping is a dynamic, and age-related process (Strack and Feifel, 1996). Thus future studies may need to examine the differences in coping among different age-groups. What is more, gender characterized different coping strategies (Hobfoll et al., 1994). Studies have indicated that male and female could cope differently when facing the same stressful situations including physical and mental health conditions (Ninot et al., 2006, Piccinelli and Wilkinson, 2000). Due to a paucity of research in this area, hence, more studies are required to investigate whether male and female have different appraisals and use different strategies when they face with MCCs.

### **Limitations**

In the research area of chronic conditions, some commonly used terms such as self-management, coping, and adaptation are confused. Audulv et al. (2016) undertook a concept review to clarify these concepts in the context of managing a neurological condition and found that coping focused on the internal control whereas self-management focused on the disease control. The current study synthesized qualitative data of coping and MCCs based on the theory developed by Lazarus and Folkman (1984). Therefore, some findings that involve coping but to a lesser extent, may have been missed. Few descriptions about MCCs in the included studies led to a lack of insight on the variation across different chronic conditions clusters. Recent research has demonstrated the associations between clusters of chronic conditions and the patient's health outcomes (González-Chica et al., 2017). Hence, this area requires

further investigation. What is more, studies met the inclusion criteria based on an abstract written in English but have not been included because of language restrictions. This means that some perspectives and insights of people with MCCs from publications in other languages may have been missed. Lastly, this study may have overlooked some potential studies published in other sources beyond peer-review journals.

## **CONCLUSION**

In summary, this review analysed 26 qualitative studies involving 654 participants concerning the experiences of coping with MCCs. The findings showed people with MCCs might face a wide range of mixed conditions, and they adopted different strategies to maintain their normal lives and tried to stay positive. The importance of coping in the social context was also addressed. Further research should pay attention to some more specific topics such as age, gender, and cross-cultural research. Health promotion and maintenance programs for developing and improving coping skills could be valuable for people with MCCs.

## **RELEVANCE FOR CLINICAL PRACTICE**

To move healthcare forward, possible guidance and counseling program should be given. This may include an understanding of stressful experienced by patients, discussion about the complicating matters in their self-management, increased attention to the multiple medications and therapies, more individualized interventions targeted to the real state of patient's needs. The consequent quality assessment of health care and guideline development and research will also be essential.

Social aspects such as health system, family, friends, and other support groups, are suggested to be valuable coping resources for people with MCCs. Every aspect

plays a role in supporting MCCs patients. The use of holistic social determinants of health would contribute to better disease management and provide complementary care (Gallant, 2003). Thus, there is necessary for health professionals to work with families, significant ones and some related support groups as a team to provide optimal health care service for these patients. To support this, a good relationship among these could be a key element.

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# Chapter 3: Research Methodology and Methods

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## 3.1 INTRODUCTION

This chapter describes the methods used in this research to achieve the aims stated in Section 1.8. Section 3.2 discusses the paradigm used in the research. Section 3.3–3.4 specifies the research design and justifies its use. Section 3.5 describes the research context and settings. Section 3.6–3.8 outlines the procedures and implementation of the research design. The final section details this project’s ethical approval.

## 3.2 PARADIGM CONSIDERATIONS

A paradigm is a set of concepts, including theories, research methods, assumptions and standards associated with a specific field (Guba & Lincoln, 1994). Guba, 1990 stated that paradigms could be characterised by their ontology (the things a person studies), epistemology (the ways a person understands) and methodology (the approaches a person uses). Nowadays, there are four commonly used paradigms: post-positivism, constructivism, transformative paradigm and pragmatism (Creswell, 2014).

The postpositivist paradigm is the traditional form of research. It represents that human knowledge is based on human conjectures rather than on a priori assessments from a person. In practice, researchers collect data through instruments and record observations to obtain knowledge. Constructivism is suggested as an approach for qualitative research. It believes that people understand the world based on their own experiences shaped by historical and social settings. Transformative paradigm

suggests that research inquiry should be involved with politics and political changes, as it focuses on the needs of people that may be marginalised and vulnerable, such as ethnic minorities, people with disabilities and indigenous people. Pragmatism is problem-centred and practice-centred in the real world, as it focuses on applying approaches and solutions to a problem in the real world. In pragmatism inquiry, researchers are free to choose methods of research that fit their aims and objectives (Creswell, 2014).

Every research design has its own philosophical foundation. In quantitative research, researchers generally use a postpositivist paradigm to obtain knowledge. In qualitative research, researchers usually generate knowledge by analysing the words, perspectives and experiences of informants with a constructivist claim. In mixed methods research, researchers discover knowledge based on pragmatism, as it allows for the quantitative and qualitative design to be matched. Pragmatism is considered an appropriate paradigm for mixed methods studies, as it aims to solve real human problems rather than discover the truth and provides an applied research philosophy. Using a pragmatic paradigm can improve communication among researchers from different research fields and offers opportunities to explore knowledge in a mixed way (Greene & Hall, 2010).

The current research explored the nature of coping with MCCs, including coping strategies and experiences, which are elusive and have various determinants. Studies of coping with MCCs are limited, and existing research predominantly adopted a single research design that solely relied on quantitative or qualitative findings (Compas, Jaser, Dunn & Rodriguez, 2012). A quantitative design uses a practical approach to measure coping data in large samples (e.g., a cross-sectional survey), while a qualitative design collects a body of context and information to explore coping

strategies and experiences (e.g., semi-structured interviews). A quantitative approach to data collection cannot explore the underlying reasoning behind participants' responses or investigate the complexities of the research context. Consequently, a mixed methods design was deemed appropriate to investigate coping within the context of MCCs because it has significant efficacy in exploring multifaceted research questions, enabling in-depth and extensive findings on this research topic (Creswell, 2014).

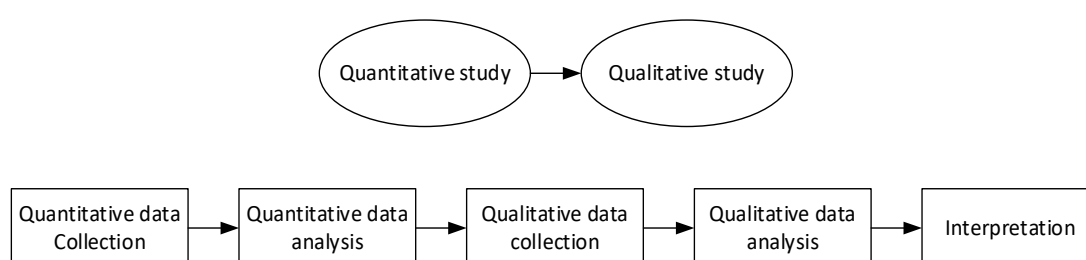
### **3.3 SEQUENTIAL EXPLANATORY MIXED METHODS DESIGN**

Mixed methods design is defined as single research, and mixes quantitative and qualitative research approaches, methods and concepts. The rationale of mixed methods research is that neither quantitative nor qualitative methods are sufficient to fully explain the complexity of the phenomenon being investigated. The mixed methods design allows researchers to combine data from different sources, identify differences and similarities among these and expand results within different research designs (Creswell, 2014). Thus, a mixed methods approach to quantitative and qualitative studies can offer a more complete and comprehensive explanation of a specific research problem.

Research designs are considered types of inquiry that provide a typical direction for research procedures. A mixed method design generally comprises three major types of methods: convergent parallel mixed methods, explanatory sequential mixed methods and exploratory sequential mixed methods. The convergent parallel design collects and analyses quantitative and qualitative data concurrently and then mixes the results during the overall interpretation. This design prioritises the methods equally. The explanatory sequential design is a two-phase design that collects quantitative and qualitative data at different times. This design suggests that quantitative data collection

is the priority and it uses quantitative results to guide the qualitative study. The exploratory sequential design is a two-phase design that collects quantitative and qualitative data at a different time. This design suggests qualitative data collection is the priority and it uses qualitative results to inform the quantitative method. These research designs represent different procedures of data collection and results interpretation (Creswell, 2014). Choosing a rigorous research design is important because it guides the research procedure and keeps the logicity of results.

The present research employed a sequential explanatory mixed methods design. This design is suitable to assess the relationship with quantitative data and explain the reasons behind the results. In this design, quantitative data collection and analysis was primarily conducted, while the qualitative data collection and analysis was conducted in sequence and elaborated on the quantitative findings obtained in the primary stage. The quantitative results offered an overall picture of the research objectives, and the qualitative study allowed further in-depth exploration of the quantitative findings through the views of participants. A visual model of the sequential explanatory mixed methods design is illustrated in Figure 3.1.



*Figure 3.1* Sequential explanatory mixed methods design

The current research used a quantitative component as a major approach that sought to describe coping strategies used by Chinese people with MCCs and examine the relationship between these coping strategies and related variables. This was followed by a qualitative study that aimed to explore the experience of coping among

people with MCCs in China and identify the role of culture in this experience. The quantitative and qualitative data were then integrated into the analysis and discussion. Combining an inventory measuring coping and the textual data describing coping enhanced the understanding of how people with MCCs manage their conditions.

### **3.4 PRIORITISATION, IMPLEMENTATION AND INTEGRATION OF THE CHOSEN DESIGN**

Criteria about a rigorous and reliable mixed methods design depend on prioritisation, implementation and integration, which represent crucial elements in designing studies. Prioritisation refers to the research emphasis between the qualitative and quantitative phases of the study. Implementation refers to the order of study (i.e., sequential, parallel and concurrent), while integration refers to the connections between the quantitative and qualitative phases of the study (Creswell, Fetters & Ivankova, 2004).

#### **Prioritisation**

The priority in this study was the quantitative phase because this research used qualitative findings to assist in explaining and understanding the quantitative findings.

#### **Implementation**

The current research had three phases: (1) a validation phase—psychometric properties of the Brief COPE inventory, (2) a cross-sectional survey phase, and (3) a qualitative interview phase. In the first phase, the candidate psychometrically examined the Brief COPE inventory among people with MCCs in China to provide a tool to measure coping for the second phase. The second phase was a cross-sectional questionnaires-based survey that aimed to examine associations between illness perceptions, coping strategies, and QoL among Chinese people with MCCs. The third phase was to conduct qualitative interviews focusing on the coping experiences of

people with MCCs. Finally, the quantitative and qualitative data were integrated to provide a holistic view of how Chinese people cope with MCCs. Table 3.1 provides an overview of the research phases in this thesis.

Table 3.1

*Research phases of the current research.*

Phase	Procedure		Products
Validation phase	Application of ethics approval	Apply for ethical approvals from the University of Newcastle Human Research Ethics Committee (HREC) and the study venue	Ethics approvals
	Sampling and recruitment	Recruit sample	290 participants
	Data collection	Administer cross-sectional survey	Numeric data
Quantitative phase	Data analysis	Exploratory factor analysis Confirmatory factor analysis	Validated Brief COPE inventory
	Sampling and recruitment	Recruit potential sample	351 participants and potential sample for the qualitative phase
	Data collection	Administer cross-sectional survey	Numeric data
	Data analysis	Descriptive analysis, correlation analysis and regression analysis	Connections between sets of variables
Qualitative phase	Sampling and recruitment	Purposeful sampling	14 participants
	Data collection	Face-to-face, semi-structured interviews Field notes	Verbal data Text data
	Data analysis	Qualitative content analysis	Themes matrix
Interpretation and explanation of quantitative and qualitative findings			

### **Integration of the data from the qualitative and quantitative study**

The mixed methods study involved joint procedures of collecting, analysing and presenting qualitative and quantitative data on the research questions of the present study. In general, there is a recognised approach to integrate qualitative and quantitative data in the design, methods and interpretation (Creswell, 2014).

### ***Integration at the design level***

A sequential explanatory mixed methods design was appropriate to obtain a comprehensive understanding of the strategies and experience of coping with MCCs.

### ***Integration at the methods level***

In the quantitative phase of this study, the candidate conducted a cross-sectional study in the identified population to investigate the coping strategy adopted by Chinese people with MCCs and to examine the relationship between coping strategies and potential explanatory factors. Next, the candidate conducted qualitative interviews to investigate the experiences of coping with MCCs in a purposive group of participants who had completed the survey. Thus, the quantitative results helped to inform the data collection procedure and develop a sample for the qualitative phase.

### ***Integration at the interpretation level***

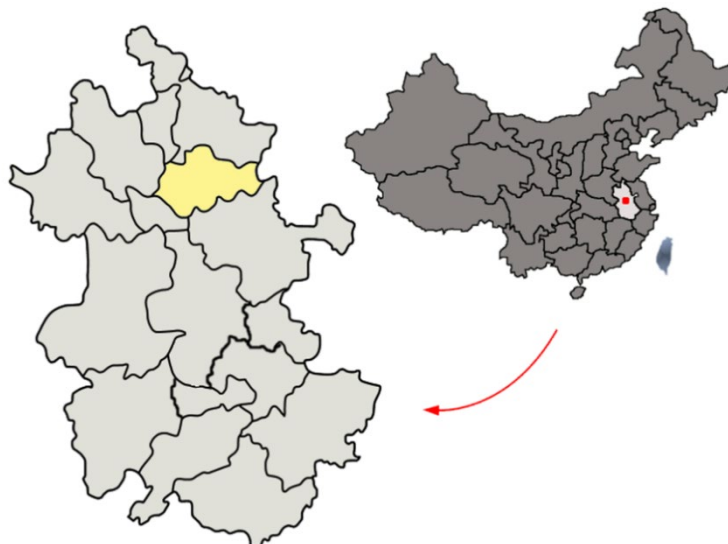
This study displays and organises both quantitative and qualitative data in a comprehensive table, in which the qualitative findings and quotations enhanced and expanded the quantitative findings. This data integration provided a holistic view of coping with MCCs. These two different designs helped to expand the knowledge about coping with MCCs by providing data on perceptions and strategies from different aspects and identifying these in association with QoL in people with MCCs.

## **3.5 RESEARCH CONTEXT AND SETTINGS**

The current study was conducted in Bengbu, Anhui Province, China. According to a report from Statistics Bureau of Anhui Province (2016), Anhui Province has a population of 60 million people, of whom 18 per cent are elderly (aged more than 60 years old). In China, the elderly population is defined as people aged 60 years old and over (Ministry of Justice of the People's Republic of China, 2019). The prevalence of chronic conditions is about 29.4 per cent for the whole population of Anhui Province

(aged more than 18 years old), with 61.3 per cent aged more than 60 years old in 2014 (Xiangqing, 2014). There are an estimated 18 million adults with at least one chronic condition in Anhui Province, the most prevalent chronic health conditions of which are hypertension (25.4%), dyslipidaemia (19.3%), diabetes (3.2%) and cancer (145.36/100,000) (Xiangqing, 2014).

Bengbu is a mid-sized city in northern Anhui Province, China. The city of Bengbu has four districts (Longzihu, Bengshan, Yuhui and Huaishang) and three counties (Huaiyuan, Wuhe and Guzhen), with an overall land area of 5,952 km<sup>2</sup> and an urban land area of 601 km<sup>2</sup>. Bengbu has a population of 3.23 million inhabitants, over one million of whom are urban residents (Information Center of Bengbu City, 2017). Figure 3.3 illustrates the location of Bengbu City jurisdiction (shown in yellow) in Anhui Province (shown in grey), China.



*Figure 3.2* Location of Bengbu City jurisdiction in Anhui Province, China.

Hospitals in China are divided into three levels, and each level has two grades. Class A tertiary comprehensive hospital is the highest level in China. Class A hospitals have at least 500 beds and they commit to deliver clinical care, conduct scientific

research, and provide medical education and training (Süssmuth-Dyckerhoff & Wang, 2010). In this study, the first affiliated hospital of Bengbu Medical College is a Class A tertiary comprehensive hospital and a University hospital. It is the largest healthcare facility in the north area of Anhui province.

A local Class A tertiary comprehensive hospital was selected as the recruitment venue in this study. The Class A tertiary comprehensive hospitals are likely to have more people with serious conditions than other lower-level hospitals. Most patients with MCCs in China seek treatment and services in these hospitals. The study findings will be able to generalise to people with MCCs who obtained medical services in Class A tertiary comprehensive hospitals.

This hospital is the First Affiliated Hospital of Bengbu Medical College, Bengbu, Anhui, China. It is the largest comprehensive hospital in northern Anhui, providing integrating medical treatment, teaching service, scientific research, rehabilitation and first aid. This hospital has 39 clinical departments, seven medical technology departments, 18 clinical teaching and research rooms and more than 2,400 beds. The average number of outpatient and emergency visits per year is 1.42 million and the average number of surgeries per year is 34,000. As a provincial healthcare centre, it also serves people from several nearby provinces such as Jiangsu, Shandong and Henan.

### **3.6 PSYCHOMETRIC PROPERTIES PHASE**

#### **Objectives**

The purpose of this phase was to evaluate the psychometric characteristics of the Chinese version of the Brief COPE inventory intended for use among people with MCCs.

## **Design**

This was a cross-sectional survey design based on self-administered questionnaires. A cross-sectional study draws a sample from the researched population at one point in time (Lavrakas, 2008). The reporting guideline of this phase followed the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) Statement (von Elm et al., 2014).

## **Setting**

This phase was conducted in a university-affiliated hospital in Bengbu, Anhui, China, from November 2017 to May 2018.

## **Participants**

There is no recognised recommendation about the appropriate sample for factor analysis (Mundfrom, Shaw & Ke, 2005). However, it is generally accepted that larger samples are more reliable (Kline, 1994). The candidate determined the sample size of this phase according to Kline's principles for factor analysis, considering there should be at least 10 participants for every item in the instrument (Kline, 1998). Thus, a sample of 280 participants was deemed appropriate.

The participants were required to satisfy the following criteria: Chinese adults aged over 18 years old, able to read and communicate in Chinese and medically diagnosed with two and more chronic conditions. Individuals who had difficulties completing the survey (such as those who could not read due to low literacy) were excluded from the study.

The chronic health conditions included in this study comprised physical health conditions such as chronic respiratory conditions, diabetes and hypertension, and mental health conditions such as depression, anxiety, schizophrenia and bipolar disorder. To identify these chronic health conditions, this research followed a list of

common chronic health conditions in China based on a past study about MCCs (Wang et al., 2015).

## **Measurements**

### ***Socio-demographic characteristics***

Socio-demographic characteristics included age, gender, educational background, marital status and employment status.

### ***Clinical characteristics***

Clinical characteristics included the number, duration and type of chronic health conditions.

### ***Brief COPE inventory***

The Brief COPE inventory is an abbreviated version of the original COPE inventory—a self-report questionnaire developed to examine a range of coping strategies (Carver, Scheier & Weintraub, 1989). This inventory has 28 items that measure 14 coping strategies using two items each (Carver, 1997). Respondents were asked to rate each item using a four-point Likert scale (1 = I haven't been doing this at all, 2 = I've been doing this a little bit, 3 = I've been doing this a medium amount and 4 = I've been doing this a lot). Higher scores indicate the more frequent use of the corresponding coping strategy.

## **Data collection**

A convenience sampling method was used in this research. Recruitment flyers and advertisements were developed and presented at outpatient clinics of the research venue. Eligible participants were approached by the candidate and were briefed on the study's aims, voluntary participation and confidentiality. Participants gave verbal and written informed consent and were asked to complete the questionnaires.

Data were collected by the candidate using structured, self-reported questionnaires. The questionnaires were administered in Chinese. An experienced research nurse assisted in this work. The candidate had training in using the questionnaires and in ethics and had knowledge of MCCs before data collection. The candidate read the questions and marked down the participants' responses if necessary. A pilot survey was conducted with 10 participants to identify any potential problems in the data collection procedures, such as time management, content arrangement or responses to questions. Participants usually spent approximately 15–20 minutes on the survey.

### **Data analysis**

Data were computed by using the IBM SPSS Statistics version 24.0 (IBM Corp 2016, Armonk, NY). Sample characteristics (i.e., age, gender and marital status) were reported using descriptive statistics.

### **Chapter(s)/paper(s) related to this phase**

Chapter 4 includes a validation paper that provides the results of this phase.

## **3.7 CROSS-SECTIONAL SURVEY PHASE**

### **Objectives**

This phase aimed to discover the coping strategies used by Chinese people with MCCs and to investigate the associations between coping strategies and socio-demographic characteristics, clinical characteristics, illness perceptions and quality of life (QoL) among this population.

### **Design**

This was a cross-sectional, correlational study based on self-reported questionnaires. The reporting guideline of this phase followed the STROBE Statement (von Elm et al., 2014).

## Conceptual framework

A conceptual framework was devised according to the Lazarus's TTSC (Lazarus & Folkman, 1984), and past research (McCabe & Barnason, 2012; Tiemensma, Gaab, Voorhaar, Asijee, & Kaptein, 2016) was used to identify and include variables about coping for this study (see Figure 3.2). Based on the coping theory, an individual initiates their coping process in response to a condition that is suggested to be challenging/stressful/detrimental. This means the condition is personally important and exceeds the individual's resources for coping. Coping strategies are then developed to manage the emotions resulting from appraisals and dealing with the condition. The candidate conceptualised MCCs as a condition and illness perceptions of MCCs as the 'primary appraisal' for reflecting on how a person makes an appraisal. Coping strategies were conceptualised as the 'secondary appraisal' for reflecting on how a person address the condition. QoL was used as an indicator of health-related outcomes. QoL is defined as '*an individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns*' (World Health Organization, 1997, p.1).

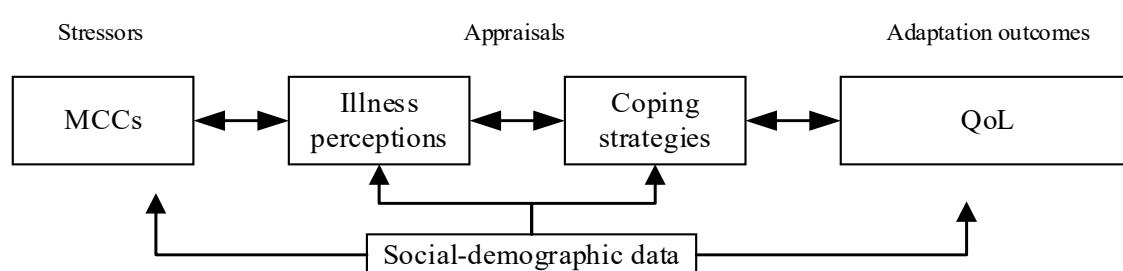


Figure 3.3 Conceptual framework of the current study.

MCCs = multiple chronic conditions; QoL = quality of life

## Setting

This phase was conducted in a university-affiliated hospital in Bengbu, Anhui, China, from November 2017 to May 2018.

## **Participants**

G\*Power 3.1.9.4 software (Faul, Erdfelder, Buchner & Lang, 2009) was used to calculate the sample size for the multiple linear regression analyses. The results of this calculation were 189 with an effect size of 0.15, a significance level of 0.05, power of 0.95 and 13 predictors. The inclusion and exclusion criteria were the same as in the past phase.

## **Measurement**

### ***Socio-demographic and clinical variables***

Socio-demographic data included age, gender, educational background, marital status and employment status. Clinical data included the number, duration and type of chronic health conditions.

### ***Illness perceptions***

Illness perceptions were examined by the Brief Illness Perception Questionnaire (Brief IPQ) (Broadbent, Petrie, Main & Weinman, 2006). The Brief IPQ has eight 11-point Likert items (from 0 to 10) and a causal scale. These eight items evaluate consequences (item 1), timeline (item 2), personal control (item 3), treatment control (item 4), identity (item 5), illness concern (item 6), coherence (item 7) and emotional representation (item 8). For items 1, 2, 5, 6 and 8, a bigger score refers to a worse disease perception. For items 3, 4 and 7, a smaller score refers to a worse disease perception. The Brief IPQ total score ranges between 0 and 80 points, where the overall score represents the degree to which the illness is perceived as threatening. Higher scores mean a more threatening perspective of the corresponding illness. The last question asks respondents to list the three most significant causal factors in their diseases. The Chinese version Brief IPQ has been validated in people with breast cancer and shown to be reliable (Cronbach's alpha = .783) (Zhang et al., 2017). In this study, the Cronbach's alpha for the Brief IPQ was .747.

### ***Coping strategies***

Coping strategies were measured by the Brief COPE inventory, which has 28 items examining 14 coping strategies using two items for each (Carver, 1997). Respondents were required to score each item using a four-point Likert scale (from 1 = Never done it to 4 = Done it a lot), with higher scores showing more frequent use of the matching coping strategy. The Brief COPE is multidimensional and needs to be adjusted based on the real research setting. This study used a five-factor structure of the Chinese version Brief COPE inventory, which has been identified in the validation phase (Cheng, Yang, Inder, and Chan, 2020). The Chinese version is psychometrically sound (Cronbach's  $\alpha = .87$ ) which examines five coping strategies, consisting of positive adaptation, denial and disengagement, spiritual coping, support seeking and self-blame.

### ***Quality of life***

QoL levels were tested by the 12-item Short Form survey version 2 (SF-12v2) (Ware, Kosinski, Turner-Bowker & Gandek, 2005). This instrument has 12 items examining eight health domains, consisting of physical functioning, physical limitations, body pain, general health, vitality, social functioning, emotional problems and mental health. The SF-12v2 generates two domains of health-related scores: the physical component score (PCS) and the mental component score (MCS). Scores range from 0 to 100 and higher scores indicate better function. The SF-12v2 has been validated in the common Chinese population and seemed reliable (Cronbach's  $\alpha$  for physical component = .67; Cronbach's  $\alpha$  for mental component = .60), and the mean standard of the PCS and MCS of the Chinese general population were  $52.65 \pm 5.76$  and  $50.23 \pm 8.24$ , respectively (Lam, Lam, Fong & Huang, 2013). In this study, the Cronbach's  $\alpha$ s were .815 for PCS and .688 for MCS, respectively.

### ***Anxiety and depression***

Anxiety and depressive symptoms were assessed by the Hospital Anxiety and Depression Scale (HADS) (Zigmond & Snaith, 1983). This scale includes 14 items, seven of which measure symptoms of anxiety (HADS-A) and the other seven of which measure symptoms of depression (HADS-D). Each item is scored from 0 to 3, giving a total score ranging from 0 to 21. Higher scores indicate more possible symptoms of anxiety and depression. The HADS has been translated into Chinese and shown to be reliable (Cronbach's alphas for anxiety = .77 and for depression = .82) (Leung, Wing, Kwong, Lo & Shum, 1999).

### **Data collection**

A convenience sampling method was used in the current study because it is affordable, convenient, and the participants are easily accessible (Etikan, 2016). Recruitment flyers and advertisements were developed and showed at outpatient clinics of the research venue. Eligible participants were approached by the candidate and were briefed on the study's aims, voluntary participation and confidentiality. Participants gave verbal and written informed consent and were asked to complete the questionnaires.

Data were collected by the candidate using structured, self-reported questionnaires. The questionnaires were administered in Chinese. An experienced research nurse assisted in this work. The candidate had training in using the questionnaires and in ethics, and had knowledge of MCCs before data collection. The candidate read the questions and marked down the participants' responses if necessary. A pilot survey was conducted with 10 participants to identify any potential problems in the data collection procedures, such as time management, content arrangement or

responses to questions. Participants usually spent approximately 15–20 minutes on the survey.

### **Data analysis**

All the collected data were entered into SPSS Statistics version 24 (IBM Corp 2016, Armonk, NY) and double-checked for errors and implausible values in the entry by the candidate. All the computations were performed using the SPSS statistics software.

Descriptive statistics included frequency distributions, means and standard deviations for participants' socio-demographic and clinical variables, illness perceptions, coping strategies and QoL. Missing data were replaced by mean imputation. Normality was checked by the histogram and the absolute values of skewness and kurtosis. Pearson's correlation was used to examine the correlations between illness perceptions, coping and QoL, with a coefficient of  $\geq .50$  indicating a strong correlation. Only variables with a significant relationship with PCS and MCS were entered into the regression model. Hierarchical multiple regressions with QoL (PCS and MCS) as a dependent variable involved imputation of variables in four steps: (1) socio-demographic variables, (2) clinical variables, (3) illness perceptions and (4) coping strategies. Regression models were performed using a forced entry method of variable inclusion. Results were considered significant at  $p < .05$ . All statistical analysis was computed using the IBM SPSS Statistics version 24.0 (IBM Corp 2016, Armonk, NY).

### **Chapter(s)/paper(s) related to this phase**

Chapters 5 and 7 are the results of this phase. Chapter 5 includes a report demonstrating the associations between coping strategies and socio-demographic characteristics, clinical characteristics, illness perceptions and QoL among people with

MCCs. This chapter also includes secondary analysis papers based on the collected data of this phase. Chapter 7 integrates the quantitative and qualitative findings of the whole research.

### **3.8 QUALITATIVE INTERVIEW PHASE**

#### **Objectives**

This phase aimed to contribute to understanding the experiences of coping with MCCs in Chinese people and exploring the role of culture in their coping.

#### **Design**

A qualitative descriptive design was employed, as it allowed the researchers to '*stay closer to their data and to the surface of words and events*' (Sandelowski, 2000) (p. 336). Also, a qualitative descriptive design provides a broad summary of an event in everyday language, and is used to reveal important elements of incompletely conceptualised phenomena and obtain basic participant responses (Sandelowski, 2000). The reporting guideline of this phase adhered to the Consolidated criteria for reporting qualitative research (COREQ) checklist (Tong, Sainsbury & Craig, 2007).

#### **Setting**

This phase was conducted from August to October 2018 in a tertiary referral and teaching hospital in Bengbu, Anhui, China.

#### **Recruitment**

A purposive sampling approach was used to recruit participants who had completed the cross-sectional survey (Cheng, Yang, Inder, and Chan, 2020). Purposive sampling aims to find participants from all available aspects to obtain a greater understanding regarding coping with MCCs (Palinkas et al., 2015). The candidate selected potential participants across a broad spectrum relating to the topic of study. The participants consisted of patients from different age groups, gender, jobs, illness

trajectories, and MCCs in order to gain a comprehensive understanding of the strategies that they used to cope with their chronic health conditions.

The potential participants were approached by the candidate via phone or in person and, after providing verbal consent, an appointment was made with each participant.

### **Data collection**

Semi-structured interviews were conducted with these participants at a location in the research venue. Two pilot interviews were conducted to check the feasibility of the questions. A topic list (see Appendix IV. Semi-structured interview protocol) was developed based on a past review: Chapter 2, 'Part 2 Patients' experiences of coping with multiple chronic conditions: A meta-ethnography of qualitative work' (Cheng, Inder & Chan, 2019), and was kept purposefully broad and open-ended to allow participants to describe their experiences. The examples of open-ended questions were:

1. How do you perceive your chronic conditions?
2. Are there any barriers to the process of coping with MCCs? If so, what kinds of barriers?
3. How do you cope with your barriers?
4. Are there any supports in the process of coping with MCCs? If so, what kinds of supports?
5. How do you suggest your support?

Questions also focused on the following areas in consideration of cultural influences:

1. Perception of diseases and coping,
2. Supportive factors in overcoming difficulties,
3. Family relationship and healthcare support.

To obtain further details about the individuals' experience, probing questions were used:

1. Could you tell me more about ...?
2. Could you give me some examples of ...?
3. This is what I thought I heard ... Is this what you think?
4. So, what I hear you saying is ...?
5. Can you give me an example of ...?
6. You told me about ... I would like to know about ...

Before the interview, every participant was informed of the nature of this study and told that participation was entirely voluntary. An information sheet and consent form outlining the research aims, recording information, data use, and anonymisation were provided and informed. The participants were asked to sign the consent form before the interview, and complete an interview booklet, including a socio-demographic data sheet and a clinical data sheet. The demographic sheet included information such as age, gender, marital status, employment and educational level. The clinical sheet collected data regarding MCCs such as type and duration.

In qualitative research, data saturation is often used as a sampling principle (Saunders et al., 2018), meaning recruitment is stopped when no new information is found. In this study, after the 14<sup>th</sup> interview, there were no new themes generated from the transcribed data. Hence, it was considered that the data collection had reached a

saturation point. Field notes were made to document impressions and decisions during the interviews because they could record unspoken information regarding behaviour and give insights into participants' interactions (Mulhall, 2003). The following information was recorded: (1) date, time and location of the interview, (2) facts, numbers and key details of what occurred during the interview, (3) sensory impressions (e.g., sights, sounds and smells), (4) personal responses to the field notes, (5) specific words, phrases, summaries of conversations and insider language, (6) questions about people or behaviour and (7) page numbers to keep papers in order.

### **Data analysis**

Socio-demographic and clinical data were analysed using descriptive statistics and presented in tables. The candidate transcribed the interviews verbatim, and the supervisors checked the transcripts against the original recording for accuracy. Qualitative content analysis with hand coding was used to analyse the transcribed data (Hsieh & Shannon, 2005). An inductive approach was following, consisting of three analytical phases: preparation, organisation and reporting (Elo & Kyngas, 2008):

1. Preparation: the candidate began by determining the unit of analysis (objects of the research objects/a research theme) based on the research aims. In this study, the unit of analysis was the transcribed data about coping experiences in Chinese adults with MCCs. The next step in this phase was to obtain a sense of the whole data by reading through it several times. This step allowed the candidate to improve understanding and familiarity with the content.

2. Organisation: the candidate conducted initial open coding and developed themes and abstract descriptions in consultation with supervisors. The text about the participants' experiences of coping with MCCs was extracted and combined into one text that constituted the unit of analysis. The condensed meaning units were then abstracted and coded. After the open coding, the candidate generated the lists of categories by grouping similar and different categories into higher-order ones that constituted the content.
3. Abstraction: the candidate reviewed the categories and discussed the tentative ones in regular meetings with supervisors. The underlying meaning (categories) was formulated into a theme and findings were reported.

The candidate translated themes, categories and quotations from Chinese to English. Another bilingual (Chinese/English) supervisor with expertise in qualitative research managed the process to assure validity of the content. If necessary, participants were contacted by telephone if any of their statements were deemed unclear.

### **Chapter(s)/paper(s) related to this phase**

Chapters 6 and 7 are the results of this phase. Chapter 6 reports the qualitative findings with respect to the coping experiences in the context of MCCs, and Chapter 7 presents the integrated findings based on the data obtained from the quantitative and qualitative phases.

## **3.9 ETHICAL CONSIDERATIONS**

This is a doctoral research project that aims to investigate how people cope with MCCs. A range of widely recommended ethical principles related to research on human subjects were followed:

1. Literature reviews of prior research on this topic were conducted to ascertain knowledge gaps and the rationale of this research. Thus, there was no unnecessary duplication of research nor have this project's research questions been effectively answered in the literature.
2. The ethical principles related to medical research involving human subjects were in accordance with the Declaration of Helsinki (World Medical Association, 2013) and the National Statement on Ethical Conduct in Human Research (National Health and Medical Research Council, 2007 [Updated 2018]).
3. Ethical approvals to conduct this research were obtained from the HREC of the University of Newcastle, Australia, and the participating hospital.
4. Permission to use a room for interviews was obtained from the participating hospital. The collected survey forms are locked in a private cabinet and the electronic data is saved on the candidate's cloud provided by the University of Newcastle, Australia.
5. Participation in the study was entirely voluntary and anonymous, and participants were informed of this and were assured that they and their private information, such as name, contacts and medical history, would remain anonymous. Participants were also advised that whether they participated in this research would not affect the care and service they received from the study venue for their MCCs, and they were free to withdraw from the study at any time without reason.
6. Declarations of any actual or potential conflict of interest were clarified and reported.

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## Chapter 4: The validation study

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### 4.1 INTRODUCTION

The construct of coping that originated from Lazarus's TTSC might be Westernised thinking. To test coping of individuals with MCCs across different settings, this chapter reports the psychometric properties for the Chinese version of the Brief COPE inventory, an extensively used questionnaire assessing coping strategies, in a population of people with MCCs.

### 4.2 OUTPUT OF THIS CHAPTER

Chapter 4 has been submitted for publication and is currently under review in a peer-reviewed journal.

Cheng, C., Yang, C. Y., Inder, K., and Chan, S. W. (2020). *Psychometric properties of the Brief COPE in people with multiple chronic conditions*. Revised manuscript under review in the International Journal of Nursing Practice. Submitted on April 16, 2020.

### 4.3 SIGNIFICANCE AND CONTRIBUTION TO THE RESEARCH

Validation of the Chinese version Brief COPE inventory has showed that it is a reliable and valid tool for the identification of coping strategies among people with MCCs. The inventory meets the criteria intended for psychometric testing. Thus, it can be successfully used to assess coping in the next phase. This chapter has addressed research aim 1.

# Psychometric properties of the Brief COPE in people with multiple chronic conditions

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Citation:

Cheng, C., Yang, C. Y., Inder, K., and Chan, S. W. (2020). *Psychometric properties of the Brief COPE in people with multiple chronic conditions*. Revised manuscript under review in the International Journal of Nursing Practice. Submitted on April 16, 2020.

## **ABSTRACT**

**Background:** Multiple chronic conditions (MCCs) is highly prevalent in primary care. Coping is an important psychological factor influencing patients' ability to adapt physically and mentally to MCCs. Testing a reliable and valid psychometric inventory is necessary to identify coping strategies, before developing coping-oriented interventions.

**Purpose:** To examine psychometric properties of the Chinese version Brief Coping Orientation to Problems Experienced (Brief COPE-CN) inventory in patients with MCCs.

**Method:** This study adopted a cross-sectional design. A convenience sample of 290 Chinese patients with MCCs was recruited from a tertiary hospital in East China. The Brief COPE-CN, socio-demographic characteristics and clinical data were collected using a self-reported questionnaire from November 2017 to May 2018. Factor analysis and reliability analysis were performed.

**Results:** The mean age of the participants was 58.5 years (range from 23 to 95 years), and half of the participants were female (49.3%). Most participants had two chronic conditions (82.1%) and had MCCs for more than two years. The explanatory factor analysis (EFA) identified five factors in the Brief COPE-CN, explaining 58.4% of the total variance. The Cronbach's alpha coefficients ranged from .65 to .85 for the five subscales.

**Conclusions:** The psychometric properties of the Brief COPE-CN were acceptable for use with Chinese patients with MCCs. With further evaluation, this instrument may help healthcare professionals to understand patients' coping and develop coping-based interventions to promote coping in this population.

Keywords: coping, measure, reliability, validity, multiple chronic conditions, psychometrics.

## SUMMARY STATEMENT

What is already known about this topic?

1. There is a growing predominance of chronic diseases in China, with many Chinese patients living with MCCs that can adversely impact physical and psychological health.
2. Coping-oriented interventions that address and enhance patients' coping strategies, which are beneficial in terms of improving their health.
3. There is no valid and reliable Chinese tool to measure coping strategies among patients with MCCs.

What does this paper add?

4. This study reports a five-factor structure of the Brief COPE-CN established by the explanatory factor analysis.
5. The five-factor structure of the Brief COPE-CN has good internal consistency.

What are the implications of this paper?

6. The five-factor Brief COPE-CN has the potential to measure coping strategies effectively in Chinese patients with MCCs.
7. With further evaluation, this instrument may be a useful tool for developing specific interventions to promote coping in Chinese patients with MCCs.

## INTRODUCTION

Multiple chronic conditions (MCCs) refer to the co-occurrence of two or more chronic conditions that last for more than one year and require long-term healthcare (Wallace et al., 2015). The most common conditions include physical conditions such as type 2 diabetes, chronic heart diseases and cancer, and mental and cognitive disorders such as depression, anxiety and substance addiction.

A systematic review involving seventy community-based studies has indicated that the overall prevalence of MCCs in community settings was 33.1% (95% confidence interval (CI): 30.0–36.3%) (Nguyen et al., 2019). The prevalence of MCCs in China has been indicated by several investigations: A large-scale population-based study estimated that there were more than 10% Chinese patients had MCCs in southern China (Wang et al., 2014). Research has shown a positive association between the prevalence of MCCs and age (Barnett et al., 2012). According to the national data from the China Health and Retirement Longitudinal Study collected between 2011 and 2015, the overall prevalence of MCCs was 42% in community-dwelling older adults (aged 50 years or older) (Yao et al., 2019).

MCCs pose a substantial impact on individuals' health and are highly associated with declines in functioning, increased risk of mortality and substantial healthcare costs (Bahler, Huber, Brungger & Reich, 2015). Patients who have MCCs often report more healthcare needs and require more intensive monitoring by healthcare providers. Thus, those patients usually have to make minor or major adjustments as the conditions may eventually impact their physical and psychological well-being (Schulze, Maercker & Horn, 2014). The ways in which patients cope with their chronic conditions and associated hardships can result in either good adherence to treatment

and successful self-management of the condition, or low self-efficacy or poor patient-reported outcomes (Penley, Tomaka, & Wiebe, 2002).

In the transactional theory of stress and coping, Lazarus (1966) defined that coping is a process for tolerating stress and is vital for maintaining physical and psychological health in stressful situations. Coping is of importance to individuals' physical and psychological health because stress has been linked with a range of health-related outcomes. According to Folkman and Lazarus (1980), there are two categories of coping: problem-focused coping refers to strategies for dealing with the cause of a stressful situation; emotion-focused coping refers to strategies for managing emotional responses to stress. An awareness of the dimensions of coping is useful for understanding coping and its association with health-related outcomes among people who are experiencing stressful life events and situations, such as AIDS (Lyimo et al., 2014), post-traumatic stress disorder (Read, Griffin, Wardell & Ouimette, 2014), and cancer (Manne et al., 2015).

People cope in different ways when confronted with health-related stressors and research shows that adoption of different types of coping strategies can have protective or negative effects on their health and well-being (Lo Buono, Corallo, Bramanti, & Marino, 2017). Duangdao & Roesch (2008) conducted a meta-analysis to examine the relationship between coping strategies (avoidance coping, approach coping, emotion-focused, and problem-focused) and adjustment index (total, depression, anxiety, glycemic control) in people with diabetes. They found that the use of approach and problem-focused coping were associated with better the total adjustment whereas the use of avoidance and emotion-focused coping were not significantly related to the total adjustment. In addition, the use of appropriate coping strategies can provide significant benefits for patients' health and wellbeings, such as fewer symptoms of depression

(Bjorklof, Engedal, Selbaek, Kouwenhoven & Helvik, 2013), better quality of life (Nipp et al., 2016), successful ageing (Ouwehand, de Ridder & Bensing, 2007) and effective disease management (Thoolen, de Ridder, Bensing, Gorter & Rutten, 2009).

To measure individual differences in these two dimensions of coping, Folkman and Lazarus (1988) developed The Ways of Coping scale, a checklist for the problem- and emotion-focused coping strategies that also be used in a variety of stressful situations. However, this binary classification has been critiqued. Carver et al. (1989) made further differentiation regarding coping based on these two dimensions and developed the Coping Orientation to Problem Experienced (COPE) inventory to measure a broader variety of coping strategies that people generally use when experiencing stressful situations. The COPE inventory was developed based on Lazarus's coping theory and the self-regulation model. It has 15 four-item subscales such as positive reinterpretation and growth, mental disengagement, and focus on and venting of emotions. Using the dispositional reply format, participants are asked to report how often they engage in each coping strategy with a four-point scale from "1 = I usually don't do this at all" and "4 = I usually do this a lot".

Given that the COPE inventory is tedious and time-consuming and may be difficult for respondents to finish, Carver (1997) condensed the original COPE inventory into the Brief COPE, changing two of the scales from the original COPE and reducing others to two items per subscale. The Brief COPE inventory has 14 two-item subscales for 14 coping strategies: self-distraction, active coping, denial, substance use, use of emotional support, use of instrumental support, behavioural disengagement, venting, positive reframing, planning, humour, acceptance, religion and self-blame (Carver, 1997). This abbreviated version of the inventory offers a timesaving, convenient method of examining the different coping strategies that

people adopt, either in general or in particular situations (Carver, 1997). Carver (1989) advised that there is no instruction to combine those subscales into problem-focused and emotion-focused categories or into a total coping because the research samples are varied across studies. To determine the relation between coping and other variables, Carver (1989) recommended forming high-order factors based the subscales and using the factors as predictors.

A body of evidence has indicated that the Brief COPE inventory has been widely used to categorise different coping strategies, facilitate interventions and improve understanding of coping with diseases (Krageloh, 2011). The Brief COPE and its translated versions have been proven psychometrically sound among American patients with lung and gastrointestinal cancer (Hagan et al., 2017), the general population in France (Muller & Spitz, 2003), Malaysian women with breast cancer (Yusoff, Low & Yip, 2010) and patients with mild traumatic brain injury in New Zealand (Snell, Siegert, Hay-Smith & Surgenor, 2011).

Past psychometric testing studies showed that the Brief COPE inventory can use different factorial structures, ranging from two to twelve factors (Kapsou et al., 2010). To date, there were two studies have used the Brief COPE in Chinese populations. Su et al. (2015) examined the structure of the Brief COPE among 258 Chinese AIDS patients and identified six primary factors (subscales) with Cronbach's alphas ranging from .61 to .80. Those factors included problem-solving and acceptance, negative venting and avoidance, support seeking, self-blame and denial, reliance on spirituality, and humor and self-distraction. The other study (Yuan, Zhang & Li, 2017) involving 176 Chinese vision-impaired adolescents used eight preliminary factors from the original Brief COPE and included three higher-order factors in a modified scale. The identified three factors were self-directed, other-directed, and relinquished-control

coping. The Cronbach's alphas were .75 for the Brief COPE and .84 for the modified scale. Those empirical results demonstrated that the Brief COPE has various dimensions and that it is necessary to reassess the psychometric test for use with different populations. The main reason for this variation is that the kinds of coping categories are specific to studies (Skinner, Edge, Altman, & Sherwood, 2003). For example, the stress experienced by patients with chronic conditions might be different from the stress experienced by the general population and those two groups could show different coping. Another possible reason is culture impact. Aldwin (2004) suggested that culture characterizes the types of stressors experienced by a person and impact the ways of assessing stressors and the choice of coping strategies used by a person. Also, the institutional mechanisms are shaped by different culture context. Therefore, researchers first need to specify the factor structures of scales used to measure coping in a specific population/setting.

Although lots of efforts have been made in the measurement of coping among different samples including people with single chronic health conditions, less is known about the extent to which measures of coping adequately capture the ways in which patients cope with MCCs. This is a knowledge gap, as research suggested that patients with MCCs could face some significant stressors, such as relations among multiple conditions, problematic symptoms, and negative emotions (Cheng, Inder & Chan, 2019), and those unique stressors may develop different strategies of coping compared to patients with single chronic health conditions. As a result, current research on coping in chronic health conditions would benefit from including coping inventories normed with MCCs populations to improve methodological rigour.

China, like other countries, is facing an increasing challenge of MCCs but the management of MCCs has been little investigated. As coping play an important role

in managing the stresses involved in living with MCCs, to ascertain coping strategies with a validated measure is the primary step in facilitating coping-based support programs for MCCs patients. Also, investigation of coping within the Chinese context is significant as it allows further refinement of the existing coping theory and provides further evidence about the psychometric properties of the Brief COPE with a non-English sample because there is lacking information at present.

## **AIMS**

The purpose of this study was to assess the psychometric properties of the Brief COPE inventory, including reliability analysis and factor structure, for use on Chinese patients with MCCs.

Two research questions were developed:

1. What is the reliability of the Brief COPE in Chinese patients with MCCs?
2. What is the factor structure of the Brief COPE inventory when applied to this population?

## **METHODS**

### **Design**

A psychometric study with a cross-sectional descriptive survey was adopted.

The study was undertaken between November 2017 and May 2018, in the outpatient department of a university-affiliated hospital with more than 1,900 beds, the largest and principal referral medical centre in northern Anhui, China. The outpatients' service provided for patients with chronic conditions included medical consultation and advice, interventions from healthcare professionals such as allied health personnel and nurse specialists, and diagnostic tests.

## **Participants**

A convenience sample of 290 patients with MCCs was recruited according to Kline's (1998) principles for factor analysis, which require there to be at least 10 participants for every item in the instrument. The calculation for sample size applied: 14 subscales x 2 items x subscale = 28 items x 10 patients = 280. An additional of 10 patients were included for non-enrolment or missing data.

The inclusion criteria were: (1) Chinese adults ( $\geq 18$  years old), (2) with two or more medically diagnosed chronic conditions, (3) diagnosed more than one year ago, and (4) can speak and read Chinese. Sixteen common chronic conditions, including hypertension, type 2 diabetes mellitus and dyslipidaemia, were identified by using a large cross-sectional survey of MCCs patients in China (Wang et al., 2015). Patients diagnosed with cognitive impairments were excluded because they may not have been able to give reliable answers.

## **Instruments**

A self-reported questionnaire was designed for this study, which included (1) socio-demographic information such as age, gender and educational background, (2) clinical data such as type, number and duration of MCCs and (3) the Chinese version of the Brief COPE inventory. The questionnaire was presented in Simplified Chinese as the current study was based in mainland China.

All the scales from the Brief COPE are freely available for use (Carver, 1997). The Chinese version of the Brief COPE (Brief COPE-CN) was retrieved from the website of the Department of Psychology, University of Miami (Wang et al., 2018). The Brief COPE-CN has been validated in studies of patients living with HIV (Su et al., 2015) and vision-impaired adolescents (Yuan et al., 2017), with Cronbach's alphas from .61 to .80 (Su et al., 2015). In those studies, the coping strategies adopted by

Chinese patients with MCCs were examined using the 28-item Brief COPE-CN including 14 subscales, with each consisting of two items. Those subscales are: self-distraction (items 1 and 19), active coping (items 2 and 7), denial (items 3 and 8), substance use (items 4 and 11), use of emotional support (items 5 and 15), use of instrumental support (items 10 and 23), behavioral disengagement (items 6 and 16), venting (items 9 and 21), positive reframing (items 12 and 17), planning (items 14 and 25), humor (items 18 and 28), acceptance (items 20 and 24), religion (items 22 and 27) and self-blame (items 13 and 26). The score of each item ranged from 1 ('I usually do not do this at all') to 4 ('I usually do this often'). Higher scores indicated more frequent use of the corresponding coping strategy.

### **Data collection**

Potential participants were approached by the candidate during their clinic appointments at the hospital. During the data collection period, each potential participant received a brief description regarding the study aim and the confidential nature of this study. Written informed consent from each participant was collected. All data about the participants' information were handled in confidentiality throughout the research process. The entire process was managed by the primary researcher. The response rate of this study was 91.5% (A total of 317 patients were approached.)

### **Data analysis**

Data were computed using the IBM SPSS Statistics version 24.0 (IBM Corp 2016, Armonk, NY). Descriptive techniques including categorical data (frequencies and percentages) and continuous data (means and standard deviation [*SD*]) were used to analyse the socio-demographic, clinical data, and the response of the Brief COPE-CN.

Construct validity was tested using exploratory factor analysis (EFA). EFA was used to explore factor structure because this was the first study to examine the use of the Brief COPE among Chinese patients with MCCs. A guide with SPSS tutorials to conduct EFA was followed (Yong & Pearce, 2013). For the EFA, a Principal Axis Factoring method with Varimax rotation was performed. Kaiser-Meyer-Olkin (KMO) and Bartlett's sphericity tests were used to determine if the data was appropriate for the factor analysis (Kline, 2005). In determining the results of EFA, the number of eigenvalues greater than 1 was checked, along with the percentage of explained variance, the scree plot and the Velicer minimum average partial criterion. The items with a factor loading of  $\geq .40$  were included in a particular factor (Watson & Thompson, 2006). The difference in the average partial correlations between the primary and secondary loading should be  $\geq .20$  (Velicer, 1976). Next, the items in the extracted factors (subscales) were assessed about the original Brief COPE items and their connotations, to ensure the content was appropriate and rational.

Internal consistency and item-total correlation (ITC) were utilized to determine the reliability of the Brief COPE. Internal consistency reliability was tested using Cronbach's alpha coefficient. A value of Cronbach's alpha  $\geq .70$  suggested satisfactory internal consistency for an instrument (Nunnally, 1978). ITC was tested using Pearson's product-moment correlation coefficient. The correlation values  $\geq .20$  were suggested satisfactory (Field, 2013).

### **Ethical considerations**

Ethics approval for this research was obtained from the Human Research Ethics Committee of the university (H-2017-0378) and the participating hospital. Informed consent was obtained from each participant after a brief and clear introduction of this

study prior to the enrolment. All procedures were conducted in accordance with the Declaration of Helsinki.

## RESULTS

### **Socio-demographic characteristics and clinical information of the sample**

The mean age of the 290 participants was 58.5 years ( $SD = 15.1$ , range = 23–95 years), and half of the participants were female ( $n = 143$ , 49.3%). All the participants had received basic schooling and were able to read and finish the questionnaires. Most participants were medically diagnosed with two chronic conditions ( $n = 238$ , 82.1%) and had had MCCs for more than two years. The three most common types of the chronic conditions experienced by the participants were cardiovascular (81.7%), endocrinologic (43.8%) and musculoskeletal (20.7%). The results of the socio-demographic data and clinical information are presented in Table 4.1.

Table 4.1

*Socio-demographic characteristics and summary of chronic conditions of the participants (n = 290)*

Socio-demographic characteristics		n	%
Age (Years; mean, <i>SD</i> )		58.5	(15.1)
Female		143	49.3
Marital status	Single	11	3.8
	Married	265	91.5
	Divorced	3	1.0
	Widowed	10	3.4
	Separated	1	0.3
Education background	Primary or below	52	17.9
	Junior high	98	33.8
	Senior high	89	30.7
	College or above	51	17.6
Employment	Employed	90	31.0
	Unemployed	71	24.5
	Retired	129	44.5
Monthly income (Chinese Yuan) *	2000 or below	128	44.1
	2001-3000	80	27.6
	3001-4000	38	13.1
	4001-5000	30	10.3
	5001 or above	14	4.9
Number of chronic conditions	2	238	82.1
	3	46	15.9
	4	6	2.0
Duration of MCCs	Less than 2 years	57	19.7
	2-5 years	111	38.3
	5-10 years	78	26.9
	More than 10 years	44	15.1
Chronic conditions	Cardiovascular conditions	237	80.7
	Endocrinologic conditions	127	43.8
	Musculoskeletal conditions	60	20.7
	Gastrointestinal conditions	50	17.2
	Cerebrovascular conditions	34	11.7
	Chronic respiratory diseases	30	10.3
	Urogenital conditions	27	9.3
	Cancer	21	7.2
	Renal diseases	15	5.2
	Dermatologic conditions	3	1.0
	Psychiatric disorders	2	.70
	Visual impairment	1	.30
	Autoimmune diseases	1	.30

MCCs: Multiple chronic conditions

\*1 US Dollar = 6.8 Chinese Yuan

### **Results of EFA**

The KMO value of the Brief COPE was .86, indicating that the sample data was adequate for factor analysis. The results of Bartlett's test of sphericity were significant (approximately,  $\chi^2 = 2674.48$ ,  $df = 378$ ,  $p < .001$ ), indicating that the sample data conformed to sphericity. The EFA yielded seven factors with an eigenvalue greater than 1, which explains 58.5% of the total variance (see Table 4.2). Item 23 ('I've been trying to get advice or help from other people about what to do') did not load any factors, and four items were cross-loaded (item 9, 'I've been saying things to let my unpleasant feelings escape'; item 18, 'I've been making jokes about it'; item 20, 'I've been accepting the reality of the fact that it has happened'; and item 25, 'I've been thinking hard about what steps to take'). The seventh factor consisted of only one item (item 21, 'I've been expressing my negative feelings').

Table 4.2

*Item factor loadings of the five solutions derived from Exploratory Factor Analysis (EFA) of the Brief COPE (n = 290)*

Items	Component <sup>2</sup>				
	1.	2.	3.	4.	5.
7. I've been taking action to try to make the situation better.	.79				
17. I've been looking for something good in what is happening.	.68				
12. I've been trying to see it in a different light, to make it seem more positive.	.67				
20. I've been accepting the reality of the fact that it has happened.	.65				
25. I've been thinking hard about what steps to take.	.65				
24. I've been learning to live with it.	.64				
2. I've been concentrating my efforts on doing something about the situation I'm in.	.63				
19. I've been doing something to think about it less, such as going to movies, watching TV, reading, daydreaming, sleeping, or shopping.	.59				
14. I've been trying to come up with a strategy about what to do.	.55				
3. I've been saying to myself 'this isn't real.'		.65			
6. I've been giving up trying to deal with it.		.65			
8. I've been refusing to believe that it has happened.		.65			
16. I've been giving up the attempt to cope.		.59			
11. I've been using alcohol or other drugs to help me get through it.			.73		
5. I've been getting emotional support from others.			.73		
4. I've been using alcohol or other drugs to make myself feel better.			.63		
15. I've been getting comfort and understanding from someone.			.57		
28. I've been making fun of the situation.				.70	
27. I've been praying or meditating.				.70	
22. I've been trying to find comfort in my religion or spiritual beliefs.				.67	
26. I've been blaming myself for things that happened.					.82
13. I've been criticizing myself.					.74
Variance explained (%)	24.4	11.8	8.4	5.5	4.8
Cronbach's alpha	.85	.65	.67	.64	.79
Item-total correlation	.49-.70	.39-.51	.34-.59	.42-.49	.65-.65

Items	Component <sup>2</sup>				
	1.	2.	3.	4.	5.

<sup>1</sup> Principal component analysis with Varimax rotation and Kaiser normalization. Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy = .84. Bartlett's Test of sphericity  $p < .001$ .

<sup>2</sup> Item loadings  $\geq .40$  were shown. 1 = Positive adaptation, 2 = Denial and disengagement, 3 = Support-seeking, 4 = Spiritual coping, and 5 = Self-blame.

Ultimately, five factors were retained, based on the scree plot, item loadings from EFA with Varimax rotation and the Velicer minimum average particle criterion. Most of the items loaded together with the other items. Each factor was assessed and named according to the content of its items. The first factor consisted of four original subscales (active coping, positive reframing, acceptance and planning) and one item from 'self-distraction' and was renamed 'positive adaptation'. The second factor was comprised of two subscales (denial and behavioural disengagement) and was renamed 'denial and disengagement'. The third factor contained two original subscales (substance use and emotional support) and was renamed 'seeking support'. The fourth factor included one original subscale (religion) and one item from 'humour' and was renamed 'spiritual coping'. The fifth factor contained two items, in line with the original subscale (self-blame), and thus it retained its original name, 'self-blame'.

### **Results of internal consistency and reliability analysis**

As shown in Table 4.2, the Cronbach's alpha coefficients of the five subscales ranged from .65 to .85, which met the minimal criterion of .60 (Nunnally, 1978). The ITC coefficients of the five retained subscales were .49–.70, .39–.51, .34–.59, .42–.49 and .65–.65, suggesting an accepted level of correlation.

## **DISCUSSION**

Coping, which were proven to be highly associated people's general health, also help to improve the overall quality of life (Penley, Tomaka, & Wiebe, 2002). The adoption of the full range of necessary coping strategies may help to optimize health-related outcomes in populations with MCCs. To address this need, this study aimed to examine the psychometric characteristics, including factor structure and internal consistency, of the Brief COPE-CN, with a sample of 290 MCCs patients. Analysis of

its structural validity and internal reliability showed that the Brief COPE-CN is a valid and reliable inventory for this area of research.

In this study, Cronbach alpha coefficient and ITC were used to test the scale's reliability. The values for all the subscales were between .65 and .85. The Cronbach alpha values of this study were similar with the findings of a past validation study of Brief COPE in China, which found that the alpha coefficients for the subscales ranged from .61 to .80 (Su et al., 2015). Literature has suggested that measurement instrument is quite reliable between .60 and .79 and it is reliable at a high level between .80 and 1.00 (Grove, Burns, & Gray, 2013). Thus, the Cronbach alpha coefficients of this study indicated a high level of reliability of the Brief COPE-CN.

ITC was used to determine the homogeneity of a measure. Corrected ITC coefficients indicate the correlation of an item with the total scale when that item is omitted. In this study, the corrected ITC values ranged from .34 to .70. Literature has suggested that values  $> 0.20$  show an acceptable level of correlation (Field, 2013). Thus, ITC coefficients of all items were at a good level and suggested good relationship of items with the construct in the Brief COPE-CN.

The construct validity of the Brief COPE-CN was tested by using EFA. KMO analysis was used to determine the sampling adequacy for factor analysis. KMO value from the present study was found to be 0.86, and the result of Bartlett test was 2674.48 ( $P < .001$ ), which was similar to the results of the past study (KMO = 0.84, Bartlett test = 2572) (Su et al., 2015). Also, the KMO value of this study indicated that the sample size was adequate for factor analysis (Kaiser, 1974).

EFA was used to uncover the underlying structure of a set of variables. In this study, this analysis provided an eigenvalue of 14.23 for the five-factor construct, which explained 58.5% of the total variance. In a past study (Su et al., 2015), a six-factor

construct was found to explain 56.1% of the total variance. A general rule indicates that the explained variance in factor analysis should be more than 50% (Streiner, 1994). Therefore, the variance in this study was comparable with the past study and was also acceptable. Factor loadings show the variance explained by the variable on a particular factor. In this study, the factor loadings of each item were between .55 and .82. In the study by Su et al. (2015), factors loading were reported between .42 and .88. The reference value recommended for the value of factor loadings should be reported as .40 and above (Watson & Thompson, 2006). Therefore, factor loadings obtained in this study supported the past study, and they were above the recommended reference values.

Skinner et al. (2003) suggested that the exploration for classification of coping strategies should have an inclusive, conceptually clear list of lower-order categories (items in the inventory) and a set of representative higher-order categories that can reflect characteristics and functions of coping (subscales in the inventory). Labelling the subscales (factors) is a subjective method of classifying the results, even though the objective criteria have been met. In addition to the statistical results of validity and reliability, past studies and the current research setting were also considered. The results established a five-factor structure for Brief COPE-CN, which differs from Carver's (1997) original work. This indicated that it might be inappropriate to categorise subscales manually into problem-focused and emotion-focused, or adaptive and maladaptive composites. The meta-ethnography data (Cheng, Inder & Chan, 2019) showed that the most common coping strategies among the MCCs population were seeking information, adapting to lifestyle changes and relying upon their spirituality. Moreover, past validated studies in vision-impaired adolescents (Yuan et al., 2017) and patients with HIV (Su et al., 2015) provided examples of validating the test using

sample populations with chronic conditions and customising the Chinese version of the Brief COPE inventory.

Coping is the personal process of managing stress, typically within a specific social context (Revenson & Lepore, 2012). Culture influences coping behaviour by shaping the context within which an individual is likely to encounter certain types of stressors (Lazarus & Folkman, 1984). Culture also affects the process of evaluating stressors and the use of coping strategies (Chun, Moos & Cronkite, 2006). Therefore, the name and approach of the psychometric inventory should be customised to fit the cultural context of the research setting, especially when the inventory is based on a Western model. In this study, the customised labels for each subscale reflected Chinese cultural considerations.

Traditional Chinese philosophies such as Taoism, Buddhism and Confucianism shape how patients perceive and respond to chronic conditions (Chen, Miaskowski, Dodd & Pantilat, 2008). Chinese people often believe that health threats are due to fate and the result of sins from past lives (Wong & Chan, 2006). In Chinese culture, personal forbearance and the ability to endure hardships (*'ren'* in Chinese) are essential and valuable characteristics, which may also provide a way of dealing with stressful events. *Ren* is believed to be necessary for success and happiness. It is thought that if a person can endure their present afflictions, their future outcomes will be good (Lee, 1996). In the results of this study, the concept of *'ren'* was implied in the first factor (positive adaptation), suggesting that Chinese patients may tend to work at becoming resilient to stressful changes.

Many individuals turn to religion for support when coping with stress (Merluzzi & Philip, 2017). China has a long and rich religious history. As mentioned, traditional Chinese religions drive Chinese and other Asian societies' perceptions and methods of

managing life stressors, which may differ from those in other parts of the world (Gonzalez et al., 2016). The findings of this study showed that Chinese MCCs patients are more likely to seek help from religion, which they believe explains their present hardships and offers comfort. This factor also illustrated the importance of designing psycho-spiritual therapies aimed at improving religious coping strategies for Chinese patients with MCCs.

The factor ‘seeking support’ reiterated the importance of external support in the process of coping with disease, which was similar to the results of Carver’s (1997) study. Social support is one of the most important elements to be considered when developing an intervention program for improving coping strategies in patients with MCCs (Naganathan et al., 2016). Support and assistance from family, friends and significant others are essential resources for patients with MCCs (Sells et al., 2009). This study sought to clarify the nature of that support, concerning Chinese society. In general, when Chinese people mention social support, they are referring to family support (Singh, Zhang, Wan & Fouad, 2018). In Confucianism, the family is the fundamental unit for people’s lives; family shields people from outside crises. Family support means a great deal to Chinese patients with a chronic disease (Luo et al., 2015). Chinese patients’ methods of coping with chronic conditions are strongly influenced by their unique family-oriented culture.

MCCs impair physical function and psychological wellbeing. In the results of this study, two factors (denial and behavioural disengagement, and self-blame) reflected some of the coping strategies that were commonly used to manage the physical and emotional difficulties caused by MCCs. The results indicated that a proportion of the sample population experienced negative moods. Similarly, Wang, Lambert and Lambert’s (2007) study used the Brief COPE to examine the connections

between anxiety, depression and coping strategies among 105 post-hysterectomy Chinese women. They found that depression was positively associated with behavioural disengagement and that patients who coped using self-blame reported higher levels of depression and anxiety.

Several implications of the current study must be addressed. There is international consensus that care for MCCs should be patient-centred, focus on the quality of life, and promote self-management towards agreed goals between patients and healthcare professionals (Salisbury et al., 2018). Fostering individuals' coping has promising outcomes and is important to healthy behaviours changes for patients with chronic health conditions. That coping-based intervention allows healthcare professionals to deliver care specific to circumstances and to actively promote patient's skills acquisition, resulting in improvements in their health-related outcomes. Thus, the need for a validated inventory to address the knowledge gaps concerning coping in Chinese patients is warranted. An understanding of coping will allow healthcare professionals to help patients with MCCs to address risks and learn healthier lifestyles, which in turn will hopefully lessen the burden of MCCs. Also, using the Brief COPE-CN may be used more broadly for a range of Chinese-speaking populations in other countries.

At a research level, this study provides additional cross-cultural evidence relating to coping, which highlights the need for healthcare professionals to incorporate cultural considerations into patient care plans. In addition, this study offered a psychometrically sound inventory of coping that has been validated in the MCCs population. The findings may be helpful to researchers designing coping scales in a cross-culture setting in the future and could also be used in further explanatory and confirmatory studies. The Brief COPE-CN has the potential to be a valid and

reliable instrument for future studies among Chinese populations. It may provide the right balance between acceptable psychometrics and convenience.

### Limitations

This study had limitations. The first was the sample selection bias as the sample comprised only a small proportion of the patients with MCCs from a region of China, those findings might not apply to MCCs patients in other parts of the country. The results obtained in this study were specific to the population with MCCs. Caution is necessary whether generalizations are to be applied because there are different combinations of chronic health condition occur. Particularly, the patients' coping could be varied with the number and type of MCC, as well as with trajectory of each chronic health condition. Moreover, the study sample included individuals who can read Chinese and most of them were covered by healthcare insurance. Hence, these findings could not accurately represent Chinese people who are illiterate and do not have any social insurance. The current five-factor Brief COPE-CN identified from the EFA requires to be confirmed by a further confirmatory factor analysis, which can help to refine its construct and evaluate the measurement model validity. Lastly, data collection relied on a self-reported questionnaire, which may be prone to patient bias.

### CONCLUSION

This study reported on the use of a five-factor structure for the Brief COPE-CN in a sample of 290 Chinese MCCs patients. It was the first attempt at using the psychometric test in this specific setting. This study has suggested that the Brief COPE-CN is a valid and reliable instrument for evaluating coping strategies in the Chinese population with MCCs.

The Brief COPE-CN is a brief and convenient tool that allows healthcare professionals to describe a set of coping strategies easily by using this measure and investigate coping more deeply but the results reported are preliminary psychometric properties. With further verification in more Chinese-speaking samples, the results will contribute to future use of the Brief COPE-CN in identifying coping models and may also inform more effective interventions for patients with MCCs. This study makes contributions to both domestic and international research as it offers added evidence about the cross-culture validation of coping by verifying its multi-dimensional structure.

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# Chapter 5: The cross-sectional study

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## 5.1 INTRODUCTION

Chapter 5 reports the results from the quantitative phase of this research in three parts. Part 1 seeks to improve the understanding regarding the relationship between illness perceptions, coping strategies and QoL in Chinese people with MCCs using a modified model of the transactional theory of stress and coping. Parts 2 and 3 are secondary analysis reports based on the data collected. Part 2 focuses on the differences in mental health between urban and rural Chinese patients with MCCs, while Part 3 seeks to determine the nature of the associations between socio-demographic variables, clinical variables, physical function and coping strategies for levels of anxiety and depression in Chinese older adults with MCCs.

## 5.2 OUTPUT OF THIS CHAPTER

This chapter was disseminated in the papers as:

Cheng, C., Yang, C. Y., Inder, K., and Chan, S. W. (2020). Illness perceptions, coping strategies, and quality of life in people with multiple chronic conditions. *Journal of Nursing Scholarship*, 52(2), 145–154. doi:10.1111/jnu.12540

Cheng, C., Yang, C. Y., Inder, K., & Chan, S. W. (2019). Urban-rural differences in mental health among Chinese patients with multiple chronic conditions. *International Journal of Mental Health Nursing*, 29(2), 224–234. doi:10.1111/inm.12666

Cheng, C., Inder, K., and Chan, S. W. (2020). *The relationship between coping strategies and psychological distress in Chinese older adults with multiple*

*chronic conditions*. Manuscript under review in the Australasian Journal on Ageing. Submitted on March 1, 2020.

### **5.3 SIGNIFICANCE AND CONTRIBUTION TO THE RESEARCH**

Part 1 of this Chapter showed that people with MCCs reported impaired QoL. Illness perceptions regarding the consequences and timelines and coping strategies of denial and disengagement and self-blame were associated with QoL. Age, the number of MCCs and education level were also associated with QoL. These findings can be used to develop interventions focusing on altering illness perceptions and on reducing avoidant coping to improve QoL in people with MCCs. This paper has addressed research aim 2.

Part 2 of this Chapter was undertaken to find out differences in mental health between rural and urban Chinese adults with MCCs. Because this population experiences increased disease burden, but studies of urban-rural differences in mental health have not provided consistent findings. Such differences have received little attention in China. This study found that rural participants reported more psychological distress and had worse mental health compared to their urban peers. Employment status, educational background, number of chronic health conditions and probable anxiety were associated with mental health levels. These findings provide evidence for rural-urban variation in mental health disorders among Chinese people with MCCs. This paper has addressed research aim 2.

Part 3 of this Chapter was undertaken to offer knowledge, about Chinese older adults with MCCs, concerning: levels of anxiety and depression, coping strategies, and potential associations that exist among anxiety, depression, coping strategies, socio-demographic and clinical data. Because the prevalence of MCCs increases in old adults worldwide and information is lacking for evidence-based care of this population. The

strategies of coping that people use may be a protective factor to buffer the effects of perceived stress from MCCs. This study reported that over 50 per cent of older adults with MCCs reported potential symptoms of anxiety and depression. This percentage was higher in male participants. More body pains and physical limitations were associated with psychologic distress. Frequent use of denial and disengagement and spiritual coping were associated with more psychologic distress, while more use of positive adaptation was associated with a relieving effect. This paper has addressed research aim 2.

## Part 1 Illness perceptions, coping strategies, and quality of life in people with multiple chronic conditions

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Citation:

Cheng, C., Yang, C. Y., Inder, K., and Chan, S. W. (2020). Illness perceptions, coping strategies, and quality of life in people with multiple chronic conditions. *Journal of Nursing Scholarship*, 52(2), 145–154. doi:10.1111/jnu.12540

## ABSTRACT

**Purpose:** To determine whether illness perceptions, coping strategies and socio-demographic and clinical variables are related to the quality of life (QoL) in adults with multiple chronic conditions (MCCs) living in China.

**Design:** By employing a cross-sectional design based on the transactional stress and coping theory, a convenience sample of adults with MCCs were recruited from a university-affiliated hospital between November 2017 and May 2018 in Northern Anhui, China.

**Method:** A self-reported questionnaire, including the Brief Illness Perception Questionnaire (Brief IPQ), the Brief Coping Orientation to Problems Experienced (Brief COPE) and the Short Form survey version 2 (SF-12v2), was administered. Socio-demographic and clinical data regarding MCCs were also collected. Descriptive statistics including frequencies, means, standard deviations (SDs) and correlation coefficients were calculated to examine the relationship between illness perceptions, coping and QoL. Hierarchical multiple regression models were used to identify variables associated with physical and mental QoL.

**Findings:** A total of 351 participants (50% male) were recruited, with a mean age of 58.9 years ( $SD = 14.6$ ). Of the participants, 83% had two chronic conditions. Participants reported impaired physical and mental QoL when compared with the general population in China. Poorer QoL was correlated with stronger illness perceptions of consequences and timeline and increased use of denial and disengagement and self-blame. Increasing age and more chronic conditions were associated with worse QoL. A higher education level was significantly associated with better physical and mental QoL.

Conclusion: This study found that adults with MCCs living in China experienced impaired QoL. The strong relationship found between the participants' perceptions of MCCs, coping strategies and QoL suggested that healthcare professionals should recognise the physical and psychological impacts of MCCs and address the significance of adaptations to MCCs in future treatment programs. The findings will help healthcare professionals design more specific interventions to modify illness perceptions and enhance certain coping strategies to improve the QoL of people with MCCs. Healthcare professionals can mobilise available resources from healthcare and social systems to enhance people's coping and adaptation to MCCs.

Clinical relevance: With an understanding of the illness perceptions of people with MCCs, healthcare professionals could offer information related to consequences, timeline and personal control to enable better alignment between people's expectations and their actual situations. By knowing people's coping strategies, healthcare professionals can offer additional support to people who prefer strategies of denial and disengagement and self-blame.

Keywords: coping, illness perceptions, multiple chronic conditions, quality of life.

## INTRODUCTION

Multiple chronic conditions (MCCs), defined as two or more coexisting medically diagnosed chronic conditions (Parekh, Goodman, Gordon, Koh & HHS Interagency Workgroup on Multiple Chronic Conditions, 2011), are expected to be increasingly common globally. Recent research has indicated that the prevalence of MCCs in the United States has significantly increased from 45.7% in 1988 to 59.6% in 2014 (King, Xiang & Pilkerton, 2018). A national survey in Australia showed that almost one in two people visiting general practices reported having MCCs (Harrison, Henderson, Miller & Britt, 2016).

People with MCCs may encounter many physical and mental challenges resulting from functioning impairments (Ryan, Wallace, O'Hara & Smith, 2015), adverse drug reactions (Marengoni & Onder, 2015) and a decreased quality of life (QoL) (Park et al., 2018). People with MCCs also reported psychological distress. Evidence has shown that having MCCs may result in depressive symptoms (Wilson-Genderson, Heid & Pruchno, 2017), and that psychological distress increased with the number of chronic conditions (Smith et al., 2014). Qualitative research showed that the onset of MCCs caused many therapeutic, mental and social difficulties, which were 'cascading' crises for the people affected (Sells et al., 2009).

Chronic health conditions are the number one cause of death and disability globally and have become the greatest health threat in China (Langenbrunner, Marquez & Wang, 2011). MCCs impose a heavy burden on China's healthcare system. A cross-sectional study in China involving 162,464 people of all ages reported that more than 10% of the study population had MCCs (Wang et al., 2014). Another national survey among adults in urban China showed that the prevalence of MCCs increased from 35%

in middle-aged group (45–59 years), to 55% in older group (60–69 years), and 61% in those over 70 years old (Chen, Cheng, Zhuang & Broad, 2018).

Treating MCCs is challenging because current treatments mostly focus on single chronic conditions. Health care is fragmented and poorly coordinated around the world. Thus, people with MCCs might experience difficulties in obtaining holistic care (Schoen et al., 2011). Specialist care for chronic conditions is dominant in China (Yip & Hsiao, 2008), Chinese people may experience repetitive medical visits and hospitalisations due to MCCs. Further, China is experiencing rapid ageing of its population, where the proportion of older adults (60 years and above) will increase from 12.4% in 2010 to 28% in 2040 (World Health Organization, 2015). It can be anticipated that there will be a substantial increase in the prevalence of MCCs in the future. This will substantially increase healthcare demands and costs.

Living with MCCs can be distressing and persistently stressful, and thus requires physical and mental adaptations (Löffler et al., 2012). In Lazarus and Folkman's (1984) transactional coping theory, coping is described as continuously altering cognitive and behavioural efforts to respond to stressful situations. Various ways of coping have been identified that are usually classified into two categories: problem-focused coping and emotion-focused coping. Problem-focused coping refers to the efforts made to deal with the stressors, whereas emotion-focused coping represents emotional regulation in response to the stressors. The ways in which people cope with stressors usually rely on their appraisal, which is the process of evaluating the stressor. Lazarus and Folkman (1984) proposed three levels of appraisal: 1) the primary appraisal, in which an individual tends to judge whether the current stressor is stressful; 2) the secondary appraisal, in which an individual judges whether the current stressor and its consequences can be managed; and 3) the reappraisal, in which an individual

will modify the ways of appraisal according to the actual situation. The process of how people appraise and cope affects their health-related outcomes, including those related to physical and mental health (Lazarus & Folkman, 1984). This theory suggests that the combination of illness perceptions and coping strategies can influence an individual's responses to the diseases and, therefore, the individual's health-related outcomes. It is reasoned that implementing an effective intervention may improve those outcomes.

People with MCCs may have quite different illness perceptions to people with a single chronic condition. Schüz, Wolff, Warner, Ziegelmann and Wurm (2014) found that individuals with MCCs had specific perceptions of disease consequences, disease control and disease duration, and that these were related to physical functioning. Qualitative findings confirmed that there was diversity in illness perceptions and suggested that these perceptions can affect the ways that illness is self-managed in people with MCCs (Bower et al., 2012; Mc Sharry, Bishop, Moss-Morris & Kendrick, 2013). The role of coping in the adjustment to chronic conditions has been demonstrated in many studies. A meta-analysis found that people who actively coped with diabetes using strategies such as planning, seeking information and staying optimistic had better glycaemic control and fewer symptoms of anxiety and depression than people who did not (Duangdao & Roesch, 2008). Another systematic review found that coping-based psychosocial interventions for couples can effectively improve several domains of QoL, including physical, mental and relationship outcomes, for patients with cancer and their spouses (Badr & Krebs, 2013). However, explicit research into whether an integrated understanding of how illness perceptions and coping can influence health-related outcomes for people with MCCs has not been performed.

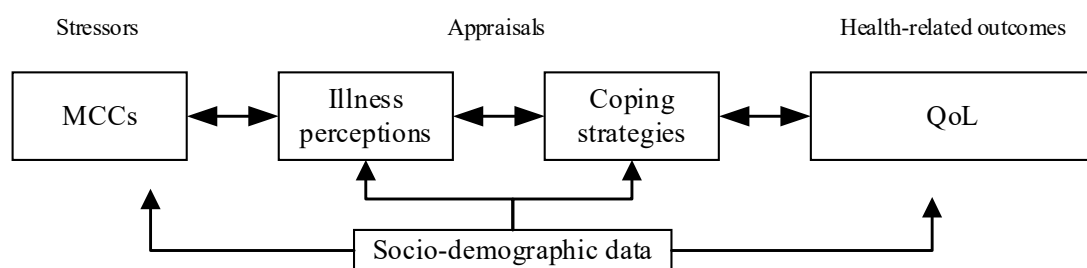
Given the increasing prevalence of MCCs and the accompanying healthcare burden, people with MCCs deserve more attention. The more that is understood about the role of coping and illness perceptions, and their association with individuals' QoL, the better healthcare professionals can help individuals to manage their chronic conditions. The current study may provide evidence to support the applicability of the Lazarus and Folkman stress and coping theory in a cross-cultural context, as well as a better understanding of the role of coping in explaining health. This study aimed to investigate the relationship between illness perceptions, coping strategies and health-related outcomes among people with MCCs. It was hypothesised that illness perceptions, coping strategies and other related variables (both socio-demographic and clinical) would explain a significant amount of variance in people's health-related outcomes—that is, people's self-perceived QoL.

## **METHODS**

### **Design**

A cross-sectional study was conducted in a university hospital in Bengbu, Anhui, China, between November 2017 and May 2018. The conceptual framework (see Figure 5.1) of this study was developed from the transactional theory of stress and coping (Lazarus & Folkman, 1984) and prior research on coping and health-related outcomes among people with chronic health conditions (Knowles, Cook & Tribbick, 2013; McCabe & Barnason, 2012). The conceptual framework guided the selection of variables, including appraisal, coping, outcomes and impact factors, for the present study. A stressor is defined as a condition/stimulus/event that has been appraised as threatening and exceeds an individual's capability to cope. Individuals constantly evaluate stressors within their environment and initiate coping strategies to manage the emotions generated from their appraisals and/or the stressor. This study

conceptualised the incidence of MCCs as a stressor that makes an individual appraise their ability to cope. This study conceptualised the patients' experience of their illness perceptions as the 'primary appraisal' for reflecting on how a patient evaluates MCCs, and their selection of coping strategies as the 'secondary appraisal' for reflecting on how a patient manages MCCs. QoL was used as an indicator of health-related outcomes. QoL is defined as '*an individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns*' (World Health Organization, 1997, p.1).



MCCs = Multiple Chronic Conditions; QoL = Quality of Life

Figure 5.1 Model of the conceptual framework

## Sampling

This study used a convenience sampling approach. The inclusion criteria were that the participants had to be 1) a Chinese adult aged 18 years or over, 2) able to read and speak Chinese and 3) medically diagnosed with two or more chronic conditions. A general practitioner helped to confirm the eligibility of participants. Individuals who had difficulties completing the survey (such as those who could not read due to low literacy) were excluded. In this study, MCCs referred to the presence of two or more medically diagnosed chronic conditions that have lasted one year or longer (Parekh et al., 2011). The chronic conditions included physical health conditions such as chronic respiratory conditions, diabetes and hypertension, and mental health conditions such as depression, anxiety, schizophrenia and bipolar disorder. The assessment of chronic

conditions adhered to a past study that investigated the prevalence and patterns of chronic disease pairs and MCCs in China (Wang et al., 2015). The candidate developed a recruitment flyer. Clinical nurses at the study venue distributed the flyers. Individuals who had an interest in participating in the research approached the candidate by telephone, email or in person.

### **Measures**

A self-reported Chinese questionnaire consisting of socio-demographic variables, clinical variables and three well-validated scales was developed for this study. There were 60 items in total. A pilot test ( $n = 6$ ) was undertaken to assess the feasibility of the recruitment process and to measure the amount of time it would take to complete the survey.

Socio-demographic and clinical variables: Socio-demographic variables including age, gender, level of education, marital status and employment were collected. Clinical variables including the number, duration and type of MCCs were also obtained.

Illness perceptions: Participants' illness perceptions were measured by the Brief Illness Perception Questionnaire (Brief IPQ) (Weinman & Petrie, 1997). The Brief IPQ includes eight 11-point (from 0 to 10) Likert items and one open-ended question item. The eight items assess consequences (item 1), timeline (item 2), personal control (item 3), treatment control (item 4), identity (item 5), illness concern (item 6), coherence (item 7) and emotional representation (item 8). For items 1, 2, 5, 6 and 8, a higher score represents a worse disease perception. For items 3, 4 and 7, a lower score represents worse disease perception. The Brief IPQ total scores range between 0 and 80 points and represent the degree to which the illness is perceived as threatening. Higher scores reflect a more threatening perspective of the corresponding illness. The

open-ended question asks the respondents to list the three most significant causal factors related to their diseases; however, this study excluded this item. The Chinese version of the Brief IPQ has been validated in people with breast cancer and shown to be reliable, with a Cronbach's alpha of 0.783 (Zhang et al., 2017). In this study, the Cronbach's alpha for the Brief IPQ was 0.747.

**Coping strategies:** Coping strategies were evaluated by the Brief COPE (Brief Coping Orientation to Problems Experienced) inventory, which is an abbreviated version of the COPE inventory. This is a self-reported, 28-item questionnaire examining 14 coping strategies with two items for each strategy (Carver, 1997). Respondents are required to score each item on a 4-point Likert scale (from 1 = 'I have never done it' to 4 = 'I have done it a lot'), with a higher score indicating more frequent use of the corresponding coping strategy. The Brief COPE is multidimensional and needs to be adjusted based on the real research setting (Krägeloh, 2011). This study used the Chinese version of the Brief COPE inventory, which has been validated in people with MCCs (Cheng, Yang, Inder & Chan, 2020). The current version is psychometrically sound with a Cronbach's alpha of 0.87, and is used to identify five coping strategies including positive adaptation, denial and disengagement, spiritual coping, support seeking and self-blame. In this study, the Cronbach's alpha for the Brief COPE inventory was 0.850.

**QoL:** QoL was tested using the 12-item Short Form survey version 2 (SF-12v2) (Ware, Kosinski, Turner-Bowker & Grandek, 2005). The 12 items in this instrument examine eight health aspects including physical functioning, physical limitations, body pain, general health, vitality, social functioning, emotional problems and mental health. The SF-12v2 generates two domains of health-related scores including the physical component score (PCS) and the mental component score (MCS). Higher

scores reflect better function. The SF-12v2 has been validated in the common Chinese population and appeared to be reliable (Cronbach's alpha for physical component = 0.67; Cronbach's alpha for mental component = 0.60). The mean standards of the PCS and MCS scores in the Chinese general population were  $52.65 \pm 5.76$  and  $50.23 \pm 8.24$ , respectively (Lam, Lam, Fong & Huang, 2013). In this study, the Cronbach's alphas were 0.815 for PCS and 0.688 for MCS.

### **Sample size**

The sample size of this study was calculated using the multiple linear regression model as the approach for statistical analysis. With effect size (0.15),  $\alpha$  error probability (0.05), power (0.95) and 13 predictors (eight for illness perceptions and five for coping strategies), the sample size was calculated to be 189 participants. Conventionally, the statistical power is set at 80% for most health research. The current study set the power at 95% because a higher power at  $> 90\%$  is suggested to be more appropriate to reduce the risk of a type II error (Columb & Atkinson, 2016). Also, the candidate was able to recruit adequate participants because of the high volume of patients at the research venue. The sample size calculation was computed by G\*Power 3.1.9.4 software (Faul, Erdfelder, Buchner & Lang, 2009). The typical sample size in most psychological studies ranges between 200 and 300 to ensure an acceptable margin of error (Fraley & Vazire, 2014; Marszalek, Barber, Kohlhart & Holmes, 2011).

### **Data collection**

Eligible participants were approached by the candidate who gave them a verbal outline of the study aims and informed them that participation was voluntary and confidential. Participants gave written informed consent and were asked to complete the questionnaires in person. Participants took approximately 15 minutes on average

to complete the survey. The candidate administered the survey and entered and cleaned the data.

### **Data analysis**

Descriptive statistics were used to analyse the means, standard deviations (SD) and frequencies of the data. Missing values were replaced by mean imputation. Normality was checked by the histogram and the absolute values of skewness and kurtosis. Pearson's correlation was used to analyse the relationship between illness perceptions, coping and QoL (PCS and MCS). A correlation coefficient greater than 0.50 indicated a strong relationship (Cohen, 1988). Potential variables that were related to the scores of PCS and MCS (correlation coefficient greater than 0.15 and  $p < 0.05$ ) were entered into the consequent regression model. Calculating hierarchical multiple linear regressions with QoL (domain scores of PCS and MCS) as a dependent variable involved four steps: 1) entering the demographic variables, 2) entering the clinical variables, 3) entering the illness perceptions and 4) entering the coping strategies. Regression models were applied using a forced entry method of variable inclusion. Results were considered significant at a level of  $p < 0.05$ . All statistical analysis was computed by the IBM SPSS Statistics version 24.0 (IBM Corp 2016, Armonk, NY).

### **Ethical considerations**

This study was approved by the Human Research Ethics Committee of the University of Newcastle, Australia (H-2017-0378) and the participating hospital in China.

## **RESULTS**

### **Socio-demographic and clinical data**

The findings related to the socio-demographic and clinical data are shown in Table 5.1. The sample consisted of 176 men and 175 women aged 23-95 years (Mean

= 58.9; SD = 14.6). Cardiovascular conditions (n = 293, 83.5%), endocrine conditions (n = 158, 43.8%) and musculoskeletal conditions (n = 69, 19.7%) were the most prevalent chronic conditions. Most participants had two chronic conditions (n = 289, 82.3%) and the maximum number of conditions was four. Most participants had a post-diagnostic time span of more than two years (n = 279, 79.5%).

Table 5.1

*Descriptive results for socio-demographic and clinical data*

Variables	n	(%)
Age, mean (SD)	58.9 (14.6), from 23 to 95 years old	
Gender	Male	176 50.1
	Female	175 49.9
Marital status	Single	11 3.1
	Married	320 91.2
	Divorced	5 1.4
	Widowed	15 4.3
Education background	Primary or below	70 19.9
	Junior high	117 33.3
	Senior high	100 28.5
	College or above	64 18.3
Employment	Employed	113 32.2
	Unemployed	238 67.8
Number of chronic conditions	2	289 82.3
	3	54 15.4
	4	8 2.3
Duration of MCCs	Less than 2 years	72 20.5
	2-5 years	112 31.9
	5-10 years	98 27.9
	More than 10 years	69 19.7
Chronic conditions clusters	Cardiovascular	293 83.5
	Endocrine	158 43.8
	Musculoskeletal	69 19.7
	Gastrointestinal	64 18.2
	Cerebrovascular	38 10.8
	Chronic respiratory diseases	36 10.3
	Urogenital	30 8.5
	Cancer	23 6.6
	Renal diseases	18 5.1
	Haematological	15 4.3
	Dermatologic	3 0.9
	Psychiatric	2 0.6
	Visual impairment	2 0.6
	Autoimmune diseases	2 0.6

MCCs = Multiple Chronic Conditions; SD = Standard Deviation

### **Illness perceptions, coping strategies and QoL**

The results of the illness perceptions, coping strategies and QoL are shown in Table 5.2. Only one missing value (item 21 of the Brief COPE inventory) was identified in the dataset and was substituted by its mean value. For sample sizes larger than 300, either an absolute skew value of  $> 2$  or an absolute kurtosis of  $> 7$  was used to determine non-normality (Kim, 2013). The variables showed normality according to the criteria. Almost half (48.7%) of the participants reported a score higher than the mean for the illness threatening item. The proportion of participants with a score higher than the mean for each coping strategy were as follows: positive adaptation (50.1%), denial and disengagement (46.2%), support seeking (29.1%), spiritual coping (43.0%) and self-blame (39.3%). The results showed that the QoL of participants was impaired, with a lower PCS than MCS (37.92 and 44.43 respectively).

Table 5.2

*Descriptive results for illness perceptions, coping strategies, and QoL*

Measures	Subscales	Mean	SD	Range
Brief IPQ	Illness threatening <sup>†</sup>	40.28	10.06	0-80
	Consequences	5.01	2.95	0-10
	Timeline	6.41	3.16	0-10
	Personal control	5.86	2.72	0-10
	Treatment control	7.16	2.47	0-10
	Identity	5.62	2.54	0-10
	Illness concern	7.49	2.51	0-10
	Coherence	6.83	2.27	0-10
	Emotional representation	5.59	2.59	0-10
Brief COPE	Positive adaptation	23.79	6.25	9-36
	Denial & disengagement	7.40	2.71	4-16
	Support seeking	8.37	3.06	4-16
	Spiritual coping	5.39	2.12	3-12
	Self-blame	4.16	1.83	2-8
SF-12v2	Physical health	37.92	11.78	0-100
	Mental health	44.43	11.18	0-100

Brief IPQ = Brief Illness Perception Questionnaire; Brief COPE = Brief Coping Orientation to Problems Experienced; SF-12v2 = Short Form survey version 2; QoL = Quality of Life; SD = Standard Deviation

<sup>†</sup> Total score of eight items.

### **Relationship between variables**

The relationship between QoL, illness perceptions and coping was tested by Pearson's correlations (see Table 5.3). Physical health, as represented by the PCS, was negatively associated with illness perceptions for six of the eight items: consequences, timeline, identity, illness concern, emotional representations and illness threatening. Physical health had negative associations with the adoption of denial and disengagement coping, spiritual coping and support seeking. Mental health, as represented by the MCS, was negatively associated with five illness perceptions items: consequences, timeline, identity, emotional representations and illness threatening. Mental health was positively associated with personal control, treatment control and coherence. Also, the MCS had negative associations with the use of denial and disengagement, support seeking, spiritual coping and self-blame.

Table 5.3

*Relationship between illness perceptions, coping strategies, and QoL*

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
<b>IP</b>																
1	1	.567**	.010	.021	.642**	.232**	-.024	.570**	.835**	.075	.182**	.322**	.293**	.042	-.626**	-.378**
2		1	.126*	.120*	.512**	.137*	.063	.252**	.631**	-.007	-.009	.167**	.096	-.079	-.508**	-.184**
3			1	.461**	.107*	.284**	.163**	.077	-.261**	-.005	-.216**	.079	-.020	-.134*	.069	.175**
4				1	.213**	.467**	.377**	.137*	-.206**	.125*	-.089	.081	-.026	-.054	.063	.130*
5					1	.296**	.139**	.594**	.715**	.132*	.165**	.268**	.227**	.060	-.418**	-.270**
6						1	.539**	.377**	.219**	.242**	-.056	.204**	.043	-.024	-.109*	.008
7							1	.155**	-.141**	.254**	-.075	.029	-.080	.008	-.005	.113*
8								1	.658**	.120*	.233**	.256**	.244**	.104	-.308**	-.272**
9									1	.058	.235**	.284**	.276**	.071	-.588**	-.410**
<b>CS</b>																
10										1	.180**	.409**	.172**	.354**	-.043	.065
11											1	.160**	.355**	.493**	-.181**	-.157**
12												1	.370**	.106*	-.206**	-.120*
13													1	.249**	-.163**	-.232**
14														1	.025	-.169**

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
<b>QoL</b>																
15															1	.142 **
16																1

IP = Illness Perceptions, CS = Coping Strategy, QoL = Quality of Life; PCS = Physical Component Score; MCS = Mental Component Score, 1 = Consequences, 2 = Timeline, 3 = Personal control, 4 = Treatment control, 5 = Identity, 6 = Illness concern, 7 = Coherence, 8 = Emotional representation, 9 = Illness threatening, 10 = Positive adaptation, 11 = Denial & disengagement, 12 = Support seeking, 13 = Spiritual coping, 14 = Self-blame.

\*\*Correlation is significant at the 0.01 level (2-tailed).

\*Correlation is significant at the 0.05 level (2-tailed).

The results of the hierarchical regressions are presented in Table 5.4. In the physical health domain, demographic and clinical variables accounted for 19.9% and 3% of the variance respectively. A higher education level was significantly associated with better physical health. Increasing age and an increasing number of MCCs were significantly associated with poorer physical health. Illness perceptions accounted for an additional 27.0% of the variance. Consequences and timeline were negatively associated with physical health. Coping strategies contributed an extra 1.4% to the final model, with denial and disengagement negatively associated with physical health. In the mental health domain, demographic and clinical variables accounted for only 4.0% and 0.3% of the variance respectively. A higher educational level was significantly associated with better mental health. Illness perceptions accounted for an additional of 17.7% of the variance. Consequences were negatively associated with mental health, and personal control was positively associated with mental health. Coping strategies contributed a further 1.6% to the final model, with self-blame negatively associated with mental health.

Table 5.4

*Hierarchical regression models for QoL<sup>†</sup>*

	PCS			MCS		
	R <sup>2</sup>	ΔR <sup>2</sup>	Beta	R <sup>2</sup>	ΔR <sup>2</sup>	Beta
Step 1	0.199	0.199		0.040	0.040	
Age			-0.408***			0.042
Educational level			0.143*			0.176**
Step 2	0.225	0.030		0.043	0.003	
Number of MCCs			-0.143**			-0.033
Step 3	0.493	0.270		0.217	0.177	
Consequences			-.381***			-.292*
Timeline			-.126*			-.009
Personal control			/			.185*
Step 4	0.507	0.014		0.234	0.016	
Denial & disengagement			-0.130**			/
Self-blame			/			-0.137**

QoL = Quality of Life; PCS = Physical Component Score; MCS = Mental Component Score

<sup>†</sup>Only significant associations are presented.

\* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$

**DISCUSSION**

Built on the transactional theory of stress and coping, the present study examined whether illness perceptions and utilisation of coping strategies were related to psychological distress and two domains of QoL (physical health and mental health) among a sample of 351 Chinese adults with MCCs.

Chronic conditions may not be life-threatening; however, they result in suboptimal health outcomes. People with MCCs in this study reported poor physical and mental health when compared against the Chinese general population in terms of the mean standards of their PCSs and MCSs. This indicated the negative effects of living with more than one chronic condition. Conditions may have clinical synergies and antagonisms; for example, people with hypertension and diabetes have a high risk of peripheral vascular disease, and people with diabetes and arthritis may find it difficult to adhere to exercise treatment. Evidence from a national survey in the United

Kingdom showed that mental disorders and some musculoskeletal conditions had the greatest effects on QoL compared with other chronic conditions (Mujica-Mota et al., 2015). The most common chronic conditions in this study indicated that the participants might experience these issues, showing the challenges in caring for people with MCCs.

Illness perceptions are ways of making sense of conditions. A major aim of the study was to determine the relationship between illness perceptions and QoL among people with MCCs. After controlling the socio-demographic and clinical variables, this study found that the illness perceptions of people with MCCs accounted for a significant amount of variance in their physical and mental health. Consequences, timeline and personal control were predictors. These findings may imply several factors. Supported by past findings (Schüz et al., 2014), the illness perceptions formed by people with MCCs may differ from those of people with a single long-term condition due to the complexity of the course of disease and treatments. The consequences of MCCs, such as the limitation of daily activities and negative moods (including fear, anxiety and anger), were the participants' major issues, and how to adjust to the life changes was their priority concern. It is likely that the predictor of timeline revealed the nature of chronic conditions, as they usually last a lifetime. Nearly 80% of the participants in the present cohort had been diagnosed with MCCs for more than two years, which was suggestive of the probable psychological influence of duration and its role in characterising illness perceptions. Collectively, these findings highlighted the importance of assessing and understanding a patient's illness perceptions because of the significant associations with health status.

Coping was related to QoL. The most frequently used coping strategy was positive adaptation, highlighting the important role of adjustment in managing chronic

conditions. Several coping strategies were associated with physical and mental health, but none showed positive relationship. Prior studies on people with cancers supported the findings that denial and self-blame correlated with worse QoL (Brunault et al., 2016). The negative association between the use of self-blame and mental health revealed that people with MCCs might suffer from feelings of guilt and a sense of shame regarding their chronic conditions, which may have made them report a worse QoL. Moreover, a past study demonstrated a strong association between denial and self-blame, coping and psychological distress in people with chronic conditions (Kauff et al., 2008), and this association may have a deteriorating effect on their QoL. The findings showed that coping accounted for little variance in physical and mental health. A possible reason for this is that the effect of coping on health may be affected by the type of disease (Aldwin & Park, 2004). However, this study could not provide more evidence because of the inhomogeneity of MCCs. Aside from that, coping is a multidimensional framework and may represent various styles and ways of coping. Although this study used a validated coping inventory, the findings indicated that the items of the Brief COPE inventory might have some limitations in a transcultural context. Greater cross-cultural knowledge may contribute to a better understanding of coping, especially in relation to non-Western countries. While there is limited research on coping with MCCs, these findings underscore that the adoption of several coping strategies may affect the health of people with MCCs and that certain coping behaviours may be more adaptive than others.

This study found that increased age and a higher number of chronic conditions were associated with worse physical QoL. This has been consistently reported by previous studies (Hunger et al., 2011). The results showed that education level played an important role in the health and illness perceptions among people with MCCs. There

are several reasons why education might positively affect an individual's health: 1) positive relationship between education level and occupational and economic conditions, 2) positive relationship between higher education level and greater acquisition of social/psychological resources and 3) positive relationship between education level and lifestyle (Ross & Wu, 1995). Lower health literacy has been linked to poorer general health status, worse adherence to treatment, a lack of understanding of health messages and inadequate use of healthcare services (Berkman, Sheridan, Donahue, Halpern & Crotty, 2011). However, this study excluded participants who could not read. Further research should emphasise health literacy within the population of MCCs before delivering advice and suggestions to maximise patients' health and wellbeing.

Culture influences stress and coping. It influences the individual self, the environment in which individuals live and their views of the environment (Tweed, White & Lehman, 2004). Simply applying Western coping theories to different ethnic groups across regions of the world may not be appropriate (Heppner, 2008). Underlying beliefs may account for many of the differences in the perceptions of stressful events such as MCCs. In the Western context, a person may actively respond to stressful events with multiple strategies (Kluckhohn & Strodtbeck, 1961). Chinese people may place emphasis on maintaining harmony in managing themselves, dealing with interpersonal relationships and confronting the environments in which they live (Huang, 2016). They may tend to avoid conflicts with stressful situations to maintain social and interpersonal harmony (Hsu, Chen, Wang & Sun, 2008). Such a belief may mean that Chinese people are more likely to adapt to their current status rather than intentionally make changes. A past cross-cultural study found that Asian people used internal coping strategies such as reappraisal, denial, self-control and repression to

change individual self-perceptions rather than their environment (Tweed et al., 2004). Such cultural influences may help to explain the findings of this study in which the strategies of denial and disengagement and self-blame, which aim to change the self, could predict physical and mental health.

### **Implications for clinical practice**

This study was the first step in researching the associations between illness perceptions, coping and self-reported health outcomes among adults with MCCs in China. Significantly, these findings indicated that illness perceptions and coping strategies play an important role in disease self-management. Restructuring illness perceptions by providing concise information, including knowledge of MCCs' trajectories and self-management skills, may help people to cope more efficiently. Future healthcare efforts should focus on increasing MCC patients' self-efficacy in managing their conditions, and diminishing negative beliefs about the consequences of MCCs. In addition, interventions that change patients' thoughts about the duration of illness (timeline) to be less chronic and facilitate perceptions between expectations and reality may help to improve QoL.

An understanding of illness perceptions can inform healthcare professionals about people's psychological reactions to their MCCs. This work is imperative, as illness perceptions can predict health behaviour (Moss-Morris et al., 2002; Zelber-Sagi et al., 2017). If too much attention is paid to physical impairments, the unspoken requirements of people with MCCs may be overlooked. By evaluating the coping strategies of people with MCCs, healthcare professionals could target people with psychological needs. Healthcare professionals can encourage patients to have more positive and realistic reactions to the MCCs and to adapt proactively. A recent meta-analysis based on the common-sense model of self-regulation has demonstrated that

effective interventions that address illness perceptions and coping strategies could improve physical and psychological functioning among people with cancer (Richardson, Schüz, N., Sanderson, Scott & Schüz, B., 2017). The next step is to develop and test culturally appropriate interventions to facilitate changing the perspectives of illness threats and promoting the use of specific coping strategies to improve health outcomes among people with MCCs.

### **Limitations and further research directions**

**Design:** The present study adopted a cross-sectional design that cannot imply causality. Coping is a dynamic process. When people change their appraisals of their chronic conditions, such as their beliefs about illness, it may influence their coping and health-related outcomes. Further longitudinal studies are needed to evaluate the changing process of people's appraisals and ways of coping related to the health outcomes of MCCs over time.

**Sample:** This study was conducted in Northern Anhui, China. Therefore, the findings may not be generalized to other parts of China or Chinese population residing in other areas of the globe. As a result, the findings of this study need to be verified in more studies. Large and robust sample sizes also contributing to improving generalizability of findings. In addition, the exclusion of participants with low literacy might have resulted in participation bias. Future research should include participants with differing levels of literacy to ensure that the research outcomes reflect a more inclusive population.

There might also be reporting bias in a self-report survey. Participants might not remember their diagnosis correctly and they might be embarrassed to reveal details of their health status such as many chronic health conditions and/or long lasting course of the conditions. These biases might affect the results.

Measures: Cultural differences in questionnaire response patterns have been reported (Kemmelmeier, 2016). The outcomes of self-report measurements might vary across different racial/ethnic groups. The present study used two scales: The Brief IPQ and the SF-12v2. These scales had been used in China with acceptable reliability but had not been fully validated in people with MCCs. Further validation of the instruments in different study populations is essential.

There are many sociocultural, emotional, cognitive and physical factors that can affect coping (Hudson, 2016). This study involved variables such as physical factors (e.g., multiple medications use, received healthcare plans and trajectories of MCCs), psychological factors (e.g., distress) and socio-demographic factors (e.g., age and sex). There are other important factors that might influence coping that were not measured in the present study (e.g., clusters of MCCs, medications and social support). Future research might include more factors to identify their role in influencing coping and health.

Given the multifaceted and interrelated nature of MCCs, illness perceptions, coping strategies and health-related outcomes, new approaches and technologies such as advanced statistical methods should be employed to reveal their potential associations. Future studies may use other validated and comprehensive scales to confirm the findings of this study, such as biomarker outcomes (e.g., blood pressure), client outcomes (e.g., mortality) and implementation outcomes (e.g., cost-effectiveness) instead of self-reported health outcomes.

## **CONCLUSION**

This was the first study to document the relationship between illness perceptions, coping strategies and QoL in Chinese adults with MCCs. Findings suggested that the ways in which people perceive their MCCs and how they cope with them could affect

their physical and mental QoL. Further research might involve developing and testing culturally adapted interventions to facilitate changing patients' perceptions of illness threats and promoting the use of specific coping strategies to improve health outcomes among people with MCCs.

## **CLINICAL RESOURCES**

Multimorbidity: Clinical assessment and management. *National Institute for Health and Care Excellence (NICE) guideline [NG56]*  
<https://www.nice.org.uk/guidance/NG56/chapter/Recommendations#multimorbidity>

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## Part 2 Urban-rural differences in mental health among Chinese patients with multiple chronic conditions

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## **ABSTRACT**

Mental health is impacted by social, economic and environmental influences related to where people live. Mental health problems commonly co-occur with long term chronic physical conditions and impact individuals' health synergistically. Multiple chronic conditions (MCCs) including mental health problems are becoming a public health challenge globally. However, there is limited information about urban-rural differences in mental health among patients with MCCs in China. The present study aimed to identify differences in mental health between urban and rural patients with MCCs. Using a cross-sectional design, 347 patients with MCCs were recruited from a tertiary hospital in North Anhui, China. A self-reported questionnaire, including socio-demographic and clinical variables, the 12-item Short-Form survey version 2 on quality of life, and the Hospital Anxiety and Depression Scale, was administered to outpatients. Findings showed that rural participants reported more symptoms of anxiety and depression and had worse mental health compared to urban participants. Unemployment status, lower educational level, more chronic health conditions and a higher degree of anxiety were associated with worse mental health. This study highlights disparities in mental health among patients with MCCs living in urban and rural areas of China. Appropriate mental health support programs should be developed for patients with MCCs, especially for those living in rural areas.

**KEYWORDS:** anxiety, depression, mental health, quality of life, multiple chronic conditions.

## INTRODUCTION

Mental health problems have become an increasingly important public health concern globally (World Health Organization, 2018a). Mental health problems can affect anyone; however, a body of evidence shows that socio-demographic factors, such as age, ethnicity, place of residence and language, and socio-economic factors like income and education, can affect an individual's health outcomes (Lyratzopoulos et al., 2012, Khan et al., 2011), especially people's mental health (World Health Organization, 2014).

The relationship between people's place of residence and their mental health has drawn much attention across countries in the past decades (Peen et al., 2010). However, epidemiological evidence for this relationship is inconclusive. For instance, an investigation involving 18,000 adults in nine countries of the former Soviet Union showed that living in urban areas was related to higher odds of psychological distress compared to living in rural areas (Stickley et al., 2015). Another study in Denmark showed that people born in the urban environment reported a higher occurrence of mental disorders in general and some specific psychiatric disorders such as schizophrenia and bipolar disorder than people born in the rural environment (Vassos et al., 2016). However, contrary to those findings, research in the United States found no difference in the prevalence of mental illness between the most urban and the most rural areas (Breslau et al., 2014). The Australian Rural Mental Health Study also found little difference in psychological distress depending upon the region. However, participants living in very remote areas reported more distress (Butterworth et al., 2014).

A recent cross-sectional study in China reported more depression and more alcohol addiction in people living in rural areas compared with urban counterparts

(Huang et al., 2019). A previous meta-analysis showed that older Chinese adults living in rural areas reported more depressive symptoms than urban counterparts (Zhang et al., 2012). Data from the China Health and Retirement Longitudinal Survey (CHARLS), Tian et al. (2015) demonstrated that older adults living in urban areas have better mental status compared with their rural peers and that gender, marital status, educational level, and social activities were associated with mental health of participants. Many factors complicate research into differences in individuals' mental health between rural and urban areas, such as different definitions of 'urban' and 'rural', cultural differences across place of research, and heterogeneity in diagnostic measures for case identification (Peen et al., 2010).

The China Mental Health Survey (CMHS) found that between 2013 and 2015 the weighted prevalence of any mental disorder was 9.3% in Chinese adults during the 12 months before clinical interview and 16.6% during the participants' lifetime before the interview (Huang et al., 2019). Patients with mental health problems in China usually receive institutional care due to the structure of China's healthcare system (Liu et al., 2011). Specialist mental healthcare dominates the present healthcare system while community-based mental healthcare is developing. As a result, mental healthcare service provision is mainly hospital-based. Factors such as lack of funding, disparity in the distribution of medical resources, and insufficient mental healthcare staff compound the issues (Liu et al., 2011, Xiang et al., 2018). Utilization of mental healthcare services for inpatients or outpatients has been low in both urban and rural areas in China. In 2015, the rate of fortnightly consultations of mental healthcare services in China was 0.15% and the admission rate to mental healthcare facilities was 0.3% (National Health and Planning Commission, 2015a). To improve mental healthcare service use, the Chinese government enacted mental health legislation in

2013 and announced a project focused on ‘central government support for the local management and treatment of serious mental illness’ in 2014. China has also integrated mental healthcare services into its national healthcare system. For example, the state council (National Health and Planning Commission, 2015b) demonstrated its commitment by releasing the *National Mental Health Working Plan, from 2015 to 2020* in 2015. This plan aimed to build a comprehensive mental healthcare network led by the government with the cooperation from community, family, and mental healthcare staff, improve current healthcare services to ensure treatment and support for people with mental disorders, and promote social understanding and acceptance for people with mental disorders (Xiong and Phillips, 2016). Despite this, barriers and challenges for mental healthcare services development in China include: (1) lack of financial investment from government, (2) insufficient mental health facilities and trained psychiatric professionals, (3) social stigma attached to mental illness and resulting discrimination, and (4) disparities in mental healthcare coverage and resource allocation between rural and urban areas across the country (Que et al., 2019, Liu et al., 2011).

Chronic diseases are a major health concern in China, accounting for an estimated 89% of all deaths, among which cardiovascular diseases (43%), cancer (23%), chronic respiratory disease (9%) and diabetes (2%) are predominant (World Health Organization, 2018b). The increased morbidity and mortality of chronic diseases cause a substantial burden of disease to patients and the healthcare system in China (National Health and Planning Commission, 2015c). Many patients may suffer from more than one chronic condition. The term ‘multiple chronic conditions’ (MCCs) refers to the co-occurrence of more than one long-term condition in an individual (Wolff et al., 2002). A cross-sectional survey involving 162,464 community residents

in southern China found that 11.1% of the total study population had two or more chronic conditions (Wang et al., 2014). Another study found that the prevalence of MCCs was much higher in older adults living in urban areas in China (49.4%) (Gu et al., 2017).

Having MCCs is highly associated with poor health outcomes such as function loss, disability and decreased quality of life (QoL) (Marengoni et al., 2011). MCCs are also a challenge for quality healthcare. Patients with MCCs may undergo multiple tests, experience more hospitalizations and have an increased risk of adverse drug events (Vogeli et al., 2007). General medical spending and total out-of-pocket spending on healthcare increase with the number of chronic conditions (Wang et al., 2014). Psychological distress also increases with the number of chronic conditions, suggesting that living with MCCs might affect patients' psychological well-being, not just their physical well-being (Gunn et al., 2012).

Despite many studies concerning MCCs, there is a paucity of research comparing the mental health of people living in urban areas with MCCs compared with that in rural areas. The twin realities that China's MCCs population is increasing and China has the world's fastest ageing population, may predict a surge in the prevalence of MCC in the future. Increased knowledge regarding urban and rural differences in MCCs including mental health problems may contribute important information to the discussion on policy development and facilitate supportive programs to manage health issues for this group. Comparisons in mental health between urban and rural areas may help to understand the urban-rural disparities and draw more attention to patients with MCCs because there is a significant relationship between the number of health conditions and psychological distress (Holden et al., 2010).

The current work aims to contribute to evidence about urban-rural differences in mental health among Chinese patients with MCCs which may have potential implications for mental health practice and policy. The candidate hypothesized that patients in rural areas in China would report more psychological distress and poorer mental health than their urban counterparts as they have less access to quality healthcare and medical resources (Li et al., 2018).

## **AIMS**

The present study aimed to identify differences in mental health between urban and rural patients with MCCs.

## **METHODS**

### **Design**

A cross-sectional survey was undertaken in a northern part of Anhui province, China, between November 2017 and May 2018. Preliminary findings of the survey have been reported elsewhere (Cheng et al., 2020).

### **Sample**

A total of 351 Chinese adults with MCCs participated in the survey. The inclusion criteria were as follows: Individuals who had MCCs, defined as more than one chronic condition, were cognitively capable of completing the questionnaire, voluntarily joined the study and could speak Chinese.

This study used the insurance type to identify whether participants lived in urban or rural areas. Currently, there are three different types of government insurance schemes in China. These include Urban Residents Basic Medical Insurance (URBMI), Urban Employees Basic Medical Insurance (UEBMI) and the New Rural Cooperative Medical Scheme (NRCMS) (Sun et al., 2017). URBMI covers self-employed people,

children, students and older adults on a voluntary basis. UEBMI is compulsory at the employee level and is financed by the employee, employer and government. URBMI and UEBMI are only available for urban residents whereas NRCMS is only available for rural residents (665 million in 2015) (National Health and Planning Commission, 2015a). Both URBMI and UEBMI are administered by the Ministry of Human Resources and Social Security of China. The NRCMS is administered by the National Health and Family Planning Commission. The NRCMS is a voluntary insurance scheme for people living in rural areas (670 million in 2015) (National Health and Planning Commission, 2015a). Further, commercial health insurance can be purchased voluntarily by individuals as a supplementary insurance cover. The use of insurance types to identify whether the participants lived in urban or rural areas has been used in a prior study in China (Cai et al., 2018). Participants were excluded if there was no precise record regarding the medical insurance scheme or residence location.

### **Recruitment**

The candidate designed and displayed posters for recruitment in outpatient clinics at the hospital. Patients interested in participating in the study approached the candidate by phone, email or in person. Those interested in participating in the study were provided with a participant information statement and were asked to sign a consent form and then complete a self-reported questionnaire.

### **Data collection**

The candidate obtained informed consent and administered the survey. The questionnaire took about 15 minutes to complete. Residential address and medical insurance information were obtained from their medical record.

## **Instruments**

The questionnaire comprised questions about socio-demographic characteristics, clinical factors, and two standardized instruments to measure the quality of life and anxiety and depression.

### ***Socio-demographic and clinical measures***

Participants were asked to provide socio-demographic information including age, gender, education, income, employment, and marital status. Clinical data included the number, type, and duration of MCCs.

### **Medical Outcomes Study 12-item Short-Form version 2 (SF-12v2)**

The SF-12v2 was used to measure the physical and mental health status of patients with MCCs (Ware et al., 2005). The SF-12v2 has been translated into Chinese and validated in China (Cronbach's alpha for physical component = 0.67; Cronbach's alpha for mental component = 0.60) (Lam et al., 2013). The SF-12v2, has 12 items assessing eight domains: body pain (BP), general health (GH), vitality (VT), social functioning (SF), physical functioning (PF), mental health (MH), role physical (RP) and role emotional (RE). The SF-12v2 scale scores were calculated by summation of the related item scores and transformed to a range from 0 to 100 based on the standard scoring algorithm (Ware et al., 2005). A higher score indicates better-perceived health. The physical component score (PCS) and mental component score (MCS) were derived from the above domains by calculation (Bruun, 2016). This study considered the MCS score as the main indicator of the mental health of patients with MCCs.

### **Hospital Anxiety and Depression Scale (HADS)**

The HADS is a widely-used scale to measure an individual's level of anxiety and depressive symptoms (Zigmond and Snaith, 1983). This scale includes 14 items: seven items measure symptoms of anxiety (HADS-A) and the other seven items

measure symptoms of depression (HADS-D). Each item is scored from 0 to 3, giving a total score ranging from 0 to 21. The HADS has been translated into Chinese and shown to be reliable (Cronbach's alpha equalling 0.86 and in the domain of anxiety 0.77 and for depression 0.82) (Leung et al., 1999).

### **Data analysis**

Univariate analysis (e.g. means and standard deviations) was used to analyse socio-demographic characteristics of the participants and levels of self-reported health. Independent t-tests or Mann-Whitney U-tests were used for continuous variables according to the distribution of data. The Bonferroni procedure was performed to adjust the significance level of hypothesis tests because of multiple tests (Salkind, 2010). A p-value of 0.0045 was set as a borderline result in terms of statistical significance. Then, stepwise linear regression was used to explore the significance of socio-demographic, clinical and psychological distress factors in interpreting the variation in mental health total score between rural and urban populations. All data were entered, managed and performed using the IBM SPSS Statistics version 24.0 (IBM Corp 2016, Armonk, NY).

### **Ethical considerations**

Ethical approval to undertake this study was obtained from the Human Research Ethics Committee (HREC) of the University of Newcastle, Australia (H-2017-0378) and the participating hospital in China. This study adhered to the ethical standards set out by the Research Ethics Committee. Eligible participants were informed of the aim of the study, that participation was voluntary and that they could withdraw from the study at any time without this decision affecting their current treatment. Written informed consent was obtained before the survey was administered and participants were informed that their information would be anonymous, that no personal data

would be identified, and all information would be kept confidential. Questionnaires were assigned a serial number. A list of resources including a hotline phone number of health advice about chronic diseases and referral to a medical psychologist was offered to all participants.

## **RESULTS**

### **Socio-demographic and clinical variables**

Socio-demographic and clinical data for the participants are presented in Table 5.5. There were 347 eligible participants in this study (female:  $n = 173$ , 49.9%), ranging in age from 23 to 95 (mean:  $58.5 \pm 15.1$ ) years. Four participants were excluded, as their insurance status could not be determined. Urban participants accounted for 68.6% of the total participants ( $n = 238$ ). Compared with participants living in rural areas, urban participants had a higher education level ( $p < .001$ ) and better monthly income ( $p < .001$ ). Most participants had two chronic conditions which did not differ by location (80.7% for urban participants vs. 86.2% for rural participants,  $p = .176$ ).

Table 5.5

*Socio-demographic and clinical characteristics of the participants with multiple chronic conditions from Anhui province China (n = 347)*

Characteristics		Total (n = 347)		Urban (n = 238)		Rural (n = 109)		p-value <sup>‡</sup>
Age (years), mean (Standard deviation)		58.5 (15.1)		59.5 (14.9)		57.8 (13.8)		0.145
Gender	Male	n	%	n	%	n	%	0.282
		174	50.1	124	52.1	50	45.9	
Gender	Female	173	49.9	114	47.9	59	54.1	0.645
Marital status	Never Married	10	2.9	7	2.9	3	2.8	0.645
	Married	317	91.4	216	90.8	101	92.7	
	Divorced	4	1.2	3	1.3	1	0.9	
	Widowed	15	4.3	11	4.6	4	3.6	
	Separated	1	0.3	1	0.4	0	0	
Education	Elementary school	69	19.9	12	5.1	57	52.3	0.000***
	Middle school	116	33.4	76	31.9	40	36.7	
	High school	99	28.5	89	37.4	10	9.2	
	College/University	63	18.2	61	25.6	2	1.8	
Monthly income <sup>†</sup> (Yuan)	Below ¥ 2000	156	45.0	75	31.5	81	74.3	0.000***
	¥ 2001-5000	175	50.4	148	62.2	27	24.8	
	Above ¥ 5000	16	4.6	15	6.3	1	0.9	
Employment	Currently employed	111	32.0	79	33.2	32	29.4	0.478
	Unemployed	236	68.0	159	66.8	77	70.6	
Number of MCCs	2	286	82.4	192	80.7	94	86.2	0.176
	3	54	15.6	39	16.4	15	13.8	
	4	7	2.0	7	2.9	0	0	
Duration of MCCs (Years)	0-1	70	20.2	50	21	20	18.3	0.324
	2-5	111	32.0	68	28.6	43	39.4	
	6-10	98	28.2	69	29.0	29	26.6	
	>10	68	19.6	51	21.4	17	15.7	
Five most commonly diagnosed chronic conditions	Cardiovascular conditions	289	83.3	202	84.9	87	79.8	N/A
	Endocrinologic conditions	157	45.0	113	47.5	44	40.4	
	Musculoskeletal conditions	69	19.9	49	20.6	20	18.3	
	Gastrointestinal conditions	63	18.2	46	19.3	17	15.6	
	Cerebrovascular conditions	36	10.4	28	11.8	8	7.3	

<sup>†</sup>1 US dollar = 6.9 Chinese Yuan; MCCs = Multiple Chronic Conditions

<sup>‡</sup>Independent t-test or Chi-square Test

\*\*\* $p < 0.001$

### **Differences in anxiety, depression, and MCS between urban and rural participants**

The health and psychological data for the participants are presented in Table 5.6. A cut-off score of above 8 indicates a possible case of anxiety or depression or both (Bjelland et al., 2002). For urban participants, the prevalence of potential cases was 30.7% for depression and 30.7% for anxiety. For rural participants, these percentages were 42.2% for potential cases of depression and 40.3% for anxiety. There were significant differences between the urban and rural participants in anxiety ( $t = -3.37$ ,  $p < .05$ ) and depression ( $t = -3.53$ ,  $p < .001$ ).

The mean scores of MCS were  $46.13 \pm 10.80$  and  $41.23 \pm 11.16$  for urban participants and rural participants, respectively. Based on the criteria of MCS for the normal population ( $50 \pm 10$ ) (Lam et al., 2016), both urban and rural participants reported impaired mental health using MCS. Participants from urban areas had significantly higher MCS than those from rural areas ( $t = 3.89$ ,  $p < .001$ ), indicating better mental health.

Table 5.6

*Health status and psychological distress by areas of participants with multiple chronic conditions from Anhui province China (n = 347)*

Variables	Total (n = 347)			Urban (n = 238)			Rural (n = 109)			t	p
	Means	SD	Range	Means	SD	Range	Means	SD	Range		
Health status											
MCS	44.59	11.14	15.77-68.05	46.13	10.80	15.77-68.05	41.23	11.16	17.00-66.32	3.89	0.000***
Psychological distress											
Anxiety	8.13	3.56	0-21	7.70	3.57	0-19	9.06	3.38	1-21	-3.37	0.001**
Depression	7.40	3.39	0-20	6.97	3.36	0-18	8.33	3.28	1-20	-3.53	0.000***

SD = Standard Deviation; MCS = Mental Component Score

\*\* $p < 0.01$ ; \*\*\* $p < 0.001$

### Stepwise regression models for mental health by areas

Regression results (see Table 5.7) showed that being employed and having a higher educational level were associated with higher MCS score for urban participants however symptoms of anxiety were negatively associated with MCS score ( $p < .001$ ). Among rural counterparts, participants who had more chronic conditions ( $p < .01$ ) and more symptoms of anxiety ( $p < .001$ ) predicted lower MCS score. All regression models were adjusted for age and gender.

Table 5.7

*Results of Stepwise multiple regression analysis for mental health measured by the SF-12v2 mental component score ( $n = 347$ )*

Populations	Variables	df	Beta	R2	F	p
Urban	Employment	3	-.124	.200	20.716	.047*
	Education		.137			.028*
	Anxiety		-.408			.000***
Rural	Number of MCCs	2	-.268	.238	17.900	.002**
	Anxiety		-.442			.000***

MCCs = Multiple Chronic Conditions  
 \* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$

## DISCUSSION

Due to the growing prevalence of MCCs in China, investigating the mental health of patients with MCCs from urban areas in comparison with those from rural areas will help increase understanding of the inequalities in mental health between these two groups and can serve as a reference for allocating medical resources and healthcare services for people with MCCs. These findings support the hypothesis that Chinese patients with MCCs living in rural areas are significantly worse off in terms of mental health and psychological distress in comparison to participants based in urban areas. More chronic conditions and symptoms of anxiety were associated with worse mental health in rural participants. Unemployment, lower educational levels and

more symptoms of anxiety were associated with worse mental health in urban participants.

Significant urban-rural differences in mental health and psychological distress were identified in this study. Past studies on chronic health conditions support these findings (Guo et al., 2018, Zhang et al., 2016) although there has been no previous published study related to MCCs. For example, Zhang et al. (2016) undertook a large survey on health-related quality of life (HRQoL) among patients with hypertension in northern China and found that rural participants reported more problems in four domains—mobility, general activities, pain, and anxiety and depression—compared to their urban peers. As suggested by the World Health Organization (2014), unfavourable social, economic and environmental circumstances are major risks for mental disorders. People living in rural areas may face a greater range of stressors compared with people living in major cities (National Rural Health Alliance, 2017), such as fewer jobs, lower incomes, and more vulnerability to natural hazards.

In China, it is known that urban residents enjoy more socioeconomic benefits, such as more medical resources, better education facilities and a better living environment (Jain-Chandra et al., 2018). Compared with residents of urban areas, Chinese rural residents may have to cope with lagging social-demographic development, lower education levels, fewer job opportunities, poor access to health services, poor health and social infrastructure, environmental hazards and economic hardships, which could be detrimental factors for people's physical and mental health (Fang et al., 2009). Previous research found that the utilization of mental health services such as hospitalization expenses, length of stay, and frequency of hospitalization was lower in rural residents than in urban residents in China (Xu et al., 2018).

Although the rural residence is usually considered to be a risk factor for mental health, evidence for this association is inconclusive worldwide. Prior research illustrated that there were considerable urban-rural differences in mental health, with mental disorders being more common in urban populations (Dekker et al., 2008, Kovess-Masf  ty et al., 2005, Paykel et al., 2000, Szabo, 2018). For example, the European Study of the Epidemiology of Mental Disorders (ESEM  D 2000 Study) found that the urban populations reported higher levels of mental health disorders (depressive disorders and anxiety disorders) compared with rural populations (Kovess-Masf  ty et al., 2005). One possible explanation for the differences might be due to more adverse urban social environments. Those studies took place in developed countries where individuals living in urban areas may encounter more stressors, such as crimes, economic burden, and environmental pollution, than their rural counterparts (McKenzie et al., 2013). However, the findings of the current study regarding differences in mental health between rural and urban patients in China are consistent with those of a prior study based in Pakistan (Mirza and Jenkins, 2004). Thus, it seems that the degree of difference in mental health between MCCs patients in urban areas and those in rural areas might depend on whether the specific areas involved in the studies concerned are developed or less developed countries.

For those living in rural and remote areas, there may also be differences in subgroups, such as age or gender. For example, Caldwell et al. (2004) compared the prevalence of mental disorders and utilization of health services by place of residence, age, and gender and found that young males living in rural and remote areas of Australia had higher suicide rates compared with their metropolitan counterparts. Future research could achieve clarification by taking into consideration age, gender, and place of residence.

Independent factors contributing to mental health were ascertained in the present study by regression analysis including employment status, education, number of MCCs and anxiety. Employment provides a steady income and a sense of worth and social engagement and has been associated with better self-reported psychological well-being (McKee-Ryan et al., 2005). Individuals with higher education levels might have a better sense of control, which makes them more adaptive (Williams, 1990). A higher education level is also associated with more knowledge and skills, which leads to stable jobs with higher income and allows people to accumulate wealth (Zajacova and Lawrence, 2018). The current study indicated that education level is positively associated with the mental health of urban MCCs patients, suggesting that a higher education level may be helpful in the management of psychological wellbeing. This conclusion is supported by a prior study, which indicated that the number of chronic conditions is associated with increased occurrence of psychological distress (Gould et al., 2016).

The present study also found that a greater number of chronic conditions is associated with poorer mental health of those living in rural areas. This finding indicates the disadvantageous impacts of MCCs on individuals' health (Makovski et al., 2018) and revealed that rural participants might be more vulnerable to chronic health conditions due to insufficient medical support, socioeconomic disadvantage, and health risks (e.g. high rates of smoking) (Wang et al., 2015).

Past studies have shown that economic hardship is a major cause of psychological distress (Brown et al., 2017). However, this study did not observe an association between monthly income and psychological distress possibly because all participants were covered by national insurance schemes which paid for the cost of treatment.

Findings of this study suggest that a higher level of anxiety is significantly associated with worse mental health. This indicates that suffering from MCCs might cause more disease-related worries and physical discomfort and, in turn, more anxiety. This finding is consistent with a past study which found more symptoms of anxiety is related to lower QoL (Blakemore et al., 2014). A meta-analysis reported that managing anxiety could be beneficial for promoting QoL in patients with chronic conditions (Hofmann et al., 2014).

However, unlike previous studies that identified the predictors of both anxiety and depression (Moubayed et al., 2015), this study has not observed an association between depression and QoL. This might reflect several factors. The HADS scale and SF-12v2, both validated in patients with chronic conditions, have not been used in studies of MCCs patients before. Rural participants might have had difficulty understanding the questions regarding negative moods due to low literacy. The interaction between anxiety and depression could be complex and, hence, too difficult to be measured using a single scale. Further research could consider using a combination of well-validated scales such as the Zung Self-Rating Anxiety Scale (SAS) and the Beck Depression Inventory (BDI), which may provide a clearer picture. A clinical diagnostic interview is also necessary to make an accurate diagnosis of anxiety and depression.

### **Limitations**

This study could not determine causal relationships due to the cross-sectional design. The researched population was recruited from a tertiary hospital in North Anhui, China, suggesting that the findings may not be representative of other areas of China. The findings were collected by self-reported questionnaires so the respondents may have been affected by social desirability bias, deficient knowledge about health

and memory recall. There is a huge rural-to-urban migration taking place in contemporary China. Generally, this migration is impermanent and does not change the migrants' official residence record. In this study, this significant migrant group was not identified. Future studies should include this migrant population as they may be more vulnerable to health-related problems (Yang, 2014). Differences in mental health between urban and rural patients in the current study might be affected by the heterogeneity of MCCs as determined by factors such as illness trajectory, severity of conditions, healthcare plans, prescribed medications, and self-management. Thus, recognizing clusters of MCCs and giving more consideration to possible impact factors may be a potential solution to a greater understanding of MCCs in future.

### **Relevance for clinical practice**

Multidisciplinary teams for mental health including healthcare professionals and workers in community settings, play important roles in mental health promotion, mental disorder prevention, early detection, assessment, treatment, rehabilitation and recovery for people with a complex array of mental health needs. Nurses comprise the single largest group of the mental healthcare workforce across countries (30–50%) (World Health Organization, 2018a). However, there are limited mental healthcare nurses in China currently. The total number of mental health professionals per 100,000 population working in mental health facilities in 2015 was 1.37, including 0.52 physicians, 0.57 nurses, and 0.28 other professionals (National Health and Planning Commission, 2016). There were 3,241,469 registered nurses (RNs) working in all types of medical institutions in China in 2015, whereas RNs based in mental health facilities only accounted for 1.76% (57,198) of the total, which was relatively low (4.07 per 100 000 population) compared with the average of upper middle income countries (6.83 per 100 000 population) and the average of high income countries

(23.49 per 100 000 population) (World Health Organization, 2018a). Chinese mental health experts have advocated that postgraduate nursing curriculum in universities in China should be updated with mental health knowledge and skills and further nursing students should be trained in mental health settings (Xu et al., 2017). Due to the insufficient numbers of nursing specialists in mental health in China, further training programs such as the Psychiatric-Mental Health Specialist Nurse (PMH-SN) and Psychiatric-Mental Health Advanced Practice Registered Nurse (PMH-APRN) programs should be encouraged to strengthen the current nursing workforce.

Importantly, this study extends current evidence on chronic conditions, addressing the importance of providing psychological support for patients with MCCs in rural areas. Policies that reduce social inequalities are crucial. For example, local government should improve health services and increase medical resources for rural areas. Policies should highlight the importance of redressing economic insecurity, through such measures as the creation of jobs, the implementation of a minimum wage, and the provision of relevant assistance programs, which not only serve the MCCs population but also contribute to financial growth.

Case management is one of the key approaches that provides continuing support for people with chronic mental conditions in community healthcare (Dieterich et al., 2017). Community nurses can be case managers for people with mental health issues. While the state of community mental healthcare in China is progressing, most patients with chronic mental illness still stay in mental healthcare facilities for long periods of time. Mental healthcare mostly relies on specialized facilities. Thus, it is important to establish an integrated community-based mental healthcare system. For example, since 2004, China started the ‘686 Program’, which aimed to promote management and treatment for mental illness in hospital and community settings. From 2005 to 2015,

this program has provided an evidence-based model that contributes to the community of mental healthcare in China, offering training for all types of personnel who provide services for people with mental disorders; over 25,100 personnel have received the training (Good and Good, 2012).

Routine assessment of potential symptoms of anxiety and depression of MCCs patients will help ensure patients with MCCs receive appropriate support services in a timely manner. The findings that symptoms of anxiety may predict poor mental health demonstrates that healthcare professionals need to integrate psychological interventions with patients' current treatment plans. Some healthcare models, such as peer support, which is proposed as an effective approach to manage chronic conditions and promote health (World Health Organization, 2008), should be introduced and facilitated. A current report on support services showed that a community-based peer support program for persons with severe mental illness was feasible and has been effectively undertaken in China (Fan et al., 2018).

## **CONCLUSION**

This study highlights the differences in mental health between patients with MCCs living in urban areas and those in rural areas of China. The levels of reported mental health and psychological distress varied, with rural participants experiencing worse mental health than their urban counterparts. Unemployment status, lower educational level, more chronic health conditions and a higher degree of anxiety were related to worse mental health. The findings emphasize the importance of mental health in the population of people with MCCs and raise an important question about how patients from rural areas should be helped to maintain or improve their psychological well-being. Also, those findings will be helpful for the development of

mental health work in other countries and areas with similar circumstances to those of China.

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## Part 3 The relationship between coping strategies and psychological distress in Chinese older adults with multiple chronic conditions

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## ABSTRACT

**Objective:** People with multiple chronic conditions (MCCs) are more vulnerable to psychological distress. There is a paucity of research examining the relationship between coping and psychological distress in older adults with MCCs. This study aimed to investigate the association between socio-demographic variables, clinical variables, physical function, and coping strategies for levels of anxiety and depression in Chinese older adults with MCCs.

**Method:** This is a secondary analysis of data from a prior cross-sectional survey. Using a convenience sampling approach, the participants were recruited from a university-affiliated hospital in Anhui, China. Participants with MCCs, aged over 60 years old, were selected from the electronic dataset.

**Results:** Of the 185 participants with MCCs (mean age  $70.12 \pm 6.98$ , 54.6% male), 62.7% of participants had scores indicating symptoms of anxiety and 54.1% had scores indicating depression. Stepwise regression models explained 46.5% of the total variance for the levels of anxiety and 34.1% for the levels of depression. In the anxiety model, gender, body pain, physical functioning, positive adaptation, denial and disengagement coping, and spiritual coping showed significant associations. In the depression model, gender, physical functioning, positive adaptation, and spiritual coping showed significant associations.

**Conclusion:** The present study provides insights into the relationship between coping and psychological distress among Chinese older adults with MCCs. This study demonstrated the need to screen negative moods, such as depression and anxiety, among older adults with MCCs. Individualized intervention that addresses coping

strategies should be encouraged to maintain psychological states in older adults with MCCs.

Keywords: Anxiety, coping, depression, multiple chronic conditions, older adults

## INTRODUCTION

Multiple chronic conditions (MCCs)—defined as the co-existence of two or more long-term care conditions (Wolff, Starfield, & Anderson, 2002)—is becoming a significant health challenge worldwide. This trend is more prevalent in older adults' group, as the existence of MCCs increases with age. A review indicates that 60% of the general global population suffer from MCCs, possibly over 80% among adults aged more than 85 years (Salive, 2013). A cross-sectional study shows that the prevalence of MCC was 49.4% in community-dwelling older adults in urban China (Gu et al., 2017).

Having MCCs is closely associated with more functional impairment (Ryan, Wallace, O'Hara, & Smith, 2015), poorer quality of life (QoL) (Martin Fortin et al., 2004), and substantial medical costs (Palladino, Tayu Lee, Ashworth, Triassi, & Millett, 2016). Older adults are more likely to suffer from MCCs because of a synergistic effect between MCCs and geriatric syndromes (Cheung, Yu, Wu, Wong, & Woo, 2018). Research finds that MCCs are closely associated with geriatric syndromes such as sarcopenia, dizziness, and urinary incontinence (Li et al., 2013). The co-occurrence of geriatric syndromes and MCCs reflects the manifold healthcare needs of older adults.

A number of studies have linked negative moods to MCCs (Fortin et al., 2006). A meta-analysis demonstrates that patients with MCCs have two to three times the risk of depression compared to people without MCCs or those who have no physical chronic condition (Read, Sharpe, Modini, & Dear, 2017). People with physical chronic conditions, who also suffer from depression or other psychological conditions experience worse health outcome (Martin Fortin, Hudon, Bayliss, Soubhi, & Lapointe, 2007). Older adults with MCCs are more vulnerable to depressive mood compared to

people with a single chronic condition or without any chronic conditions (Sharpe et al., 2017).

Adapting to chronic health conditions and the associated distress is key to managing physical and psychosocial aspects of MCCs (Löffler et al., 2012). Psychological variables, such as coping strategies, have proved to be significant in adjusting to chronic conditions. The transactional theory of stress and coping suggests that coping is a process where an individual uses certain strategies to manage the internal and external demands of stressful events (Lazarus & Folkman, 1984). This theory makes a distinction between problem-focused coping and emotion-focused coping: problem-focused coping refers to the efforts of changing the stressful environments whereas emotion-focused coping refers to the management of moods resulting from the stressful events (Lazarus & Folkman, 1984). A recent review synthesizes that patients with MCCs adopt a repertoire of strategies to preserve a normal everyday life, maintain mental health and wellbeing, and engage in social situations (Cheng, Inder, & Chan, 2019).

Particular coping strategies are observed to be crucial predictors of psychological distress among chronically ill patients (Hong, Wei, & Wang, 2015; Nipp et al., 2016). Hong et al. (2015) conducted a survey in a sample of 165 cancer patients and found that psychological distress positively correlated with four coping strategies—avoidance, resignation, fantasy, and catharsis—and negatively correlated with the strategy of confrontation. Another study indicated that emotional support and acceptance were associated with better QoL and better moods, whereas denial and self-blame were associated with worse QoL and mood among patients with incurable cancer (Nipp et al., 2016). However, the relationship between coping strategies and psychological distress among older adults with MCCs is not well investigated.

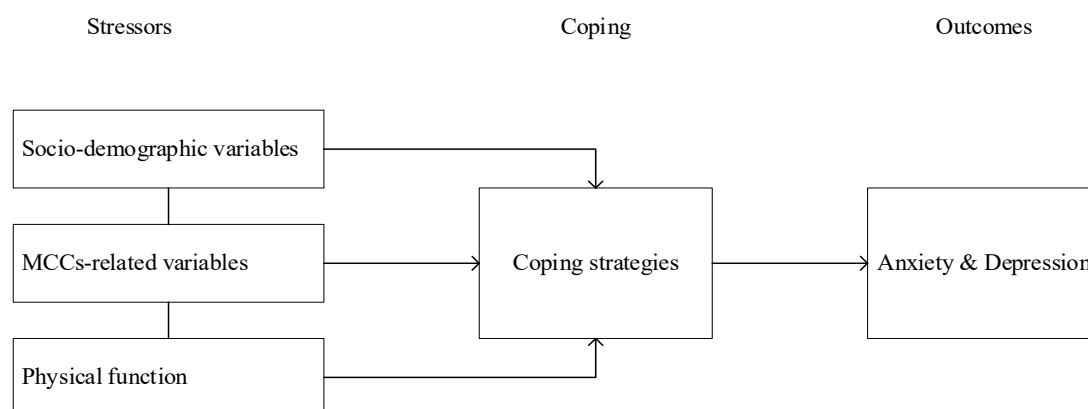
The population of older Chinese adults is expected to reach 250 million in 2020 (United Nations, 2017). It is critical that the current healthcare system can accommodate the healthcare needs of this group. Due to the role played by coping in maintaining psychological functioning and wellbeing in aging, older adults are able to facilitate their coping resources to adjust to life changes and cope with the adverse impact of a stressful environment (Nieto et al., 2019). Understanding coping strategies that account for psychological distress may serve as a foundation for designing appropriate interventions to reduce psychological distress in older adults with MCCs. Little research is available on the role of coping strategies in relation to psychological distress in the Chinese MCCs-affected older population.

The framework of this study is based on the model of the transactional theory of coping and stress (Lazarus & Folkman, 1984) (see Figure 5.2). We modified this model to illustrate how we applied stressors, coping, and outcomes to the model: the stressors include socio-demographic variables, such as gender, educational level, and marital status (Gage-Bouchard, Devine, & Heckler, 2013); MCC-related variables (Maes, Leventhal, & de Ridder, 1996); and physical health (Pearlin & Bierman, 2013). These stressors characterized the patient's coping strategies, which then affected their psychological distress in forms of levels of anxiety and depression. These variables only represent part of a complex reality. The current study aimed to investigate the association between socio-demographic variables, clinical variables, physical function, coping strategies, and levels of anxiety and depression in Chinese older adults with MCCs.

Based on the framework, this study's research questions are:

1. What is the frequency of co-occurring anxiety and depression among older Chinese adults with MCCs?

2. What coping strategies, socio-demographic variables, clinical variables, and physical functions are associated with anxiety and depression in older Chinese adults with MCCs?



*Figure 5.2 Framework of MCCs-coping and outcomes*

## METHODS

### Research design

This is a secondary analysis based on a cross-sectional study aimed at investigating coping with MCCs in mid-eastern China, which was conducted between November 2017 and May 2018. Using a convenience sampling approach, 351 adults with MCCs were recruited at a tertiary hospital in Bengbu, Anhui, China. A questionnaire booklet consisting of socio-demographic variables, MCCs-related variables, coping strategies, and health-related scales was administered. The details of the research design and the recruitment procedure have been reported elsewhere (Cheng, Yang, Inder, & Chan, 2020).

### Participants

A total of 351 Chinese adults with MCCs participated in the survey. The inclusion criteria were as follows: people who were medically diagnosed with more than one chronic condition, were cognitively capable of completing the survey,

voluntarily joined the survey and could speak Chinese. To identify the samples for the current study, the participants were aged over 60 years old were included.

## **Instruments**

### ***Predicting variables of psychological distress***

Socio-demographic variables: Age, sex, marital status, educational level, and monthly income.

Clinical variables: Number of chronic conditions and duration of MCCs.

Physical function: The 12-Item Short Form Health Survey version 2 (SF-12v2) is a measurement of general health status consisting of 12 items that generate eight domains to evaluate the physical and mental health of individuals (Ware, QualityMetric Incorporated, New England Medical Center Hospital, & Health Assessment Lab., 2005). Physical function domains include General Health (GH), Physical Functioning (PF), Role Physical (RP), and Body Pain (BP). Mental health domains include Vitality (VT), Social Functioning (SF), Role Emotional (RE), and Mental Health (MH). Scores range from 0 to 100 with higher scores indicating better outcomes. The SF-12 has been validated in the Chinese population and shows good reliability (Lam, Eileen, & Gandek, 2005). The current study conceptualized scores of GH, PF, RP, and BP as variables of the physical function. The scoring for the above variables is norm-based with  $50 \pm 10$  (Mean  $\pm$  SD) (Lam, Lam, Fong, & Huang, 2013).

Coping: The original Brief COPE is an abbreviated version of the COPE inventory consisting of 28 items that assess 14 coping strategies (Carver, 1997). Scores for each item ranged from 1, 'I have not done it at all', to 4, 'I have done it a lot', with a higher score indicating more use of this type of coping strategy. This study used a Chinese version of Brief COPE that assesses five coping strategies: positive adaptation, denial and disengagement, support-seeking, spiritual coping, and self-

blame (Cheng, Yang, Inder, & Chan, 2020). The Chinese version of Brief COPE has been validated in Chinese adults with MCCs and has sound psychometric properties.

### ***Outcome variables—anxiety and depression***

Psychological distress: The Hospital Anxiety and Depression Scale (HADS) is a measurement that is used to assess the symptoms of anxiety and depression during the previous week (Zigmond & Snaith, 1983). This scale has 14 items that generate two domains: anxiety and depression. The response to each question was scored on a four-point Likert scale (0–3). Higher scores indicate more symptoms of anxiety and depression. Scores range from 0 to 21, with 0–7 indicating normal, 8–10 indicating probable abnormal, and 11–21 indicating abnormal (Bjelland, Dahl, Haug, & Neckelmann, 2002). The HADS has sound reliability and has been validated in Chinese people with chronic conditions (Cronbach's  $\alpha$  for the subscales of anxiety and depression were 0.874 and 0.874, respectively) (Li et al., 2016).

### **Data analysis**

The IBM SPSS Statistics version 24.0 (IBM Corp 2016, Armonk, NY).was used to compute data. Descriptive analysis was performed for socio-demographic and clinical data. As the data showed normal distribution, the Spearman correlation coefficient was used to examine relationships between variables and identify the variables for the regression model. The predictors that correlated with outcome variables (HADS) with a correlation coefficient  $> .20$  were entered into the regression model (Dancey & Reidy, 2007). For every dependent variable, stepwise multiple linear regression was performed to identify the importance of socio-demographic variables, clinical variables, physical function, and coping in describing levels of anxiety and depression.

### **Ethical considerations**

The present study was conducted in compliance with the Helsinki Declaration. Participants were informed that their questionnaires were coded to ensure privacy and confidentiality. The decision to participate would not affect their current healthcare plan. Every participant was asked to sign a consent form after being informed about the study by reading a participant information statement and following the opportunity to ask questions about the research before completing the survey. The current study was approved by the Human Research Ethics Committee of the University of Newcastle (H-2017-0378) and the study venue.

## **RESULTS**

### **Socio-demographic and clinical variables**

The self-reported socio-demographic and clinical variables are presented in Table 5.8. The mean age (standard deviation) was 70.12 years (SD = 6.98). More than half were male (54.6%). The majority of participants were married (91.4%) and were unemployed (91.9%). Most participants were diagnosed with two chronic conditions (75.1%) and most had experienced MCCs for over two years (87.0%). The most common chronic conditions were cardiovascular conditions (98.9%).

Table 5.8

*Self-reported demographic and clinical variables*

Demographic characteristics		n	(%)
Age, mean (SD)	70.12 (6.98), from 60 to 95 years old		
Gender	Male	101	54.6
	Female	84	45.4
Marital status	Single	0	0.0
	Married	169	91.4
	Divorced	2	1.1
	Windowed	13	7.0
	Separated	1	0.5
Education background	Primary or below	44	23.8
	Junior high	69	37.3
	Senior high	46	24.9
	College or above	26	14.0
Employment	Employed	15	8.1
	Unemployed	48	25.9
	Retired	122	66.0
Number of chronic conditions	2	139	75.1
	3	39	21.1
	4	7	3.8
Duration of MCCs	Less than 2 years	24	13.0
	2–5 years	58	31.4
	5–10 years	52	28.0
	More than 10 years	51	27.6
Five most common conditions clusters	Cardiovascular	183	98.9
	Endocrinologic	103	55.7
	Musculoskeletal	35	18.9
	Chronic respiratory	27	14.6
	Cerebrovascular	26	14.1

**Anxiety and depression, coping strategies, and physical function**

Descriptive statistics for the revised subscales are displayed in Table 5.9. Using the cut-off scores of 0–7 indicating normal, 8–10 indicating probable abnormal, and 11–21 indicating abnormal (Bjelland et al., 2002), scores greater than 7 by 62.7% of participants showed potential anxiety, and for 54.1% of participants showed potential depression. The level of anxiety was higher than depression. Other results indicated that 29.1% of people reported the use of positive adaptation, 29.2% reported denial and disengagement, 28.1% reported seeking support, 27.6% reported using spiritual

coping, and 34.1% used self-blame. The mean scores for PF, RP, BP, and GH all demonstrated low functioning levels, with mean scores of below 40%.

Table 5.9

*Descriptive statistics for anxiety and depression, coping strategies, and physical function*

Scales	Subscales	Mean	SD	Range
HADS	Anxiety	8.44	3.67	0–21
	Depression	7.91	3.42	0–21
Brief COPE	Positive adaptation	23.72	6.23	9–36
	Denial & disengagement	7.22	2.73	4–16
	Support seeking	8.71	3.24	4–16
	Spiritual coping	5.37	2.14	3–12
	Self-blame	3.94	1.74	2–8
Physical function	Physical functioning (PF)	36.45	11.20	22.11–56.47
	Role physical (RP)	33.12	16.69	20.32–57.18
	Body pain (BP)	35.85	9.37	16.68–57.44
	General health (GH)	31.09	8.97	18.87–55.52

HADS = Hospital Anxiety and Depression Scale; SD = Standard Deviation

### **Results of correlations and regressions**

The correlations between coping strategies, clinical variables, and psychological outcomes are presented in Table 5.10. Positive adaptation, denial and disengagement, spiritual coping, and all physical function variables were significantly associated with anxiety and depression and were entered into the regression models.

Table 5.10

*Results of correlations between coping, physical function, and psychological distress*

	Positive adaptation	Denial & disengagement	Support seeking	Spiritual coping	Self- blame	Physical functioning	Role physical	Body pain	General health	Depression	Anxiety
Positive adaptation	1	.129	.462**	.169*	.286**	.100	-.027	-.062	.083	-.319**	-.217**
Denial & disengagement		1	.056	.327**	.563**	-.178*	-.203**	-.208**	-.144	.202**	.295**
Support seeking			1	.368**	.066	-.152*	-.168*	-.130	-.042	-.046	.084
Spiritual coping				1	.250**	-.164*	-.282**	-.262**	-.100	.216**	.344**
Self-blame					1	.003	-.044	-.080	-.108	.064	.102
Physical functioning						1	.572**	.625**	.516**	-.432**	—
Role physical							1	.544**	.386**	-.298**	—
Body pain								1	.518**	-.369**	—
General health									1	-.278**	—
Depression										1	.688**
Anxiety											1

\*\* . Correlation is significant at the 0.01 level (2-tailed).

\* . Correlation is significant at the 0.05 level (2-tailed).

Table 5.11 shows the two regression models with predictor variables of anxiety and depression. Regression analysis for anxiety showed six predictors: Gender ( $p = .023$ ), BP ( $p = .000$ ), PF ( $p = .034$ ), positive adaptations ( $p = .000$ ), denial and disengagement ( $p = .027$ ) and spiritual coping ( $p = .001$ ). They accounted for 46.5% of the total variance. Male participants, participants who had more body pains, and participants with functional loss reported more symptoms of anxiety. Use of denial and disengagement and spiritual coping were positively related to symptoms of anxiety while the use of positive adaptation correlated with fewer symptoms of anxiety.

Regression analysis for depression showed four predictors: gender ( $p = .025$ ), PF ( $p = .006$ ), positive adaptation ( $p = .000$ ), and spiritual coping ( $p = .006$ ), accounting for 34.1% of the total variance (see Table 5.11). Male participants and participants with more functional loss reported more symptoms of depression. Use of spiritual coping was positively related to depressive symptoms while the use of positive adaptation correlated with less depressive symptoms.

Table 5.11

*Results of Stepwise multiple regression-predictor variables of anxiety and depression*

Variables	Anxiety				Depression			
	Beta	p	R <sup>2</sup>	F	Beta	p	R <sup>2</sup>	F
Gender (1 = male)	-.126	.023	46.5	12.434	-.138	.025	34.1	8.334
Body pain	-.307	< .001			/	/		
Physical functioning	-.171	.034			-.248	.006		
Positive adaptation	-.231	< .001			-.291	< .001		
Denial & disengagement	.133	.027			/	/		
Spiritual coping	.219	.001			.185	.006		



## DISCUSSION

More than half of the participants reported probable symptoms of anxiety and depression, indicating that older adults with MCCs were vulnerable to psychological distress in the form of anxiety and depression. The figures reported here are much higher than those reported in a previous study based in the US (Pruchno, Wilson-Genderson, & Heid, 2016). The variation might be due to the different MCCs clusters. Most of the participants of the current cohort suffered from cardiovascular chronic conditions. People with cardiovascular chronic conditions suffer more depression compared with the general population, and having depression is a risk factor for cardiovascular chronic conditions (Hare, Toukhsati, Johansson, & Jaarsma, 2013). Research illustrated that psychological stress, such as depression, can cause deregulation in the sympathetic nervous system, which in turn results in the development of hypertension (Veith et al., 1994). However, variation in the instruments used to measure psychological distress may lead to different results, making it hard to compare the results of different studies. Such finding triggers concerns that the issues of psychological distress among older people with MCCs, especially for those with cardiovascular disease, warrants greater focus. Also, further studies that include more divergent clusters of MCCs and multiple tools of assessing moods are required to verify this finding.

Inconsistent with previous evidence regarding gender disparity in moods (Nolen-Hoeksema, 2001), this study observed that male participants reported more symptoms of anxiety and depression. This finding might reflect several factors. First, in the coping context, women are more flexible than men in response to stressful events such as MCCs and the related hardships and men could be more vulnerable to psychological distress. A national study based in the US indicated that males might

hide their depression due to ideals of masculinity and that traditional inventories might not be capable of identifying male-type depressive symptoms; their results showed that no gender differences were found when alternative and traditional symptoms concerning depression were combined (Martin, Neighbors, & Griffith, 2013). What is more, the older population might encounter other stresses associated with the history of mental disorders, social isolation, financial restrictions, and adverse life events (Lim et al., 2011). This is a noteworthy finding for further prevention programs as older men in China are exposed to more health risks, such as tobacco use and heavy alcohol taking (Wang et al., 2017), which may contribute to morbidity and mortality of MCCs.

Previous research has indicated the older persons who perceived their health as poor were more likely to suffer from depressive symptoms (He, Liu, Liu, Lu, & Yin, 2017). This was reinforced by our findings that poorly perceived physical issues are significant predictors of anxiety and depression. Physical symptoms and depression are interrelated (Sheng, Liu, Wang, Cui, & Zhang, 2017). For example, people presenting with painful physical symptoms such as joint pains, back pains, and headaches may be more likely to report a mood disorder than patients with few physical symptoms, and physical pains also trigger depressive symptoms (Holmes, Christelis, & Arnold, 2013). This finding suggested that the management of MCCs focusing on physical symptoms should involve identifying potential psychological distress, establishing collaborative healthcare, and increasing understanding of combined effects between physical symptoms and moods. Also, this finding implied that improving an individual's ability to relieve depression may be associated with the improvement of perceived physical symptoms.

Using the Brief COPE, this study found that specific coping strategies were related to anxiety and depressive symptoms. It seems that older adults with MCCs

were inclined to use self-blame and denial and disengagement as their coping strategies. Those could be categorized as ineffective emotion-focused coping, which is related to maladaptive thoughts and activities (Knight & Sayegh, 2010). This finding might explain the high prevalence of psychological distress among our cohort. Using more positive adaptation was associated with fewer distress symptoms, including anxiety and depression. In this study, positive adaptation represents an individual who is willing to maintain positive moods and thoughts. Consistent with our findings, in studies with people with diabetes, positive reframing was negatively associated with anxiety (Tuncay, Musabak, Gok, & Kutlu, 2008).

Spiritual coping was found to be negatively associated with more psychological distress. This finding challenged the previous findings that greater religious coping could be beneficial for people's health (Lazarus & Folkman, 1984). A plausible explanation was that the people with MCCs might experience religious struggles, known as a combination of tension, conflict, and struggle (Pargament, Feuille, & Burdzy, 2011), as religious coping was not identified as positive or negative in this study.

Denial and disengagement are suggested as ineffective coping strategies, which means people try to reject the reality of the stressor (Burker, Evon, Marroquin Loiselle, Finkel, & Mill, 2005). In line with the prior studies (Oei, Strod, Pang, & Cui, 2013), which showed that people who have potential emotional issues are less likely to be less socially engaged, such as being less engaged in the process of treatment. Although this study indicated that promoting certain coping strategies may help to mitigate psychological symptoms in people with MCCs, such findings should be verified in the further research to obtain a more reliable inference, which can support the positive role of coping.

This was the first study to examine the relationship between coping and psychological distress among older adults with MCCs in China. People with MCCs may be in complex situations and have divergent health outcomes because of the varieties in trajectory and conditions; thus, it is difficult to set up a standard to determine the exact situation of a person with MCCs. Currently, there is no well-recognized scale available for evaluating the physical health status of the population with MCCs. This study used four indicators of SF-12 as four indicators of the physical function of people with MCCs. The candidate suggests that this solution is a convenient and efficient way to obtain an integrative understanding of the health of a patient with MCCs. It may contribute to further research on this topic, especially for a large questionnaire-based survey.

Routinely detecting negative moods among the older MCCs population is important. However, identifying negative moods in older adults is more difficult than identifying them in younger people due to MCCs and cognitive dysfunction because the symptoms of psychological distress sometimes accompany the symptoms of aging. Carrying out regular assessments is useful but insufficient. Consequently, in order to provide more targeted supportive service, multidisciplinary and cooperative healthcare regarding both psychology and gerontology should be recommended, especially on screening negative moods at the start.

A review demonstrated that psychological treatments and physical exercise could relieve mild–moderate depression in the older population, while antidepressants and electroconvulsive therapy can effectively control major depression (Kok & Reynolds, 2017). Therefore, individual preferences should be taken into account as a priority when providing healthcare treatments, especially for older adults. For example, a person with MCCs may prefer psychological therapy, such as cognitive

behaviour therapy, or a person may experience risks of polypharmacy due to frailty. Since this study has confirmed the significant role of coping in interpreting psychological distress, the findings may serve as a foundation for other researchers who are considering incorporating coping-enhancing components, such as self-management, into behaviour-change programs in MCCs research areas. The findings may also inform the development of similar intervention tailored specifically for people with other chronic conditions.

The current study has limitations. Data from a cross-sectional study is not capable of determining causality. Participants were recruited from a single hospital and the most common conditions were cardiovascular conditions. Thus, the generalizability of the findings is limited. Most of the participants had cardiovascular conditions and this may affect the heterogeneity of the data. Some potentially relevant factors were not collected in this study, such as the stage of each chronic condition, current treatment, and family background. These factors are suggested to be essential in determining the ability to cope and influencing access to coping resources. This study used a self-reported scale to measure anxiety and depression, in which bias may occur.

In conclusion, this study identified an integral relationship between socio-demographic variables, physical function, coping, and psychologic distress. Given the significant role of coping based on these findings, further interventions targeting coping-improving components may help to sustain psychological wellbeing in the context of stress such as MCCs among older Chinese people.

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# Chapter 6: The qualitative study

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## 5.4 INTRODUCTION

Chapter 6 presents the results from the qualitative phase of this research. The prevalence of MCCs is growing, creating a series of challenges for patients, families and healthcare professionals. However, recognition of the significance of psychosocial dimensions such as coping has received little attention in the literature, especially in the Asian context. More insights into patients' experiences may help to understand how they perceive and act in daily life as well as contribute to further coping-oriented interventions that address their actual needs. Thus, this chapter investigates the experiences of coping in a sample of Chinese people with MCCs.

## 5.5 OUTPUT OF THIS CHAPTER

This chapter was disseminated in a paper as:

Cheng, C., Bai, J., Yang, C. Y., Li, M., Inder, K., & Chan, S. W. (2019). Patients' experiences of coping with multiple chronic conditions: A qualitative descriptive study. *Journal of Clinical Nursing*, 28(23/24), 4400–4411.  
doi:10.1111/jocn.15022

## 5.6 SIGNIFICANCE AND CONTRIBUTION TO THE RESEARCH

This chapter has provided qualitative research containing important, culturally grounded information on a range of coping strategies used by Chinese people with MCCs. This chapter has addressed research aims 3 and 4.

# Patients' experiences of coping with multiple chronic conditions: A qualitative descriptive study

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Citation:

Cheng, C., Bai, J., Yang, C. Y., Li, M., Inder, K., & Chan, S. W. (2019). Patients' experiences of coping with multiple chronic conditions: A qualitative descriptive study. *Journal of Clinical Nursing*, 28(23/24), 4400–4411.  
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## **ABSTRACT**

**Objective:** To explore the experiences of how Chinese adults cope with multiple chronic conditions in everyday life.

**Background:** Having multiple chronic conditions is stressful, requiring people to make physical and mental adaptations. There is little evidence exploring how people cope with multiple chronic conditions, especially in an Asian context.

**Design:** A qualitative descriptive design was employed. The Consolidated criteria for reporting qualitative research (COREQ) was used to report this study.

**Methods:** This study was conducted in a tertiary referral and teaching hospital in Bengbu, Anhui, China, between August and October 2018. A purposive sample of 14 people with multiple chronic conditions, aged between 32 and 75 years, completed a demographic questionnaire and semi-structured face-to-face interviews. The interviews were digitally recorded and transcribed verbatim. Qualitative content analysis guided data analysis.

**Results:** Four distinctive themes comprising of subthemes were developed from participants' narratives pertaining to coping with multiple chronic conditions: (1) appraising multiple chronic conditions, (2) addressing multiple chronic conditions management, (3) maintaining psychological well-being, and (4) fulfilling a social role. Illustrative quotations were cited to support each theme.

**Conclusions:** This study underscores that people cope with multiple chronic conditions in everyday life by using a compendium of coping strategies. As one of the influencing factors, culture dominates the ways of coping at different levels among people with multiple chronic conditions. These findings expand the current literature on coping based on an Asian perspective and inform further cross-culture research on this topic.

Relevance to clinical practice: Healthcare professionals should understand peoples' experiences of coping with multiple chronic conditions to provide more holistic and dynamic healthcare to address their actual needs. Healthcare professionals should be acquainted with how culture impacts individuals' coping and develop culture-tailored supportive programs such as family-based interventions, to promote the health of people with multiple chronic conditions.

Keywords: Coping, multiple chronic conditions, qualitative research

What does this paper contribute to the wider global clinical community?

Further attention should be given to individuals' adaptation to multiple chronic conditions due to the increasing prevalence of multiple chronic conditions and the manifold impacts of multiple chronic conditions on peoples' lives.

Healthcare professionals should learn from peoples' experiences of coping with multiple chronic conditions that may vary across countries. Evidence-based knowledge can serve as a foundation for healthcare and guide the formation of a clinical environment within different cultural contexts.

Healthcare professionals need to move forward in building appropriate coping-based interventions that reduce barriers to day-to-day life and maximize the benefits of the healthcare plan among people with multiple chronic conditions.

## INTRODUCTION

Multiple chronic conditions (MCCs), also known as multimorbidity, refer to the co-existence of two or more long-term health conditions, which include physical and psychological health conditions (e.g. diabetes), ongoing symptoms (e.g. chronic back pain), sensory loss (e.g. vision loss), and alcohol and substance abuse (National Institute for Health and Care Excellence, 2016). MCCs affect all age groups but tend to increase with age. A past review indicated that the prevalence of MCCs ranged from 20%-30% in the whole population to 55%-98% in the older adults population globally (Marengoni et al., 2011). With improved healthcare and better living conditions, it can be expected that people are generally living longer with MCCs and may spend more time in poor health. MCCs are linked with more healthcare utilization and costs (Wang, Si, Cocker, Palmer, & Sanderson, 2018), resulting in a considerable economic burden for the healthcare system. A systematic review found that the annual out-of-pocket expenditure (OOPE) on medications associated with 0 to 1, 2, and more than 3 chronic conditions increased by 2.7 times, 5.2 times, and 10.1 times, respectively (Sum et al., 2018). Thus, MCCs represent a significant challenge for present and further healthcare services.

MCCs have a significant impact on people's lives. MCCs are highly associated with physical limitations (Calderon-Larranaga et al., 2018), negative moods (Read, Sharpe, Modini, & Dear, 2017), and poor quality of life (QoL) (Shad et al., 2017). MCCs also pose massive burdens to people's families. Qualitative research depicted that people with MCCs often perceived being 'falling apart' due to the burden of MCCs (Mason et al., 2016).

Caring for people with MCCs is challenging. A common issue for healthcare is that pharmacological and non-pharmacological treatments might be burdensome for

people with MCCs. People with MCCs are at risk of polypharmacy, inconsistent health suggestions, and adverse drug events (Boyd & Fortin, 2010; Calderón-Larrañaga et al., 2012). Healthcare for MCCs can become uncoordinated and fragmented. This is related to the lack of integration among specialist health services of different health conditions, healthcare delivery at different levels, and by different healthcare professionals (Døssing & Burau, 2015).

Some healthcare models are developed to support people with MCCs. For example, Australia developed a framework for managing MCCs through a patient-centered approach. The framework highlighted the importance of effective communication and coordination in healthcare provision. People with MCCs and healthcare professionals need to work together to negotiate priorities and evaluate the outcomes of healthcare (Harris, Dennis, & Pillay, 2013). In Europe, the multimorbidity care model was designed and developed by a collaborative research project (Joint Action on Chronic Diseases and Promoting Healthy Ageing across the Life Cycle, JA-CHRODIS). This integrative model focuses on five healthcare domains: healthcare delivery, decision-making and self-management, technology application, and social resources (Palmer et al., 2018).

## **BACKGROUND**

Management of MCCs requires people to adapt physically and mentally (Wister et al., 2016). Coping, as one of the psychological variables that explain adaptations to disease, is suggested to be a significant tool to look after psychological health (Cox et al., 2017) and physical health (Ito & Matsushima, 2017). Many studies have demonstrated the significant role of coping in buffering the outcomes of stressful scenarios such as living with chronic conditions (Aldwin & Park, 2004; Carlson, 2016; Traa, De Vries, Bodenmann, & Den Oudsten, 2015). According to the transactional

model of stress and coping (Lazarus & Folkman, 1984), coping refers to a process where people make conscious and/or unconscious efforts to respond to stressful situations, which exceed their available resources and jeopardize their well-being. The stress and coping theory describes how people evaluate and cope with stressful situations. First people assess the stressor they face. This process is known as ‘primary appraisal’, which helps people to know the importance of the stressor. Then people perform ‘secondary appraisal’ to see if they have enough resources to manage the stressor. Both of these appraisals affect their ‘coping efforts’, which determine people’s physical and mental health outcomes. The coping process includes either problem-based or emotion-based coping. Problem-based coping refers to ways of dealing with stressful events while emotion-based coping refers to ways of managing negative emotional responses. Meaning-focused coping was added in Folkman’s later work (Folkman, 2008). This process of coping refers to an individual person’s personal beliefs, values, and existential goals to focus on the positive aspects in order to sustain his or her coping process. There are no ‘good’ or ‘bad’ coping strategies. However, some may be more effective than others for different people. Adopting appropriate and effective coping strategies is significant for people with MCCs to maintain good QoL (Livneh, 2016). Many factors such as demographic characteristics, the trajectory of diseases, health care, and culture may influence the adoption of different coping strategies (Folkman & Nathan, 2011).

There has been an increasing number of studies investigating coping in the context of MCCs. Coventry, Small, Panagioti, Adeyemi, and Bee (2015) systematically reviewed and synthesized qualitative findings regarding the experience of MCCs, and offered three elements for facilitating effective self-management for those suffering from MCCs, management of medicines and moods, and available

resources, and self-preservation. Rosbach and Andersen (2017) synthesized qualitative literature on the burden of treatment in people with MCCs. Their findings identified the different components in the burden of treatment and indicated the burden was related to the workload of demands, the capacity, and the context. People with MCCs used strategies such as prioritizing different treatments to routinize their everyday lives. However, there is a paucity of primary studies regarding how Asian people cope with MCCs or that have considered the experience of coping with MCCs cross-culturally (Cheng, Inder, & Chan, 2019). Lazarus and Folkman (1984) considered that coping is a dynamic process impacted by various factors such as culture, external support, and life experiences. Knowledge regarding coping with MCCs can help to understand the ways that people deal with complex stressors resulting from MCCs, and may assist in developing appropriate interventions with adjustments to meet psychological needs and achieve effective self-management. Through a qualitative inquiry, researchers are able to obtain deep insights into people's perceptions of their MCCs to explore the experience of living with MCCs (Creswell, Hanson, Clark Plano, & Morales, 2007).

China has undergone a health shift from communicable to non-communicable diseases in recent decades. It is expected that the prevalence of chronic diseases is projected to increase by 40% by 2030 in China (World Health Organization, 2015). Meanwhile, China is facing an aging crisis with projection that older adults (over 60 years old) will increase from 12% in 2010 to 28% in 2040 (World Health Organization, 2015). Increasing aging populations and the increase in chronic conditions predict a rise in the number of people with MCCs.

The prevalence of MCCs has been investigated by several population-based studies in China. A cross-sectional study based in northeastern China showed that

almost a quarter of adults had MCCs (Wang et al., 2015). Evidence from the China Health and Retirement Longitudinal Study (CHARLS) indicated that nearly half of middle-aged and older participants in the urban area reported having MCCs (Chen, Cheng, Zhuang, & Broad, 2018). Recent research has shown a high prevalence of MCCs in China, indicating that there is a potential increase in problems concerning MCCs, which may impact on people's health (Wang et al., 2014).

Despite the growing number of people suffering from MCCs in China, people with MCCs receive little attention in the current healthcare service provision (Chen et al., 2018). Few studies have assessed the ways in which people describe and perceive everyday experiences of coping with MCCs. There is a paucity of research that has investigated the experiences of people with MCCs in China. This study aimed to explore the experiences of coping with MCCs in China. By utilizing a qualitative approach, the findings of this study will contribute to understanding and theorizing coping of MCCs in Asian contexts and will expand the current knowledge about cultural consequences on coping.

## **METHODS**

### **Design**

The current study employed a qualitative descriptive design, which is suggested as an appropriate method of choice to obtain '*straight descriptions of phenomena*' and provide '*comprehensive summary of an event in the everyday terms of those events*' (Sandelowski, 2000). This design is appropriate to facilitate an exploration of people's experiences of coping with MCCs from their own stories. The Consolidated criteria for reporting qualitative research (COREQ) (Tong, Sainsbury, & Craig, 2007) was followed throughout the research process to maximize the rigor of the analyzing

process and the trustworthiness of the findings (See Supplementary File\_ COREQ 32-item checklist).

### **Sample and setting**

This study took place from August to October 2018, in a tertiary referral and teaching hospital in Bengbu, Anhui, China. Recruitment flyers were posted and distributed by clinical nurses at the study venue. Individuals interested in participating in the research approached the candidate by phone, mail or in person.

A purposive sampling approach was used to recruit participants who had completed the cross-sectional survey (Cheng, Yang, Inder, and Chan, 2020). Purposive sampling aims to find participants from all available aspects to obtain a greater understanding regarding coping with MCCs (Palinkas et al., 2015). The candidate selected potential participants across a broad spectrum relating to the topic of study. The participants consisted of patients from different age groups, gender, jobs, illness trajectories, and MCCs in order to gain a comprehensive understanding of the strategies that they used to cope with their chronic health conditions.

A general practitioner at the study venue helped to confirm the eligibility of people with MCCs. The inclusion criteria were (1) Chinese adults ( $\geq 18$  years old) who had more than one chronic condition, and (2) can communicate in the language of Mandarin. People who were not able to understand the informed consent or had difficulties complying with the research procedures were excluded. In qualitative research, data saturation is often used as a sampling principle (Morse, 2015). Data saturation means that recruitment would be stopped when no new information was found. In this study, data saturation was reached at the 14th interview. The candidate found that the participants reported similar experiences regarding coping with MCCs (e.g. strategies of managing daily life) and no new results were identified to confirm

emerging themes. The last two interviews were coded to confirm this. Moreover, a saturation grid that included major topics and interviews was developed. The candidate and the supervisors met regularly to discuss the content of the grid and this process was documented as evidence (Saunders et al., 2018).

### **Data collection**

An interview booklet including a demographic data sheet and a clinical data sheet were developed. The demographic sheet collected information on age, gender, marital status, employment, and educational background. The clinical sheet obtained information regarding MCCs such as type and duration. Semi-structured questions were developed by the candidate based on findings from a past review (Cheng et al., 2019). An expert panel including two academic scholars and two clinical nurses helped to refine the interview questions by close reading (Castillo-Montoya, 2016). Through the reading, the candidate asked the panel members putting themselves in the place of the potential interviewees. This work helped to identify how interviewees might understand the interview questions. Pilot interviews ( $n = 2$ ) were conducted to test the essentials of the interviews such as procedure, consent, data recording, venue, and timing. In this study, coping was defined as the strategies that Chinese adults used to manage their chronic conditions and the associated impacts.

Before the interviews, potential participants were informed of the study objectives. Written informed consent was obtained. All interviews were conducted in a quiet and comfortable meeting room at the study venue so that the interviewees could share their stories without disruption. The interview schedule was arranged according to the participants' preferences. The participants' demographic and clinical data were obtained before the interview. Each participant spent approximately 5 minutes completing the demographic and clinical sheets.

Participants were asked to answer questions such as, ‘Please describe the chronic conditions you are experiencing?’ and ‘How did you cope with these conditions or cope with the impact these conditions have on your life?’ If the interviewees had difficulty in understanding the interview questions, several approaches were used to improve understanding and prompt a response: (1) using probing questions. Examples of probing questions were, ‘How do the chronic conditions impact your life...?’, ‘How do you manage your chronic conditions?’, ‘What is the biggest problem you have encountered in trying to cope with your chronic conditions?’, and ‘What types of information or skills do you think would be most beneficial for you?’, (2) allowing for more time for reflection, and (3) rephrasing questions by using simple words. The duration of the interviews ranged from 30 to 55 minutes. All interviews were digitally recorded. Field notes were taken during the interview.

### **Data analysis**

Demographic and clinical data were summarized by descriptive statistics. Recordings were transcribed verbatim by the candidate. Qualitative content analysis with hand coding was used to analyse the data. Qualitative content analysis is a systematic way to describe the phenomenon and could be applied using an inductive or deductive method (Hsieh & Shannon, 2005). Inductive content analysis is used when there is little knowledge available for the current research questions while deductive content analysis is used to examine a past theory or model (Elo & Kyngäs, 2008). As this was the first study exploring the experiences of Chinese people with MCCs, an inductive approach with three analytical phases: preparation, organizing, and reporting was undertaken (Elo & Kyngäs, 2008). The first phase ‘preparation’ began with selecting the unit of analysis which refers to various objects of the specific research (e.g. a group of individuals) or a research theme. In this study, the unit of

analysis was the transcribed interviews of Chinese adults with MCCs. The next step in the preparation phase is to make sense of the obtained data by reading through the data several times to improve understanding and familiarity with the content. The second phase is ‘organization’ where the candidate conducted initial open coding, developed themes, and abstract descriptions. Open coding involved making notes and headings to describe the data when reading through it. After the open coding, the candidate started to reduce the lists of categories by grouping those similar and dissimilar categories into higher-order categories. The last phase ‘abstraction’ refers to the development of an overall description of the research questions by collapsing the categories. The conflicts in grouping and generating categories were discussed by the candidate and the supervisors until consensus reached. Finally, the research group examined and reported the findings.

Participants were approached by telephone to clarify unclear statements if necessary. The candidate translated themes, subthemes, and quotations from Chinese to English. A bilingual (Chinese/English) supervisor with expertise supervised the whole procedure to assure the validity of the content.

### **Rigor**

To improve trustworthiness, the candidate enhanced credibility by adopting purposive sampling to represent a range of experiences regarding coping with MCCs. A reflective diary was kept throughout the interview process, and memos of preliminary analyses were taken. The interview questions were designed by an international team including experienced qualitative researchers, and the interview questions were refined by consulting a panel of academic and clinical experts. The findings were discussed and reviewed by the candidate and the supervisors (two bilingual speakers) to reach an agreement. Illustrative quotes from the transcripts were

used to support the findings. Transferability was improved by providing a thick description of the phenomenon such as research setting, participants' background, and verbatim statements.

### **Ethics considerations**

This study was approved for implementation by the human research ethics committee of the University (H-2017-0378) and the study venue. Participants were informed that all data would be anonymous and that their names would not be associated with any data reporting or publication. They were informed that the health services where they currently received care would not be influenced by whether they take part in the interview. They could stop the interview or withdraw from the study at any time without reason.

## **RESULTS**

### **Sample characteristics**

All 14 participants (57% Female,  $n = 8$ ) were married. More than half had three chronic conditions ( $n = 8$ , 57%). The most common conditions were hypertension (systolic blood pressure  $\geq 140$  mm Hg and/or diastolic blood pressure  $\geq 90$  mm Hg), type 2 diabetes (fasting plasma glucose  $\geq 7.0$  mmol/), and nonalcoholic fatty liver disease. Sample characteristics are presented in Table 6.1.

Table 6.1

*Sample characteristics (n = 14)*

Sample characteristics	Frequency (%)
Age (years)	
30~39	3 (21.4)
40~49	3 (21.4)
50~59	3 (21.4)
60~69	3 (21.4)
More than 70	2 (14.4)
Gender	
Male	8 (57.1)
Female	6 (42.9)
Employment	
Full-time	5 (35.7)
Self-employed	4 (28.6)
Retired	5 (35.7)
Educational level	
Primary	3 (21.4)
Secondary	8 (57.2)
Tertiary	3 (21.4)
Number of chronic conditions	
2	5 (35.8)
3	7 (50.0)
4	1 (7.1)
5	1 (7.1)
Duration of MCCs (Years)	
1~4	4 (28.6)
5~9	5 (35.7)
More than 10	5 (35.7)
Chronic conditions clusters	
Cardiovascular	12 (85.7)
Endocrine	5 (35.7)
Musculoskeletal	4 (28.6)
Gastrointestinal	5 (35.7)
Cerebrovascular	6 (42.9)
Chronic respiratory diseases	2 (14.3)
Cancer	1 (7.1)
Visual impairment	1 (7.1)

### **An overview of major themes**

Four major themes consisting of subthemes emerged from the participants' statements of coping with MCCs. The participants reported that their experiences of suffering from the consequences of MCCs for day-to-day life were complex as the multifarious nature of MCCs. Those consequences resulted in a series of challenges

that influenced many spheres of daily life. To deal with MCCs, the participants developed a range of coping strategies. Quotations from the transcripts were used to illustrate the theme and the gender, age, and MCCs of each participant were identified.

### **Appraising MCCs**

The first theme is ‘Appraising MCCs’, which refers to how people made appraisals based on the perceived impacts of MCCs and the associated challenges. This theme covers three subthemes.

#### ***Prioritize conditions***

People with MCCs usually evaluated their co-existing chronic conditions and repeatedly expressed concerns about the conditions with the greatest physical impacts. No patient considered two or more conditions as equals. Almost all people were able to elaborate on their experiences concerning a single condition rather than ‘the whole situation I have’. A patient reported his prioritization of treating three chronic conditions.

‘I do not care about it (hyperlipidemia) because I cannot feel it. I think we should treat my hypertension and diabetes first...’ (Male, 60s, hypertension, diabetes, hyperlipidemia, fatty liver diseases)

#### ***Consequences of MCCs***

As identified by most participants, the most common and serious issues were physical limitations associated with their MCCs. The typical descriptions were provided by participants with limited mobility and painful disorders. For example, a patient emphasized ‘terrible’ experiences of Ménière's disease:

*‘Having MCCs is physically uncomfortable for me. Lots of symptoms: tiredness, dizziness, out of sorts, drenched in sweat. Drugs can't control them.’* (Female, 70s, Ménière's disease, diabetes, vision impairment, and hypertension)

Another participant remembered the pains when gout came on suddenly.

*‘(Gout) hurts, really hurts, it hurts too much to get out of bed...’* (Male, 40s, gout, hyperlipidemia, and fatty liver disease)

### ***Challenges associated with MCCs***

Challenges happen at any phase of coping with MCCs. From the view of participants, a challenge could mean a hardship, a difficulty, and a dilemma. Participants viewed healthcare as fragmented. Some expressed a need for better communication between health professionals and themselves. A typical example was that a patient expressed some worries about long-term care after discharge.

*‘We did not receive any further support or service. We had to rely upon ourselves. People (patients and their caregivers) do not have any knowledge about care for MCCs. It will be helpful if nurses could provide some self-care training.’*  
(Female, 60s, stroke and hypertension)

Optimal health outcomes in MCCs hinge on good self-management. Adherence to medications and lifestyle modification might be the greatest challenge in a patient’s daily life. For example, a patient described struggles with following a prescription.

*‘If I could adhere to regular medical check-ups, probably I do not get sick. When I took medications as prescribed, I felt okay, everything was fine, and then I stopped the pills... I took them again when I felt uncomfortable. Sometimes I was too busy to take the medicine. Sometimes, I just forgot to do it. I thought that it was okay as my body could endure it (hypertension)...soon I got used to it (non-adherence)... I have tried three times to quit smoking. I can do nothing about it. I am a taxi driver, sometimes I am tired, and (smoking) is a way to relax for me...’* (Male, 50s, hypertension, heart disease, and stroke)

Some people talked about the difficulties of maintaining a healthy lifestyle.

*'Sometimes I did exercise, but rarely. For example, sometimes I did press-ups at home. On a whim, I tried to control my diet...two days or three days? (Because) I do not have much time to do it.'* (Male, 30s, hypertension and fatty liver disease)

### **Addressing MCCs management**

'Addressing MCCs management' stands for people's efforts to manage a source of stressful events. The participants presented a strong desire to keep MCCs under control by employing various strategies to treat their chronic conditions. Those strategies include taking medications, choosing alternative therapies, changing lifestyles, and seeking informational support.

*Taking medications* prescribed by doctors was the most common way of managing chronic conditions. All participants detailed their prescriptions.

*'To treat hypertension, currently, I take Diovan (medicine name) and Shihuida (medicine name), one pill every morning. That is, one Diovan, and one Shihuida. I take the medication like this every day...'* (Male, 60s, diabetes, hypertension, and fatty liver disease)

Apart from the medications prescribed by doctors, people reported seeking additional treatments. Traditional Chinese Medicine (TCM) was suggested by TCM physicians as a component of treating MCCs. Some participants reported replacing prescription drugs with TCM or using TCM as a supplement.

*'He (Doctor of TCM) told me that I had a lot of 'dampness' (refers to the water retained in the body) inside my body. My body was not able to remove these fluids so they were gathering together increasingly. I had to vomit all the fluids. He prescribed some Chinese herbal medicine for me. After several times of taking herbs, probably*

*after more than half a year, I felt better, I stop to vomit. I think it works.*’ (Female, 70s, Ménière's disease, diabetes, vision impairment, and hypertension)

Opinions differed about whether to choose TCM as a therapy with some participants questioning the effect of TCM.

*I met two patients, one of them said that taking TCM medications have cured his diabetes..., I do not believe it. I said the diabetes is a worldwide health problem. Can it be cured by taking some TCM drugs?’* (Male, 60s, diabetes, hypertension, and fatty liver disease)

Health products as a supplementary treatment were reported by some participants.

*‘Health is important. You cannot take care of your body until it becomes weak. You should do something when you know the risks. As I have told you before, we should spend the money on prevention instead of treatment. For example, do fitness and take vitamin supplements. The efforts that we spend on prevention (fitness and vitamin supplements) far outweigh what we spend on treating the diseases. This is a view of what I always say: health supplements are very important. Frankly speaking, it is too late when you spend money on medications and visiting a doctor.’* (Male, 40s, gout, hyperlipidemia, and fatty liver disease)

Participants described trying to exercise and change dietary habits to build a healthy lifestyle. The exercise format included attending an exercise training class, jogging, visiting a local fitness gym.

*‘I’ve kept exercising for a long time. I like brisk walking. I usually walk after dinner every day, about 40 minutes, sometimes one hour.’* (Female, 40s, hypertension and diabetes)

Some participants had positive perspectives on lifestyle changes.

*'The most important thing is keeping your health. Doing exercise is a way to keep healthy. Life is meaningless if you lose health.'* (Male, 40s, gout, hyperlipidemia, and fatty liver disease)

Information seeking is a way to know illness better. A distinctive example is that a participant reported seeking information about caring MCCs by using the internet.

*'After the diagnosis of MCCs, in order to relieve my pain (gout) and treat it well, I tried to get more information on the internet, for example, Baidu (a Chinese searching engine)...'* (Male, 40s, gout, hyperlipidemia, and fatty liver disease)

More than half of the participants described 'a story of friends' or 'someone I knew before'. They described what they can learn from the 'stories' and how they perceived the 'stories'.

*'For example, one of my friends, he managed his diabetes very well in the beginning. After one or two years, he thought it (diabetes) was unimportant...he didn't take it seriously. After some time, his blood sugar went up again and he felt uncomfortable with his heart, something wrong with his heart. Then he took an examination. Last time I saw him, he said he was rushed to a tertiary hospital for quadruple-bypass surgery due to diabetic complications. From his story, I think most patients will manage diabetes well at the very beginning because they feel fear. After some time, some of them may think they could control it so they let down their guard... Any patient cannot let down the guard.'* (Male, 60s, diabetes, hypertension, and fatty liver disease)

### **Maintaining psychological well-being**

‘Maintaining psychological well-being’ involves efforts that reduce negative emotional moods regarding stress such as fear, anxiety, depression, and frustration. Most participants reported experiencing negative moods when diagnosed with chronic conditions and encountered some functional loss, but they tried to maintain their moods by reappraising the stressor in a positive light and comparing with others. This theme includes two subthemes.

*Accepting the reality* means that people adapt themselves to the current situations and the uncontrollable changes. Most participants reported being capable of multiple, simultaneous life changes, resulting in positive representations of health. For example, a patient stated the experiences of enduring what happened.

*‘I am mentally very strong. (The reason for having MCCs is that you have done something wrong), you have to admit your faults and have to be realistic. You have to endure what you could. The key point is that you have to manage yourself when you are sick.’* (Male, 50s, hypertension, heart disease, and stroke)

*Positive reframing* represents that people view life changes regarding MCCs more positively. For example, a patient stated the ways of transforming think. She thought that her body was a good shape because she still kept mobility.

*‘There were some stressful feelings, but I am optimistic. (Because)I do not have any physical restrictions. I sleep well and eat well. It is a chronic condition rather than an injury causing physical limitations. If one day I suffer from stroke and I cannot move, that will be a big problem...Now I think I am still young...’* (Female, 30s, cancer and fatty liver disease)

### **Fulfilling a social role**

The theme of ‘fulfilling a social role’ refers to people’s efforts in building responsibility towards others and keeping their autonomy. People expressed their willingness to have a routine life to the most possible extent. Two subthemes were identified.

#### ***Being a family member***

Most reported managing MCCs meant a lot to their family. Some participants stressed that they had to manage their conditions well as they were responsible for maintaining their family.

*‘I am 50 years old, I am the ‘the cornerstone’ of his family, I have to take care of my parents and my children. I will do it (manage MCCs) for my family rather than for myself.’* (Male, 50s, hypertension, heart disease, and stroke)

#### ***Being a friend***

Most participants described interactions with their friends and emphasized what they obtained from those interactions. For example, a patient who was active in some informal groups (e.g. Online diabetes forum), described the experiences with ‘Tang You’ (friends with diabetes). He shared his experiences of living a meaningful life by helping others.

*‘...I met some patients with diabetes usually. We called us ‘Tang You’. Sometimes met other patients with hypertension. I would like to ask about their conditions and share my stories. Everyone is different, so the conditions are different...I thought, sharing my experiences of treatment and management such as lifestyle modification and medications for hypertension will be helpful for someone else.’* (Male, 60s, diabetes, hypertension, and fatty liver disease)

## DISCUSSION

The current study used a qualitative interviewing approach to explore experiences of coping for people with MCCs. All participants were Chinese and married, varying in terms of age, education, and employment. The stories of the participants revealed that they were living actively while coping with MCCs, although they cited worries about how MCCs impacted them. For those participants, experiences of coping helped develop an array of strategies to address symptoms of chronic health conditions, psychological well-being, and social roles by dynamic appraisals of life changes resulting from MCCs.

The theme ‘appraising MCCs’ indicates a personal evaluation of what is happening caused by MCCs. Lazarus (2012) suggests that this appraisal is a negotiation between two elemental parts: (1) aspiration of perceiving what is occurring; (2) aspiration of making the best of what is occurring. First, it is not surprising that people develop their own perceptions in response to MCCs. Prior research on illness perceptions considered five domains: identity, timeline, causes, consequences, and controllability (Lau & Hartman, 1983). This study found that people with MCCs mainly focused on three domains including consequences of MCCs, identity (priority in conditions), and controllability (coping), showing that people with MCCs might hold different perceptions compared to people with a single chronic condition, even though both have an incurable lifelong process potentially filled with distressing moments. The overriding concern of people with MCCs was impaired health status. The combined impacts of co-existing chronic conditions modified the perceptions of people with MCCs such as identity, cause, and timeline (Gibbons et al., 2013). Second, narrative accounts of people showed how they prioritized a collection of complex conditions for self-management. Research

indicated that people's prioritization among several chronic conditions with management practices were dynamic and might be supportive for accommodating their MCCs (Morris, Sanders, Kennedy, & Rogers, 2011). In line with a past review (Bratzke et al., 2015), prioritization of MCCs appeared to be a specific day-to-day task experienced by people with MCCs who had to uphold a balance between their chronic conditions. Furthermore, this study found that people predominantly constituted priorities by targeting individual conditions that impact a lot, but the potential effects of the prioritization were not identified. Thus, several questions then arise for further research: How does this prioritization impact self-management of MCCs? What can healthcare professionals learn from this prioritization? How do healthcare professionals set up a collaborative healthcare plan integrated with clinical concerns and statements of the people?

Living with MCCs is a lifelong process that needs long-term treatment. This treatment could be thought of as a burden. However, treatment is a crucial component for illness management and better health status for people with MCCs. One of the biggest issues for people with MCCs was adherence to medications. Medication adherence is associated with many factors such as socio-demographic characteristics, the relationship between people and doctors, disease-related factors, and medication factors (Vlasnik, Aliotta, & DeLor, 2005). Our participants attributed their non-adherence to 'I forgot to take it' and 'I think I am fine'. These explanations might indicate that people misunderstood their health regarding MCCs and an inability to participate in disease self-management (Pages-Puigdemont et al., 2016). Key reasons for non-adherence to treatments among MCCs population are varied, including differences in clinical variables (Kim, Bennett, Wallace, Fahey, & Cahir, 2018), medication beliefs (Schüz et al., 2011), fragmented care (Green, Hawley, & Rask,

2007), and synergistic effects between chronic conditions (Calderón-Larrañaga et al., 2019). Participants in this study did not report issues of managing multiple prescriptions nor adverse effects. However, they liked to control immediate symptoms and slow the perceived most severe condition. This finding also reiterated that people with MCCs prioritized their chronic conditions.

This study found that coping strategies adopted by people with MCCs interacted with chronic conditions management, psychological preservation, and maintenance of social roles. Despite different labels in categorizing coping, the emerged strategies were congruent with past studies (Cheng et al., 2019; Löffler et al., 2012), which categorized coping strategies in the context of MCCs into three levels: practically, referring to the management of conditions; emotionally, referring to positive reframing; and socially, referring to the preservation of autonomy. In comparison, our participants displayed more particular skills, such as using TCM medications. Complementary and alternative therapies have been little investigated in the area of coping with MCCs. As this study was based in China, using TCM medicine and visiting a TCM doctor would be easy to obtain in general. Lee, Lin, Wrench, Adler, and Eisenberg (2000) suggested the reason that Chinese women with breast cancer were more likely to use herbal therapies than white or black peers was the prevalent use of herbal therapies by Chinese. Participants in the present study, reported using TCM because these drugs took effect sometimes. What is more, a review of complementary and alternative medicine (Bishop, Yardley, & Lewith, 2007) showed that the participants in the present study might be trying to control their conditions by means of what they knew before. They considered TCM as a part of self-management where they could be a decision maker.

Paralleled with past research in which the importance of family was noted (Ridgeway et al., 2014), this study found that coping at the family level might play a significant role in promoting health among people with MCCs. Traditional Chinese cultures value the collectivist orientation, which considers that the foundation of Chinese society is the family unit. Individuals make sense of their roles within the family context where individual issues are usually considered as family issues (Mak & Chan, 1995). The family will support an individual to overcome difficulties when it is necessary. Chinese families suggest that it is harmonious and honorable to be gathered as a unit when facing life changes (Mak & Chan, 1995). This was a study based in mainland China and all participants were married thus it is reasonable to apply a family perspective to understand the significance of family in an individual's coping. In the present study, participants expressed 'I would like to do it for my family' rather than 'I do it for myself'. Collectively, this finding provided insights into the role of the family played in the personal coping process and how individuals experience this kind of 'engagement', which refers to common stresses and mutual needs between participants and their family members. The present study paid close attention to personal experiences but the indicators of family functions such as family relationships, unity, and roles were not explored. A future study could investigate how an individual and family cope with MCCs as a joint group.

Coping with MCCs is an adaptive process consisting of professional support and social influence. Those contextual factors might have a direct and/or an indirect impact on people's coping. This study found that most participants described how they were impacted by 'a story of one of my friends' when seeking informational support, reflecting the important role of social networks played in influencing people's coping experiences. In the Chinese context, social networks are often conceptualized as forms

of relationships by which individuals are able to achieve specific objectives (Duran Bell, 2000). Those relationships can be classified into (1) affective (relationships with family members and significant others); (2) instrumental (relationships with those for a practical aim); and (3) Guanxi or connections (relationships that include both affective and instrumental components) (Bond & Hwang, 1986). This study suggested narratives of ‘a friend’s story’ as experiences of making use of Guanxi, in which the people developed a personal trust and a strong relationship with someone in the cases they have the same background. Making of use Guanxi might provide a buffer against adverse life events. For example, people might set ‘a friend’ as an example to improve a coping strategy (e.g following the advice about exercise to lose weight) and validate an understanding about MCCs (e.g. sharing the therapies and feelings by internet forums). What is more, the subtheme of ‘*being a friend*’ indicated that the people valued and wanted to contribute to Guanxi through interactions with ones who had similar chronic conditions. This finding implied the development of Guanxi, in which a patient was not merely acting as a recipient, but exchanged favors to maintain the relationship (Ellis, 2009).

Support from social networks are proved to be helpful for individuals who are at risk of chronic physical and psychological health problem because it can improve one’s social identity, offer information and inspiration, and help a person to go through stressful situations (Shilling et al., 2013). It is no doubt that social network is a significant factor to explain adaptations to stressful life events (Brissette, Scheier, & Carver, 2002) and health behaviour-related outcomes (Laranjo et al., 2015). However, social relationships can consist of both positive and negative components, concurrently (Ahn, Kim, & Zhang, 2016). As suggested by a past study (Vassilev, Rogers, Kennedy, & Koetsenruijter, 2014), it is inappropriate to consider that network support develops

in a cumulative way (e.g. the more providers, the more support), and engaging in the social network may have a negative influence (Gallant, Spitze, & Grove, 2010). People's stories regarding involvement in social networks might represent their needs for formal social supports. This study did not identify negative examples of social networks. A plausible explanation is that our participants may subjectivize their experiences as they inclined to say an 'I have coped well' story. Nevertheless, it is necessary to examine support from multiple sources in the future. Collectively, those findings of social networks supported previous works that culture shapes a person's coping by influencing both the person and the surrounding environment (Chun, Moos, & Cronkite, 2006).

### **Strengths and limitations**

This is the first published qualitative research on coping with MCCs in mainland China. Using a qualitative design, this study presented a theoretical underpinning to explain experiences of MCCs. Participants varied in demographic and clinical characteristics, allowing for multiple perspectives. A culture-based discussion recognized the important role of the family and the social networks in shaping people's coping experiences.

One of the major limitations was that participants were purposively recruited from a single hospital in East China, thus the findings may not represent other areas of China. Findings might not be representative of people who live alone or in residential aged care. Due to regional disparities in China, healthcare for MCCs and people's perspectives on health and disease are varied limiting the generalizability of the findings. As coping changes over time, knowledge of changes in coping can be obtained if interviews are undertaken based on the disease trajectory. Participants

volunteered, therefore they may be motivated to share their stories more than other people, suggesting better coping than other people with MCCs.

This study was not able to determine whether the type of MCCs or the severity of the MCCs impacted the use of different coping strategies. Previous research has found that the severity of people's chronic health conditions was related to the use of specific coping strategies (Casagrande et al., 2019). More detailed information regarding MCCs could be collected in future studies through laboratory experiments and physical examination and would help to address changes and differences in the coping strategies used by people with MCCs. Coping strategies that emerged from this study need to be further explored by both qualitative and quantitative research methods.

## **CONCLUSION**

This qualitative descriptive study illustrates how Chinese adults cope with MCC in day-to-day life. Key findings highlight the ways that people appraise MCCs and adopt ways of coping to make sense of their daily life, and also emphasize the significance of family and social networks in coping for Chinese adults. This work is as a first step in filling the practical knowledge gap about stress and health among Chinese populations with MCC and contributes to the present knowledge on cross-culture coping. Well-designed, comprehensive interventions with consideration of individuals' needs in the context of a particular culture may reduce the suffering of people with MCCs.

## **RELEVANCE TO CLINICAL PRACTICE**

The current traditional disease-oriented specialization in the healthcare system is inadequate to manage the healthcare concerns of people with MCCs. People with

MCCs have different health concerns when compare to people with single one chronic condition. There is a need to redesign the healthcare system in accordance with local resources and demands focusing on the management of MCCs. Some high-income countries such as the UK and Australia have established clinical guidelines and developed policies to address care of people with MCCs (Chandraratne, Pathirathna, Harrison, & Siriwardena, 2018). China, as a developing country with significant regional inequality, still lacks an effective healthcare model for people with MCCs. Thus, management of MCCs required more attention from health policymakers, healthcare professionals and their educators, and healthcare services researchers. The top priority for healthcare services is to adjust the current healthcare delivery and allocate healthcare resources to support people with MCCs.

A multi-disciplinary, integrated approach focusing on patient empowerment strategies such as self-management during care delivery could help people and their families to cope and manage their MCCs. People with MCCs may have difficulty in accommodating all treatments and management recommendations so that collaborative priority setting in a comprehensive healthcare plan should be considered. People with MCCs should be engaged in organizing priorities of treating MCCs and aspects of self-management. Dynamic assessment and monitoring of patient priorities will help guarantee optimal healthcare in which people can obtain continuous support as MCCs may change over time. With integrated care and good self-management, people with MCCs can live well and continue to have a good quality of life.

Healthcare professionals need an in-depth understanding of the psychological needs of people with MCCs. Healthcare professionals could facilitate psychoeducation programs and patient peer support groups to enhance people's understanding of their health conditions, promote their coping and psychological well-being, as well as peer

support among people with MCCs. Healthcare professionals should be aware that people cope differently in different social contexts. A better understanding of coping may be gained from effective communication between healthcare professionals and people with MCCs based on the knowledge of their cultural backgrounds

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### COREQ 32-item checklist

No	Item	Guide questions/description
<b>Domain 1: Research team and reflexivity</b>		
Personal Characteristics		
1.	Interviewer/facilitator	CC conducted all interviews in Bengbu, Anhui, China. JB, CYY, and ML participated.
2.	Credentials	CC (MSc), JB (MSN, RN), CYY (BSc, RN), ML (BSc, RN), KI (PhD, RN), SC (PhD, RN).
3.	Occupation	CC (Doctoral candidate), JB (Lecturer), CYY (Head nurse), ML (Head nurse), KI (Associate Professor), SC (Professor).
4.	Gender	CC (Male), other authors are female.
5.	Experience and training	CC, ML, and CYY have experience in conducting interviews for qualitative research studies. SC has experience in analyzing qualitative data. CC is a doctoral candidate, with training in qualitative research.
Relationship with participants		
6.	Relationship established	None.
7.	Participant knowledge of the interviewer	The participants knew that the researchers were from a university. The participants were briefed about the research and signed the consent forms. See data collection section.
8.	Interviewer characteristics	The participants knew that the researchers would like to conduct research on multiple chronic conditions. See data collection section.
<b>Domain 2: Study design</b>		
Theoretical framework		
9.	Methodological orientation and Theory	A qualitative design introduced by Sandelowski in 2010. See design section.
Participant selection		
10.	Sampling	Purposive sampling approach was used. See sample and setting section.
11.	Method of approach	See methods section.
12.	Sample size	14 participants were included. See sample and setting section.

No	Item	Guide questions/description
13.	Non-participation	N/A
Setting		
14.	Setting of data collection	A quiet room at the study venue. See data collection section.
15.	Presence of non-participants	No.
16.	Description of sample	See Table 6.1. Sample characteristics (n = 14).
Data collection		
17.	Interview guide	An interview guide was developed based on a past review prior to conducting the study and was further refined based on the comments from the experts panel. See data collection section.
18.	Repeat interviews	No.
19.	Audio/visual recording	Audio-recorded was used. See data collection section.
20.	Field notes	Yes. See data collection section.
21.	Duration	Around 30-55 minutes. See data collection section.
22.	Data saturation	Yes. See sample and setting section.
23.	Transcripts returned	No
<b>Domain 3: Analysis and findings</b>		
Data analysis		
24.	Number of data coders	The candidate (CC). See data analysis section.
25.	Description of the coding tree	No.
26.	Derivation of themes	Yes. See data analysis section.
27.	Software	No, hand coding was used.
28.	Participant checking	No.
Reporting		
29.	Quotations presented	Yes. See results section.
30.	Data and findings consistent	Very illustrative quotations presented.
31.	Clarity of major themes	Yes. See results section.

No	Item	Guide questions/description
32.	Clarity of minor themes	Yes. See results section.

# Chapter 7: Integration of quantitative and qualitative data and discussion

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## 7.1 INTRODUCTION

This chapter discusses the study and conclusion of the whole research. The research aims and questions are revisited, with the findings discussed within the context of the relevant published literature. The key findings of this research, a comprehensive discussion with research strengths and limitations and the implications for clinical practice and further research are revealed.

## 7.2 OUTPUT OF THIS CHAPTER

This chapter was disseminated in a paper as:

Cheng, C., Inder, K., and Chan, S. W. (2020). *To understand coping, illness perception and quality of life among Chinese people with multiple chronic conditions: An explanatory sequential mixed methods study*. Unpublished manuscript submitted for publication. Submitted on July 12, 2020.

## 7.3 SIGNIFICANCE AND CONTRIBUTION TO THE RESEARCH

This chapter has provided a full interpretation and discussion of the results with respect to this research. Broadly, this work expands current knowledge about coping and health in people with chronic health conditions with a mixed methods approach. The original efforts of this study to document coping in people with MCCs also allow for further research aiming to explore coping in supporting people with MCCs. The next challenge will be to develop a coping-based intervention to promote health in this cohort.

# To understand coping strategies, illness perceptions, and quality of life among Chinese people with multiple chronic conditions: An explanatory sequential mixed methods study

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Citation:

Cheng, C., Inder, K., and Chan, S. W. (2020). *To understand coping, illness perception and quality of life among Chinese people with multiple chronic conditions: An explanatory sequential mixed methods study*. Unpublished manuscript submitted for publication. Submitted on July 12, 2020.

## **ABSTRACT**

**Aims:** This study was to examine coping strategies, illness perceptions and quality of life (QoL) in Chinese people with MCCs.

**Method:** An explanatory sequential mixed methods design was employed. Descriptive statistics and logistic regression were used to examine quantitative data. Content analysis was for qualitative data. Then, two types of data were integrated.

**Results:** Three hundred and fifty-one participants completed the survey and 14 joined the interview at a hospital in China from December 2017 to October 2018. Survey participants had high levels of concern over MCCs, timeline of MCCs, and personal control while less concern about coherence and treatment control. Most participants reported frequent use of positive adaptation but little use of denial and behavioural disengagement or religion. Regression models indicated that consequences of illness, timeline, treatment control and strategies of denial and disengagement were associated with QoL. Qualitative results extended quantitative findings by offering perceptions of prioritization of MCCs, strategies of lifestyle changes, and culture-related coping.

**Conclusion:** Perceptions and strategies found in this study, especially the coping taxonomy ascertained, play a significant role in explaining QoL among people with MCCs. Findings serve as a basis for further psychometric studies on coping in the Chinese population, as well as a reference for cross-cultural coping research. Healthcare professionals may consider applying this information to design interventions to improve physical and psychological health among people with MCCs.

**Keywords:** coping, illness perception, mixed methods, multiple chronic conditions, quality of life.

## INTRODUCTION

Multiple chronic conditions (MCCs) are co-existing chronic conditions, where two or more chronic conditions affect a person concurrently (Parekh, Goodman, Gordon, & Koh, 2011). MCCs is a global public health problem. Several population-based studies investigated the prevalence of MCCs in Australia, the United States, and Britain and found the prevalence of MCCs ranged from 25.5% to 27.2% (Cassell et al., 2018; Harrison, Henderson, Miller, & Britt, 2017; Ward, Schiller, & Goodman, 2014). In China, a cross-sectional study showed that more than one in ten of the researched population reported having MCCs and the prevalence of MCCs was more than 50% for participants aged over 55 years (Wang et al., 2014).

People with MCCs may be overwhelmed by many challenges and difficulties related to their MCCs such as poor-coordinated healthcare (Doessing & Burau, 2015), drug interactions (Marengoni & Onder, 2015), adherence to multiple treatments (Wong et al., 2014), psychological distress (Prior, Vestergaard, Larsen, & Fenger-Grøn, 2018), poor quality of life (QoL) (Wang, Palmer, Cocker, & Sanderson, 2017), and increased healthcare costs (Bähler, Huber, Brüngger, & Reich, 2015).

To live with MCCs, people require continuous physical and mental adaptation to their chronic conditions and learn to manage those conditions (Cheng et al., 2019). The transactional theory of coping and stress (Lazarus & Folkman, 1984) proposes that coping is a dynamic process of making responses to the internal and external stressors with available resources. This theory assumes that good adaptation to stressful events such as MCCs requires the use of appropriate coping strategies. There are two key concepts of adaptation proposed by the transactional theory: (1) cognitive appraisal, referring to individuals' appraisal of stressful events that are labelled as 'challenging'; (2) coping strategies, referring to strategies initiating from the appraisal

process to address the stressful events and/or control emotions. Strategies that focus on the stressful events are considered as problem-focused coping whereas strategies aiming to deal with emotions are emotion-focused coping. The two coping strategies are complementary, not contradictory (Löffler et al., 2012).

Individuals may perceive the same stress differently. Thus they have unique appraisals of events as ‘stressful’, including living with MCCs. Building on the individual appraisal of the stress, individuals may behave in different ways. Some may tend to cope with a particular strategy. People with MCCs may hold different perceptions when compared with people who have a single chronic health condition (Gibbons et al., 2013). According to the coping theory, understanding how people perceive and cope with their conditions and their adaptation process to chronic conditions are critical.

Studies suggest the availability of coping resources has a significant impact on the way people handle their chronic conditions. However, few studies address MCCs (Löffler et al., 2012). Prior research on coping and MCCs has predominantly relied on qualitative designs with face-to-face interviews (Cheng, Inder, & Chan, 2019). A study on coping with MCCs in older adults identified three types of coping strategies: coping at the social level, referring to maintaining one’s self-sufficiency; coping at the emotional level, referring to managing psychological distress resulting from MCCs; and coping at the practical level: referring to one’s efforts of managing chronic conditions (Löffler et al., 2012). Qualitative data provides an in-depth description of a repertoire of coping strategies but is not able to indicate the tendency of adopting certain coping strategies. Several studies related to coping with MCCs used cross-sectional surveys to ascertain coping strategies and their associations with health. One cross-sectional survey of people with MCCs (n = 292) found three coping-related

variables: including emotion-focused coping, problem-focused coping, and coping efficiency; mediated the relationship between sense of coherence and mental QoL (Kristofferzon, Engstrom, & Nilsson, 2018). However, using means or frequency-based analyses may limit the in-depth understanding of coping strategies.

There is a paucity of studies using mixed methods designs to examine coping in people with MCCs. A literature search found one study which investigated the relationship between MCCs (diabetes and depression) and stress, examining these factors in relation to self-management, however, a scale to identify coping strategies was not used and a limited description of coping was provided (Whiting, Scammell, Gray, Schepers, & Bifulco, 2006).

This study investigated coping in the context of MCCs through a mixed methods design. The use of a mixed methods design may enrich the current knowledge concerning coping and appraisal with MCCs. The combination of scales measuring coping, and the discourse describing coping will enhance understanding of how people with MCCs manage their conditions. With such understanding, effective interventions could be developed to promote coping and improve health outcomes. Mixed methods research refers to a methodology that integrates quantitative and qualitative data within a single research program (Creswell & Clark, 2017). This methodology collects and analyses both quantitative and qualitative data either simultaneously or sequentially. The quantitative and qualitative data are integrated into the analysis and discussion. Mixed methods research helps to understand interactions and contradictions from different aspects, and address research questions more comprehensively by using quantitative and qualitative data (Creswell & Clark, 2017).

## **AIMS**

The specific aims of this study were to (1) identify and describe coping strategies, illness perceptions and QoL among Chinese people with MCCs, and (2) establish whether coping strategies and illness perceptions were associated with differences in levels of QoL in this population.

Cognitive appraisals and coping strategies in the transactional theory are the fundamental frameworks for the current research (Lazarus & Folkman, 1984). This study conceptualized the ways that people perceive their MCCs as ‘cognitive appraisals’. The ways that people manage their MCCs and accompanying emotions and challenges are defined as ‘coping strategies’. The research questions were:

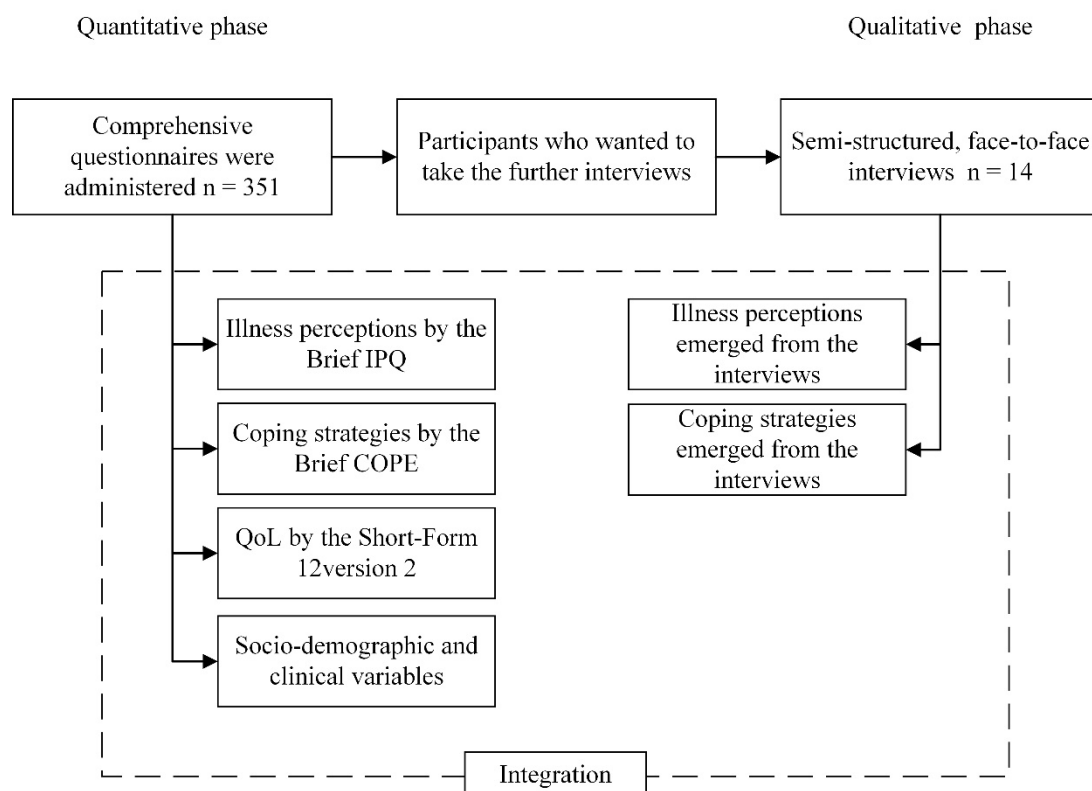
1. How do people with MCCs perceive their illness?
2. What strategies do people with MCCs use to coping with MCCs?
3. What are the relationships between illness perceptions, coping strategies, and QoL?

## **METHODS**

### **Design**

This study was guided by an explanatory sequential mixed methods design where the quantitative data collection and analysis was conducted first, followed by the qualitative data collection and analysis which aimed to explain the quantitative findings obtained from the primary stage (Creswell & Clark, 2017). The study primarily focused on the cross-sectional, quantitative phase (post-positivist paradigm) to examine perceptions and strategies concerning coping, with qualitative interviews (constructivist paradigm) added to support and inform quantitative results. The flow chart of this study is illustrated in Figure 7.1. The report of this study adhered to the

guidelines for conducting and reporting mixed research in health services research (O'Cathain, Murphy, & Nicholl, 2008).



Brief IPQ = Brief Illness Perception Questionnaire, Brief COPE = Brief Coping Orientation to Problems Experienced inventory, QoL = Quality of Life.

*Figure 7.1* Mixed methods design flow chart

## Participants

For the quantitative phase, a convenience sample of people with MCCs was recruited from an outpatient clinic at a tertiary University-affiliated hospital in eastern China. People with MCCs were eligible to participate if they were over 18 years old, medically-diagnosed with MCCs, cognitively capable of completing the survey and the interview. The sample size for the present study was calculated by G\* Power 3.1.9.4 (available online: <http://www.gpower.hhu.de/>) (Faul, Erdfelder, Lang, & Buchner, 2007). A sample size of 307 was estimated to be adequate for performing

logistic regression with the following input parameters: odds ratio = 1.6, Pr HO = 0.2, error prob = 0.05, and power = 0.9.

For the qualitative phase, a purposive sample was recruited among participants who completed the survey and would like to participate in the interview. Data saturation was used as a sampling principle and a criterion for discontinuing data collection (Morse, 2015). The candidate stopped recruitment when no new information was found to contribute anything to the whole story (Saunders et al., 2018). In this study, data saturation was reached at the 14th interview.

### **Instrument/measures**

#### ***The Brief Illness Perception Questionnaire (Brief IPQ)***

The Chinese Brief IPQ is an 8-item scale designed to evaluate individuals' cognitive and emotional perceptions of illness (Broadbent, Petrie, Main, & Weinman, 2006). The scale measures consequences (item 1), timeline (item 2), personal control (item 3), treatment control (item 4), identity (item 5), illness concern (item 6), coherence (item 7), and emotional representation (item 8). Items are rated on an 11-point Likert scale (from 0 to 10). For items 1, 2, 5, 6, and 8, a greater score means a person has a more threatening disease perception. Items 3, 4, and 7 are reverse scored, where a smaller score means a more threatening disease perception. An open-ended question asks participants to list the three major causes of their diseases. The Chinese Brief IPQ has been validated and showed good reliability among people with cancer (Zhang et al., 2017). Cronbach's alpha was 0.75 in the current study.

#### ***The Brief Coping Orientation to Problems Experienced (Brief COPE)***

The Chinese Brief COPE is a 28-item, 14-subscale inventory, which measures coping responses to stressful events (Carver, 1997). Items are rated on a four-point Likert scale (1 = not doing it at all, 2 = doing this a little bit, 3 = doing this a medium

amount, and 4 = doing it a lot). The Brief COPE does not calculate a total score; higher item scores represent better adaptation of the corresponding coping strategy. Under the transactional coping theory this could reflect that an individual is more willing to cope with stressful situations (Carver, 1997). The original Chinese Brief COPE has been validated in a group of patients with MCCs (Cheng, Yang, Inder, & Chan, 2020). The validated version has 22 items categorized into five subscales: positive adaptation, denial & disengagement, support-seeking, spiritual coping, and self-blame (Cheng et al., 2020). Cronbach's alpha was 0.87 in the current study.

### ***The Short-Form 12 version 2 (SF-12v2)***

The SF-12v2 is an improved version of the original SF-12, which aims to examine the general health status of individuals (Ware, QualityMetric Incorporated, New England Medical Center Hospital, & Health Assessment Lab., 2005). The SF-12v2 has 12 items divided into eight health-related domains: Physical Functioning (PF), Physical Role (RP), Bodily Pain (BP), General Health (GH), Vitality (VT), Social Functioning (SF), Emotional Role (RE), and Mental Health (MH). The scores of the eight domains are entered into a computer program (Bruun, 2016), which provides summarized scores of Physical Composite Scale (PCS) scores and Mental Composite Scale (MCS) scores. A greater score on the summarized subscales means a better perceived QoL. The SF-12v2 is a valid and reliable scale of QoL in the Chinese population with a mean and standard deviation of PCS and MCS scores of  $52.65 \pm 5.76$  and  $50.23 \pm 8.24$ , respectively (Lam, Lam, Fong, & Huang, 2013). In the current study, Cronbach's alphas were 0.82 for PCS and 0.69 for MCS, respectively.

### ***Semi-structured interviews***

Semi-structured individual face-to-face interviews were used to obtain qualitative data regarding coping with MCCs. An interview guide was developed by

the research team: Please describe *the chronic conditions you are experiencing?* and *How did you cope with these conditions or cope with the impact these conditions have on your life?*. Examples of probing questions were: *How do the chronic conditions impact your life...?* and *How do you manage your chronic conditions?*. Three healthcare professionals at the study venue were consulted to ensure the appropriateness of the questions.

### **Data collection**

Promotional flyers were posted at the outpatient clinics of the study venue. Potential participants who were interested in the study and provided verbal consent to the candidate, were screened for eligibility by a general practitioner. Each eligible participant was briefed about the aim and the nature of the study before providing written informed consent. After obtaining consent, participants were asked to complete the survey in a safe and quiet place at the study venue, administered by the candidate. Participants spent on average 15 minutes completing the survey. Participants who completed the survey and were willing to participate in the interview were asked to leave their contact information. Interviews were arranged at the same study venue. The interviews ranged from 30 to 55 minutes in duration and were digitally recorded. Field notes were taken during the interviews.

### **Data analysis**

#### ***Quantitative data***

Quantitative data were analysed using the IBM SPSS Statistics version 24.0 (IBM Corp 2016, Armonk, NY). Missing values were substituted with the mean score of the computed variables. The socio-demographic and clinical variables, illness perceptions, coping strategies and QoL (PCS and MCS) of the participants were analyzed by frequency, percentage, mean, and standard deviation. Normality and

homogeneity of variance were examined for each variable. To determine the differences in level of QoL (PCS and MCS scores) related to the socio-demographic and clinical variables, t-tests and ANOVA were conducted. Pearson's correlation coefficients were used to determine the correlations among variables. Only variables with a significant relationship with PCS and MCS were entered into the regression model.

Tolerance and variation inflation factor (VIF) were used to determine multicollinearity among the independent variables, and factors associated with PCS and MCS scores from SF-12v2 (dependent variables) analyzed using hierarchical multiple regressions. Hierarchical multiple regressions with the PCS and MCS scores involved imputation of variables in four steps: (1) socio-demographic variables, (2) clinical variables, (3) illness perceptions, and (4) coping strategies. Regression models were performed using a forced entry method of variable inclusion. Further details of the quantitative data collected are provided elsewhere (Cheng, Yang, Inder, & Chan, 2020).

### ***Qualitative data***

Audio-recorded interviews were transcribed verbatim in Chinese by the candidate who then translated the Chinese transcriptions into English and checked against the records for accuracy by the supervisors. Qualitative data were analysed using qualitative content analysis (Hsieh & Shannon, 2005). The analytical procedure included four stages (Bengtsson, 2016): (1) Decontextualization: the researchers read through the whole transcribed materials to become familiar with the context, then break the context into meaningful units. (2) Re-contextualization: the researchers re-read the meaning units to check if they accurately reflect the context. (3) Categorization: the researchers identify themes and subthemes and make a reasonable

explanation for them. (4) Compilation: the researchers write up the process and report the findings in a logical way. Further details of the qualitative data collected are provided elsewhere (Cheng et al., 2019).

### ***Integration of qualitative and quantitative data***

This study implemented integration at the results level by integrating two types of data through narratives and displaying them in a matrix. Narrative integration refers to the quantitative and qualitative findings presented in a single report (Fetters, Curry, & Creswell, 2013). A results matrix is a joint display that is used to juxtapose two types of findings for providing comparisons and drawing inferences (O'Cathain, Murphy, & Nicholl, 2010).

General information including socio-demographic and clinical variables, illness perceptions, coping strategies, and QoL were presented and associations between these variables were analysed and interpreted. Then, the quantitative and qualitative data sets were combined by comparing similarities and differences. The perceptions of MCCs and the coping strategies from the Brief IPQ and the Brief COPE were compared with qualitatively coded categories. The candidate and the supervisors reviewed and discussed any discrepancies between two forms of data. Following this, an integrated report was developed to juxtapose quantitative and qualitative results to draw insights into the research topic.

### **Rigour**

This study adhered to a reporting guideline of mixed methods (O'Cathain et al., 2008). For the quantitative phase, the study was designed under the coping and stress theory and the sample size estimation was determined via software. This study used three psychometrically sound instruments that have been used internationally and reported Cronbach's alphas for all the scales to ensure reliability. The survey

instrument was pilot tested in a group of 15 participants to ensure the accuracy of the content.

For the qualitative phase, the interview guide was developed by a panel of academic scholars and healthcare professionals to ensure the content was relevant and appropriate. A pilot ( $n = 2$ ) was conducted to check the clarity of the interview questions. The current research was supervised by two supervisors. An international team involving two bilingual speakers in Chinese and English guaranteed feasibility and achievability of this study. This report provided detailed information about the research setting, recruitment, and interview procedure. This work allows for potential comparisons with other studies and future research designs.

### **Ethical considerations**

The current study was approved by the Human Research Ethics Committee (HREC) of the University of Newcastle, Australia (H-2017-0378) and the participating hospital in China. Participants were informed that all data collected would be kept confidential and participants would remain anonymous during reporting. Participants were informed they could withdraw from the research at any time without providing any reason.

## **RESULTS**

### **Socio-demographic and clinical variables**

In total, 351 participants (female: 175, 49.9%) completed the survey. The mean age was 58.9 (SD: 14.6) years. Most participants had two chronic conditions (82.3%) and nearly half of participants had MCCs ranging from one to four years (48.7%).

Fourteen participants participated in the qualitative phase (female: 6, 42.9%) with a mean age of 60.9 (SD: 17.3) years. Compared with participants in the quantitative phase, most interviewed participants had three or more chronic conditions

(74.3%) and most had these for more than five years (71.4%) and all interviewees were married. Their socio-demographic and clinical data are shown in Table 7.1.

Table 7.1

*Socio-demographic variables and clinical variables of two phases*

Demographic characteristics		Quantitative phase		Qualitative phase	
		n	(%)	n	(%)
Age	Mean (SD), range	58.9	14.6	60.9	17.3
		23–95 years		32–82 years	
Gender	Male	176	50.1	8	57.1
	Female	175	49.9	6	42.9
Marital status	Single	31	8.8	-	-
	Married	320	91.2	14	100
Education background	Primary	70	19.9	3	21.4
	Secondary	217	61.8	8	57.2
	Tertiary	64	18.2	3	21.4
Employment	Employed	113	32.2	9	64.3
	Unemployed	238	67.8	5	35.7
Number of chronic conditions	2	289	82.3	5	35.7
	3	54	15.4	7	50.0
	4	8	2.3	2	24.3
Duration of MCCs	1 - 4 years	171	48.7	4	28.6
	5 - 9 years	100	28.5	5	35.7
	More than 10 years	80	22.8	5	35.7
Chronic conditions clusters	Cardiovascular	293	83.5	12	85.7
	Endocrine	158	43.8	5	35.7
	Musculoskeletal	69	19.7	7	50.0
	Gastrointestinal	64	18.2	5	35.7
	Cerebrovascular	38	10.8	4	28.6
	Chronic respiratory diseases	36	10.3	1	7.1
	Urogenital	30	8.5	/	/
	Cancer	23	6.6	1	7.1
	Renal diseases	18	5.1	/	/
	Haematological	15	4.3	/	/
	Dermatologic	3	0.9	/	/
	Psychiatric	2	0.6	/	/
	Visual impairment	2	0.6	1	7.1
	Autoimmune diseases	2	0.6	/	/

MCCs = Multiple Chronic Conditions, SD = Standard Deviation.

### **Perceptions of MCCs**

The Brief IPQ results (see Table 7.2) showed that most participants (75.2%) had a high score on illness concern (emotional and cognitive concerns regarding MCCs), 59.5% on timeline (duration of MCCs) and 57.4% on personal control (disease management of MCCs). Nearly a third of participants (29.3%) reported high concern on coherence and 27.6% on treatment control, indicating that most participants had less understanding of MCCs (e.g. the extent of an individual's understanding about his/her MCCs) and fewer beliefs on the effectiveness of current treatment of MCCs (e.g. the extent of an individual's belief about the effect of treatment).

Qualitative interviews found a theme of illness perceptions that was not identified in the quantitative data. Prioritization of chronic conditions refers to the participants' perception of their chronic conditions in order of importance and consequently, they treat them differently. For example, a female patient who had Ménière's disease, hypertension, and visual impairment reported that she had fewer concerns about hypertension compared with her other chronic conditions.

*'It seems that having hypertension makes no difference to me. Sometimes, (physical examinations showed) my systolic pressure was 150-160 mm Hg... It doesn't matter to me...' (Female, aged 70s)*

Table 7.2

*Illness perceptions endorsed on the Brief IPQ and the interviews*

Illness perceptions identified by the Brief IPQ				Quotations from interviews that support the corresponding identified items
Items	Interpretation in the current context	Reported a score higher than five points		
		n	(%)	
Illness concern	Emotional and cognitive concerns regarding MCCs	264	75.2	<i>‘Yes, I have some concerns (regarding my MCCs), especially when I met some other patients...so I have got to be more careful about my drinking habit and healthy eating.’</i> (Male, aged 40s)
Timeline	Duration of MCCs	209	59.5	<i>‘I have had hypertension for over 7~8 years, treated with medications.’</i> (Male, aged 50s)
Personal control	Management of MCCs	201	57.4	<i>‘The most important thing is keeping healthy. Keeping a healthy lifestyle to manage it (MCCs)...I will try my best to find time to do physical exercises...’</i> (Male, aged 50s)
Emotional representation	Emotions resulting from MCCs	170	48.4	<i>‘... I was forbidden to smoke and drink alcohol by them (family members) but I did not listen to them. I feel guilty enough...I feel sorry because having MCCs is burdensome on my whole family.’</i> (Male, aged 50s)
Identity	Symptoms of MCCs	169	48.1	<i>‘Having MCCs is physically uncomfortable for me. Lots of symptoms: tiredness, dizziness, out of sorts, drenched in sweat. Drugs can't control them.’</i> (Female, aged 70s)
Consequences	Outcomes of MCCs	139	39.6	<i>...you're in the process (MCCs). The MCCs may result in serious outcomes if you don't manage it. You cannot change anything by then. For example, I have a problem with my liver. It may develop to hepatic cirrhosis if I do not manage it. Right? At last, I may have liver cancer. That's scary.</i> (Male, aged 30s)
Coherence	Understanding of MCCs	103	29.3	<i>‘For example, obesity, fatty liver disease, and cardiovascular diseases are strongly associated with our diet. In the past, these diseases only affect old people, but nowadays more young people have chronic health conditions, I think (the reason) is our foods (dietary habits).’</i> (Male, aged 40s)

Illness perceptions identified by the Brief IPQ				Quotations from interviews that support the corresponding identified items
Items	Interpretation in the current context	Reported a score higher than five points		
		n	(%)	
Treatment control	Beliefs on the current treatment of MCCs	97	27.6	
				<i>‘For treating my hypertension, I take medications every day...My blood pressure is under control currently. I measured it at the hospital. Now it is normal and the readings are 120~130/65~70 mm Hg.’</i> (Male, aged 50s)
Brief IPQ = Brief Illness Perception Questionnaire, MCCs = Multiple Chronic Conditions.				

Brief IPQ = Brief Illness Perception Questionnaire, MCCs = Multiple Chronic Conditions.

### **Coping strategies**

The Brief COPE results (see Table 7.3) showed that people with MCCs used more positive adaptation (75.8%) whereas less than a third reported using denial and behavioural disengagement (29.9%) or religious coping (27.1%). Strategies stated in quantitative data that were not or barely illustrated in qualitative data included denial & disengagement (e.g. a person gives up on managing his/her MCCs, a person avoids thinking about his/her MCCs) and spiritual coping (e.g. a person prays to God asking him to help ease the physical pain, a person prays for comfort from the mercy of God or the compassion of Buddha).

Qualitative data found participants used other strategies not reported in quantitative data including using alternative therapies, changing current lifestyles, and coping at the family level:

#### ***Using alternative therapies***

Besides prescribed medicines, people with MCCs reported that they attempted to visit a traditional Chinese medicine (TCM) practitioner and take Chinese herbal medicine and examination of tongue and pulse conditions.

*'I visited TCM practitioner. That practitioner felt my pulse. He prescribed me traditional Chinese medicine. He said I could take more if I felt better.'* (Female, aged 70s)

#### ***Making lifestyles changes***

People with MCCs reported they changed their lifestyle to promote health. The two most frequently reported lifestyle changes were diet and exercise.

*'The new dietary habits must be developed...As a diabetic patient, (I) should eat food with less fat and try to eat more vegetables'* (Male, aged 50s)

*'I have the opportunity to exercise such as gymnasium activities, swimming, and bicycling. I usually do my workout at home and jogging nearby home, about half an hour or 40 minutes.'* (Male, aged 40s)

### ***Coping at family level***

Most participants expressed concerns about the impacts of MCCs on their family and laid emphasis on the importance of family support.

*About family...I think one of the biggest changes is our dietary habit. This is the first one needs changing. (Having) diabetes affects our family lifestyle. For example, a diabetes diet is a healthy-eating plan with food lower in calories, fat, and sugar. However, it affects others (because they may not like this style). I reckon that we should do our best at keeping a good home. A harmonious family environment is good for a patient and has positive effects in improving a patient's health. ...* (Male, aged 50s)

Table 7.3

*Coping strategies endorsed on the Brief COPE and the interviews*

Coping strategies identified by the Brief COPE				Quotations from interviews that support the corresponding identified items
Items	Sub-items	Reported at least ‘have been doing this a little bit’		
		n	(%)	
Positive adaptation	Active coping, positive reframing, acceptance, and planning	266	75.8	‘... It is far better to take things (MCCs) as they come. It is useless to think about its causes. (For me), it is a waste of time to wrestle with whether it's good or bad... Don't you hold this opinion? I always thought that was an optimistic person...a quite optimistic one.’ (Female, aged 40s)
Self-blame	Self-blame	138	39.3	‘Some people (family members and friends) told me ‘you should take it (MCCs) seriously’. However, I thought I was young... I stayed up late and had poor diet control... I did not manage it well. (It’s my problem that) I could not manage myself well.’ (Male, aged 30s)
Support-seeking	Substance use and emotional support	130	37.0	‘...After the physical examination, I was diagnosed with hypertension. I started to take some antihypertensive tablets every day....’ (Male, aged 50s)
Denial & disengagement	Denial and behavioural disengagement	105	29.9	‘...When I was diagnosed with diabetes, it was a blow to me. Why me? Because I always pay attention to my lifestyle. I eat very little sugar (as I know it is not good). I mean, when the doctor told me the results, I could not believe it. I doubt their diagnosis...’ (Male, aged 50s)
Spiritual coping	Religion	95	27.1	Not found in the qualitative transcripts.

Brief COPE inventory = Brief Coping Orientation to Problems Experienced inventory, MCCs = Multiple Chronic Conditions.

### **QoL including PCS and MCS**

Participants reported an overall impaired QoL, with a lower PCS than MCS;  $37.92 \pm 11.78$  and  $44.43 \pm 11.18$  respectively. Different age groups ( $p < 0.001$ ), levels of education background ( $p < 0.001$ ), employment status ( $p < 0.001$ ), number of MCCs ( $p < 0.001$ ), and duration of MCCs ( $p = 0.001$ ) had significant differences in PCS scores. MCS scores were found to be significantly different among groups of different education backgrounds ( $p < 0.001$ ) and employment status ( $p = 0.009$ ). See Table 7.4.

Table 7.4

*The PCS scores and the MCS scores by variables*

Variables		PCS scores			MCS scores		
Socio-demographic data		Mean	SD	p value <sup>§</sup>	Mean	SD	p value <sup>§</sup>
Age groups	≤ 49	44.27	10.77	<0.001***	45.22	12.43	0.595
	50-59	41.26	10.95		44.90	10.47	
	60-69	36.23	10.86		44.91	10.75	
	70-79	31.84	10.68		43.21	11.47	
	≥ 80	28.22	7.93		41.51	9.55	
Gender	Male	38.08	11.44	0.804	44.17	11.49	0.655
	Female	37.77	12.14		44.70	10.88	
Marital status	Single	37.54	11.60	0.850	43.53	12.59	0.638
	Married	37.96	11.81		44.52	11.05	
Education	Primary	32.16	10.32	<0.001***	41.02	11.84	<0.001***
	Secondary	38.37	11.54		44.15	10.93	
	Tertiary	42.73	11.67		49.12	9.78	
Employment	Employed	42.69	10.98	<0.001***	46.69	11.31	0.009**
	Unemployed	35.66	11.48		43.36	10.97	
Clinical data of MCCs							
Number of MCCs	2	39.20	11.43	<0.001***	44.84	10.93	0.176
	3	33.08	11.68		41.91	12.05	
	4	24.44	8.42		46.78	12.95	
Duration of MCCs	1 - 4 years	40.24	12.04	0.001**	44.69	10.95	0.717
	5 - 9 years	36.58	11.44		44.71	11.87	
	More than 10 years	34.65	10.67		43.54	10.84	
	> 6	34.88	11.14		40.90	12.44	

PCS = Physical Composite Scale scores, MCS = Mental Composite Scale scores, MCCs = Multiple Chronic Conditions, SD = Standard Deviation.

\*  $p < 0.05$ .

\*\*  $p < 0.01$ .

\*\*\*  $p < 0.001$ .

† Binary categories: Fewer concerns than normal VS more illness concerns than normal.

‡ Binary categories: I have never been doing this VS I have been doing this a little and more.

§ p-value by t-test or ANOVA

### **Relationship between illness perceptions, coping strategies, and QoL**

The PCS scores were negatively related to illness perceptions including consequences, timeline, identity, illness concern, emotional representations and illness threatening and were negatively related to the use of denial and disengagement coping, spiritual coping and support seeking. The MCS scores were negatively related to illness perceptions including consequences, timeline, identity, emotional representations and illness threatening and were positively related to personal control, treatment control and coherence. The MCS scores were negatively related to the use of denial and disengagement, support seeking, spiritual coping and self-blame. See table 7.5.

Table 7.5

*Correlations between illness perceptions, coping strategies, and QoL*

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
<b>IP</b>																
1	1	.567**	.010	.021	.642**	.232**	-.024	.570**	.835**	.075	.182**	.322**	.293**	.042	-.626**	-.378**
2		1	.126*	.120*	.512**	.137*	.063	.252**	.631**	-.007	-.009	.167**	.096	-.079	-.508**	-.184**
3			1	.461**	.107*	.284**	.163**	.077	-.261**	-.005	-.216**	.079	-.020	-.134*	.069	.175**
4				1	.213**	.467**	.377**	.137*	-.206**	.125*	-.089	.081	-.026	-.054	.063	.130*
5					1	.296**	.139**	.594**	.715**	.132*	.165**	.268**	.227**	.060	-.418**	-.270**
6						1	.539**	.377**	.219**	.242**	-.056	.204**	.043	-.024	-.109*	.008
7							1	.155**	-.141**	.254**	-.075	.029	-.080	.008	-.005	.113*
8								1	.658**	.120*	.233**	.256**	.244**	.104	-.308**	-.272**
9									1	.058	.235**	.284**	.276**	.071	-.588**	-.410**
<b>CS</b>																
10										1	.180**	.409**	.172**	.354**	-.043	.065
11											1	.160**	.355**	.493**	-.181**	-.157**
12												1	.370**	.106*	-.206**	-.120*
13													1	.249**	-.163**	-.232**

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
14														1	.025	-.169 **
<b>QoL</b>																
15															1	.142 **
16																1

IP = Illness Perceptions, CS = Coping Strategy, QoL = Quality of Life; PCS = Physical Component Score; MCS = Mental Component Score, 1 = Consequences, 2 = Timeline, 3 = Personal control, 4 = Treatment control, 5 = Identity, 6 = Illness concern, 7 = Coherence, 8 = Emotional representation, 9 = Illness threatening, 10 = Positive adaptation, 11 = Denial & disengagement, 12 = Support seeking, 13 = Spiritual coping, 14 = Self-blame.

\*\*Correlation is significant at the 0.01 level (2-tailed).

\*Correlation is significant at the 0.05 level (2-tailed).

## Predictors of QoL

The significant predictors of physical health were age, educational level, number of MCCs, timeline, consequences and denial & disengagement. The overall model ( $p < 0.0001$ ), accounted for 50.7% of the variance of PCS scores (see Table 7.6). Likewise, for mental health, educational level, consequences, personal control, and self-blame were significant predictors with the overall model ( $p < 0.0001$ ), accounting for 23.4% of the variance of MCS scores (see Table 7.6).

Table 7.6

*Variables associated with the PCS scores and the MCS scores by regressions†*

	PCS			MCS		
	R2	$\Delta R^2$	Beta	R2	$\Delta R^2$	Beta
Step 1	0.199	0.199		0.040	0.040	
Age			-0.408***			0.042
Educational level			0.143*			0.176**
Step 2	0.225	0.030		0.043	0.003	
Number of MCCs			-0.143**			-0.033
Step 3	0.493	0.270		0.217	0.177	
Consequences			-0.381***			-0.292*
Timeline			-0.126*			-0.009
Personal control			/			0.185*
Step 4	0.507	0.014		0.234	0.016	
Denial & disengagement			-0.130**			/
Self-blame			/			-0.137**

QoL = Quality of Life; PCS = Physical Component Score; MCS = Mental Component Score

†Only significant associations are presented.

\* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$

## DISCUSSION

This study aimed to investigate illness perceptions, coping strategies, and QoL among Chinese people with MCCs through a two-phase sequential explanatory mixed methods design. Phase 1 of this study employed a cross-sectional survey of 351 people with MCCs and phase 2 of the study used face-to-face semi-structured interviews with 14 participants recruited from phase 1.

### **Perceptions of MCCs**

Quantitative data from the Brief IPQ showed that over 50% of participants expressed strong concerns on three aspects including the disease itself (illness concerns), the duration of MCCs (timeline), and the management of MCCs (personal control). This finding indicated that people with MCCs worried about the life-threatening nature of the chronic conditions and implied their sufferings resulting from MCCs. Consistent with past qualitative findings (Richardson et al., 2016), this study found that people with MCCs might treat their MCCs hierarchically and focus on how a chronic health condition influences their body. This also echoed quantitative findings that participants worried about the nature of MCCs and their disease management. Together, these findings corroborated that individuals having several co-existing conditions may have overwhelming experiences and facing more complexed situations (Bower et al., 2012). It also reflected that the current healthcare plans for MCCs might be principally driven by single-disease practical guidelines so that the patients had to make their own decisions on how to manage MCCs because they might be confused.

### **Strategies of coping with MCCs**

This study found that positive adaptation was the most frequently reported strategy by the participants, suggesting most participants had an optimistic view of their MCCs and tended to maintain their health by accepting the changes. It also implied that people with MCCs wanted to cope actively in everyday life. Religion was the least reported coping strategy in the quantitative results and was not identified qualitatively, suggesting that most participants probably had no religious belief given the low frequency of corresponding items. A national survey reported that almost 90% of Chinese reported being neutral in matters of religion (Lu, 2014). Further research is needed to investigate the contributions of religious coping among people with MCCs

by involving a population with religious beliefs. Using a well-defined and appropriate inventory such as religious COPE (R-COPE) (Pargament, Koenig, & Perez, 2000) would be pertinent.

Discussing coping in a particular context should consider the possible impacts of culture (Kosciulek, 2007). Culture is an ecological system that characterizes the whole stress and coping process (Chun, Moos, & Cronkite, 2006). The present study widened the current volume of coping for MCCs by offering two culture-shaped strategies. First, most participants reported a history of visiting a TCM practitioner and use of TCM drugs, which represented a general cultural inclination to TCM, implying that TCM was regarded as a complementary element of treatment for MCCs. This finding was supported by a past review, which summarized perceptions on TCM medicine among the Chinese population across regions (Chung et al., 2014). Second, coping within the family context, especially for Chinese, should be interpreted based on an eastern cultural context. Traditionally, family issues should be resolved within the family. In a scenario of facing stressful events, Chinese culture would lay stress on interactions with significant others, respect to collective interests, a balance between self and nature, an emphasis on family, and respect and loyalty to authority. (Hsu, Chen, Wang, & Sun, 2008). As a result, maintaining idealized interpersonal interactions and behaving properly within a certain setting might be more important than controlling the nature, despite simultaneous stressful events such as MCCs. Future research investigating coping in Chinese people should take into account these interactions as this culture-oriented premise may help explain individuals' physical and emotional adaptations to stress in a given cultural context.

### **Relationship between illness perceptions, coping strategies, and QoL**

In line with former studies on some other chronic health conditions such as fibrous dysplasia (Majoor et al., 2018) and epilepsy (Ji et al., 2016), regression results demonstrated negative relationships between illness perceptions on consequences and timeline and QoL in people with MCCs. This finding found consequences impacts on the perceived physical and mental functioning of individuals with MCCs. Perceptions about the timeline showed that people with MCCs viewed having MCCs as a cyclical process. Concerns about the duration of MCCs was associated with worse QoL while more confidence in treatment was associated with better QoL. This finding was supported by prior research on people with acromegaly (Tiemensma et al., 2011). Collectively, these findings suggest that modifying unhelpful and negative illness perceptions in people with MCCs may represent a promising tool in their management of MCCs. Providing information about MCCs effectively may help to increase the goodness-of-fit between the patients' illness perceptions and the healthcare from the providers, which in turns allows these patients have a better understanding about the course and possible impacts of MCCs. Moreover, developing effective self-management skills to increase confidence, which people could bring their MCCs under control and mitigate people's perceived impacts of MCCs, may improve their health status.

In accordance with prior studies on AIDS/HIV (Kamen et al., 2012), hemodialysis (Niihata, Fukuma, Akizawa, & Fukuhara, 2017), and cancer (Nipp et al., 2016), this study found that frequent use of denial and disengagement was associated with decreased QoL in mental health among people with MCCs. Denial and disengagement coping refers to the efforts of rejecting what is happening and withdrawing from the involvement of stressful events. These efforts can also be

involved in avoidance coping (Billings & Moos, 1985). Past research has shown that denial and disengagement coping correlated with more psychological distress in people with other chronic conditions such as schizophrenia (Ong, Ibrahim, & Wahab, 2016) and cancer (Nipp et al., 2016). Negative moods regarding MCCs are speculated to contribute to the deterioration of mental health because of the high prevalence of psychological distress in populations with MCCs (Holden, Scuffham, Hilton, Vecchio, & Whiteford, 2010). The frequent adoption of avoidance may increase intrusive perceptions of stressful situations and could generate a route to new stressors (Holahan, Moos, Holahan, Brennan, & Schutte, 2005). To sum up, this finding is able to further support the necessity of evaluating people's adoption of coping strategies and facilitating healthcare professionals to modify people's healthcare plans based on unique profiles of coping in the context of MCCs. It can be speculated that effective healthcare plans that involve coping components (e.g. interventions that lessen the reliance on denial and disengagement) may be conducive to maintaining psychological well-being among people with MCCs.

Higher education level was associated with better perceived mental health. This suggests that people with higher education could have better adaptations to stressful situations by managing their thoughts, feelings, and actions. Individuals with more years of education may have better health literacy (van der Heide et al., 2013) and a deeper understanding of treatments which could lead to better adherence and more feelings of mastery (Bosma, Lamers, Jonkers, & van Eijk, 2011). Consequently, healthcare professionals need to improve the appropriateness of mental health support for low-education groups and expand their delivery of services to these groups by using a multi-level approach.

### **Strengths and limitations**

The current study was unique in that the mixed methods design allowed people with MCCs to describe their perceptions of MCCs and coping strategies in their own words. This is the first study of its kind conducted in mainland China. This complemented the quantitative questionnaires and provided supplementary descriptions for deepening and widening the quantitative results. The mixed methods helped to overcome the shortcomings of employing a single design. For example, using the Brief IPQ allowed the extent of an individual's beliefs about the MCCs to be presented, and the Brief COPE showed the frequency of adoption of coping strategies. Those two Likert-type measures offered findings on participants' tendency of perceiving MCCs and using coping in a representative and large research sample. However, such a measure has limited scope because it is limited by its listed items. Qualitative data by semi-structured interviews assisted in filling this gap by contributing an exhaustive and contextual description of coping. As a result, the current study offers greater insights into coping among people with MCCs by integrating qualitative and quantitative data.

This study had limitations. This study adopted a cross-sectional design in its quantitative phase, therefore changes in coping over time could not be examined nor the temporal sequence of events. Due to the cross-sectional design, this study conceptualized 'perceptions of illness' as 'appraisals' in coping with MCCs. Lazarus criticized that illness perceptions were not the same as an evaluation of what was happened to an individual (Lazarus, 2012). Perceptions and strategies are suggested as 'process' rather than 'events'. Further research may consider using some specific scales of cognitive appraisal such as the Appraisal of Illness Scale (AIS), the Cognitive Appraisal of Health Scale (CAHS), and the Stress Appraisal Measure (SAM). Also,

longitudinal research to follow the participants over time to address the stability of coping throughout the course of MCCs would be beneficial.

Although this study found some significant correlations between certain coping strategies and self-reported health-related outcomes, it did not indicate causation. There may be a survey response bias in those participants who responded as they may be more interested in the health and wellness of people with MCCs.

This study only interviewed the participants once thus could not capture changes in coping throughout the trajectories of MCCs. The qualitative results also have limited inference as they documented the specific experiences of the participants who were willing to share their stories. Despite the limitations, an in-depth and rich understanding of the participants' experiences was gained and a range of perceptions regarding MCCs and strategies of coping were identified from the study findings.

This study included variables such as clinical factors (e.g., trajectories of MCCs) and socio-demographic factors (e.g., age and gender). However, there are other significant coping-related factors such as medications, non-drug treatment, clustering of chronic health conditions, and social support, which were not evaluated in the current study. Future research should include more factors to identify their role in influencing coping and health.

This study used a previously validated coping inventory, allowing for a more reliable and valid result. However, a coping inventory developed in the US such as the Brief COPE might be not capable of identifying coping strategies in a Chinese sample although translation and validation have been well conducted.

## CONCLUSION AND IMPLICATIONS

This study found that people with MCCs expressed emotional and cognitive concerns about their chronic conditions, duration, and management and they might prioritize these conditions. People with MCCs cope with their chronic conditions actively by a variety of strategies. Additional strategies including alternative treatments, lifestyle changes, and family support were identified. Regression models indicated concerns about consequences and timeline, and use of denial and disengagement coping, predicted poor QoL while faith in treatment control predicted better QoL.

For clinical practice, illness perceptions and coping strategies are two important psychological domains that healthcare professionals working with people with MCCs can help modify. Programs that offering appropriate knowledge about the course and the consequences of MCCs and improving their confidence in the treatment may be beneficial. Also, healthcare professional should actively coach and train people with MCCs to find effective control over their chronic conditions, and to teach them to employ positive coping strategies rather than denial and disengaged ones.

For further research, coping with chronic health conditions is a complex process affected by several factors including environmental factors such as available resources, personal factors such as self-efficacy (Moos & Holahan, 2003), and complexities regarding MCCs. Further research exploring potential factors that shape people's coping based on current theoretical frameworks and examining the relevance between these factors and coping with more advanced statistical approaches is needed.

As the relationship between coping and health in an individual with MCCs is proposed to be dynamic due to the course of chronic health conditions, longitudinal studies may offer a better understanding of how both illness perceptions and coping

influence physical and psychological well-being in people with MCCs. Routine screening using a coping inventory may assist healthcare professionals in understanding people's coping strategies. Further research should consider further validation of existing coping scales and the potential development of a new scale for specific settings. The identified perceptions and coping strategies in this study may help to develop specific inventory for coping research among this group.

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## Chapter 8: Conclusions

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The last chapter revisits the research aims and outlines the significance of this research to policymakers, healthcare professionals, and researchers. This chapter concludes with a synopsis of the significant findings from this research and the implications for policy, practice, and future research.

### 8.1 SIGNIFICANCE OF THIS RESEARCH

Given the increased prevalence of reported MCCs worldwide, there have been growing calls for healthcare professionals and researchers to develop tailored, innovative, comprehensive, and cost-effective interventions to promote health among people with MCCs. Interventions that reframe and foster coping are one approach to address the multiple healthcare needs of this population, and the efficacy of these interventions has been confirmed in some chronic health conditions with the exception of MCCs. There is limited data regarding coping with MCCs in China, where a range of cultural influences affect coping and an increasing number of people are affected by MCCs. This research sought to investigate coping among Chinese people with MCCs using a mixed methods study design.

The findings of this research contribute new knowledge to the field of coping with MCCs and add to other emergent perspectives to form part of the larger developing picture of this topic. A summary of the significance of this research to policy, clinical practice, future research, and prior knowledge is presented below (see Table 8.1 and Table 8.2)

Table 8.1

*Significance of this research to policy, practice, and future research*

Significance to policy	Significance to clinical practice	Significance to research
<p>Chronic conditions are the primary cause of illness, disability, and death in China. Policymakers should consider setting MCCs as a national priority and optimizing the allocation of health resources for this priority. The vulnerable and disadvantaged groups among people with MCCs, such as people who are living in rural areas, older patients, and people with a greater number of chronic conditions, are worthy of more attention. Moreover, an emphasis on prevention can significantly diminish the disease burden and severity of chronic conditions and lead to better health outcomes.</p> <p>A policy that establishes multi-department coordination for improving healthcare for people with MCCs between multiple healthcare providers, healthcare facilities, and caregivers should be developed. Multidisciplinary collaboration between relevant healthcare professionals (such as surgery, nursing, pharmacy, and psychology), the community, and the family should be designed to guide thinking and practice in the context of MCCs.</p>	<p>Providing healthcare for people with MCCs is challenging. This research offers findings that may contribute to the development of a coping-based intervention. To promote health among people with MCCs, healthcare professionals should consider:</p> <ul style="list-style-type: none"> <li>• Actively coaching and teaching people with MCCs to obtain effective control over their chronic conditions by using positive coping strategies in preference to denial and disengagement strategies.</li> <li>• Restructuring illness perceptions among people with MCCs by providing concise information. Programs that alter timeline perceptions to be less cyclical and chronic, reduce perceptions of the severity of MCCs, increase the perceptions of believing in the current treatments of MCCs should be encouraged.</li> </ul>	<p>The relationship between coping and health in a person having MCCs is suggested to be dynamic because of the course of chronic health conditions. When people modify their appraisals of their chronic conditions, it may influence their coping and health-related outcomes. Further longitudinal studies are needed to assess the changing process of people's appraisals and ways of coping related to the health outcomes of MCCs over time. This work may help to obtain more details about people's coping as stressful situations change.</p> <p>There are many other important factors such as socio-cultural, emotional, cognitive and physical factors that can affect coping. Further research exploring potential factors that shape people's coping based on current theoretical frameworks and examining the relevance between these factors and coping with more advanced statistical approaches is necessary.</p>

Significance to policy	Significance to clinical practice	Significance to research
As there is a lack of guidelines that apply to complex chronic health conditions and a lack of evidence on how best to treat people with MCCs, policymakers should review the research evidence and make necessary adjustments prior to implementing a new intervention in different settings.	Healthcare professionals need an in-depth understanding of the complex physical and psychological needs of people with MCCs. They should be aware that people cope differently in different social contexts. A better understanding of coping may be gained from a knowledge of patients' cultural backgrounds.	This study was conducted in a mid-sized city in northern Anhui Province, China. Therefore, the findings may not be generalized to other parts of China or the Chinese people residing in other areas of the globe. More studies should be undertaken to verify the findings of this study across areas. Given the complexity of MCCs, large and robust sample sizes may contribute to improving the generalizability of findings. Also, future research should include participants with differing levels of literacy to ensure that the research outcomes reflect a more inclusive population.
	Healthcare professionals should provide related health information in ways that are easily understood by patients with low education levels and implement clear communication between them and patients for successful outcomes. Also, ensuring that people with MCCs in rural areas have access to adequate healthcare throughout their illness and recovery is important.	Cultural differences exist in questionnaire response patterns. Thus, the outcomes of a self-report survey might vary across different racial/ethnic populations. The present study used three scales: The Brief IPQ, the HADS, and the SF-12v2. These scales had been used in China with acceptable reliability but had not been fully validated in people with MCCs. Further validation of those instruments in this group is essential.

Table 8.2

*Significance of each paper/publication to prior knowledge*

Paper/publication	Extant literature	Significance to prior knowledge
Chapter 2 Coping with multiple chronic conditions: An integrative review	Comparatively few reviews have specifically examined coping in the context of MCCs.	This review underscores the significant role of coping in managing MCCs and identifies the relationship between coping and health-related outcomes. Age, gender, and clusters of MCCs affect significantly the choice of coping strategies among people with MCCs. Social support could be an important source for people's coping. People with MCCs may be inclined to use particular coping strategies according to their ethnicity and cultural backgrounds.
Chapter 2 Patients' experiences of coping with multiple chronic conditions: A meta-ethnography of qualitative work	Past studies of the lived experiences of people with a single chronic condition have contributed knowledge to this field. However, few attempts have been conducted to examine experiences relevant to MCCs in a coping context.	This review provides a collection of narratives on coping with MCCs. The findings recognise the daily stress experienced by people with MCCs and the complicating matters in their self-management. The findings potentially serve as a foundation for designing feasible interventions to more optimally manage the demands of living with MCCs.
Chapter 4 Psychometric properties of the Brief COPE in people with multiple chronic conditions	No previous study has psychometrically tested the Brief COPE inventory in people with MCCs.	This study provides a five-factor Chinese Brief COPE inventory with sound psychometric properties that has the potential for use to measure coping strategies in an Asian context.
Chapter 5 Illness perceptions, coping strategies, and quality of life in people with multiple chronic conditions	The relationship between illness perceptions, coping strategies and QoL among people with MCCs is unknown.	The relationship found between people's perceptions of chronic health conditions, coping strategies and QoL proposes that health professionals should recognise the physical and psychological effects of MCCs and address the importance of adaptations to MCCs in further treatment programs.

Paper/publication	Extant literature	Significance to prior knowledge
Chapter 5 Urban-rural differences in mental health among Chinese patients with multiple chronic conditions	There has been limited research into urban-rural disparities in mental health in Chinese people with MCCs.	This study highlights disparities in mental health among patients with MCCs living in urban and rural areas of China. Appropriate mental health support programs should be developed for patients with MCCs, especially for those living in rural areas.
Chapter 5 The relationship between coping strategies and psychological distress in Chinese older adults with multiple chronic conditions	The association between coping strategies and psychological distress among Chinese older adults with MCCs has not been investigated in past research.	This study calls for a special focus on routinely screening for negative moods such as depression and anxiety among older adults with MCCs. Individualised interventions that address coping strategies should be encouraged to maintain psychological health in older adults with MCCs.
Chapter 6 Patients' experiences of coping with multiple chronic conditions: A qualitative descriptive study	There is little evidence exploring people's experiences of coping with MCCs, especially in an Asian context.	This study illustrates that people cope with MCCs in everyday life by using a compendium of coping strategies. Culture dominates the ways of coping at different levels among Chinese people with MCCs.
Chapter 7 To understand coping strategies, illness perceptions, and quality of life among Chinese people with multiple chronic conditions: An explanatory sequential mixed methods study	Past research relies on a single design, while a mixed methods design enables researchers to comprehensively explore coping using different methods.	This study offers comprehensive knowledge of coping with MCCs by integrating quantitative and qualitative data. People with MCCs expressed higher emotional and cognitive concerns about MCCs, duration of MCCs, and management of MCCs and they might prioritize these conditions. Additional coping strategies were identified including using alternative treatments, changing lifestyles, and obtaining family support. Tailored interventions that alter timeline perceptions to be less cyclical and chronic, reduce perceptions of the severity of MCCs, increase the perceptions of believing in the current treatments of MCCs, and lessen maladaptive coping such as denial and disengagement may improve QoL in this population.

## 8.2 CONCLUSIONS

The current research provided a psychometrically sound instrument for evaluating coping strategies among Chinese people with MCCs. Findings of this research may serve as a basis for further psychometric studies on coping in the Chinese population, as well as a reference for cross-cultural coping research.

Informed by Lazarus's coping theory, this research provided new knowledge about how Chinese people perceived MCCs and the strategies they used, about how they exhibited impaired QoL in both physical and mental health domains and identified the vital role of coping in the explanation of individuals' health in this group. This work highlighted the importance of modifying patients' illness perceptions, as those cognitive and emotional responses may demonstrate a pathway to using many coping strategies and a potential approach of promoting the perceived health among people with MCCs. The identified associations between illness perceptions, coping strategies, socio-demographic variables, and clinical variables may support healthcare professionals in identifying coping-related resources useful to people with MCCs. Healthcare professionals may consider applying this information to design interventions to improve physical and psychological health among this population.

This research extended an existing understanding of how culture shapes Chinese individuals' coping in the context of MCCs by exploring people's coping strategies when managing MCCs. The significance of traditional Chinese medicine and family and social networks in coping for Chinese adults was emphasised. Comprehensive interventions with culture-based elements may help to reduce the suffering of people with MCCs.

This research identified differences in mental health between people with MCCs living in urban areas and those in rural areas of China. Factors such as increasing age,

unemployment status, lower educational level, more chronic health conditions were linked with worse mental health among people with MCCs. Therefore, policies that can reduce the health inequity between urban and rural areas should be developed, for example, to raise financial funding and offer social assistance to vulnerable sub-groups with MCCs as they may be exposed to worse QoL. There is no single way that will eliminate healthcare disparities among people with MCCs. In addition to policy development, local solutions should be developed so that a culturally competent healthcare system can be established, and quality care should be implemented for this population.



# Appendices

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## 1. QUESTIONNAIRES BOOKLET

### Survey-coping with multiple chronic conditions NO.

Version # 1, dated 29/09/2017

The survey will take about 30-40 minutes to complete.

You will be asked to complete the survey in the hospital. Alternatively, you can complete the survey at a time convenient to you.

Please complete the survey and return the survey to the researcher Mr. Cheng Cheng (049 1043 909).

The information you give us by completing this survey will help us to identify how care might be improved for people with multiple chronic conditions in the future. Your responses are anonymous and any information you give us will remain confidential. Survey completion is voluntary.

If you would like more information about the purpose of this survey please call Mr. Cheng Cheng (049 1043 909).

Thank you for taking the time to complete this survey

If you would like to be interviewed after the survey, please leave your name, phone/email etc. The researcher will contact you when appropriate.

Surname		Given name	
Phone:		Other contacts:	
Address:			

## Part 1 Demographic and clinical data

1. Age\_\_\_\_\_
2. Ethnicity/race\_\_\_\_\_
3. Household registration
  - ☐ Urban
  - ☐ Rural
4. Gender
  - ☐ Male
  - ☐ Female
5. Marital Status
  - ☐ Single, never married
  - ☐ Married
  - ☐ Widowed
  - ☐ Divorced
  - ☐ Separated
6. Education level
  - ☐ No schooling completed
  - ☐ Primary school level
  - ☐ Junior high school
  - ☐ Senior high school
  - ☐ Associate degree

☐ Bachelor degree or above

7. Income\_\_\_\_\_ (RMB/Month)

8. Social health insurance schemes

☐ Rural cooperative medical

☐ Urban employee-based

☐ Urban resident-based

9. Employment Status:

☐ Employed for wages

☐ Self-employed

☐ Out of work

☐ A student

☐ Retired

10. Status of multiple chronic conditions

Name	Duration
Name _____	Duration _____
Name _____	Duration _____
Name _____	Duration _____
Name _____	Duration _____
_____	_____

**Part 2 SF-12 Health Survey version 2 (Ware, QualityMetric Incorporated, New England Medical Center Hospital, & Health Assessment Lab., 2005)**

This survey asks for your views about your health. This information will help keep track of how you feel and how well you are able to do your usual activities. Answer each question by choosing just one answer. If you are unsure how to answer a question, please give the best answer you can.

1. In general, would you say your health is:					
	<input type="checkbox"/> Excellent	<input type="checkbox"/> Very good	<input type="checkbox"/> Good	<input type="checkbox"/> Fair	<input type="checkbox"/> Poor
The following questions are about activities you might do during a typical day. Does your health now limit you in these activities? If so, how much?					
		YES, limited a lot	YES, limited a little	NO, not limited at all	
2. Moderate activities such as moving a table, pushing a vacuum cleaner, bowling, or playing golf.		<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	
3. Climbing several flights of stairs.		<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	
During the past 4 weeks, have you had any of the following problems with your work or other regular daily activities as a result of your physical health?					
	All of the time	Most of the time	Some of the time	A little of the time	None of the time
4. Accomplished less than	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
5. Were limited in the kind of work or other activities.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
During the past 4 weeks, have you had any of the following problems with your work or other regular daily activities as a result of any emotional problems (such as feeling depressed or anxious)?					
	All of the time	Most of the time	Some of the time	A little of the time	None of the time
6. Accomplished less than you would like.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
7. Did work or activities less carefully than usual.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
8. During the past 4 weeks, how much did pain interfere with your normal work (including work outside the home and housework)?					
	Not at all	A little bit	Moderately	Quite a bit	Extremely
	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
These questions are about how you have been feeling during the past 4 weeks. For each question, please give the one answer that comes closest to the way you have been feeling. How much of the time during the past 4 weeks					

	All of the time	Most of the time	Some of the time	A little of the time	None of the time
9. Have you felt calm & peaceful?	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
10. Did you have a lot of energy?	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
11. Have you felt down-hearted and	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
12. During the past 4 weeks, how much of the time has your physical health or emotional problems interfered with your social activities (like visiting friends, relatives, etc.)?					
	All of the time	Most of the time	Some of the time	A little of the time	None of the time
	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5

### Part 3 Brief Coping Orientation for Problem Experiences Inventory (Brief COPE inventory) (Carver, 1997)

These items deal with ways you've been coping with the stress in your life since you found out you had more than one chronic conditions. Use these response choices. Try to rate each item separately in your mind from the others. Make your answers as true for you can.

#### Score:

1 = I haven't been doing this at all, 2 = I've been doing this a little bit, 3 = I've been doing this a medium amount, 4 = I've been doing this a lot

Items	1	2	3	4
1. I've been turning to work or other activities to take my mind off things.				
2. I've been concentrating my efforts on doing something about the situation I'm in.				
3. I've been saying to myself 'this isn't real.'				
4. I've been using alcohol or other drugs to make myself feel better.				
5. I've been getting emotional support from others.				
6. I've been giving up trying to deal with it.				
7. I've been taking action to try to make the situation better.				
8. I've been refusing to believe that it has happened.				
9. I've been saying things to let my unpleasant feelings escape.				
10. I've been getting help and advice from other people.				
11. I've been using alcohol or other drugs to help me get through it.				
12. I've been trying to see it in a different light, to make it seem more positive.				
13. I've been criticizing myself.				
14. I've been trying to come up with a strategy about what to do.				
15. I've been getting comfort and understanding from someone.				
16. I've been giving up the attempt to cope.				
17. I've been looking for something good in what is happening.				
18. I've been making jokes about it.				
19. I've been doing something to think about it less, such as going to movies, watching TV, reading, daydreaming, sleeping, or shopping.				
20. I've been accepting the reality of the fact that it has happened.				
21. I've been expressing my negative feelings.				
22. I've been trying to find comfort in my religion or spiritual beliefs.				
23. I've been trying to get advice or help from other people about what to do.				
24. I've been learning to live with it.				
25. I've been thinking hard about what steps to take.				
26. I've been blaming myself for things that happened.				
27. I've been praying or meditating.				
28. I've been making fun of the situation.				

For the following questions, please circle the number that best corresponds to your views:

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Please list in rank-order the three most important factors that you believe caused your illness. *The most important causes for me:-*

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_

**Part 5 Hospital Anxiety and Depression Scale (HADS) (Zigmond & Snaith, 1983)**

Tick the box beside the reply that is closest to how you have been feeling in the past week.

D	A		D	A	
		<b>I feel tense or 'wound up':</b>			<b>I feel as if I am slowed down:</b>
	3	Most of the time	3		Nearly all the time
	2	A lot of the time	2		Very often
	1	From time to time, occasionally	1		Sometimes
	0	Not at all	0		Not at all
		<b>I still enjoy the things I used to enjoy:</b>			<b>I get a sort of frightened feeling like 'butterflies' in the stomach:</b>
0		Definitely as much	0		Not at all
1		Not quite so much	1		Occasionally
2		Only a little	2		Quite Often
3		Hardly at all	3		Very Often
		<b>I get a sort of frightened feeling as if something awful is about to happen:</b>			<b>I have lost interest in my appearance:</b>
	3	Very definitely and quite badly	3		Definitely
	2	Yes, but not too badly	2		I don't take as much care as I should
	1	A little, but it doesn't worry me	1		I may not take quite as much care
	0	Not at all	0		I take just as much care as ever
		<b>I can laugh and see the funny side of things:</b>			<b>I feel restless as I have to be on the move:</b>
0		As much as I always could	3		Very much indeed
1		Not quite so much now	2		Quite a lot
2		Definitely not so much now	1		Not very much
3		Not at all	0		Not at all
		<b>Worrying thoughts go through my mind:</b>			<b>I look forward with enjoyment to things:</b>
	3	A great deal of the time	0		As much as I ever did
	2	A lot of the time	1		Rather less than I used to
	1	From time to time, but not too often	2		Definitely less than I used to
	0	Only occasionally	3		Hardly at all
		<b>I feel cheerful:</b>			<b>I get sudden feelings of panic:</b>
3		Not at all	3		Very often indeed
2		Not often	2		Quite often
1		Sometimes	1		Not very often
0		Most of the time	0		Not at all

		<b>I can sit at ease and feel relaxed:</b>			<b>I can enjoy a good book or radio or TV program:</b>
	0	Definitely	0		Often
	1	Usually	1		Sometimes
	2	Not Often	2		Not often
	3	Not at all	3		Very seldom

---

THANK YOU FOR YOUR PARTICIPATION!

THE END

日期： 年 月 日

编号（研究者填）： A

尊敬的参与者：

您好！

本问卷调查是用来了解您关于疾病的看法、感受、应对策略和生活质量等情况。

您所提供的信息将有助于医务工作者了解患者的看法、感受、应对策略和生活质量,从而为进一步改善患者的身心境况提供科学依据。

本研究自愿参与。如果您同意参加,请您填写下面的问卷,填写过程大概需要 20 分钟。

本问卷为匿名填写,不会侵犯您的隐私。所有资料将得到妥善保管,敬请放心。

非常感谢您的帮助！

### 第一部分 基本情况

请根据您的实际情况,在下面相应的方框内打“√”或在空白处填写文字。□□

11. 年龄： 岁

12. 身高： 厘米,体重： 公斤

13. 性别： ☐ 男性 ☐ 女性

14. 民族： ☐ 汉族 ☐ 其他

15. 婚姻状况： ☐ 未婚 ☐ 已婚 ☐ 离婚 ☐ 丧偶 ☐ 分居

16. 教育层次： ☐ 小学及以下 ☐ 初中 ☐ 高中 ☐ 大学及以上

17. 医保类型： ☐ 城镇居民医保 ☐ 城镇职工医保 ☐ 新农合 ☐ 其他

18. 工作状况： ☐ 全职工作 ☐ 个体经营 ☐ 无业 ☐ 退休

19. 月均收入水平： 元

20. 患病情况

疾病名称：	_____	确诊时间：	_____ 年 月
疾病名称：	_____	确诊时间：	_____ 年 月
疾病名称：	_____	确诊时间：	_____ 年 月
疾病名称：	_____	确诊时间：	_____ 年 月
疾病名称：	_____	确诊时间：	_____ 年 月
疾病名称：	_____	确诊时间：	_____ 年 月

## 第二部分 健康调查 12 条简表 (SF-12)

下面的问题是询问您对自己健康状况的看法、感觉以及您进行日常活动的能  
力。请在最符合您实际情况的答案上打“√”。

### 1.总体来说,您认为您现时的健康状况是:

- ☐ 非常好      ☐ 很好      ☐ 好      ☐ 一般 (不好不坏)      ☐ 差

以下各项是关于您日常生活中可能进行的活动。

以您目前的健康状况,您在进行这些活动时,有没有受到限制? 如果有的话,程度如何?

问题	有很大限制	有一点限制	没有任何限制
2.中等强度的活动,例如搬桌子、打扫或清洁地板、打保龄球、或打太极拳?			
3.是否影响您步行上楼?			

以下问题是关于您身体健康状况和日常活动的关系。

问题	常常如此	大部分时间	有时	偶尔	从来没有
4.在过去四个星期里,您是否因为身体健康的原因,在日常生活或工作中感到力不从心?					
5.在过去四个星期里的工作或日常活动中,您是否因为身体健康的原因而令您的工作或活动受到限制?					
6.在过去四个星期里,您是否因为情绪方面的原因(比如感到沮丧或者焦虑)而令您在工作或日常活动中感到力不从心?					
7.在过去四个星期的工作或日常活动中,您是否因为情绪方面的原因(比如感到沮丧或焦虑)而令您的工作或活动受到限制?					

### 8.在过去四个星期里,您身体上的疼痛对您的日常工作包括上班和家务有多大影响?

- ☐ 完全没有影响      ☐ 有很少影响      ☐ 有一些影响      ☐ 有较大影响      ☐ 有非常大的影响

以下问题是有关您在过去四个星期里的感觉情况。

问题	常常如此	大部分时间	有时	偶尔	从来没有
9.在过去四个星期里,您有多少时间感到心平气和?					
10.在过去四个星期里,您有多少时间感到精力充足?					

11.在过去四个星期里,您有多少时间觉得心情不好,闷闷不乐或沮丧?					
-----------------------------------	--	--	--	--	--

12.在过去四个星期里,有多少时间由于您身体健康或情绪问题而妨碍了您的社交活动（比如探亲、访友等）？

- ☐ 常常都有     
 ☐ 大部分时间有     
 ☐ 有时有     
 ☐ 偶尔有一次半次     
 ☐ 完全没有

### 第三部分 简易版 COPE 量表 (Brief COPE)

下面的题目是为了解以往当您感到有压力时,您采取过怎样的应对措施及频率。请依据您的真实情况作答,并且在相应一栏中打'√'。请不要根据您的有效性进行作答。

序号	题目	从不	偶尔	有时	多次
1	我埋头于工作或其他活动以忘记压力。				
2	我根据所处情境集中精力做该做的事。				
3	我跟自己说'这些不是真的'。				
4	我喝酒、服用药物,让自己感觉好一点。				
5	我从别人那里寻求情感支持。				
6	我放弃和压力抗争。				
7	我拿出行动,尽力让情况好转。				
8	我拒绝相信事情真的发生了。				
9	为了让不开心的感觉消失,我不停地说话。				
10	我从别人那里寻求帮助和建议。				
11	我喝酒或服用药物,帮助自己度过这段日子。				
12	我从另外一个更积极的角度看待压力。				
13	我批评我自己。				
14	我制定了接下来要怎样应对压力的策略。				
15	我从别人那里得到了同情和理解。				
16	我放弃了应对。				
17	我寻找事情好的一面。				
18	我拿压力来开玩笑。				
19	我做其他事,例如看电影、电视、读书、做白日梦、睡觉或者购物,从而让自己不去想有压力的事。				
20	我接受已经发生的事实。				
21	我表达出我的负面情绪。				
22	我努力从宗教和神灵信仰中寻求安慰。				
23	我尽力从别人那里得到建议或帮助。				
24	我学会了与压力共存。				
25	我努力去思考应该采取什么措施。				
26	我为发生的事情自责。				
27	我祈祷并沉思。				
28	我取笑现状。				

#### 第四部分 简易疾病感知问卷 (Brief IPQ)

下面的问题是为了了解您对于疾病的看法与感受。请您在最接近您真实情况的数字上画圈。数字从'0'到'10',程度逐渐增加,'0'代表毫无影响或程度最轻,'10'代表影响最大或程度最重。

1. 您的疾病对您的生活的影响有多大？										
0	1	2	3	4	5	6	7	8	9	10
毫无影响						严重影响				
2. 您认为您的疾病将持续多长时间？										
0	1	2	3	4	5	6	7	8	9	10
很短时间						永远				
3. 您感觉您能在多大程度上控制住您的疾病？										
0	1	2	3	4	5	6	7	8	9	10
绝对不能控制						有极大的控制力				
4. 您认为您接收的治疗（药物等）能在多大程度上对疾病有所帮助？										
0	1	2	3	4	5	6	7	8	9	10
毫无帮助						极其有帮助				
5. 您经受疾病引起的症状的程度有多大？										
0	1	2	3	4	5	6	7	8	9	10
毫无症状						很多严重症状				
6. 您有多关切您的疾病？										
0	1	2	3	4	5	6	7	8	9	10
毫不关切						极其关切				
7. 您感觉您在多大程度上了解自己的疾病？										
0	1	2	3	4	5	6	7	8	9	10
毫不了解						很清楚地了解				
8. 疾病在多大程度上影响您的情绪？（比如它是否让您生气、害怕、沮丧或忧郁？）										
0	1	2	3	4	5	6	7	8	9	10
毫无影响						极大影响				
<p>请按照顺序列出三个您认为导致您疾病的最重要的因素。</p> <p>对我来说最重要的病因是：</p> <p>1. _____</p> <p>2. _____</p> <p>3. _____</p>										

## 第五部分 医院焦虑抑郁量表 (HADS)

请您阅读以下各个项目,在其中最符合您近一个月内情绪的选项上打'√'。答题时无需考虑,以免影响结果的准确性。

1. 我感到紧张 (或痛苦)。  
(3)几乎所有时候 (2)大多数时候  
(1)有时 (0)根本没有
2. 我对以往感兴趣的事情还是有兴趣。  
(0)肯定一样 (1)不像以往那样多  
(2)只有一点儿 (3)基本上没有了
3. 我感到有点害怕,好像预感到有什么可怕事情要发生。  
(3)非常肯定和十分严重 (2)是有,但并不太严重  
(1)有一点,但并不使我苦恼 (0)根本没有
4. 我能够哈哈大笑,并看到事物好的一面。  
(0)我经常这样 (1)现在已经不大这样了  
(2)现在肯定是不太多了 (3)根本没有
5. 我的心中充满烦恼。  
(3)大多数时间 (2)常常如此  
(1)有时,但并不经常 (0)偶然如此
6. 我感到愉快。  
(3)根本没有 (2)并不经常  
(1)有时 (0)大多数时间
7. 我能够安闲而轻松地坐着。  
(0)肯定 (1)经常  
(2)并不经常 (3)根本没有
8. 我对自己的仪容 (打扮自己) 失去兴趣。  
(3)肯定 (2)并不像我应该做到的那样关心  
(1)我可能不是非常关心 (0)我仍像以往一样关心
9. 我有点坐立不安,好像感到非要活动不可。  
(3)确实非常多 (2)是不少  
(1)并不很多 (0)根本没有
10. 我对一切都是乐观地向前看。  
(0)差不多是这样做的 (1)并不完全是这样做的  
(2)很少这样做 (3)几乎从来不这样做
11. 我突然发现恐慌感。  
(3)确实很经常 (2)时常

(1)并非经常      (0)根本没有

12. 我好像感到情绪在渐渐低落。

(3)几乎所有的时间      (2)很经常

(1)有时      (0)根本没有

13. 我感到有点害怕,好像某个内脏器官变坏了。

(0)根本没有      (1)有时

(2)很经常      (3)非常经常

14. 我能欣赏一本好书或一项好的广播或电视节目。

(0)常常      (1)有时

(2)并非经常      (3)很少

—————问卷到此结束,感谢您的配合!—————

## 2. PARTICIPANT'S INFORMATION SHEET

# Information Statement-Coping with multiple chronic conditions

---



[Professor Sally Chan]  
[School of Nursing and Midwifery]  
[RW-139, Richard Wing, University Drive, Callaghan, NSW 2308 Australia]  
[+61 02 4921 7873]  
[Sally.Chan@newcastle.edu.au]

### **Information Statement for the Research Project: [Coping with multiple chronic conditions] Document Version [1]; dated [16/08/17]**

You are invited to participate in the research project identified above which is being conducted by [Mr. Cheng Cheng] from the [School of Nursing and Midwifery] at the University of Newcastle.

The research is part of [Mr. Cheng Cheng's] Doctor of Philosophy (PhD) at the University of Newcastle, supervised by [Professor Sally Chan and Associate Professor Kerry Inder] from the [School of Nursing and Midwifery].

This project has been funded by [China Scholarship Council].

#### ***Why is the research being done?***

The purpose of the research is explore the strategies and experience of coping for people with MCCs through a mixed methods study.

#### ***Who can participate in the research?***

You are invited to participate if you (1) Chinese adults (aged 18 years and older), (2) have two or more medically diagnosed chronic conditions, (3) can understand and speak Mandarin, and (4) understand and sign an informed consent.

Please note that you are ineligible to participate if you: (1) have health problems such as dysgnosia, logopathy, and cognitive impairment, (2) life expectancy less than one year due to a terminal disease according to the medical records.

#### ***What would you be asked to do?***

If you agree to participate, you will be asked to complete a survey about coping strategies, disease perception, status of disease, psychological symptoms, and quality of life.

Later in the study, you may also be asked to participate in an individual face to face interview where you can tell us your experience about the diseases.

***What choice do you have?***

Participation in this research is entirely your choice. Only those people who give their informed consent will be included in the project. Whether or not you decide to participate, your decision will not disadvantage you. If you do decide to participate, you may withdraw from the project at any time prior to submitting your completed survey. Please note that due to the anonymous nature of the survey, you will not be able to withdraw your response after it has been submitted.

Later in the study, you may be asked to participate in an individual face to face interview. The interview will be audio-recorded. If you choose to participate, you are free to stop the interview session at any time. Unless you say that you want us to keep the record, the information you have provided will not be included in the study results. You may also refuse to answer any questions that you do not wish to answer at any time during the interview.

***How much time will it take?***

The questionnaire should take about [15-20 minutes] to complete.

The interview should take about [30-40 minutes] to complete.

***What are the risks and benefits of participating?***

There are no anticipated risks associated with participating in this research.

The findings will help contribute to the available literature on the subject of coping with MCCs and will help to develop interventions for enhance coping skills among people with MCCs.

***How will your privacy be protected?***

*Data will be retained for at least 5 years* on the University of Newcastle's own Cloud secure server. Hard copy surveys will be stored in a locked filing cabinet in the Chief Investigator's office, audio recordings will be stored on the University of Newcastle's own Cloud secure server. Researchers will sign a confidentiality agreement for the transcribing of the interview data, data will be securely destroyed in line with UON policy provisions. For research conducted by University staff and students at least a copy of the data used for analysis is to be held at the University of Newcastle.

Due to the anonymous nature of the survey/questionnaire the responses you provide will not be identifiable.

***How will the information collected be used?***

The collected data [will contribute towards Mr. Cheng Cheng's PhD research] and may be presented in academic publications, journals or conferences. Non-identifiable data may also be shared with other parties to encourage scientific scrutiny and to contribute to further research and public knowledge, or as required by law.

It is expected that participants be offered at least a summary of the results written in lay language. It is not appropriate to provide them with, or refer them to, journal publications. If you would like a copy of the summary of the results, please email the Chief Investigator Sally Chan [Sally.Chan@newcastle.edu.au] after [12/31/2019].

Individual participants will not be named or identified in any reports arising from the project although individual anonymous responses may be quoted.

Non-identifiable data may be also be shared with other parties to encourage scientific scrutiny, and to contribute to further research and public knowledge, or as required by law.

### ***What do you need to do to participate?***

Please read this Information Statement and be sure you understand its contents before you consent to participate. If there is anything you do not understand, or you have questions, please contact the researcher.

If you would like to participate, please [complete and return the attached anonymous questionnaires] with the help of our researchers. You may be invited to an interview by the researchers after the survey.

### ***Further information***

If you would like further information please contact [Mr. Cheng Cheng, phone: 049 1043 909 or Email: ccheng1@uon.edu.au].

Thank you for considering this invitation.

[Signature]

[Name: Professor Sally Chan]  
[Chief Investigator]

[Name: Mr. Cheng Cheng]  
[Student Researcher]

### ***Complaints about this research***

This project has been approved by the University's Human Research Ethics Committee and the participating hospital, Approval No. H-2017-0378.

Should you have concerns about your rights as a participant in this research, or you have a complaint about the manner in which the research is conducted, it may be given to the researcher, or, if an independent person is preferred, to the Human Research Ethics Officer, Research Services, NIER Precinct, The University of Newcastle, University Drive, Callaghan NSW 2308, Australia, telephone (02) 49216333, email [Human-Ethics@newcastle.edu.au](mailto:Human-Ethics@newcastle.edu.au).

# 声明信息-多重慢性病的应对

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[Sally Chan 教授]  
[护理与助产学院,纽卡斯尔大学]  
[RW-139, Richard Wing, University Drive, Callaghan, NSW 2308 Australia]  
[+61 02 4921 7873]  
[Sally.chan@newcastle.edu.au]

项目信息声明:  
[多重慢性病的应对]  
文件版本 [1]; 日期 [16/08/17]

您好!

我们诚挚地邀请您参加一项由纽卡斯尔大学护理与助产学院博士研究生程骋负责的研究。

此项研究是纽卡斯尔大学护理与助产学院博士研究生程骋课题的一部分,并由护理与助产学院 Sally Chan 教授和 Kerry Inder 副教授指导。

此项研究由中国国家留学基金委资助。

## 研究目的?

此项研究是通过混合研究方法,了解中国多重慢性病患者对于疾病的应对策略和探索其应对体验。

## 研究对象?

参与者需要满足以下条件:

(1) 中国公民(18 岁以上), (2) 患有两种或两种以上的慢性病, (3) 可以使用中文阅读和沟通交流, (4) 理解并签署知情同意书。

以下人员不适宜参加此项研究:

(1) 患有智力障碍,言语障碍或认知功能不全, (2) 处于生命终末期。

## 研究内容?

如果您同意参加,您将会被要求填写一份关于您应对策略、疾病认知、心理状况及生活质量的问卷。

在研究的后半段,我们有可能邀请你参与一项面对面的访谈,其内容有关于您的疾病体验。

## 您的选择?

此项研究完全自愿参与,我们只纳入签署知情同意书的参与者。您是否参与,都不会影响您今后接受到的治疗与服务。如果您决定参与,您也可以在研究的任何阶段退出。同时,整个过程将保持匿名,您的个人信息将得到妥善保管。请注意:当您完成并提交问卷后,因为匿名关系,您的退出申请将不被受理。

在研究的后半部分,我们可能会邀请部分参与进行一项面对面的访谈,我们将对访谈内容进行录音。如果您愿意参与,您可以在访谈的任何阶段退出。您所提供的个人信息将被妥善保管,同时您可以拒绝回答您不愿意涉及的问题。

**所需时间?**

完成问卷调查约需要 15 到 20 分钟时间。

后续的访谈约需要 30 到 40 分钟时间。

**风险与好处?**

参加此项研究对您没有风险。

此项研究结果有助于帮助医护人员了解慢性病患者如何应对疾病,从而帮助他们更好的为患者制定有效的干预措施,从而提高其生活质量。

**隐私问题?**

所有数据将被上传至纽卡斯尔大学云端数据库妥善保存 5 年。其中,纸质资料将被存至研究者的个人资料保险柜,同时语音资料将被上传至纽卡斯尔大学云端数据库。所有资料将根据纽卡斯尔大学相关政策进行销毁。

根据匿名要求,您关于个人资料的查询将无法进行,敬请放心。

**资料使用?**

所有收集而来的资料将用于完成程骋的博士研究课题,结果可能会发表在学术刊物及会议论文中。同时匿名资料可能被用于未来研究中。

如果需要,参与者将得到一份研究结果的说明。

如果有需要或更多要求,请于 2019 年 12 月后咨询程骋 [ccheng1@uon.edu.au]。

在整个研究过程中,参与者将全程匿名。任何个人资料将以编号形式呈现。

**您需要做什么?**

请您仔细阅读这项声明并确保了解每项内容。如果有任何问题,请及时联系我们的研究者以便解释说明。

如果您愿意参与,请在我们的研究者的帮助下完成调查。同时,您有可能会被邀请参加后续的访谈。

**更多信息**

如果您需要更多信息,请通过以下方式联系我们的研究者  
程骋

电话: 18255245869

邮件: ccheng1@uon.edu.au.

感谢您的支持与参与!

[Signature]

[Sally Chan 教授]  
[首席专家]

[程骋]  
[学生调查者]

投诉与质询

此项研究通过纽卡斯尔大学伦理委员会审查和参与机构认可,编号: H-2017-03178

作为参与者,如果您对本项研究有任何投诉与质询,请联系我们的研究者或与纽卡斯尔大学伦理委员会,我们的联系方式是: Human Research Ethics Officer, Research Services, NIER Precinct, The University of Newcastle, University Drive, Callaghan NSW 2308, Australia, 电话: (02) 49216333, 邮件: Human-Ethics@newcastle.edu.au.

### 3. PARTICIPANT'S CONSENT FORM

## Consent Form – Coping with multiple chronic conditions

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[Consent Form – Coping with multiple chronic conditions]

[Professor Sally Chan]  
[School of Nursing and Midwifery]  
[RW-139, Richard Wing, University Drive, Callaghan, NSW 2308 Australia]  
[+61 02 4921 7873]  
[Sally.Chan@newcastle.edu.au]



#### **Consent Form for the Research Project:**

**[Coping with multiple chronic conditions]**  
**[Professor Sally Chan (Chief Investigator and Project Supervisor),**  
**Mr. Cheng Cheng (Student Investigator),**  
**Associate Professor Kerry Inder (Co-Investigator)]**  
Document Version [1]; dated [16/08/17]

I agree to participate in the above research project and give my consent freely.

I understand that the project will be conducted as described in the Information Statement, a copy of which I have retained.

I understand I can withdraw from the project at any time, and do not have to give any reason for withdrawing.

Please tick the box/boxes of the activities that you agree to participate in this research project.

I consent to

- ☐ Completing a questionnaire;
- ☐ Participating in an interview;
- ☐ Allowing the researchers to access my medical records to extract information on my medical history, diagnosis, and treatment.

I understand that my personal information will remain confidential to the researchers.

I have had the opportunity to have questions answered to my satisfaction.

**Print Name:** \_\_\_\_\_

**To participate in the further interview after the questionnaire survey I can be contacted by**

**Phone:**

**Email:**  
**Other:**

**Signature:** \_\_\_\_\_ **Date:** \_\_\_\_\_

# 知情同意书 – 多重慢性病的应对

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[知情同意书-多重慢性病的应对]

[Sally Chan 教授]

[护理与助产学院,纽卡斯尔大学]

[RW-139, Richard Wing, University Drive, Callaghan, NSW 2308 Australia]

[+61 02 4921 7873]

[Sally.chan@newcastle.edu.au]



## 知情同意书-多重慢性病的应对

[Sally Chan 教授 (首席专家、项目指导),  
程骋 (学生研究者),  
Kerry Inder 副教授 (协同研究者)]  
文件版本[1]; 日期[16/08/17]

我同意参加此项研究。

我理解声明中关于此项研究的各个条目。

我明白我可以在研究的任何时间段退出,并且无须给出任何理由。

请您选择您愿意参加的研究项目,

我同意:

- ☐ 完成一份问卷调查;
- ☐ 参与一项访谈 (在问卷调查之后);
- ☐ 允许研究者知晓并查阅我的就诊资料及与此项研究相关的信息 (仅限本次就诊)。

我明白我的个人信息将会得到充分的保密。

我保留质询的权利。

姓名: \_\_\_\_\_

我愿意参加后续的访谈项目,请使用以下方式与我联系,

电话:

邮件:

其他:

签名: \_\_\_\_\_ 日期: \_\_\_\_\_

#### 4. SEMI-STRUCTURED INTERVIEW PROTOCOL

##### Interview Protocol-Coping with MCCs

Before the interview

Introduction and greeting.

Reiteration of participation options (withdrawal etc.), organize consent form and ask for permission to start audio-recording.

Essential information

Demographic data

Age		Gender		Occupation	
Health insurance		Marital status		Education	

Clinical data

MCCs		Duration (Y)	
MCCs		Duration (Y)	
MCCs		Duration (Y)	

Disease level

Please describe the chronic conditions you are experiencing?

How do you feel these chronic conditions?

How do these chronic conditions impact your life...?

Since you have mentioned the impacts of A, how about B and/or C?

Coping strategy level

What you have tried to do to help cope with these conditions or cope with the impact these conditions have on your life? Please describe the coping strategies that you have tried?

How do you manage your conditions?

Any help from your family?

Any help from some other aspects?

What is the biggest problem you have encountered in trying to cope with your MCCs?

What types of information or skills do you think would be most beneficial for you?

Is there anything else you would like to share with us?

Thanks

Thank the participant and ask if they wish for feedback in the form of a summary of findings.

-----End-----

## 5. ETHICAL APPROVAL

### HUMAN RESEARCH ETHICS COMMITTEE



#### Notification of Expedited Approval

To Chief Investigator or Project Supervisor:	Professor Sally Chan
Cc Co-investigators / Research Students:	Mr Cheng Cheng Doctor Kerry Inder
Re Protocol:	Coping with multiple chronic conditions: a mixed methods study
Date:	15-Mar-2018
Reference No:	H-2017-0378
Date of Initial Approval:	14-Mar-2018

Thank you for your **Response to Conditional Approval** submission to the Human Research Ethics Committee (HREC) seeking approval in relation to the above protocol.

Your submission was considered under **Expedited** review by the Chair/Deputy Chair.

I am pleased to advise that the decision on your submission is **Approved** effective **14-Mar-2018**.

In approving this protocol, the Human Research Ethics Committee (HREC) is of the opinion that the project complies with the provisions contained in the National Statement on Ethical Conduct in Human Research, 2007, and the requirements within this University relating to human research.

Approval will remain valid subject to the submission, and satisfactory assessment, of annual progress reports. *If the approval of an External HREC has been "noted" the approval period is as determined by that HREC.*

The full Committee will be asked to ratify this decision at its next scheduled meeting. A formal *Certificate of Approval* will be available upon request. Your approval number is **H-2017-0378**.

**If the research requires the use of an Information Statement, ensure this number is inserted at the relevant point in the Complaints paragraph prior to distribution to potential participants** You may then proceed with the research.

For Noting

#### 1. Interview Schedule

a. Please ensure the interview schedule includes the current University of Newcastle logo, version number, date, title of the project and any necessary instructions prior to recruitment.

#### Conditions of Approval

This approval has been granted subject to you complying with the requirements for *Monitoring of Progress, Reporting of Adverse Events*, and *Variations to the Approved Protocol* as detailed below.

#### PLEASE NOTE:

In the case where the HREC has "noted" the approval of an External HREC, progress reports and reports of adverse events are to be submitted to the External HREC only. In the case of Variations to the approved protocol, or a Renewal of approval, you will apply to the External HREC for approval in the first instance and then Register that approval with the University's HREC.

- **Monitoring of Progress**

Other than above, the University is obliged to monitor the progress of research projects involving human participants to ensure that they are conducted according to the protocol as approved by the HREC. A progress report is required on an annual basis. Continuation of your HREC approval for this project is conditional upon receipt, and satisfactory assessment, of annual progress reports. You will be advised when a report is due.

- **Reporting of Adverse Events**

1. It is the responsibility of the person **first named on this Approval Advice** to report adverse events.
2. Adverse events, however minor, must be recorded by the investigator as observed by the investigator or as volunteered by a participant in the research. Full details are to be documented, whether or not the investigator, or his/her deputies, consider the event to be related to the research substance or procedure.
3. Serious or unforeseen adverse events that occur during the research or within six (6) months of completion of the research, must be reported by the person first named on the Approval Advice to the (HREC) by way of the Adverse Event Report form (via RIMS at <https://rims.newcastle.edu.au/login.asp>) within 72 hours of the occurrence of the event or the investigator receiving advice of the event.
4. Serious adverse events are defined as:
  - Causing death, life threatening or serious disability.
  - Causing or prolonging hospitalisation.
  - Overdoses, cancers, congenital abnormalities, tissue damage, whether or not they are judged to be caused by the investigational agent or procedure.
  - Causing psycho-social and/or financial harm. This covers everything from perceived invasion of privacy, breach of confidentiality, or the diminution of social reputation, to the creation of psychological fears and trauma.
  - Any other event which might affect the continued ethical acceptability of the project.
5. Reports of adverse events must include:
  - Participant's study identification number;
  - date of birth;
  - date of entry into the study;
  - treatment arm (if applicable);
  - date of event;
  - details of event;
  - the investigator's opinion as to whether the event is related to the research procedures; and
  - action taken in response to the event.
6. Adverse events which do not fall within the definition of serious or unexpected, including those reported from other sites involved in the research, are to be reported in detail at the time of the annual progress report to the HREC.

- **Variations to approved protocol**

If you wish to change, or deviate from, the approved protocol, you will need to submit an *Application for Variation to Approved Human Research* (via RIMS at <https://rims.newcastle.edu.au/login.asp>). Variations may include, but are not limited to, changes or additions to investigators, study design, study population, number of participants, methods of recruitment, or participant information/consent documentation. **Variations must be approved by the (HREC) before they are implemented** except when Registering an approval of a variation from an external HREC which has been designated the lead HREC, in which case you may proceed as soon as you receive an acknowledgement of your Registration.

#### Linkage of ethics approval to a new Grant

HREC approvals cannot be assigned to a new grant or award (ie those that were not identified on the application for ethics approval) without confirmation of the approval from the Human Research Ethics Officer on behalf of the HREC.

Best wishes for a successful project.

Associate Professor Helen Warren-Forward  
**Chair, Human Research Ethics Committee**

*For communications and enquiries:*

**Human Research Ethics Administration**

Research & Innovation Services

Research Integrity Unit

The University of Newcastle

Callaghan NSW 2308

T +61 2 492 17894

[Human-Ethics@newcastle.edu.au](mailto:Human-Ethics@newcastle.edu.au)

RIMS website - <https://RIMS.newcastle.edu.au/login.asp>

**Linked University of Newcastle administered funding:**

Funding body	Funding project title	First named investigator	Grant Ref
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## 6. PUBLISHER PERMISSION

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Cheng, C., Inder, K. and Chan, S. W. (2020), Coping with multiple chronic conditions: An integrative review. *Nursing & Health Science*.  
doi:10.1111/nhs.12695

Cheng, C., Inder, K., & Chan, S. W. (2019). Patients' experiences of coping with multiple chronic conditions: A meta-ethnography of qualitative work. *International Journal of Mental Health Nursing*, 28(1), 54–70.  
doi:10.1111/inm.12544

Cheng, C., Yang, C. Y., Inder, K., and Chan, S. W. (2020). Illness perceptions, coping strategies, and quality of life in people with multiple chronic conditions. *Journal of Nursing Scholarship*, 52(2), 145–154. doi:10.1111/jnu.12540

Cheng, C., Yang, C. Y., Inder, K., & Chan, S. W. (2019). Urban-rural differences in mental health among Chinese patients with multiple chronic conditions. *International Journal of Mental Health Nursing*, 29(2), 224–234.  
doi:10.1111/inm.12666

Cheng, C., Bai, J., Yang, C. Y., Li, M., Inder, K., & Chan, S. W. (2019). Patients' experiences of coping with multiple chronic conditions: A qualitative descriptive study. *Journal of Clinical Nursing*, 28(23/24), 4400–4411.  
doi:10.1111/jocn.15022

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## Coping with multiple chronic conditions: An integrative review

Cheng Cheng PhD candidate, MSc<sup>1,2</sup> | Kerry Inder PhD, RN<sup>1,3</sup> | Sally Wai-Chi Chan PhD, RN, FAAN<sup>3,4</sup>

<sup>1</sup>School of Nursing and Midwifery, The University of Newcastle, Callaghan, New South Wales, Australia

<sup>2</sup>Department of Nursing, Bengbu Medical College, Bengbu, China

<sup>3</sup>Hunter Medical Research Institute, New Lambton Heights, New South Wales, Australia

<sup>4</sup>The University of Newcastle Singapore, Singapore, Singapore

### Correspondence

Cheng Cheng, RW2-56 Richardson Wing, University Drive, Callaghan, NSW 2308 Australia.  
Email: ccheng1@uon.edu.au

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### Abstract

There is a paucity of summarized evidence concerning coping with multiple chronic conditions. An integrative review approach was used to synthesize current evidence on: (i) coping in forms of perceptions and strategies, (ii) relationship between coping and health-related outcomes, and (iii) factors related to coping. Five electronic databases were searched without time limitation. Thirty-two studies met inclusion criteria and were included for full-text review: 24 qualitative, seven quantitative, and one mixed-methods study. Studies were assessed for quality using an appraisal system of rigor and relevance. A constant comparison method was used to synthesize findings from eligible studies. This review synthesized perceptions of multiple chronic conditions involving negative moods and physical limitations, and strategies of coping with multiple chronic conditions including problem- and emotion-focused strategies. Findings suggested that coping is a promising path to manage multiple chronic conditions and emphasized that appropriate coping might have positive impacts on health-related outcomes. Five impact factors including age, gender, clusters of multiple chronic conditions, social support, and ethnicity and culture were associated with people's coping. Future healthcare plans should address the physical and psychological needs of people with multiple chronic conditions and highlight the importance of modifying their illness perceptions and enhancing appropriate coping strategies.

### KEYWORDS

adaptation, coping, multimorbidity, multiple chronic conditions

## 1 | INTRODUCTION

### 1.1 | Multiple chronic conditions

Most people with chronic health conditions have more than one condition. Multiple chronic conditions (MCCs) are defined as two or more coexisting chronic conditions in the same person (Benjamin, 2010). MCCs represent physical conditions such as asthma, diabetes, and hypertension, as well as mental and cognitive disorders such as anxiety, addictive behavior, and dementia (Parekh, Goodman, Gordon, & Koh, 2011).

MCCs are becoming increasingly prevalent worldwide. More than 25% of adults in the United States (US) reported having more than two chronic health conditions (Ward, Schiller, & Goodman,

2014). The Australia National Health Survey (2014–2015) showed that about 50% of Australians had a chronic condition, of which around 20% of respondents reported at least two chronic conditions (Australian Institute of Health and Welfare, 2016). MCCs are more common in the older population compared with the general population. A systematic review indicated the prevalence of MCCs ranged from 20 to 30% for the whole population and from 55 to 98% for populations older than 65 years (Marengoni et al., 2011). The high prevalence of MCCs is mostly attributed to the increasing prevalence of chronic conditions and increasing life expectancy (Vancampfort et al., 2017). This high prevalence of MCCs is one of the most crucial public health concerns faced by the healthcare system worldwide (Salisbury, 2012).

People with MCCs may be overwhelmed by many challenges posed by their chronic conditions. These challenges can be triggers of significant stress and are affected by stress in other areas of individuals' lives. People with MCCs may experience physical, psychosocial, and spiritual challenges that lead to deterioration of their health status. A literature review synthesized seven common challenges experienced by people with MCCs, which included fragmented healthcare, multiple medications, adherence to treatment, psychological distress, loss of function, decreased quality of life (QoL), and increased healthcare utilization (Wallace et al., 2015). Caregivers may also be adversely affected by the burden of providing health and social care for their care recipients with MCCs (Andersson, Ekwall, Hallberg, & Edberg, 2010).

## 1.2 | The transactional theory of stress and coping

Managing stress such as MCCs requires individuals to resolve a stressful situation and deal with any emotional reactions triggered by the situation—that is, individuals with MCCs need to learn how to cope with their chronic health conditions. The transactional theory of stress and coping developed by Lazarus and Folkman (1984) is a framework that focuses on individuals' appraisals to assess stress (primary appraisal), which leads to the process of coping (secondary appraisal). According to Lazarus and Folkman (1984), the primary appraisal is a process of assessing how stressful an event is for a person, whereas secondary appraisal is a dynamic process with cognitive appraising and behaviour tailoring: an individual's active adjustment to internal and/or external changes (stress).

The secondary appraisal, known as coping, is referred to as an individual's changing cognitive and behavioral efforts to manage a stressful situation that exceeds one's capacity according to the transactional theory of stress and coping (Lazarus, 1966; Lazarus & Folkman, 1984). The transactional theory proposes that individuals normally cope with stress using problem-focused coping strategies and emotion-focused coping strategies (Lazarus & Folkman, 1984). Problem-focused coping represents strategies to reduce the source of the stress, whereas emotion-focused coping is aimed at managing the emotions that come with the perception of stress (Lazarus & Folkman, 1984). More precisely, people use problem-focused coping strategies to manage the cause of the stressor, including tackling problems, taking medication for health conditions, and obtaining social support. On the other hand, people manage the harmful emotional responses caused by stress (such as fear, distress, and frustration), by using emotion-focused coping strategies (such as distraction, prayer, and emotion releasing). Individuals usually deal with stress by adopting both problem-focused and emotion-focused coping strategies.

Both theoretical and empirical literature shows a strong link between coping and people's physical and psychological health. For example, Li and Shun (2016) conducted a systematic review and found that emotion-focused coping with acceptance, and disavowal together with problem-focused coping might promote self-care activities among people with chronic heart failure. Self-management

programs informed by coping theories have been designed to facilitate coping in people with chronic health conditions. Examples include, helping to improve the understanding of diseases and their treatment (Nahlen Bose et al., 2016), fostering coping strategies for dealing with stress (such as emphasizing the roles of cognitive appraisal and coping strategies to keep a positive attitude and respond to stressful situations in a more positive way) (Ye, Yu, Zhu, Chen, & Lin, 2018), and managing symptoms (such as developing a behavior-tailoring plan to increase access to psychological treatment) (Bennell et al., 2016).

## 1.3 | The present review

Existing evidence supports the significant role of coping in explaining physical health and psychological well-being among people with chronic conditions. However, most studies investigated one single chronic condition because most clinical practice guidelines were designed for the management of individual conditions (Millar, Dowell, Lawrenson, Mangin, & Sarfati, 2018). Even though the coping theory has been applied in research on chronic health conditions in different ways, evidence about coping in the context of MCCs is limited. Given the prevalence of MCCs globally, a review of the current evidence on how people cope with MCCs is necessary to better understand the process of adaptation to MCCs and to advise further research on MCCs. Moreover, past reviews on coping and chronic health conditions mainly investigated the associations between the use of coping strategies and health but lacked a focus on the primary appraisals in people's coping (Graven & Grant, 2013). As a result, informed by Lazarus's coping theory, this review intended to underscore the importance of two core components in the framework of coping and stress: primary appraisals and coping; and identify the influence of coping on health-related outcomes in people with MCCs and factors that may impact individuals' coping.

In this review, primary appraisals were conceptualized as an individual's perceptions that assess whether what is happening could be stressful, harmful, or threatening, and coping refers to strategies that people adopt to manage feelings and behavior encountered during various stages of managing MCCs. Health-related outcomes include quantity of life (e.g. mortality), process-based health outcomes (e.g. readmission rates), QoL includes physical, mental, and social dimensions, and satisfaction with healthcare services (Sansoni, 2016). Factors relevant to coping include sociodemographic factors (e.g. age and gender), characteristics of MCCs (e.g. stage of disease), and available support and information, self-efficacy, and empowerment (Gage, 1992).

## 2 | METHODS

An integrative review approach was chosen because it allows the inclusion of both empirical and theoretical studies to explore the phenomenon of coping with MCCs using diverse methodologies

and perspectives (Whittemore & Knafl, 2005). A five-step procedure proposed by Whittemore and Knafl (2005) was followed: (i) identifying the research questions, (ii) conducting a comprehensive literature search, (iii) examining the collected data, (iv) synthesizing the extracted data, and (v) reporting the findings.

## 2.1 | Review questions

The review questions were: (i) What are perceptions of chronic health conditions among people with MCCs? (ii) What strategies are adopted by people with MCCs to cope with their chronic health conditions? (iii) What are the associations between coping and health-related outcomes among people with MCCs? and (iv) What are the potential impact factors regarding coping in this population?

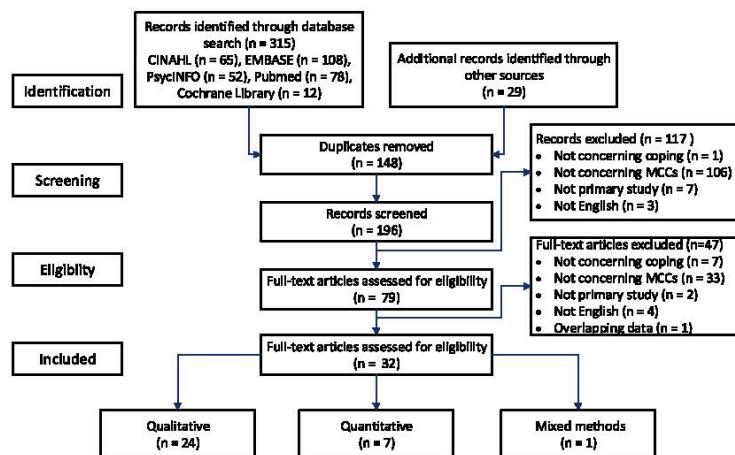
## 2.2 | Search methods

The search strategy developed by a prior integrative review on coping and health outcomes in people with chronic diseases (Graven & Grant, 2013) guided this review. An electronic search was conducted in five electronic databases: PubMed, CINAHL, EMBASE, Cochrane Library, and PsycINFO. No restrictions were applied to the publication period. Keywords used were: "appraisal-focused," "problem-focused," "emotion-focused," "occupation-focused," "meaning-focused," "coping," "coping behavior," "coping strategy," "coping style," "coping model," and "coping pattern." Combined keywords used were: "multiple chronic conditions,"

"multiple chronic diseases," "multiple chronic illnesses," "comorbidity," "multimorbidity," "chronic conditions," "chronic diseases," and "chronic illness." Reference lists of selected literature were searched to identify potential studies and an additional search of a relevant journal (*Journal of Comorbidity*) was undertaken to minimize missing relevant literature.

Studies that met the following criteria were eligible: (i) investigated aspects of coping and MCCs, (ii) focused on adult patients aged 18 years and older, (iii) published in English, and (iv) based on original research. Published editorials, discussions, commentaries, opinions, views, or textbooks, unpublished manuscripts (abstract, poster, and conference oral report), and papers that focused on patients under 18 years old were excluded. The first author read titles and abstracts of each paper and made the decision to include papers in the review according to the above criteria. Another two reviewers checked the accuracy of the inclusion. All disagreements were resolved by regular meetings with all authors.

The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) diagram (Moher, Liberati, Tetzlaff, Altman, & Group, 2009) is presented to show the study selection process (see Figure 1). A checklist guided the screening process to determine study eligibility (see Screening checklists). The initial search identified 315 references: CINAHL ( $n = 65$ ), EMBASE ( $n = 108$ ), PsycINFO ( $n = 52$ ), PubMed ( $n = 78$ ), and Cochrane Library ( $n = 12$ ). The additional search of reference lists identified 29 studies. Following the removal of duplicates ( $n = 148$ ), the titles, abstracts, and keywords of 196 studies were screened for relevance. Studies that did not meet the inclusion criteria were removed ( $n = 117$ ). The remaining studies ( $n = 79$ ) were retrieved in full-text and checked for eligibility, with additional studies ( $n = 47$ ) removed as they were not eligible. Thirty-two studies remained for the final analytical stage.



**FIGURE 1** Preferred reporting items for systematic reviews and meta-analyses (PRISMA) flow diagram for search strategy on multiple chronic conditions (MCCs) and coping (Moher, Liberati, Tetzlaff, Altman, & group, 2009)

## 2.3 | Data examination

This review examined eligible studies using a two-criterion scale of research quality (high, moderate, or low) and data relevance (yes or no), which is suggested by Whittemore and Knafl (2005). For research rigor, a quality scoring system was adapted from a past integrative review (Loureiro, Figueiredo, & Charepe, 2019) supplemented by new items including ethical issues, rigor of data collection, and analysis, interpretation, and research implications (see Table S1). Quality scores ranged from 0 to 7 ("Yes" = 1 and "Unclear/No" = 0) and were summarized into three categories: low quality (0–3); moderate quality (4–5); and high quality (6–7). Data relevance was checked by three questions about whether the study focused on: (i) coping by adults with MCCs, (ii) potential associations between coping strategies and health-related outcomes, and (iii) potential factors related to coping. A study was considered relevant if at least one of the three questions was assigned a "yes." A high score indicates a high quality of research and strong evidence contributing to the current review. Studies with low quality (0–3) or irrelevant data would be excluded. However, no study was excluded from this review. Eligibility was checked and any discrepancy was deliberated until consensus was reached.

## 2.4 | Data extraction and synthesis

Data were extracted from the included studies to describe their characteristics and key findings into a comprehensive matrix. The first author did the initial extraction, and the others checked the accuracy. Extracted data included information on the citation, place of study, design, aim, sample, MCCs clusters, data collection/measures, and key findings.

A constant comparison method was used to order, code, and summarize the primary data from the included literature. This method is a data-analytic procedure where each finding is compared with existing findings (Lewis-Beck, Bryman, & Liao, 2004). The collected data is broken down into distinct "units" and those "units" are then coded into categories. The present review adhered to a four-step process: (i) comparing incidents applicable to each category, (ii) integrating categories and their properties, (iii) delimiting the theory, and (iv) writing the theory (Miles & Huberman, 1994). The first author coded every incident in eligible studies that aligned with the formulated research questions into categories. Each incident in a category was compared with prior incidents in the same categories and possible differences between incidents were noted. Generated categories were refined by repeating coding several times and the relationship between categories were explored. Finally, categories were integrated and presented in a logical way as per the research aims. Irrelevant categories (e.g. not covered by research questions) were excluded.

## 2.5 | Findings presentation

This last step of the review procedure was to present the findings, addressing the topics that contribute to answering the research questions.

## 3 | RESULTS

### 3.1 | Study characteristics

There were 32 eligible studies: 24 qualitative studies, seven quantitative studies, and one mixed-methods study. Studies originated from: US ( $n = 12$ ), Australia ( $n = 5$ ), Sweden ( $n = 4$ ), United Kingdom ( $n = 4$ ), Belgium ( $n = 1$ ), Botswana ( $n = 1$ ), Canada ( $n = 1$ ), Germany ( $n = 1$ ), Iran ( $n = 1$ ), Jordan ( $n = 1$ ), and New Zealand ( $n = 1$ ). The publication period ranged from 1990 to 2018. Characteristics of included studies were presented in Table S2 and key findings of these studies were shown in Table S3.

There were 24 qualitative studies included in this review: of 18 studies used a descriptive qualitative approach, three used a phenomenological approach, two adopted a grounded theory approach, and one was a case analytical study. The majority used semi-structured interviews, field notes, and diaries to collect data with sample sizes ranging from six to 48. Included studies focused on different stages of MCCs from diagnosis to long-term experiences.

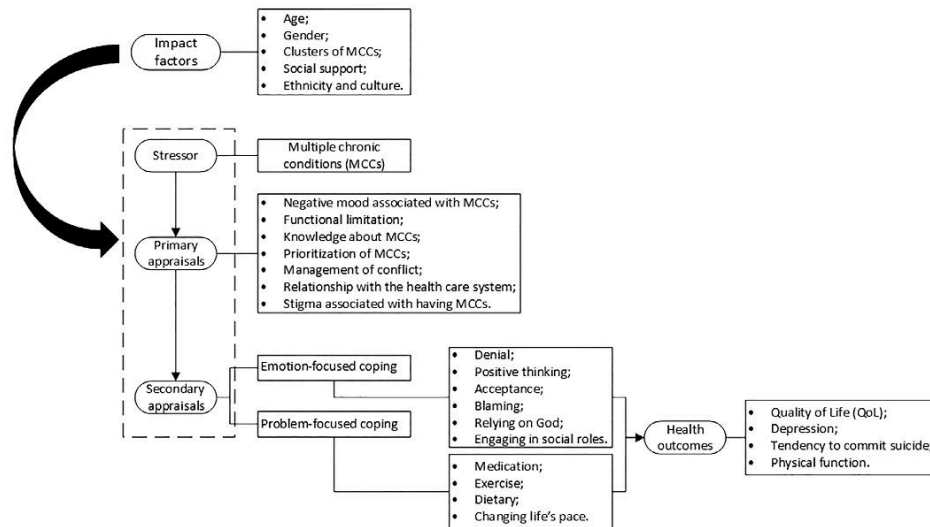
Of the seven quantitative studies included, six adopted a cross-sectional design and one adopted a single group pre/post-intervention design. The sample size ranged from 62 to 3,570. Five focused on outcomes of coping among people with MCCs (Assari, 2014; Di Benedetto et al., 2014; Kristofferzon, Engstrom, & Nilsson, 2018; Safa, Boroujerdi, Talischi, & Masjedi, 2014; Smith, Strachan, & Buchwald, 2009), one investigated the status of adopting different coping strategies (Lind et al., 2015), and one was a coping-based intervention pilot study (Holloway et al., 2018).

One study adopted a mixed-methods design, although only the qualitative phase described coping (Whiting, Scammell, Gray, Schepers, & Bifulco, 2006). A questionnaire survey was administered to 389 participants with type 2 diabetes and examined depression, life-threatening experiences, and self-care and activities.

An illustration can provide a visual explanation of a text and work as a starting point for the interpretation of an integrative review (Whittemore & Knafl, 2005). A figure was developed to assist in the visualization of relationship within and across the constructs of coping and MCCs (see Figure 2). This figure showed the content of primary and secondary appraisals in the context of MCCs and presented their links with health-related outcomes and the potential impact factors.

### 3.2 | Perceptions regarding MCCs

Negative mood associated with MCCs was the most reported theme in 12 studies. Negative mood included frustration (Al-Amer, Ramjan, Glew, & Salamonson, 2015), fear (Molefe & Duma, 2009), feelings of uncertainty (Coventry, Dickens, & Todd, 2014; Nyhlin, 1990), loss (Boeckxstaens et al., 2012; Coventry et al., 2014; Eckerblad, Theander, Ekdahl, Jaarsma, & Hellstrom, 2015; Stanners, Barton, Shakib, & Winefield, 2014), and lack of control (Eckerblad et al., 2015; Fix et al., 2014; Nyhlin, 1990; Van Wissen et al., 2017).



**FIGURE 2** Illustration of coping with MCCs

Functional limitation was an important consequence perceived by people with MCCs in eight studies (Boeckxstaens et al., 2012; Coventry et al., 2014; Fix et al., 2014; Hillege, Beale, & McMaster, 2008; Roberto, Gigliotti, & Husser, 2005; Van Wissen et al., 2017; Ward, 2011; Warren-Jeanpiere, Dillaway, Hamilton, Young, & Goparaju, 2014).

Other themes reported were knowledge about MCCs (Fix et al., 2014; Morris, Sanders, Kennedy, & Rogers, 2011; Warren-Jeanpiere et al., 2014), prioritization of MCCs (Fix et al., 2014; Morris et al., 2011; Roberto et al., 2005), management of conflict (Elliott, Ross-Degnan, Adams, Safran, & Soumerai, 2007; Fix et al., 2014; Hillege et al., 2008; Morris et al., 2011), relationship with the health care system (Loeb, Penrod, Falkenstein, Gueldner, & Poon, 2003; Morris et al., 2011; Nyhlin, 1990; Ridgeway et al., 2014), and stigma associated with having MCCs (Lekas, Siegel, & Leider, 2011; Ward, 2011).

### 3.3 | Coping strategies reported by people with MCCs

When a situation is considered "stressful," individuals make efforts to manage a stressful situation. In this review, strategies used for coping with MCCs consisted of two major patterns: emotion-focused and problem-focused coping.

Emotion-focused coping refers to efforts to manage emotions resulting from MCCs. Subthemes identified consisted of denial (Al-Amer et al., 2015; Stanners et al., 2014; Ward, 2011), positive thinking

(Molefe & Duma, 2009; Nyhlin, 1990; Ridgeway et al., 2014; Stanners et al., 2014; Yorgason et al., 2010), acceptance (Al-Amer et al., 2015; Boeckxstaens et al., 2012; Fix et al., 2014; Molefe & Duma, 2009; Nyhlin, 1990; Stanners et al., 2014; White, Lentin, & Farnworth, 2016), blaming (Molefe & Duma, 2009), relying on God (Loeb et al., 2003; Molefe & Duma, 2009; Sells et al., 2009; Ward, 2011; Warren-Jeanpiere et al., 2014), and engaging in social roles (Loeb et al., 2003; Sells et al., 2009; Townsend, Wyke, & Hunt, 2006; Warren-Jeanpiere et al., 2014).

Problem-focused coping refers to efforts to manage MCCs. Emerged subthemes included medication (Elliott et al., 2007; Fix et al., 2014; Loeb et al., 2003; Ridgeway et al., 2014; White et al., 2016; Yorgason et al., 2010), exercise (Fix et al., 2014; Loeb et al., 2003; Morris et al., 2011; Sells et al., 2009; Yorgason et al., 2010), dietary (Loeb et al., 2003; Morris et al., 2011; Yorgason et al., 2010), and changing life's pace (Boeckxstaens et al., 2012; Coventry et al., 2014; Ridgeway et al., 2014; Yorgason et al., 2010).

Quantitative studies reporting the full version of the following coping inventories: Di Benedetto et al. (2014) used the Coping Resources Inventory to assess individual's coping resources in five aspects (cognitive, social, physical, emotional and spiritual); Kristofferzon et al. (2018) used the Jalowiec coping scale to evaluate eight coping strategies: evasive, fatalistic, emotive, palliative, confrontative, optimistic, supportive, and self-reliant. The first four were categorized into emotion-focused coping and the rest were problem-focused coping; Safa et al. (2014) used Ways of Coping Questionnaire to measure problem-focused coping and emotion-focused coping strategies; Smith et al. (2009) adopted

the Billings & Moos coping responses scale to identify problem-focused and emotion-focused coping strategies. Two studies used personal statements to ascertain strategies of coping: Assari (2014) followed indicators based on past studies to measure religious coping and Lind et al. (2015) used an identified list from a study on coping in chemical intolerance to investigate problem-focused coping strategies.

### 3.4 | Relationship between coping strategies and health-related outcomes among people with MCCs

Four studies used a cross-sectional design and examined the relationship between utilization of coping strategies and mental health outcomes among people with MCCs. Assari (2014) found that higher levels of religious coping buffered the effect of MCCs on depressive disorders and were related to the reduced depressive symptoms. Di Benedetto et al. (2014) found higher levels of coping resources (mixed strategies including cognitive, social, physical, emotional, and spiritual) were associated with better mental health, and higher levels of coping resources were associated with lower levels of depression. Safa et al. (2014) found that the tendency towards suicidal ideation was greater among people with MCCs who chose emotion-focused coping strategies. Kristofferzon et al. (2018) showed a significant direct and indirect effect of sense of coherence on the mental component of QoL through emotion-focused coping, problem-focused coping, and efficiency of coping. In a single group pre/post-intervention study, Holloway et al. (2018) designed a problem-focused coping intervention to examine improvement in QoL, depressive symptoms, and the ability of problem coping in 18 people with vision impairment and depression. Results showed a 53% improvement in depression, 23% increase in QoL, and 53% increase in confidence when using problem-focused coping strategies.

Only one study focused on associations between coping and people's physical health outcomes. Smith et al. (2009) developed two chronic-condition models (pain and fatigue) to examine associations of coping strategies and self-efficacy with functional impairment among people with chronic pain and chronic fatigue. Findings suggested that emotional coping strategies were positively related to the functional impairment caused by pain and inversely related to the functional impairment caused by fatigue.

### 3.5 | Factors with relevance to coping among people with MCCs

Five major factors were associated with coping for people with MCCs in the studies reviewed: age, gender, clusters of MCCs (the combination of chronic health conditions), social support, and ethnicity, and culture.

#### 3.6 | Age

Clinical characteristics included the number, duration, and type of chronic health conditions. Six studies investigated coping among older

adults using a qualitative design (Eckerblad et al., 2015; Elliott et al., 2007; Loeb et al., 2003; Löffler et al., 2012; Naganathan et al., 2016; Warren-Jeanpiere et al., 2014). Older adults living with MCCs demonstrated their coping experience was embedded in family and healthcare supportive networks. For example, participants expressed how they adhere to a physician's suggestions about lifestyle and knowledge of prescribed medications (Löffler et al., 2012).

#### 3.6.1 | Gender

Three qualitative studies examined women's coping in the context of MCCs (Loeb et al., 2003; Molefe & Duma, 2009; Roberto et al., 2005) describing the challenges of living with MCCs and ways women dealt with those challenges. Female participants used more emotion-focused coping strategies such as positive reappraisal, accepting reality, and blaming. Warren-Jeanpiere et al. (2014) found that women with HIV (Human Immunodeficiency Virus) and other chronic health conditions expressed their desire for companionship and looked forward to the future.

#### 3.6.2 | Clusters of MCCs

Lind et al. (2015) found that commonly adopted coping strategies in people with asthma and allergy were avoiding certain environments and accepting their situation. People with contagious chronic conditions, such as HIV and Hepatitis C reported more stigmatizing behaviour (Lekas et al., 2011). Molefe and Duma (2009) found that participants reported frequent use of blaming after HIV diagnosis. Another study indicated that people with HIV and other chronic health conditions experienced stigma including prejudice and negative attitudes. People might choose to only focus on certain chronic health conditions (e.g. patients and the public viewed HIV as more deadly than HCV) (Lekas et al., 2011).

#### 3.6.3 | Social support

Social support, referring to the psychological and material resources from a social network to help people manage MCCs (Thoits, 1986), also emerged from this review. Social support can be obtained from formal sources such as health care professionals (Loeb et al., 2003; Morris et al., 2011; Naganathan et al., 2016; Nyhlin, 1990; White et al., 2016) and informal sources such as family members (Loeb et al., 2003; Molefe & Duma, 2009; Naganathan et al., 2016; Sells et al., 2009; Yorgason et al., 2010) and significant others (e.g. friends) (Loeb et al., 2003; Sells et al., 2009). One study investigated perceptions of social support from patients, informal caregivers, and health care professionals and indicated that patients with MCCs differentiated health professionals from their care-givers (Naganathan et al., 2016). They overvalued the capacity of their caregivers and over-relied on their support (Naganathan et al., 2016).

### 3.6.4 | Ethnicity and culture

Assari (2014) identified the role of ethnicity in shaping the relationship between MCCs, religious coping, and health outcomes across various populations. Positive religious coping was found to relieve the impacts of MCCs on depressive disorders in Caribbean Blacks compared to African Americans or non-Hispanic Whites.

Three qualitative studies discussed the impact of culture on coping (Al-Amer et al., 2015; Lekas et al., 2011; Whiting et al., 2006). Although samples varied involving Arabic, Asian, and African American peoples, a shared experience was that participants talked about how culture affects their understanding of MCCs and their behavior for dealing with health conditions. Arabic people believed having MCCs was a judgment by God, therefore, accepting the reality was regarded as a connection with God (Al-Amer et al., 2015).

## 4 | DISCUSSION

### 4.1 | Methodological considerations

This integrative review of 32 studies explored what is known regarding coping among people with MCCs. Most included studies were of good methodological rigor. Most reviewed studies used a qualitative design, suggesting a potential gap of knowledge around quantitative research. Not all qualitative studies justified how they reached theoretical saturation of data, which decreases confidence in stated claims. For quantitative studies using a cross-sectional design, justification of sample size or power lacked except for two population-based studies (Assari, 2014; Lind et al., 2015). Convenience samples without a size calculation were common in those quantitative studies.

Most of the included studies were conducted between 2000 and 2018 and more than half after 2010. This may be related to two factors: the attention on MCCs is rising as it is becoming more prevalent; and the definition of MCCs is relatively new, initially proposed in 2010. Research into chronic conditions before 2010 was limited to single chronic conditions suggesting that routine healthcare provided to patients might have an emphasis on single condition rather than using an integrated approach to care (Moffat & Mercer, 2015).

There were inconsistent definitions of coping across the included studies and the absence of theoretical frameworks in most studies. Twelve studies defined "coping" and eight studies used a consistent definition. Only a few studies adopted a theoretical framework of coping, with Lazarus' coping theory the most cited. Theoretical frameworks can help to refine research design, organize related constructs; and disseminate results whereas a poor or missing framework may fail to justify the importance of the study (Lederman & Lederman, 2015). Coping inventories used in the quantitative studies contained various domains with seven different coping measures used in the seven studies reviewed. Two studies used participants' responses to identify coping strategies instead of adopting validated scales (Assari, 2014; Lind et al., 2015). One study used two questions to examine participants' religious coping "How important is prayer when you deal with a

stressful situation? How much do you look to God for strength, support, and guidance?" (Assari, 2014). This might impair the reliability and credibility of the findings in these studies.

### 4.2 | Coping in people with MCCs

To understand how people cope with MCCs within the framework of Lazarus's transactional theory, coping has been further conceptualized to encompass two main components including perceptions regarding MCCs and strategies of coping with MCCs. People with MCCs may develop different perceptions about their illnesses from people with a single chronic condition due to the impacts of MCCs (Bower et al., 2012). First, the identified perceptions regarding MCCs showed the complexity of having MCCs in everyday life. This review identified that negative mood and impaired functioning were most commonly reported by people with MCCs, implying that psychological distress and physical consequences of MCCs might be the two key health burdens among this population. These findings were consistent with a quantitative study in which MCCs gave rise to a higher risk of loss of functional independence (Wang et al., 2017), as well as a large cross-sectional survey that showed a close association between depression and MCCs (Smith et al., 2014). Due to the nature of MCCs, specific disease combinations and clusters of diseases result in complex healthcare needs among people with MCCs. Thus, being able to assist people with MCCs might start with offering appropriate healthcare that addresses issues that they are most concerned about rather than general approaches to MCCs.

The myriad combinations of coping strategies identified in this review indicated people's efforts to cope with their MCCs. However, the adoption of strategies that merged in this review may be different from people's coping when confronted with stress in the actual situations because their selection of problem-focused and/or emotion-focused strategies mainly depends on the stressor. More importantly, this review did not aim to find out which coping strategy is more effective than another but provide a plethora of strategies that people used to cope with MCCs. This work provides an insight into the development of a specific coping measurement for people with MCCs. As the effectiveness of a coping strategy is influenced by contextual factors, personality traits, and circumstances, an understanding of people's subjective perceptions of MCCs and their inclination for certain coping strategies, may offer an element of an organized intervention program for this population.

### 4.3 | Coping and health

Illness perceptions and coping have an important role to play in the explanation of health-related outcomes among people with physical illness (Dempster, Howell, & McCorry, 2015). However, no research has been conducted to determine the relationship between illness perceptions and health-related outcomes in the context of MCCs. The finding that appropriate coping strategies may help to relieve

psychological distress, improve QoL, and change health behavior among people with MCCs is encouraging. However, it is difficult to draw conclusions regarding the positive impacts of specific coping strategies on health-related outcomes in this population because of the variation in research samples and coping inventories used. Included studies recruited participants with large variations in histological typing, stages, and healthcare plans and different definitions of MCCs were used (Johnston, Crilly, Black, Prescott, & Mercer, 2019). Terms such as multiple chronic conditions, comorbidity, and multimorbidity were used interchangeably and varied measurements for MCCs were used (Xu, Mishra, & Jones, 2017).

Interactions between coping, stress, and health are complex. Studies that explored the direct associations between coping and health outcomes while the interlinkage between stressor and coping might be ignored. Research has shown that the effects of coping on health-related outcomes are mediated and/or moderated in the context of a chronic condition (Grech et al., 2016). Thus, the role of coping may be more complicated in the context of MCCs because of the increased number of conditions. These findings suggest implementing empirically based coping interventions to lessen, reduce, and prevent stress and to facilitate optimizing physical and mental health outcomes in people with MCCs. For example, interventions that enhance cognitive, social, and emotional coping strategies may mitigate depression and promote mental health in people with MCCs. However, such relationship requires validation in future quantitative and qualitative research. Examining the coping process over longer durations in patients with MCCs to determine strategies consistently used over time based on the nature of chronic conditions is required.

#### 4.4 | Impact factors concerning coping

This review showed that clusters of chronic conditions might present different stressors, which might trigger specific coping strategies among people with MCCs. For example, people with contagious chronic conditions such as HIV or HCV (Lekas et al., 2011) and people with substance abuse (Ward, 2011) experienced more stigma than those with other conditions. Past quantitative studies revealed that variation in health-related outcomes exists in different clusters of MCCs. Two large cross-sectional studies from Korea and Australia indicated that a particular cluster of chronic conditions, such as musculoskeletal conditions, has a relatively large impact on patients' QoL when compared with other conditions (González-Chica et al., 2017; Park et al., 2018). This finding might imply that categorizing stressors (chronic conditions) could be a better way to capture people's coping and associated health-related outcomes.

Different cultures and living contexts reflect differences in coping. Hobfoll (2001) suggested that most studies about stress and coping have been shaped by a monocultural viewpoint rooted in western countries, particularly in the US, where most studies were undertaken. In this review, more studies were undertaken in North America, Europe, and Oceania, with limited studies in Asia or Africa, suggesting little attention has been paid to the discussion of coping theories in

those areas. Few studies mentioned how culture might shape personal coping among people with MCCs. Most studies did not clarify the ethnicity of participants, nor report whether mixed cultures existed. Sells et al. (2009) identified participants were Caucasian, African American, and Hispanic but did not analyze potential distinctions in coping between groups.

This review identified that social support was a significant and independent coping resource rather than overlapping with either problem-focused coping or emotion-focused coping. According to Folkman and Lazarus (1988), social support could be an effective way of dealing with stress and relieving long-term stress. Appropriate social support may promote healthy behavior that improves one's adaptation to stress (Sippel, Pietrzak, Charney, Mayes, & Southwick, 2015). Consequently, there is a need to improve the current nomenclature of coping to have better applicability in chronic health conditions (Thomsen, Rydahl-Hansen, & Wagner, 2010).

#### 4.5 | Limitations

Limitations include that only peer-review journal articles published in English were reviewed, which may result in publication bias and omit important studies published in other languages. Most of the included studies of this review were conducted in English-speaking countries and the findings are largely US focused, which may generate a skewed opinion.

Although this review contains wide-ranging literature, it was not possible to have conclusive findings due to different methodological and theoretical approaches, and the various nomenclatures and instruments to measure coping. Although broad search terms were used, there may be potential limitations in the search process related to the various terms used to describe MCCs. The construct of coping is also multifaceted. Hence, the classification of coping strategies into categories might result in different statements by scholars with a varied background.

In this review, the strategies of coping were categorized into problem-focused and emotion-based under Lazarus's theory. However, there were some other types of coping proposed by a number of theorists such as active versus passive coping (Billings & Moos, 1981). The current understanding of coping may be more substantiated and explained in greater depth if analyzed from different angles.

#### 4.6 | Knowledge gaps and future research directions

The new knowledge that is uncovered in this integrative review includes: (i) more research is needed for investigating the role of coping components such as illness perceptions and coping strategies in coping with MCCs, (ii) there is a paucity of quantitative research in this research area, (iii) current research methods need improvement and research samples (e.g. characteristics of MCCs) are unclear, and (iv) cross cultural understanding of coping in people with MCCs is lacking.

In considering the role of illness perceptions in explaining health-related outcomes, it is worth taking illness perceptions as a component of coping when investigating coping in people with MCCs. Further research should focus on the relationship between coping and its constructs and health-related outcomes. For example, whether certain coping strategies could be considered as a mediator or as a covariate. Using a theoretical model can underpin the research design and clarify the role of each variable investigated.

Most studies investigated coping with MCCs using qualitative designs with a dearth of quantitative research in this area. The integration of quantitative measurements and qualitative interpretations is needed to gain a deeper, broader understanding of perceptions about coping, coping strategies, and health. Prior research has supported applying mixed methods approaches to contribute to a broader understanding of stress and coping (Drageset, Eide, & Hauge, 2016). Thus, it is expected that a mixed-methods design may offer a more holistic view and may help to gain a better understanding of coping among people with MCCs. Given the multifaceted and interlinked nature of MCCs, more innovative statistical approaches might be helpful to understand the relationship between coping strategies by people with MCCs and health-related outcomes.

Further research should clarify the definition(s) and measure(s) of MCCs. Inclusion and exclusion criteria for chronic conditions should be explicit and rigorous sampling would ensure data representativeness and reduce bias for future research. All reviewed studies collected data at a one-time point. More longitudinal research is needed to examine the effectiveness of coping strategies on health-related outcomes over time among the MCCs population. Such research may help healthcare practitioners develop and implement appropriate and timely interventions to improve coping.

Most of the included studies did not compare or discuss their findings between ethnic populations. As coping, illness perceptions, and treatment of MCCs are shaped by culture and socioeconomic environments. Thus, research in diverse cultures is needed, especially in Asian regions where the prevalence of MCCs is growing substantially (Chen, Cheng, Zhuang, & Broad, 2018).

#### 4.7 | Implications for healthcare practice

Illness perceptions are a vital predictor of individuals' health outcomes (Petrie, Broadbent, & Kydd, 2008) and have a strong association with patients' coping and self-management of MCCs. Knowledge generated from this review may help healthcare professionals to develop psychosocial interventions to improve patient's coping. For example, interventions that improve perceptions regarding the controllability of MCCs might lessen psychological distress and improve QoL among people with MCCs (Richardson, Scott, Schüz, Sanderson, & Schüz, 2017). Hence, the implementation of an effective healthcare plan highlighting modifications to illness perceptions and components of coping strategies may be beneficial.

Present healthcare for people with MCCs focuses on single chronic conditions (Harris, Dennis, & Pillay, 2013). Patients have

difficulty obtaining care for different health conditions and the care is fragmented increasing disease burden and expenditure (Wallace et al., 2015). Healthcare should be integrated taking into account patients' holistic needs. Treatment goals and priorities, self-management interventions, and guidelines for health service utilization should be developed and integrated based on actual conditions. Collaborative care programs involving nurses and healthcare team members offering integrative management of physical and psychological diseases and implementation of guideline-based healthcare could significantly improve the control of chronic conditions among this population (Katon et al., 2010).

Every age group is affected by MCCs despite the prevalence of MCCs increasing with age. A national survey in the US presented that younger adults with MCCs (less than 65 years old) have a higher prevalence of asthma, cognitive impairment, and psychological distress, reported more health risks such as smoking, obesity, poorer access to health care, and worse QoL, in contrast to older adults with MCCs (aged 65 or above) (Adams, 2017). There is a need for age-specific healthcare planning taking into account individual needs in managing chronic health conditions.

## 5 | CONCLUSION

This integrative review presents an overview of coping in the context of MCCs by involving studies with different designs, providing an understanding of this phenomenon. In-depth understanding of perceptions and coping strategies and significant linkage between coping and health outcomes have the potential to become a solution, targeted either at particular clusters of chronic health conditions or at health problems of people with MCCs, serving as a base to provide appropriate, holistic healthcare for people with MCCs. In addition, this review identified five impact factors including age, gender, clusters of multiple chronic conditions, social support, and ethnicity, and culture to be associated with people's coping. The increasing prevalence of MCCs internationally, requires studies, preferably with mixed-methods designs and using rigorous methods, particularly in cross-cultural settings. For clinical practice, the potential for interventions to modify coping is supported by some evidence proposing that altering coping could lead to improvements in the management and experience of stress among people with MCCs.

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#### CONFLICTS OF INTEREST

Nothing to declare.

#### AUTHOR CONTRIBUTIONS

Study design: C.C., K.L., and S.C.

Data collection: C.C.

Data analysis: C.C., K.L., and S.C.

Study supervision: K.I., and S.C.  
 Manuscript writing: C.C.  
 Critical revisions: C.C., K.I., and S.C.

# ORCID

Cheng Cheng  <https://orcid.org/0000-0002-5829-6014>

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#### SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section at the end of this article.

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REVIEW ARTICLE

# Patients' experiences of coping with multiple chronic conditions: A meta-ethnography of qualitative work

Cheng Cheng,<sup>1,2</sup>  Kerry Inder<sup>1</sup>  and Sally Wai-Chi Chan<sup>1</sup>

<sup>1</sup>School of Nursing and Midwifery, University of Newcastle, Newcastle, New South Wales, Australia, and <sup>2</sup>School of Nursing, Bengbu Medical College, Bengbu, Anhui, China

**ABSTRACT:** Multiple chronic conditions (MCCs) pose a major and growing burden on the individuals' health. The ways in which people cope with their stresses related to their chronic conditions are significant to their health outcomes. This review sought to understand lived experiences of coping with MCCs by a meta-ethnography of qualitative studies. Twenty-six studies were identified in four electronic databases including PubMed, PsycINFO, EMBASE, and CINAHL that were searched from 1966 to 2017. A seven-step analytic method was used after a quality evaluation based on Joanna Briggs Institute Qualitative Assessment and Review Instrument (JBI-QARI). The findings illustrated that experiences of coping with MCCs were interacted with (i) appraisals of MCCs, (ii) strategies to maintain a normal life, (iii) strategies to keep the spirits up, and (iv) coping in the social context. To sum up, this review provided a collection of narratives on coping with MCCs. The findings would help to recognize the high complexity experienced by these patients, also potentially offered a foundation for the design of a feasible intervention to more optimally highlight the demands of managing MCCs.

**KEY WORDS:** coping, coping strategies, chronic diseases, meta-ethnography, multiple chronic conditions.

## INTRODUCTION

People with multiple chronic conditions (MCCs) refer to those suffering from two or more chronic conditions that normally last more than a year, and these conditions include physical and mental health conditions

(e.g. diabetes, heart diseases, and depression), continuing conditions (e.g. learning disability), chronic symptoms (e.g. back pain), and alcohol and substance abuse (Farmer *et al.* 2016). The National Health Interview Survey (NHIS) indicated that more than 25% of American adults reported having more than two chronic conditions (Ward 2014). An Australia study involving 9156 patients estimated the prevalence of MCCs to be 37% with more than half of surveyed patients suffering from three or more conditions and 33% from four or more (Britt *et al.* 2008).

People with MCCs commonly experience a high disease burden of living with a certain number of chronic conditions and the combined treatments (Gallacher *et al.* 2011). The presence of MCCs is associated with lower quality of life (Fortin *et al.* 2004), decrement in physical and/or cognitive functioning (Bayliss *et al.* 2004), and increasing healthcare costs (Rezaee & Pollock 2015). A qualitative research describes that living

**Correspondence:** Cheng Cheng, School of Nursing and Midwifery, University of Newcastle, Newcastle, NSW, Australia.  
Email: ccheng1@uon.edu.au

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Cheng Cheng, PhD candidate, MSc  
Kerry Inder, PhD, RN  
Sally Wai-Chi Chan, PhD, RN, FAAN  
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with MCCs is 'a virtual cascade of medical, emotional and social hardships' (Sells *et al.* 2009). In addition, psychological distress is prevalent among people with MCCs (Fortin *et al.* 2006). The current principle of caring people with MCCs is to improve their quality of life by reducing disease burden, adverse events, and inadequate care (Farmer *et al.* 2016).

Coping is seen as ways of responding to illness and as a potential intervention for chronic conditions (Martz *et al.* 2007). According to the stress appraisal and coping model, in which coping is defined as 'consistently changing cognitive and behavioural effort to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person' (Lazarus & Folkman 1984; P. 141). This model proposes that people commonly cope with stressors via problem-focused coping strategies and/or emotional-focused coping strategies (Lazarus & Folkman 1984). Problem-focused coping refers to the strategies of reducing the source of the stress, whereas emotional-focused coping aims at managing the emotions that come with the perception of stress (Lazarus & Folkman 1984). Besides, there are some other classifications of coping in the literature such as active coping, avoidance coping, assimilative coping, and accommodative coping (Brandtstädter 2015; Christen *et al.* 1986; Roth & Cohen 1986). The utilization of a type of coping strategy largely depends on the individual's personality and personal perception of the stressor (Ferguson 2001).

Although it is unnecessary to distinguish good coping from bad coping (Lazarus 2000), the accessibility of coping resources shape the ways that patients manage their chronic conditions, then possibly affect their health outcomes (Löffler *et al.* 2012; Trump & Mendenhall 2017; Yorgason *et al.* 2010). Evidence shows that appropriate coping strategies are positively associated with health-related quality of life and psychological well-being (Aldwin & Yancura 2004). A meta-analysis by Duangdao and Roesch (2008) suggested that coping strategies consisting of approach-avoidance, problem-focused, and emotion-focused were related to the psychological health of people with diabetes. Allman *et al.* (2009) demonstrated that greater use of adaptive coping was associated with less depression whereas greater use of maladaptive coping was associated with more depression in heart failure patients. Lo Buono *et al.* (2017) addressed that the patients who were inclined to use active/accommodative coping strategies usually reported a better quality of life after stroke compared with patients who preferred assimilative coping strategies. Previous studies mainly

investigate coping in people with one single chronic disease, research on coping with MCCs is still lacking.

Qualitative research is a way of providing a combination of opinions, thoughts, and perspectives of coping and contributing to a common understanding of a focused whole (Creswell & Creswell 2017). There are several qualitative reviews existing with reference to experiences of people with MCCs: Rosbach and Andersen (2017) highlighted that the complexity of burden of treatment and sum up some factors such as workload of demands, patients' capacity, and the social context influenced patients' coping. Cottrell and Yardley (2015) summarized the lived experiences of MCCs from different perspectives including patients, general practitioners, and trainees. Another study involving MCCs and some other particular chronic diseases offered an overview of patient's capacity and its interacted factors including the processes of living with chronic conditions, available resources, social environment, and medical treatment (Boehmer *et al.* 2016). These qualitative studies into the lived experiences have added some useful knowledge of the people with MCCs and have demonstrated the research field regarding MCCs is extensive. However, few attempts have been conducted to look at the experiences relevant to MCCs in a coping context.

## AIM

The present study aimed to undertake an in-depth exploration of the lived experiences about how patients cope with MCCs by synthesizing the existed qualitative research as the qualitative findings could explicate nuanced meanings of living with MCCs. We believe this study would be valuable to make qualitative findings more accessible for application in practice related to MCCs.

## DESIGN

We adopted the meta-ethnography approach (Noblit & Hare 1988) to synthesize qualitative data in this review. The meta-ethnography is a broad and combined review approach, which presents, appraises, and synthesizes the findings from qualitative studies in a systematic and logical way (Jensen & Allen 1996). It can identify shared themes and compare differences on a particular topic, provide deeper insights into the topic than a single study, and generate meanings through an interpretative process (Erwin *et al.* 2011). What is more, the benefits of using meta-ethnography and the practical steps have been supported by the past studies (Britten

*et al.* 2002; Noblit & Hare 1988), which can contribute to our current work.

## METHOD

The seven steps of meta-ethnography described by Noblit and Hare (1988) and developed further by Walsh and Downe (2005) were followed.

Step 1 was to frame a meta-ethnography study. A literature search concerning coping and MCCs was undertaken with the help of a librarian at the university library, and the research aim was formulated.

Step 2 was to search and identify the included studies. Studies were identified using systematic database searches of PUBMED (provided by National Center for Biotechnology Information, U.S. National Library of Medicine), PsycINFO (provided by Ovid), EMBASE (provided by Ovid), and CINAHL (provided by EBS-COhost) from the year 1966 when the preliminary conception of coping was described by Lazarus (1966) till Nov 2017. The search terms identified in the article title, abstract, and keywords included 'coping', 'multiple chronic conditions/diseases/illnesses', 'multifactorial chronic /diseases/illnesses', 'comorbidity', 'multi-morbidity', and 'qualitative'. For instance, the search in PUBMED was built of three components:

1. Search ('Qualitative Research' [Mesh] OR qualitative [Text Word])
2. Search ('adaptation, psychological' [MeSH Terms] OR coping[Text Word])
3. Search (((((chronic disease\*) OR chronic illness\*) OR chronic conditions) OR ('comorbidity' [MeSH Terms] OR comorbidity[Text Word])) OR ('comorbidity' [MeSH Terms] OR multimorbidity[Text Word])) OR ('multiple chronic conditions' [MeSH Terms] OR multiple chronic conditions[Text Word])

In this step, two reviewers independently screened studies for eligibility against the inclusion/exclusion criteria, according to the title and abstract. Full texts of all possibly related articles were retrieved for a further check. Two reviewers will designate the full-text papers, independently. The third reviewer resolved the possible conflicts concerning eligibility.

Inclusion criteria were:

1. Studies that employ a qualitative methodology or a mixed methodology with qualitative data description.
2. Studies that focus on adults (over 18 years) with MCCs.

3. Studies that include a description of the experience of coping with MCCs.

Exclusion criteria were:

1. Studies published in languages other than English.
2. Studies that focus on people with a single chronic condition/disease/illness.
3. Studies that focus on children and/or adolescents.
4. Studies that focus on the experiences of people such as caregivers, health professionals, and social workers.
5. Dissertations, secondary research (e.g. summary of existing research), opinions, conference abstracts, protocols, and reports.

Step 3 was to assess the quality of the included studies. For this study, we relied on the peer-reviewed articles to eliminate scientifically unsound studies. We adopted the Joanna Briggs Institute Qualitative Assessment and Review Instrument (JBI-QARI) comprising ten questions about the congruity between the essential parts in different studies (Porritt *et al.* 2014). Each question was answered with a 'yes', 'no', 'unclear', or 'not applicable' response. We scored '+1' for 'yes' and '0' for others. The final scores were computed and classified as follows: low (0–4 scores), moderate (5–7 scores), and high (8–10 scores), respectively. Studies with a 'low' quality rating would be excluded. Two reviewers undertook the quality assessments independently. The discrepancies were recorded, compared, and discussed between the two reviewers until consensus was reached. The third author was approached in cases where consensus was not reached.

Step 4 was to extract and present key data from the included studies. The characteristics involved the following headlines: author and year, country, title, objective, description of MCCs, duration of MCCs, sample, data collection, and data analysis methods.

Step 5 was to determine the relations among the included studies. We looked across, read, and reread the included studies in order to be familiar with the whole contexts. We noted the first-order constructs (views of the patients) and looked into the second constructs (interpretations of the authors). A table was created to present the first- and second-order constructs in two columns (Table 1).

Step 6 was to translate the studies into one another. Noblit and Hare (1988) identified three types of

synthesis including reciprocal approach, reputational approach, and line of argument approach. In this step, we took each included paper in chronological order. We read off the grid and checked each column. We compared the first- and second-order constructs from the first study to the first- and second-order constructs from the second study and identified specific and common interpretations. After that, we repeatedly compared these findings to the first- and second-order constructs from the third study and so on.

Step 7 was to synthesize translations. Each study has offered a different view of coping experiences depending on the time point at which the patients were interviewed. Key and crucial themes found were consolidated into a line of argument (third-order analysis). Therefore, the third-order interpretations based on the 1st- and 2nd-order interpretations were developed and a line of argument was made.

## FINDINGS

### Study inclusion

An initial search identified 1515 studies and removed 250 duplicate studies. After checking the title and reading the abstract, 1186 studies were excluded based on inclusion and exclusion criteria. Seventy-nine studies were retrieved from electronic databases in full and 26 studies were included in the review. In addition, a

**TABLE 1:** *JBIC QARI critical appraisal checklist for interpretive and critical research*

Questions in the checklist
1. Is there a congruity between the stated philosophical perspective and the research methodology?
2. Is there a congruity between the research methodology and the research question or objectives?
3. Is there a congruity between the research methodology and the methods used to collect the data?
4. Is there a congruity between the research methodology and the representation and analysis of data?
5. Is there a congruity between the research methodology and the interpretation of results?
6. Is there a statement locating the researcher culturally or theoretically?
7. Is the influence of the researcher on the research, and vice versa addressed?
8. Are participants, and their voices, adequately represented?
9. Is the research ethical according to current criteria or, for recent studies, is there evidence of ethical approval by an appropriate body?
10. Do the conclusions drawn in the research report flow from the analysis, or interpretation, of the data?

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bibliographic searching was carried out manually in the most relevant systematic reviews (de Bruin *et al.* 2012; Smith *et al.* 2012) plus the reference lists of the included studies. No further relevant articles were identified based on the inclusion/exclusion criteria. The PRISMA flow diagram (Moher *et al.* 2009) that illustrates the search process is presented in Figure 1.

### Methodological quality

As the results appeared in Table 2, the majority of these studies described a clear aim, utilized an appropriate method, and offered meaningful interpretations. All included studies did well in the quality appraisal and no studies were excluded.

### Characteristics of included studies

Data display matrices were prepared to present the core data from each study (See Table 3). There were 654 participants in the 26 reviewed studies, which published between 1990 and 2017. The included studies were undertaken in the United States ( $n = 9$ ), UK ( $n = 6$ ), Australia ( $n = 3$ ), Sweden ( $n = 2$ ), New Zealand ( $n = 1$ ), Germany ( $n = 1$ ), Belgium ( $n = 1$ ), Canada ( $n = 1$ ), Botswana ( $n = 1$ ), and Jordan ( $n = 1$ ). The qualitative data were mainly collected by interviews, only one study used personal diaries as a supplementary (Townsend *et al.* 2006). The three most common analytical methods were grounded theory ( $n = 5$ ), thematic analysis ( $n = 4$ ), and phenomenological descriptive approach ( $n = 3$ ). Due to the variations in patients, we created two columns to present the type and the duration of MCCs. However, most of the studies did not give a detailed description of MCCs, nor the duration of chronic conditions.

### An outline of synthesized results

Generally, MCC patients 'appraise MCCs' by identifying 'relations among multiple conditions', experiencing 'problematic symptoms', and perceiving 'negative emotions'. Coping with MCCs is a multilevel process within the context of the patient's everyday life. At the first level, the patients use strategies including 'taking medication', 'exercise & dietary', and 'seek information by themselves' to 'maintain a normal life'. The second level is about psychological adaptation, strategies of 'adapt to changes' and 'rely on spiritual support' are used to 'keep a positive mental attitude'. At the level of 'coping in the social context', MCC patients rely on

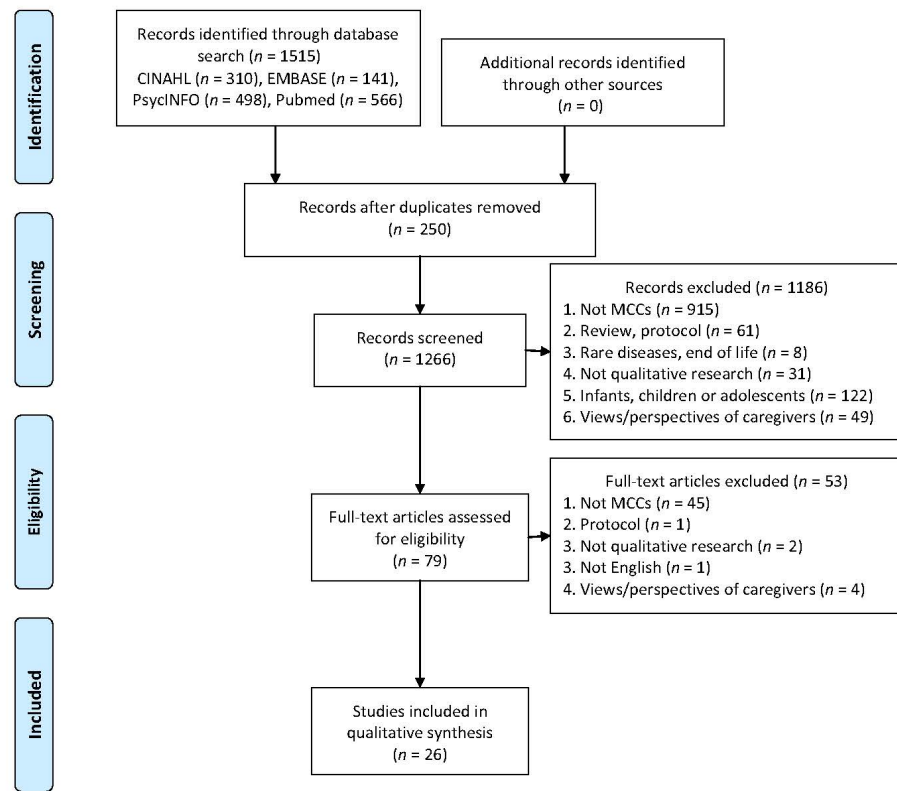


FIG. 1. PRISMA flowchart of the identification process of included studies. [Colour figure can be viewed at [wileyonlinelibrary.com](http://wileyonlinelibrary.com)]

‘engage in social roles’ and ‘social support’. The summary of the analysis and synthesis is shown in Table 4.

### Appraise MCCs

The main theme ‘appraise MCCs’ described the stressful conditions and occasions that people with MCCs perceived in their daily life. The ‘appraise MCCs’ comprised three subthemes, namely ‘relations among multiple conditions’, ‘problematic symptoms’, and ‘negative emotions’.

‘Relations among multiple conditions’ refers to patients find specific connections and comparisons

among their multiple health conditions (Dysch *et al.* 2012; Eckerblad *et al.* 2015; Fix *et al.* 2014; Hillege *et al.* 2008; Lekas *et al.* 2011; Molefe & Duma 2009; Morris *et al.* 2011; Roberto *et al.* 2005; Stanners *et al.* 2014; Townsend 2011; Ward 2011; Warren-Jeanpiere *et al.* 2014; White *et al.* 2016; Whiting *et al.* 2006; Wissen *et al.* 2017). Patients compared the symptoms and conditions caused by each disease and perceived the hierarchical ordering between their chronic conditions. For example, the patients described how they reprioritize health conditions, and repeatedly have to focus on one condition more than another one.

**TABLE 2:** JBI QARI critical appraisal checklist for selected papers (chronological order)

Selected papers		JBI QARI criteria from Table 1									
		[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
1.	Nyhlin (1990)	Y	Y	Y	Y	Y	Y	Y	Y	U	Y
2.	Loeb <i>et al.</i> (2003)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
3.	Roberto <i>et al.</i> (2005)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
4.	Townsend <i>et al.</i> (2006)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
5.	Whiting <i>et al.</i> (2006)	Y	Y	Y	U	Y	Y	N	Y	Y	Y
6.	Elliott <i>et al.</i> (2007)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
7.	Hillege <i>et al.</i> (2008)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
8.	Molefe and Duma (2009)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
9.	Sells <i>et al.</i> (2009)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
10.	Lekas <i>et al.</i> (2011)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
11.	Morris <i>et al.</i> (2011)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
12.	Townsend (2011)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
13.	Ward (2011)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
14.	Boeckxstaens <i>et al.</i> (2012)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
15.	Dysch <i>et al.</i> (2012)	Y	Y	Y	Y	Y	Y	N	Y	Y	Y
16.	Löffler <i>et al.</i> (2012)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
17.	Coventry <i>et al.</i> (2014)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
18.	Fix <i>et al.</i> (2014)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
19.	Ridgeway <i>et al.</i> (2014)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
20.	Stanners <i>et al.</i> (2014)	Y	Y	Y	Y	Y	Y	N	Y	Y	Y
21.	Warren-Jeanpiere <i>et al.</i> (2014)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
22.	Al-Amer <i>et al.</i> (2015)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
23.	Eckerblad <i>et al.</i> (2015)	Y	Y	Y	Y	Y	Y	N	Y	Y	Y
24.	Naganathan <i>et al.</i> (2016)	Y	Y	Y	Y	Y	Y	N	Y	Y	Y
25.	White <i>et al.</i> (2016)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
26.	Wissen <i>et al.</i> (2017)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

Y, Yes; N, NO; U, Unclear; N/A, not applicable.

Q: What is kind of, your main priority at the moment with [G.P]?

A: Probably blood pressure, probably and cholesterol... so I am more worried about those because they are more serious things. IBS did not kill anybody, you know, but blood pressure is serious and cholesterol is serious so IBS has gone into the background, you know. pp. 155 (Morris *et al.* 2011)

'Problematic symptoms' refers to burdensome symptoms caused by MCCs, which are frequently reported in the most of studies (Al-Amer *et al.* 2015; Boeckxstaens *et al.* 2012; Coventry *et al.* 2014; Dysch *et al.* 2012; Eckerblad *et al.* 2015; Elliott *et al.* 2007; Fix *et al.* 2014; Hillege *et al.* 2008; Lekas *et al.* 2011; Löffler *et al.* 2012; Molefe & Duma 2009; Morris *et al.* 2011; Nyhlin 1990; Roberto *et al.* 2005; Sells *et al.* 2009; Stanners *et al.* 2014; Townsend 2011; Townsend *et al.* 2006; Ward 2011; Warren-Jeanpiere *et al.* 2014; White *et al.* 2016; Whiting *et al.* 2006; Wissen *et al.* 2017). For example:

Then I started to get attacks [angina] during the night for no reason, I was losing sleep because the pain was

that intense...then I had three attacks one evening, each one more severe than the other...It was so intense I was screaming and I lost control-emotions, everything' pp. 4 (Wissen *et al.* 2017)

'Negative emotions' were apparent in the response to the diagnosis of MCCs and the daily life along with MCCs (Al-Amer *et al.* 2015; Boeckxstaens *et al.* 2012; Coventry *et al.* 2014; Eckerblad *et al.* 2015; Hillege *et al.* 2008; Lekas *et al.* 2011; Löffler *et al.* 2012; Molefe & Duma 2009; Nyhlin 1990; Sells *et al.* 2009; Stanners *et al.* 2014; Townsend 2011; Ward 2011; Whiting *et al.* 2006; Wissen *et al.* 2017). A patient described the mixed negative feelings:

I felt down... got really upset... I got frustrated... felt down... pp. 235 (Al-Amer *et al.* 2015)

The cultural contexts and social stigma attached to their chronic conditions were suggested to be stressful and may increase the undesirable feelings (Al-Amer *et al.* 2015; Lekas *et al.* 2011; Molefe & Duma 2009; Stanners *et al.* 2014; Ward 2011; Warren-Jeanpiere *et al.* 2014; Whiting *et al.* 2006). Two studies illustrated

TABLE 3: Characteristics of included studies for meta-synthesis (chronological order)

Author & Year	Country	Title	Objective	Description of MCCs	Duration of MCCs	Sample	Data collection	Data analysis
Nylin (1990)	Sweden	Diabetic patients facing long-term complications: coping with uncertainty	Obtain a understanding of coping strategies used by diabetic patients facing long-term complications	Type 1 diabetes and long-term complications (retinopathy, nephropathy, neuropathy); MCCs	20-54 years	14 patients (8 females), age 26-62 years	Unstructured interview	Grounded theory
Loeb <i>et al.</i> (2003)	USA	Supporting older adults living with multiple chronic conditions	Explore the coping strategies of managing daily life in older adults in with MCCs	Unclear	Unclear	37 patients (70% females), age 55-88 years	Focus group interview	Thematic and content analyses
Roberto <i>et al.</i> (2005)	USA	Older women's experiences with multiple health conditions: daily challenges and care practices	Explore how women with MCCs perceive various chronic conditions and how they manage their daily lives	Heart disease, diabetes, and osteoporosis	Unclear	17 female patients, 69-84 years	Closed- and open-ended questions	Open-coding procedures method
Townsend <i>et al.</i> (2006)	UK	Self-managing and managing self: practical and moral dilemmas in accounts of living with chronic illness	Explore how people negotiate multiple chronic illness, and everyday life	MCCs	Unclear	23 patients (gender unclear), age early 50s	Semi-structured interview and diary	Constant comparison method
Whiting <i>et al.</i> (2006)	UK	Managing type 2 diabetes and depression in primary care	Identify the connections between diabetes and depression and stress, and the factors about self-care	Type 2 diabetes and depression	Unclear	16 patients, age (unclear), gender (unclear)	In-depth interview	Thematic analysis
Ellott <i>et al.</i> (2007)	USA	Strategies for coping in a complex world: adherence behaviour among older adults with chronic illness	Explore how older adults with MCCs make choices about medicines	MCCs (3-9 comorbidities such as hypertension, hypercholesterolaemia, and ischemic heart disease)	Unclear	20 patients (12 females), mean age 67 years	Semi-structured interviews	Constant comparison
Hillego <i>et al.</i> (2008)	Australia	The impact of type 1 diabetes and eating disorders: the perspective of individuals	Describe the perspectives of people with the chronic conditions of both type 1 diabetes and eating disorders	Type 1 diabetes and eating disorders	Unclear	4 female patients, between 18-30 years	Semi-structured interviews	Grounded theory
Molefe and Duma (2008)	Botswana	Experiences of Botswana women diagnosed with both HIV/AIDS and cervical cancer	Explore the experiences of living with both HIV/AIDS and cervical cancer	HIV/AIDS and cervical cancer	Unclear	6 female patients, age (unclear)	Semi-structured interviews	Phenomenological descriptive approach
Sells <i>et al.</i> (2009)	USA	Cascading crises, resilience and social support within the onset and development of multiple chronic conditions	Describe people's responses to the onset, accrual, and influence of multiple chronic conditions	MCCs	Unclear	33 patients (23 females), mean age 50.5 years	Semi-structured interview	Phenomenological descriptive approach

(Continued)

TABLE 3: (Continued)

Author & Year	Country	Title	Objective	Description of MCCs	Duration of MCCs	Sample	Data collection	Data analysis
Lelas <i>et al.</i> (2011)	USA	Felt and enacted stigma among HIV/HCV-infected adults: the impact of stigma layering	Explore the experience of stigma among former and current injecting drug users with both HIV and HCV.	HIV and HCV	Unclear	132 patients (31% females), age 30–69 years	In-depth interview	Qualitative analysis
Morris <i>et al.</i> (2011)	UK	Shifting priorities in multimorbidity: a longitudinal qualitative study of patient's prioritization of multiple conditions	Explore how individuals experience MCCs	MCCs	Unclear	21 patients (10 females), age 36–84 years	Semi-structured interview	Narrative analysis
Townsend (2011)	UK	Applying Bourdieu's theory to accounts of living with multimorbidity	Explore lived experience of people with MCCs	MCCs	Unclear	23 patients (gender unclear), age early 50s	In-depth interview	Narrative approach
Ward (2011)	USA	The lived experience of adults with bipolar disorder and comorbid substance use disorder	Explore lived experience of adults with bipolar disorder and substance use disorder	Bipolar disorder and substance use disorder	Bipolar disorder (mean = 1–35 years, 10 years), Substance use 5–27 years	12 patients (11 females), age 33–52 years	In-depth interview	Phenomenological descriptive approach
Boeckstaens <i>et al.</i> (2012)	Belgium	Chronic obstructive pulmonary disease and comorbidities through the eyes of the patient	Explore opinion of patients with COPD and comorbidities in primary care.	COPD and comorbidities	Unclear	7 patients (3 females), age unclear	Open patient interviews	Thematic analysis
Dyck <i>et al.</i> (2012)	UK	How do people with intellectual disabilities and diabetes experience and perceive their illness?	Explore lived experience of people with people with intellectual disabilities and diabetes	Intellectual disabilities and diabetes	Unclear	4 patients (2 females), age 30–43 years	Semi-structured interviews	Interpretative phenomenological analysis
Löffler <i>et al.</i> (2012)	Germany	Coping with multimorbidity in old age – a qualitative study	Explore coping strategies of people with multimorbidities	MCCs	Unclear	19 patients (13 females), mean age 75 years	In-depth interviews	Grounded theory
Coventry <i>et al.</i> (2014)	UK	How does mental–physical multimorbidity express itself in lived time and space? A phenomenological analysis of encounters with depression and chronic physical illness	Explore the lived experience of people with mental–physical multimorbidity	Mental–physical multimorbidity	Unclear	32 patients (17 females), age 32–82 years	In-depth, semi-structured interviews	Interpretative phenomenological analysis
Fix <i>et al.</i> (2014)	USA	The role of comorbidities in patients' hypertension self-management	Explore the barriers to the self-management among people with hypertension and comorbidities	Hypertension and comorbidities	Unclear	48 patients (5 females), mean age 60 years	Semi-structured interviews	Grounded theory

(Continued)

TABLE 3: (Continued)

Author & Year	Country	Title	Objective	Description of MCCs	Duration of MCCs	Sample	Data collection	Data analysis
Ridgway <i>et al.</i> (2014)	USA	Factors that lessen the burden of treatment in complex patients with chronic conditions: a qualitative study	Explore views of patients with Multinorbidity and its impacts	MCCs	Unclear	Phase 1: 50 patients (29 females), 25–85 years Phase 2: 25 patients (11 females), 52–87 years	Semi-structured interview, focus group interview	Framework analysis
Stammers <i>et al.</i> (2014)	Australia	Depression diagnosis and treatment among multinorbid patients: a thematic analysis	Explore experiences of people with depression and multinorbidities	Depression and multinorbidities	Unclear	12 patients (7 females), age 46–86 years	Semi-structured interviews	Inductive thematic analysis
Warren-Jacopiere <i>et al.</i> (2014)	USA	Taking it one day at a time: African American women ageing with HIV and comorbidities	Describe how age, identity, comorbidities, social responsibilities, and relationship status of older women with HIV impact their self-management	HIV and comorbidities	Unclear	23 patients (23 females), mean age 57 years	Semi-structured interview	Constant comparison
Al-Amer <i>et al.</i> (2015)	Jordan	Diagnosis of type 2 Diabetes: the experiences of Jordanian patients with coexisting depression	Explore emotional reflections of Jordanian people with coexisting depression and diabetes	Diabetes and depression	Unclear	15 patients (10 females), 36–73 years	Semi-structured interviews	Thematic analysis
Eckerblad <i>et al.</i> (2015)	Sweden	To adjust and endure: a qualitative study of symptom burden in older people with multinorbidity	Explore the experience of living with a high symptom burden from people with MCCs	MCCs	Unclear	20 patients (16 females), mean age 84 years	Semi-structured interviews	Content analysis
Naguathian <i>et al.</i> (2016)	Canada	Perceived value of support for older adults coping with multinorbidity: patient, informal caregiver, and family physician perspectives	Explore the value of informal and formal supports for older adults with multinorbidity	MCCs	Unclear	27 patients (43% females), mean age 82.3 years	Semi-structured interviews	General inductive approach
White <i>et al.</i> (2016)	Australia	Multinorbidity and the process of living with ongoing illness	Explore how people with MCCs experience their conditions	MCCs	1–27 years	16 patients (11 females), age 20–67 years	Interview	Grounded theory
Wissen <i>et al.</i> (2017)	New Zealand	Cardiovascular disease and prediabetes as complex illness: people's perspectives	Explore how patients live with cardiovascular disease and prediabetes	Cardiovascular disease and prediabetes	Unclear	23 patients (6 females), age 43–85 years	Interview	Interpretive description

that the patients from Asian and the Middle East experienced this problem (Al-Amer *et al.* 2015; Whiting *et al.* 2006).

'I never [consulted a GP about depression], you know I think it's a, it's a cultural thing where you say it's taboo to think about...' pp. 181 (Whiting *et al.* 2006)

Besides, for patients with contagious diseases such as HIV (human immunodeficiency virus) and HCV (hepatitis C virus) (Lekas *et al.* 2011; Molefe & Duma 2009; Warren-Jeanpiere *et al.* 2014) and the patients with a history of substance use (Ward 2011), their narratives showed that they were living in the shadow of stigma.

'They [uninfected people] might think it's dirty [an HIV+ person]... I guess the same thing [for HCV]. Dirty. Foul [an HCV+ person]' pp. 16 (Lekas *et al.* 2011)

### Maintain a normal life

Once people develop MCCs, there could be a broad range of barriers to life such as physical restrictions, insufficient knowledge, lack of emotional support, and financial burden in managing their diseases (Bayliss *et al.* 2009). 'Maintain a normal life' refers to people with MCCs how to manage the various chronic conditions and their impacts on everyday life. Three sub-themes were merged: 'taking medication', 'exercise & dietary', and 'seek information by themselves'.

'Taking medication' was a common way of managing MCCs. This subtheme was frequently reported in more than half of the studies (Boeckxstaens *et al.* 2012; Elliott *et al.* 2007; Fix *et al.* 2014; Hillege *et al.* 2008; Loeb *et al.* 2003; Löffler *et al.* 2012; Morris *et al.* 2011; Nyhlin 1990; Ridgeway *et al.* 2014; Stanners *et al.* 2014; Townsend *et al.* 2006; Ward 2011; Warren-Jeanpiere *et al.* 2014; White *et al.* 2016).

'I take 21 prescriptions a day, this morning I did my weekly [pill organiser]...' pp. 14 (Loeb *et al.* 2003)

The problems of managing multiple medications, the financial burden of medical costs, and adherence to prescriptions were reported (Elliott *et al.* 2007; Fix *et al.* 2014). For instance, some patients reported the difficulties with schedules and worries about the adverse effects.

'I get nervous if I have to take a couple different medications at the same time, because mind over matter, I guess. I think that when you take too many medications, it does something to you' pp. 10 (Fix *et al.* 2014)

The subtheme of 'dietary and exercise' was quoted in ten studies (Coventry *et al.* 2014; Dysch *et al.* 2012; Elliott *et al.* 2007; Fix *et al.* 2014; Hillege *et al.* 2008; Loeb *et al.* 2003; Morris *et al.* 2011; Roberto *et al.* 2005; Stanners *et al.* 2014; Townsend *et al.* 2006). The patients described that they maintained a healthy life-style such as controlling sugar intake, consuming low-calorie foods, and eating special foods in their everyday lives. Another important category of coping strategies was exercise. Patients reported performing physical activities such as walking, yoga, and some other fitness programmes, and these activities will give them a sense of relief.

'It's physical activity that gets your mind going' pp. 15 (Loeb *et al.* 2003)

'Seek information by themselves' refers to the patients' actions to obtain information to have a better understanding of their conditions and disease management. They sought information from newspapers, magazines, online courses, and education programmes (Loeb *et al.* 2003; Löffler *et al.* 2012; Morris *et al.* 2011; Ridgeway *et al.* 2014). A patient described a way of gaining information about migraines:

'I read a lot of magazines and newspapers and quite often they included reports about a migraine and I know 100% certain how I need to react' pp. 5 (Löffler *et al.* 2012)

Although many information resources were supportive, a study reported that the mixed information led to a confusion among MCC patients (Loeb *et al.* 2003).

### Keep a positive mental attitude

People with MCCs are a vulnerable population due to the unpredictability in everyday life. Beyond the management of physical symptoms, the theme 'keep a positive mental attitude' represents ways of dealing with negative emotions and staying positive. This main theme comprised two subthemes: 'adapt to changes' and 'rely on spiritual support'.

'Adapt to the changes' refers to trying to accept stressful situations resulted from MCCs. It was seen as a 'never-ending struggle' where patients had to learn how to adopt chronic conditions. The patients reported various strategies of adaptation and emphasized the importance of a positive self-concept (Al-Amer *et al.* 2015; Boeckxstaens *et al.* 2012; Coventry *et al.* 2014; Eckerblad *et al.* 2015; Löffler *et al.* 2012; Molefe & Duma 2009; Nyhlin 1990; Ridgeway *et al.* 2014;

Roberto *et al.* 2005; Sells *et al.* 2009; Stanners *et al.* 2014; Townsend *et al.* 2006; Ward 2011; White *et al.* 2016). Some patients reported that comparing oneself to other patients could enable them to believe that their situations were not particularly bad (Ridgeway *et al.* 2014; Roberto *et al.* 2005; Stanners *et al.* 2014). Some negotiated life changes by lowering their life expectations (Löffler *et al.* 2012). Also, distractions (e.g. hobbies and daily activities) were used to take their mind off their current situations (Roberto *et al.* 2005). For example:

'No, this is how it is now and there is nothing I can do. Maybe I can choose one of the things I want to do and just push the other things aside. But that makes you feel bad about yourself. However, you know there are so many ailments hindering me'. pp. 6 (Eckerblad *et al.* 2015)

'Rely on spiritual support' refers to the faith own by the patients to manage their conditions. Faith could influence patients' perceptions about their lives (Arcury *et al.* 2000). MCC patients viewed their relationship with God as a spiritual support when they need help. Nine studies cited strategies regarding faith and religion that the participants used to manage chronic conditions (Al-Amer *et al.* 2015; Elliott *et al.* 2007; Loeb *et al.* 2003; Molefe & Duma 2009; Ridgeway *et al.* 2014; Roberto *et al.* 2005; Sells *et al.* 2009; Ward 2011; Warren-Jeanpiere *et al.* 2014). A patient described the important role of God in every life:

'I pray a lot. God is everything. He is everything. I pray a lot. I thank Him for waking me up in the morning and I pray every morning. I have suffered a lot; God erases it from my life' pp. 25 (Ward 2011)

### Coping in the social context

In the theme of coping in the social context, patients' narratives show that their coping is a mixed interplay of the personal and social circumstances. Two encompassed subthemes were as follows: 'engage in social roles' and 'social support'.

Eight studies reported the findings of 'engage in social roles' (Elliott *et al.* 2007; Loeb *et al.* 2003; Löffler *et al.* 2012; Nyhlin 1990; Ridgeway *et al.* 2014; Roberto *et al.* 2005; Sells *et al.* 2009; Townsend *et al.* 2006). The MCC patients tried to fulfil their social roles as a way of coping and talked about the importance of 'being in a certain role', which was beneficial for personal identification of living with MCCs (Townsend *et al.* 2006). In addition, they expressed the needs

of keeping up appearances and emphasizing their health through some normal activities (e.g. doing some housework). For example, people with MCCs tried to be 'a regular worker' as before:

'People ... they say that I work too much ... but it's not like that at all, it's completely different from that. If I did not have that [work] what, what would I be, just sitting here and that's it'. pp. 190 (Townsend *et al.* 2006)

'Social support' is a common way of coping with stress (Skinner *et al.* 2003). For people with MCCs, the availability and accessibility of external coping resources such as health system, family member, friends, and other social systems were key facilitators in managing their chronic conditions (Koch *et al.* 2015). Five studies noted the support of the healthcare system and beneficial connections with healthcare providers (Loeb *et al.* 2003; Löffler *et al.* 2012; Morris *et al.* 2011; Ridgeway *et al.* 2014; Whiting *et al.* 2006). A patient described the views on a well-constructed healthcare system:

'This is a good hospital system because I have all of my doctors all in one network, so that makes it easier'. pp. 345 (Ridgeway *et al.* 2014)

A good relationship between healthcare staff and patients impacted the quality of healthcare delivery and the quality of life of the patient (Goold & Lipkin 1999). Some patients considered that they had a 'coexisting' relationship with their health professionals (Roberto *et al.* 2005). The majority of patients said they had approached their healthcare providers to discuss the chronic conditions and had received useful advice, which could make them feel respected and comfortable (Loeb *et al.* 2003; Löffler *et al.* 2012; Naganathan *et al.* 2016; Whiting *et al.* 2006).

This review found six studies describing the role of the family members and the significant others (Al-Amer *et al.* 2015; Loeb *et al.* 2003; Löffler *et al.* 2012; Ridgeway *et al.* 2014; Roberto *et al.* 2005; Yorgason *et al.* 2010). The family is a crucial source of social support for patients with chronic diseases (Boise *et al.* 1996; Callant 2003). The family provided various types of assistance such as emotional support, health information, and health evaluation support (Ridgeway *et al.* 2014). Along with the family support, some patients also described the companion support from their friends (Ridgeway *et al.* 2014). However, two studies reported patients' conflicts with family members (Löffler *et al.* 2012; Roberto *et al.* 2005). A patient described an occasion of failure to understand:

TABLE 4: Summary of analysis and synthesis

Identified main themes	Interpretations	Identified subthemes	Contribution of each study (order as Tables 2 and 3)
Appraise MCCs	People with MCCs perceive the burdensome conditions and occasions following illness onset and accrual.	Relations among multiple conditions Problematic symptoms Negative emotions	3, 5, 7, 8, 10, 11, 12, 13, 15, 18, 20, 21, 23, 25, 26 1, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 20, 21, 22, 23, 25, 26 1, 5, 7, 8, 9, 10, 12, 13, 14, 16, 17, 20, 22, 23, 26,
Maintain a normal life	People with MCCs manage to alter or eliminate the sources of treatment burden.	Taking medication Exercise and Dietary Seek information by themselves	1, 2, 4, 6, 7, 11, 13, 14, 16, 18, 19, 20, 21, 25 2, 3, 4, 6, 7, 11, 15, 17, 18, 20 2, 11, 16, 19
Keep a positive mental attitude	People with MCCs manage and control negative emotions associated with treatment burden.	Adapt to the changes Rely on the spirituality	1, 3, 4, 8, 9, 13, 14, 16, 17, 19, 20, 22, 23, 25 2, 3, 6, 8, 9, 13, 19, 21, 22
Coping in social context	People with MCCs maintain control over their social roles and receive external help.	Engage in social roles Support and assistance from the others	1, 2, 3, 4, 6, 9, 16, 19 1, 2, 3, 4, 5, 6, 8, 9, 11, 15, 18, 19, 21, 24

'The oldest one [daughter] doesn't understand that you have to eat at a regular time. The one that lives here with me, she knows what is going to happen if you don't, but the others are just kind of blank'. pp. 687  
(Roberto *et al.* 2005)

## DISCUSSION

The aim of this review was to identify, compare, and synthesize published qualitative evidence concerning the experiences of coping with MCCs. This study was of value for three relevant reasons. First of all, by following a structured approach (Noblit & Hare 1988), we merged four themes related to coping with MCCs: 'appraise MCCs', 'maintain a normal life', 'keep a positive mental attitude', and 'coping in the social context' and offered a line of argument regarding coping with MCCs. The synthesized findings presented a general perception of MCCs from the patient's side and located a variety of coping strategies to manage MCCs. Next, although the qualitative studies do not require representative samples or external validity, the included studies involved a more homogenous subset of people with MCCs. Moreover, we adopted a JBI tool to evaluate the quality of the included studies and the evaluation results were satisfactory. This allowed us to provide reliable and authentic findings.

MCC patients had various perspectives on their compound health conditions by appraising their situations, and these perceptions developed by MCC patients may differ from those developed by patients with a single chronic condition (Bower *et al.* 2012).

This study confirmed the complexities they faced. More specific, when they described the perceptions, they presented a holistic view of MCCs itself with reference to the disease burden and priorities of different conditions. This finding reiterated the difficulties of managing a certain number of chronic conditions. What is more, research suggests that the illness perceptions affect the way in which people make sense of their conditions and the consequent management (Leventhal *et al.* 1980), and these personal perceptions may or may not be in line with the perspectives of health professionals (Naganathan *et al.* 2016). The current study did not compare the difference in perceptions between the patients and providers but it is necessary to pay attention to this area because understanding illness perceptions are significant as they are capable of predicting a patient's behaviours (Hagger & Orbell 2003).

Altered perspectives reintegrated by constructions about MCCs and new information resulted in a shift of patients' responses to diseases, and these perspectives characterized the ways of coping. This study illustrated that people with MCCs used many strategies to cope with the difficulties of MCCs. The two major themes ('maintain a normal life' and 'keep a positive mental attitude') were similar to problem-focused and emotional-focused coping (Folkman & Lazarus 1984). The finding showed that people with MCCs adopted problem-focused coping strategies to resolve their health problems and kept their dignity and independence in order to maintain a normal life. These strategies included taking medication, changing lifestyle, and seeking information. Besides, this study showed that

people with MCCs experienced mixed feelings about their chronic conditions, and this supported a previous study: Löffler *et al.* (2012) showed that people with MCCs experienced multiple emotions including both an interplay of negative emotions such as depression, anxiety, and sadness on one side and happiness on the other side in their coping process. It was also presented that MCC patients tried to stay positive with emotional coping strategies such as pray, distraction, and humour. An interesting finding was that we identified that the medicating behaviour and personal adaptation were the most common coping strategies among people with MCCs. This indicated the importance of these two strategies and gave us some hints of promoting health care such as facilitating an optimized medication management plan and implementing recommendations for medication for the MCC patients.

Coping with MCCs is not an isolated process, but an environment-related process (Lazarus & Folkman 1984). This study showed that living with chronic conditions was a journey that was combined with professional and other social networks. The finding of 'coping at the social level' indicated the significance of support from the social aspects, which echoed a past study by Kosciulek (2007). However, due to the complexity of MCCs, we found that the supporting information from family and friends might be fragmented, and conflicting (Stange 2009; Tinetti & Fried 2004; Weiner *et al.* 2010). These conflicts between demands and provisions were consistent with a past study (Ploeg *et al.* 2017), which revealed the disconnected communication and interactions between MCC patients and their caregivers. Similarly, one of the difficult areas of managing MCCs found in some past studies involved the conflicts concerning targets of health care between the providers and people with MCCs (Sinnott *et al.*, 2013). As a result, more attention should focus on how to provide accurate health information to patients and identify reliable sources of information.

#### Implications for further research

The studies included in this review were mostly conducted in Western countries, with only one from an Arab country. The majority of the concepts of coping and research about coping have been developed and conducted in Western countries (Hobfoll 2001). This was criticized by some scholars (Folkman & Moskowitz 2004) as it fails to take cultural influences into consideration (Chun *et al.* 2006). Culture has not been

adequately studied within the current coping literature, and related research outside of Western countries is still rare (Heppner *et al.* 2006). Thus, it is needed to conduct studies in various cultures to identify the role of culture in coping with MCCs.

Older patients have a higher prevalence of chronic disease and comorbidity (Kennedy *et al.* 2014). This study identified that most of the studies focused on elderly people with MCCs. However, chronic diseases may strike any age groups, and coping is a dynamic, and age-related process (Strack & Feifel 1996); thus, future studies may need to examine the differences in coping among different age groups. What is more, gender characterized different coping strategies (Hobfoll *et al.* 1994). Studies have indicated that male and female could cope differently when facing same stressful situations including physical and mental health conditions (Ninot *et al.* 2006; Piccinelli & Wilkinson 2000). Due to a paucity of research in this area, hence, more studies are required to investigate whether male and female have different appraisals and use different strategies when they face with MCCs.

#### Limitations

In the research area of chronic conditions, some commonly used terms such as self-management, coping, and adaptation are confused. Auduly *et al.* (2016) undertook a concept review to clarify these concepts in the context of managing a neurological condition and found that coping focused on the internal control whereas self-management focused on the disease control. The current study synthesized qualitative data of coping and MCCs based on the theory developed by Lazarus and Folkman (1984). Therefore, we may have missed some findings that involve coping but to a lesser extent. Few descriptions about MCCs in the included studies led to a lack of insight on the variation across different chronic conditions clusters. A recent research has demonstrated the associations between clusters of chronic conditions and patient's health outcomes (González-Chica *et al.* 2017). Hence, this area requires further investigation. What is more, studies met the inclusion criteria based on an abstract written in English but have not been included because of language restrictions. This means that we may have missed some perspectives and insights of people with MCCs from publications in other languages. Lastly, this study may have overlooked some potential studies published in other sources beyond peer-reviewed journals.

## CONCLUSION

In summary, this review analysed 26 qualitative studies involving 654 participants concerning the experiences of coping with MCCs. The findings showed people with MCCs might face a wide range of mixed conditions, and they adopted different strategies to maintain their normal lives and tried to stay positive. The importance of coping in the social context was also addressed. Further research should pay attention to some more specific topics such as age, gender, and cross-cultural research. Health promotion and maintenance programmes for developing and improving coping skills could be valuable for people with MCCs.

## RELEVANCE FOR CLINICAL PRACTICE

To move health care forward, we suggest that the possible guidance and counselling programme should be given. This may include an understanding of stressful experienced by patients, discussion about the complicating matters in their self-management, increased attention to the multiple medications and therapies, more individualized interventions targeted to the real state of patient's needs. The consequent quality assessment of health care and guideline development and research will also be essential.

Social aspects, such as health system, family, friends, and other support groups, are suggested to be valuable coping resources for people with MCCs. Every aspect plays a role in supporting MCC patients. The use of holistic social determinants of health would contribute to the better disease management and provide a complementary care (Gallant 2003). Thus, there is necessary for health professionals to work with families, significant ones and some related support groups as a team to provide optimal healthcare service for these patients. To support this, a good relationship among these could be a key element.

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# Illness Perceptions, Coping Strategies, and Quality of Life in People With Multiple Chronic Conditions

Cheng Cheng, MSc<sup>1</sup> , Cong-Yan Yang, BSc, RN<sup>2</sup>, Kerry Inder, PhD, RN<sup>3</sup>, & Sally Wai-Chi Chan, PhD, RN, FAAN<sup>4</sup>

<sup>1</sup> PhD candidate, School of Nursing and Midwifery, the University of Newcastle, Callaghan, Australia; Lecturer, Department of Nursing, Bengou Medical College, Bengou, China

<sup>2</sup> Head nurse, Department of Nursing, the First Affiliated Hospital of Bengou Medical College, Bengou, China

<sup>3</sup> Associate Professor, School of Nursing and Midwifery, the University of Newcastle, Callaghan, Australia

<sup>4</sup> Upsilon Eta, Professor, the University of Newcastle Singapore, Singapore

## Key words

Coping, illness perceptions, multiple chronic conditions, quality of life

## Correspondence

Cheng Cheng, RW2-56 Richardson Wing,  
University Drive, Callaghan, NSW 2308  
Australia

E-mail: ccheng1@uon.edu.au

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## Abstract

**Purpose:** To determine whether illness perceptions, coping strategies, and sociodemographic and clinical variables are related to the quality of life (QoL) in adults with multiple chronic conditions (MCCs) living in China.

**Design:** By employing a cross-sectional design based on the transactional stress and coping theory, a convenience sample of adults with MCCs were recruited from a university-affiliated hospital between November 2017 and May 2018 in Northern Anhui, China.

**Methods:** A self-reported questionnaire, including the Brief Illness Perceptions Questionnaire, the Brief Coping Orientation to Problems Experienced inventory, and the Short Form Survey version 2, was administered. Sociodemographic and clinical data regarding MCCs were also collected. Descriptive statistics including frequencies, means, standard deviations, and correlation coefficients were calculated to examine the relationship between illness perceptions, coping, and QoL. Hierarchical multiple regression models were used to identify variables associated with physical and mental QoL.

**Findings:** A total of 351 participants (50% male) were recruited, with a mean age of 58.9 years ( $SD = 14.6$ ). Of the participants, 83% had two chronic conditions. Participants reported impaired physical and mental QoL when compared with the general population in China. Poorer QoL was correlated with stronger illness perceptions of consequences and timeline and increased use of denial and disengagement and self-blame. Increasing age and more chronic conditions were associated with worse QoL. A higher education level was significantly associated with better physical and mental QoL. **Conclusions:** This study found that adults with MCCs living in China experienced impaired QoL. The strong relationship found between the participants' perceptions of MCCs, coping strategies, and QoL suggested that healthcare professionals should recognize the physical and psychological impacts of MCCs and address the significance of adaptations to MCCs in future treatment programs. The findings will help healthcare professionals design more specific interventions to modify illness perceptions and enhance certain coping strategies to improve the QoL of people with MCCs. Healthcare professionals can mobilize available resources from healthcare and social systems to enhance people's coping and adaptation to MCCs.

**Clinical Relevance:** With an understanding of the illness perceptions of people with MCCs, healthcare professionals could offer information related to consequences, timeline, and personal control to enable better alignment between people's expectations and their actual situations. By knowing people's coping strategies, healthcare professionals can offer additional support to people who prefer strategies of denial and disengagement and self-blame.

Multiple chronic conditions (MCCs), defined as two or more coexisting medically diagnosed chronic conditions (Parekh, Goodman, Gordon, Koh, & HHS Interagency Workgroup on Multiple Chronic Conditions, 2011), are expected to be increasingly common globally. Recent research has indicated that the prevalence of MCCs in the United States has increased significantly, from 45.7% in 1988 to 59.6% in 2014 (King, Xiang, & Pilkerton, 2018). A national survey in Australia showed that almost one in two people visiting general practices reported having MCCs (Harrison, Henderson, Miller, & Britt, 2016).

People with MCCs may encounter many physical and mental challenges resulting from functioning impairments (Ryan, Wallace, O'Hara, & Smith, 2015), adverse drug reactions (Marengoni & Onder, 2015), and a decreased quality of life (QoL; Park et al., 2018). People with MCCs also reported psychological distress. Evidence has shown that having MCCs may result in depressive symptoms (Wilson-Genderson, Heid, & Pruchno, 2017), and that psychological distress increases with the number of chronic conditions (Smith et al., 2014). Qualitative research showed that the onset of MCCs caused many therapeutic, mental, and social difficulties, which were "cascading" crises for the people affected (Sells et al., 2009).

Chronic health conditions are the number one cause of death and disability globally and have become the greatest health threat in China (Langenbrunner, Marquez, & Wang, 2011). MCCs impose a heavy burden on China's healthcare system. A cross-sectional study in China involving 162,464 people of all ages reported that more than 10% of the study population had MCCs (Wang et al., 2014). Another national survey among adults in urban China showed that the prevalence of MCCs increased from 35% in middle-aged group (45–59 years), to 55% in older group (60–69 years), and 61% in those over 70 years old (Chen, Cheng, Zhuang, & Broad, 2018).

Treating MCCs is challenging because current treatments mostly focus on single chronic conditions. Health care is fragmented and poorly coordinated around the world; thus, people with MCCs might experience difficulties in obtaining holistic care (Schoen et al., 2011). Specialist care for chronic conditions is dominant in China (Yip & Hsiao, 2008); thus, Chinese people may experience repetitive medical visits and hospitalizations due to MCCs. Further, China is experiencing a rapid aging of its population, where the proportion of older adults (60 years and above) will increase from 12.4% in 2010 to 28% in 2040 (World Health Organization, 2015). It can be anticipated that there will be a substantial increase in the prevalence of MCCs in the future. This will substantially increase healthcare demands and costs.

Living with MCCs can be distressing and persistently stressful, and thus requires physical and mental adaptations (Löffler et al., 2012). In Lazarus and Folkman's (1984) transactional coping theory, coping is described as continuously altering cognitive and behavioral efforts to respond to stressful situations. Various ways of coping have been identified that are usually classified into two categories: problem-focused coping and emotion-focused coping. Problem-focused coping refers to the efforts made to deal with the stressors, whereas emotion-focused coping represents emotional regulation in response to the stressors. The ways in which people cope with stressors usually rely on their appraisal, which is the process of evaluating the stressor. Lazarus and Folkman proposed three levels of appraisal: (a) the primary appraisal, in which an individual tends to judge whether the current stressor is stressful; (b) the secondary appraisal, in which an individual judges whether the current stressor and its consequences can be managed; and (c) the reappraisal, in which an individual will modify the ways of appraisal according to the actual situation. The process of how people appraise and cope affects their health-related outcomes, including those related to physical and mental health (Lazarus & Folkman, 1984). This theory suggests that the combination of illness perceptions and coping strategies can influence an individual's responses to the diseases and, therefore, the individual's health-related outcomes. It is reasoned that implementing an effective intervention may improve those outcomes.

People with MCCs may have illness perceptions that are quite different from those of people with a single chronic condition. Schütz, Wolff, Warner, Ziegelmann, and Wurm (2014) found that individuals with MCCs had specific perceptions of disease consequences, disease control, and disease duration, and that these were related to physical functioning. Qualitative findings confirmed that there was diversity in illness perceptions and suggested that these perceptions can affect the ways that illness is self-managed in people with MCCs (Bower et al., 2012; McSharry, Bishop, Moss-Morris & Kendrick, 2013). The role of coping in the adjustment to chronic conditions has been demonstrated in many studies. A meta-analysis found that people who actively coped with diabetes using strategies such as planning, seeking information, and staying optimistic had better glycemic control and fewer symptoms of anxiety and depression than people who did not (Duangdao & Roesch, 2008). Another systematic review found that coping-based psychosocial interventions for couples can effectively improve several domains of QoL, including physical, mental, and relationship outcomes, for patients with cancer and their spouses (Badr

& Krebs, 2013). However, explicit research into whether an integrated understanding of how illness perceptions and coping can influence health-related outcomes for people with MCCs has not been performed.

Given the increasing prevalence of MCCs and the accompanying healthcare burden, people with MCCs deserve more attention. The more that is understood about the role of coping and illness perceptions, and their association with individuals' QoL, the better healthcare professionals can help individuals to manage their chronic conditions. The current study may provide evidence to support the applicability of the Lazarus and Folkman stress and coping theory in a cross-cultural context, as well as a better understanding of the role of coping in explaining health. This study aimed to investigate the relationship between illness perceptions, coping strategies, and health-related outcomes among people with MCCs. It was hypothesized that illness perceptions, coping strategies, and other related variables (both sociodemographic and clinical) would explain a significant amount of variance in people's health-related outcomes, that is, people's self-perceived QoL.

## Methods

### Design

A cross-sectional study was conducted in a university hospital in Bengbu, Anhui, China, between November 2017 and May 2018. The conceptual framework (Figure S1) of this study was developed from the transactional theory of stress and coping (Lazarus & Folkman, 1984) and prior research on coping and health-related outcomes among people with chronic health conditions (Knowles, Cook, & Tribbick, 2013; McCabe & Barnason, 2012). The conceptual framework guided the selection of variables, including appraisal, coping, outcomes, and impact factors, for the present study. A stressor is defined as a condition or stimulus or event that has been appraised as threatening and exceeds an individual's capability to cope. Individuals constantly evaluate stressors within their environment and initiate coping strategies to manage the emotions generated from their appraisals or the stressor. This study conceptualized the incidence of MCCs as a stressor that makes individuals appraise their ability to cope. This study conceptualized the patients' experience of their illness perceptions as the primary appraisal for reflecting on how a patient evaluates MCCs, and their selection of coping strategies as the secondary appraisal for reflecting on how a patient manages MCCs. QoL was used as the indicator of health-related outcomes.

QoL is defined as "an individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns" (World Health Organization, 1997, p. 1).

### Sampling

This study used a convenience sampling approach. The inclusion criteria were that the participants had to be (a) a Chinese adult 18 years of age or older, (b) able to read and speak Chinese, and (c) medically diagnosed with two or more chronic conditions. A general practitioner helped to confirm the eligibility of participants. Individuals who had difficulties completing the survey (such as those who could not read due to low literacy) were excluded. In this study, MCCs referred to the presence of two or more medically diagnosed chronic conditions that have lasted 1 year or longer (Parekh et al., 2011). The chronic conditions included physical health conditions such as chronic respiratory conditions, diabetes, and hypertension, and mental health conditions such as depression, anxiety, schizophrenia, and bipolar disorder. The assessment of chronic conditions adhered to a past study that investigated the prevalence and patterns of chronic disease pairs and MCCs in China (Wang et al., 2015). The primary investigator developed a recruitment flyer. Clinical nurses at the study venue distributed the flyers. Individuals who had an interest in participating in the research approached the primary researcher by telephone, email, or in person.

### Measures

A self-reported Chinese questionnaire consisting of sociodemographic variables, clinical variables, and three well-validated scales was developed for this study. There were 60 items in total. A pilot test ( $n = 6$ ) was undertaken to assess the feasibility of the recruitment process and to measure the amount of time it would take to complete the survey.

#### Sociodemographic and clinical variables.

Sociodemographic variables including age, gender, level of education, marital status, and employment were collected. Clinical variables including the number, duration, and type of MCCs were also obtained.

**Illness perceptions.** Participants' illness perceptions were measured by the Brief Illness Perception Questionnaire (Brief IPQ) (Weinman & Petrie, 1997). The Brief IPQ includes eight 11-point (from 0 to 10)

Likert items and one open-ended question item. The eight items assess consequences (item 1), timeline (item 2), personal control (item 3), treatment control (item 4), identity (item 5), illness concern (item 6), coherence (item 7), and emotional representation (item 8). For items 1, 2, 5, 6, and 8, a higher score represents a worse disease perception. For items 3, 4, and 7, a lower score represents worse disease perception. The Brief IPQ total scores range between 0 and 80 points and represent the degree to which the illness is perceived as threatening. Higher scores reflect a more threatening perspective of the corresponding illness. The open-ended question asks the respondents to list the three most significant causal factors related to their diseases; however, this study excluded this item. The Chinese version of the Brief IPQ has been validated in people with breast cancer and shown to be reliable, with a Cronbach's alpha of 0.783 (Zhang et al., 2017). In this study, the Cronbach's alpha for the Brief IPQ was 0.747.

**Coping strategies.** Coping strategies were evaluated by the brief Coping Orientation to Problems Experienced (Brief COPE) inventory, which is an abbreviated version of the COPE inventory. This is a self-reported, 28-item questionnaire examining 14 coping strategies with two items for each strategy (Carver, 1997). Respondents are required to score each item on a 4-point Likert scale (from 1 = "I have never done it" to 4 = "I have done it a lot"), with a higher score indicating a more frequent use of the corresponding coping strategy. The Brief COPE is multidimensional and needs to be adjusted based on the real research setting (Krägeloh, 2011). This study used the Chinese version of the Brief COPE inventory, which has been validated in people with MCCs (Cheng, Congyan, Inder, & Chan, in press). The current version is psychometrically sound, with a Cronbach's alpha of 0.87, and is used to identify five coping strategies, including positive adaptation, denial and disengagement, spiritual coping, support seeking, and self-blame. In this study, the Cronbach's alpha for the Brief COPE inventory was 0.850.

**QoL.** QoL was tested using the 12-item Short Form Survey version 2 (SF-12v2) (Ware, Kosinski, Turner-Bowker, & Grandek, 2005). The 12 items in this instrument examine eight health aspects, including physical functioning, physical limitations, body pain, general health, vitality, social functioning, emotional problems, and mental health. The SF-12v2 generates two domains of health-related scores, including the physical component score (PCS) and the mental component score (MCS). Higher scores reflect better function. The SF-12v2 has been validated in the common Chinese population

and appeared to be reliable (Cronbach's alpha for physical component = 0.67; Cronbach's alpha for mental component = 0.60). The mean standards of the PCS and MCS scores in the Chinese general population were  $52.65 \pm 5.76$  and  $50.23 \pm 8.24$ , respectively (Lam, Lam, Fong, & Huang, 2013). In this study, the Cronbach's alphas were 0.815 for PCS and 0.688 for MCS.

### Sample Size

The sample size of this study was calculated using the multiple linear regression model as the approach for statistical analysis. With effect size (0.15),  $\alpha$  error probability (0.05), power (0.95), and 13 predictors (eight for illness perceptions and five for coping strategies), the sample size was calculated to be 189 participants. The sample size calculation was computed by G\*Power 3.1.9.4 software (Faul, Erdfelder, Buchner, & Lang, 2009). The typical sample size in most psychological studies ranges between 200 and 300 to ensure an acceptable margin of error (Fraley & Vazire, 2014; Marszalek, Barber, Kohlhart, & Holmes, 2011).

### Data Collection

Eligible participants were approached by the primary investigator, who gave them a verbal outline of the study aims and informed them that participation was voluntary and confidential. Participants gave written informed consent and were asked to complete the questionnaires in person. Participants took approximately 15 min on average to complete the survey. The primary investigator administered the survey and entered and cleaned the data.

Descriptive statistics were used to analyze the means, standard deviations, and frequencies of the data. Missing values were replaced by mean imputation. Normality was checked by the histogram and the absolute values of skewness and kurtosis. Pearson's correlation was used to analyze the relationship between illness perceptions, coping, and QoL (PCS and MCS). A correlation coefficient greater than 0.50 indicated a strong relationship (Cohen, 1988). Potential variables that were related to the scores of PCS and MCS (correlation coefficient greater than 0.15 and  $p < .05$ ) were entered into the consequent regression model. Calculating hierarchical multiple linear regressions with QoL (domain scores of PCS and MCS) as a dependent variable involved four steps: (a) entering the demographic variables, (b) entering the clinical variables, (c) entering the illness perceptions, and (d) entering the coping strategies. Regression models were applied using a forced entry method

of variable inclusion. Results were considered significant at a level of  $p < .05$ . All statistical analysis was computed by IBM SPSS Statistics version 25.0 (IBM Corp., Armonk, NY, USA).

### Ethical Considerations

This study was approved by the Human Research Ethics Committee of the University of Newcastle, Australia (H-2017-0378) and the participating hospital in China.

## Results

### Sociodemographic and Clinical Data

The results of the sociodemographic and clinical data are shown in Table S1. The sample consisted of 176 men and 175 women 23 to 95 years of age (mean = 58.9;  $SD = 14.6$ ). Cardiovascular conditions ( $n = 293$ , 83.5%), endocrine conditions ( $n = 158$ , 43.8%), and musculoskeletal conditions ( $n = 69$ , 19.7%) were the most prevalent chronic conditions. Most participants had two chronic conditions ( $n = 289$ , 82.3%), and the maximum number of conditions was four. Most participants had a postdiagnostic time span of more than 2 years ( $n = 279$ , 79.5%).

### Illness Perceptions, Coping Strategies, and QoL

The findings related to illness perceptions, coping strategies, and QoL are shown in Table S2. Only one missing value (item 21 of the Brief COPE inventory) was identified in the dataset and was substituted by its mean value. For sample sizes larger than 300, either an absolute skew value of  $>2$  or an absolute kurtosis of  $>7$  was used to determine non-normality (Kim, 2013). The variables showed normality according to the criteria. Almost half (48.7%) of the participants reported a score higher than the mean for the illness-threatening item. The proportion of participants with a score higher than the mean for each coping strategy were as follows: positive adaptation (50.1%), denial and disengagement (46.2%), support seeking (29.1%), spiritual coping (43.0%), and self-blame (39.3%). The results showed that the QoL of participants was impaired, with a lower PCS than MCS (37.92 and 44.43, respectively).

### Relationship Between Variables

The relationship between QoL, illness perceptions, and coping was tested by Pearson's correlations (Table S3). Physical health, as represented by the PCS, was negatively associated with illness perceptions for six of the

eight items: consequences, timeline, identity, illness concern, emotional representations, and illness threatening. Physical health had negative associations with the adoption of denial and disengagement coping, spiritual coping, and support seeking. Mental health, as represented by the MCS, was negatively associated with five illness perceptions items: consequences, timeline, identity, emotional representations, and illness threatening. Mental health was positively associated with personal control, treatment control, and coherence. Also, the MCS had negative associations with the use of denial and disengagement, support seeking, spiritual coping, and self-blame.

The results of the hierarchical regressions are presented in Table S4. In the physical health domain, demographic and clinical variables accounted for 19.9% and 3% of the variance, respectively. A higher education level was significantly associated with better physical health. Increasing age and an increasing number of MCCs were significantly associated with poorer physical health. Illness perceptions accounted for an additional 27.0% of the variance. Consequences and timeline were negatively associated with physical health. Coping strategies contributed an extra 1.4% to the final model, with denial and disengagement negatively associated with physical health. In the mental health domain, demographic and clinical variables accounted for only 4.0% and 0.3% of the variance, respectively. A higher educational level was significantly associated with better mental health. Illness perceptions accounted for an additional 17.7% of the variance. Consequences were negatively associated with mental health, and personal control was positively associated with mental health. Coping strategies contributed a further 1.6% to the final model, with self-blame negatively associated with mental health.

## Discussion

Built on the transactional theory of stress and coping, the present study examined whether illness perceptions and utilization of coping strategies were related to psychological distress and two domains of QoL (physical health and mental health) among a sample of 351 Chinese adults with MCCs.

Chronic conditions may not be life threatening; however, they result in suboptimal health outcomes. People with MCCs in this study reported poor physical and mental health when compared against the Chinese general population in terms of the mean standards of their PCSs and MCSs. This indicated the negative effects of living with more than one

chronic condition. Conditions may have clinical synergies and antagonisms; for example, people with hypertension and diabetes have a high risk for peripheral vascular disease, and people with diabetes and arthritis may find it difficult to adhere to exercise treatment. Evidence from a national survey in the United Kingdom showed that mental disorders and some musculoskeletal conditions had the greatest effects on QoL compared with other chronic conditions (Mujica-Mota et al., 2015). The most common chronic conditions in this study indicated that the participants may experience these issues, showing the challenges in caring for people with MCCs.

Illness perceptions are ways of making sense of conditions. A major aim of the study was to determine the relationship between illness perceptions and QoL among people with MCCs. After controlling the sociodemographic and clinical variables, this study found that the illness perceptions of people with MCCs accounted for a significant amount of variance in their physical and mental health. Consequences, timeline, and personal control were predictors. These findings may imply several factors. Supported by past findings (Schüz et al., 2014), the illness perceptions formed by people with MCCs may differ from those of people with a single long-term condition due to the complexity of the course of disease and treatments. The consequences of MCCs, such as the limitation of daily activities and negative moods (including fear, anxiety, and anger), were the participants' major issues, and how to adjust to the life changes was their priority concern. It is likely that the predictor of timeline revealed the nature of chronic conditions, as they usually last a lifetime. Nearly 80% of the participants in the present cohort had been diagnosed with MCCs for more than 2 years, which was suggestive of the probable psychological influence of duration and its role in characterizing illness perceptions. Collectively, these findings highlighted the importance of assessing and understanding a patient's illness perceptions because of the significant associations with health status.

### Coping Was Related to QoL

The most frequently used coping strategy was positive adaptation, highlighting the important role of adjustment in managing chronic conditions. Several coping strategies were associated with physical and mental health, but none showed a positive relationship. Prior studies on people with cancers supported the findings that denial and self-blame correlated with worse QoL (Brunault et al., 2016). The negative

association between the use of self-blame and mental health revealed that people with MCCs may suffer from feelings of guilt and a sense of shame regarding their chronic conditions, which may have made them report a worse QoL. Moreover, a past study demonstrated a strong association between denial and self-blame, coping, and psychological distress in people with chronic conditions (Kauff et al., 2008), and this association may have a deteriorating effect on their QoL. The findings showed that coping accounted for little variance in physical and mental health. A possible reason for this is that the effect of coping on health may be affected by the type of disease (Aldwin & Park, 2004). However, this study could not provide more evidence because of the inhomogeneity of MCCs. Aside from that, coping is a multidimensional framework and may represent various styles and ways of coping. Although this study used a validated coping inventory, the findings indicated that the items of the Brief COPE inventory may have some limitations in a transcultural context. Greater cross-cultural knowledge may contribute to a better understanding of coping, especially in relation to non-Western countries. While there is limited research on coping with MCCs, these findings underscore that the adoption of several coping strategies may affect the health of people with MCCs and that certain coping behaviors may be more adaptive than others.

This study found that increased age and a higher number of chronic conditions were associated with worse physical QoL. This has been consistently reported in previous studies (Hunger et al., 2011). The results showed that education level played an important role in the health and illness perceptions among people with MCCs. There are several reasons why education might positively affect an individual's health: (a) positive relationship between education level and occupational and economic conditions, (b) positive relationship between higher education level and greater acquisition of social/psychological resources, and (c) positive relationship between education level and lifestyle (Ross & Wu, 1995). Lower health literacy has been linked to a poorer general health status, worse adherence to treatment, a lack of understanding of health messages, and an inadequate use of healthcare services (Berkman, Sheridan, Donahue, Halpern, & Crotty, 2011). However, this study excluded participants who could not read. Further research should emphasize health literacy within the population of MCCs before delivering advice and suggestions to maximize patients' health and well-being.

Culture influences stress and coping. It influences the individual self, the environment in which an individual lives, and his or her views of the environment

(Tweed, White, & Lehman, 2004). Simply applying Western coping theories to different ethnic groups across regions of the world may not be appropriate (Heppner, 2008). Underlying beliefs may account for many of the differences in the perceptions of stressful events such as MCCs. In the Western context, a person may actively respond to stressful events with multiple strategies (Kluckhohn & Strodtbeck, 1961). Chinese people may place emphasis on maintaining harmony in managing themselves, dealing with interpersonal relationships, and confronting the environments in which they live (Huang, 2016). They may tend to avoid conflicts with stressful situations to maintain social and interpersonal harmony (Hsu, Chen, Wang, & Sun, 2008). Such a belief may mean that Chinese people are more likely to adapt to their current status rather than intentionally make changes. A past cross-cultural study found that Asian people used internal coping strategies such as reappraisal, denial, self-control, and repression to change individual self-perceptions rather than their environment (Tweed et al., 2004). Such cultural influences may help to explain the findings of this study in which the strategies of denial and disengagement and self-blame, which aim to change the self, could predict physical and mental health.

### Implications for Clinical Practice

This study was the first step in researching the associations between illness perceptions, coping, and self-reported health outcomes among adults with MCCs in China. Significantly, these findings indicated that illness perceptions and coping strategies play an important role in disease self-management. Restructuring illness perceptions by providing concise information, including knowledge of MCCs' trajectories and self-management skills, may help people to cope more efficiently. Future healthcare efforts should focus on increasing MCC patients' self-efficacy in managing their conditions, and diminishing negative beliefs about the consequences of MCCs. In addition, interventions that change patients' thoughts about the duration of illness (timeline) to be less chronic and facilitate perceptions between expectations and reality may help to improve QoL.

An understanding of illness perceptions can inform healthcare professionals about people's psychological reactions to their MCCs. This work is imperative, as illness perceptions can predict health behaviors (Moss-Morris et al., 2002; Zelber-Sagi et al., 2017). If too much attention is paid to physical impairments, the unspoken requirements of people with MCCs may be overlooked. By evaluating the coping strategies of people with MCCs, healthcare professionals could target people

with psychological needs. Healthcare professionals can encourage patients to have more positive and realistic reactions to the MCCs and to adapt proactively. A recent meta-analysis based on the common-sense model of self-regulation has demonstrated that effective interventions that address illness perceptions and coping strategies could improve physical and psychological functioning among people with cancer (Richardson, Schüz, Sanderson, Scott, & Schüz, 2017). The next step is to develop and test culturally appropriate interventions to facilitate changing the perspectives of illness threats and promoting the use of specific coping strategies to improve health outcomes among people with MCCs.

### Limitations and Further Research Directions

#### Design

The present study adopted a cross-sectional design that cannot imply causality. Coping is a dynamic process. When people change their appraisals of their chronic conditions, such as their beliefs about illness, it may influence their coping and health-related outcomes. Further longitudinal studies are needed to evaluate the changing process of people's appraisals and ways of coping related to the health outcomes of MCCs over time.

#### Sample

This study was conducted in Northern Anhui, China; therefore, the findings may not be generalized to other parts of China or Chinese populations residing in other areas of the globe. As a result, the findings of this study need to be verified in more studies. Large and robust sample sizes also contributed to improving the generalizability of the findings. In addition, the exclusion of participants with low literacy might have resulted in participation bias. Future research should include participants with differing levels of literacy to ensure that the research outcomes reflect a more inclusive population.

There might also be reporting bias in a self-report survey. Participants might not remember their diagnosis correctly and they might be embarrassed to reveal details of their health status such as many chronic health conditions or the long-lasting course of the conditions. These biases might affect the results.

#### Measures

Cultural differences in questionnaire response patterns have been reported (Kemmelmeyer, 2016). The

outcomes of self-report measurements might vary across different racial or ethnic groups. The present study used two scales: the Brief IPQ and the SF-12v2. These scales had been used in China with acceptable reliability but had not been fully validated in people with MCCs. Further validation of the instruments in different study populations is essential.

There are many sociocultural, emotional, cognitive, and physical factors that can affect coping (Hudson, 2016). This study involved variables such as physical factors (e.g., multiple medications use, received health-care plans, and trajectories of MCCs), psychological factors (e.g., distress), and sociodemographic factors (e.g., age and sex). There are other important factors that might influence coping that were not measured in the present study (e.g., clusters of MCCs, medications, and social support). Future research might include more factors to identify their role in influencing coping and health.

Given the multifaceted and interrelated nature of MCCs, illness perceptions, coping strategies, and health-related outcomes, new approaches and technologies such as advanced statistical methods should be employed to reveal their potential associations. Future studies may use other validated and comprehensive scales to confirm the findings of this study, such as biomarker outcomes (e.g., blood pressure), client outcomes (e.g., mortality), and implementation outcomes (e.g., cost-effectiveness) instead of self-reported health outcomes.

## Conclusions

This was the first study to document the relationship between illness perceptions, coping strategies, and QoL in Chinese adults with MCCs. Findings suggest that the ways in which people perceive their MCCs and how they cope with them could affect their physical and mental QoL. Further research might involve developing and testing culturally adapted interventions to facilitate changing patients' perceptions of illness threats and promoting the use of specific coping strategies to improve health outcomes among people with MCCs.

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## Clinical Resources

- National Institute for Health and Care Excellence. Multimorbidity: Clinical assessment and management. National Institute for Health and Care Excellence guideline [NG56]. <https://www.nice.org.uk/guidance/NG56/chapter/Recommendations#multimorbidity>

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## Supporting Information

Additional supporting information may be found in the online version of this article at the publisher's web site:

- Figure S1. Model of the conceptual framework.
- Table S1. Descriptive Results for Socio-Demographic and Clinical Data
- Table S2. Descriptive Results for Illness Perceptions, Coping Strategies, and QoL
- Table S3. Relationship Between Illness Perceptions, Coping Strategies, and QoL
- Table S4. Hierarchical Regression Models for QoL†

## 10. PUBLISHED ARTICLE


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ORIGINAL ARTICLE

# Urban–rural differences in mental health among Chinese patients with multiple chronic conditions

Cheng Cheng,<sup>1,2</sup>  Cong-Yan Yang,<sup>3</sup> Kerry Inder<sup>1</sup> and Sally Wai-Chi Chan<sup>4</sup>

<sup>1</sup>School of Nursing and Midwifery, University of Newcastle, Callaghan, New South Wales, Australia, <sup>2</sup>Department of Nursing, Bengbu Medical College, Bengbu, Anhui, China, <sup>3</sup>Department of Nursing, the First Affiliated Hospital of Bengbu Medical College, Bengbu, Anhui, China, and <sup>4</sup>University of Newcastle Singapore, Singapore, Singapore

**ABSTRACT:** Mental health is impacted by social, economic, and environmental influences related to where people live. Mental health problems commonly co-occur with long-term physical conditions and impact individuals' health synergistically. Multiple chronic conditions (MCCs) including mental health problems are becoming a public health challenge globally. However, there is limited information about urban–rural differences in mental health among patients with MCCs in China. The present study aimed to identify differences in mental health between urban and rural patients with MCCs. Using a cross-sectional design, 347 patients with MCCs were recruited from a tertiary hospital in North Anhui, China. A self-reported questionnaire, including socio-demographic and clinical variables, the 12-item Short-Form survey version 2 on quality of life, and the Hospital Anxiety and Depression Scale, was administered to outpatients. Findings showed that rural participants reported more symptoms of anxiety and depression and had worse mental health compared to urban participants. Unemployment status, lower educational level, more long-term health conditions, and a higher degree of anxiety were associated with worse mental health. This study highlights disparities in mental health among patients with MCCs living in urban and rural areas of China. Appropriate mental health support programmes should be developed for patients with MCCs, especially for those living in rural areas.

**KEY WORDS:** anxiety, depression, mental health, multiple chronic conditions, quality of life.

## INTRODUCTION

Mental health problems have become an increasingly important public health concern globally (World

Health Organization, 2018a). Mental health problems can affect anyone; however, a body of evidence shows that socio-demographic factors, such as age, ethnicity, place of residence and language, and socio-economic factors like income and education, can affect an individual's health outcomes (Khan *et al.*, 2011; Lyratzopoulos *et al.*, 2012), especially people's mental health (World Health Organization, 2014).

The relationship between people's place of residence and their mental health has drawn much attention across countries in the past decades (Peen *et al.*, 2010). However, epidemiological evidence for this relationship is inconclusive. For instance, an investigation involving 18 000 adults in nine countries of the former Soviet Union showed that living in urban areas was related to higher odds of psychological distress compared to living in rural areas (Stickley *et al.*, 2015).

**Correspondence:** Cheng Cheng, School of Nursing and Midwifery, University of Newcastle, Callaghan, New South Wales, Australia. Email: ccheng1@uon.edu.au

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Cheng Cheng, PhD Candidate MSc.

Cong-Yan Yang, BSc RN.

Kerry Inder, PhD RN.

Sally Wai-Chi Chan, PhD RN FAAN.

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Another study in Denmark showed that people born in the urban environment reported a higher occurrence of mental illnesses in general and some specific psychiatric disorders such as schizophrenia and bipolar disorder than people born in the rural environment (Vassos *et al.*, 2016). However, contrary to those findings, research in the United States found no difference in the prevalence of mental illness between the most urban and the most rural areas (Breslau *et al.*, 2014). The Australian Rural Mental Health Study also found little difference in psychological distress depending upon region; however, participants living in very remote areas reported more distress (Butterworth *et al.*, 2014).

A recent cross-sectional study in China reported more depression and more alcohol addiction in people living in rural areas compared with urban counterparts (Huang *et al.*, 2019). A previous meta-analysis showed that older Chinese adults living in rural areas reported more depressive symptoms than urban counterparts (Zhang *et al.*, 2012). Data from the China Health and Retirement Longitudinal Survey (CHARLS), Tian *et al.* (2015) demonstrated that older adults living in urban areas had better mental status compared with their rural peers and that gender, marital status, educational level, and social activities were associated with the mental health of the participants. Many factors complicate research into differences in individuals' mental health between rural and urban areas, such as different definitions of 'urban' and 'rural', cultural differences across place of research, and heterogeneity in diagnostic measures for case identification (Peen *et al.*, 2010).

The China Mental Health Survey (CMHS) found that between 2013 and 2015 the weighted prevalence of any mental illness was 9.3% in Chinese adults during the 12 months before clinical interview and 16.6% during the participants' lifetime before the interview (Huang *et al.*, 2019). Patients with mental health problems in China usually receive institutional care due to the structure of China's healthcare system (Liu *et al.*, 2011). Specialist mental health care dominates the present healthcare system, while community-based mental health care is developing. As a result, mental healthcare service provision is mainly hospital-based. Factors such as lack of funding, disparity in the distribution of medical resources, and insufficient mental healthcare staff compound the issues (Liu *et al.*, 2011; Xiang *et al.*, 2018). Utilization of mental healthcare services for inpatients or outpatients has been low in both urban and rural areas in China. In 2015, the rate of fortnightly consultations of mental healthcare services in China

was 0.15% and the admission rate to mental healthcare facilities was 0.3% (National Health & Planning Commission, 2015a, 2015b). To improve mental healthcare service use, the Chinese government enacted mental health legislation in 2013 and announced a project focused on 'central government support for the local management and treatment of serious mental illness' in 2014. China has also integrated mental healthcare services into its national healthcare system. For example, the state council (National Health and Planning Commission, 2015b) demonstrated its commitment by releasing the *National Mental Health Working Plan, from 2015 to 2020* in 2015. This plan aimed to build a comprehensive mental healthcare network led by the government with the cooperation from community, family, and mental healthcare staff; improve current healthcare services to ensure treatment and support for people with mental illnesses; and promote social understanding and acceptance for people with mental illnesses (Xiong & Phillips, 2016). Despite this, barriers and challenges for mental healthcare services development in China include the following: (i) lack of financial investment from government, (ii) insufficient mental health facilities and trained psychiatric professionals, (iii) social stigma attached to mental illness and resulting discrimination, and (iv) disparities in mental healthcare coverage and resource allocation between rural and urban areas across the country (Liu *et al.*, 2011; Que *et al.*, 2019).

Long-term diseases are a major health concern in China, accounting for an estimated 89% of all deaths, among which cardiovascular diseases (43%), cancer (23%), long-term respiratory disease (9%), and diabetes (2%) are predominant (World Health Organization, 2018b). The increased morbidity and mortality of long-term diseases cause a substantial burden of disease to patients and the healthcare system in China (National Health & Planning Commission, 2015c, 2015b). Many patients may suffer from more than one long-term condition. The term 'multiple chronic conditions' (MCCs) refers to the co-occurrence of more than one long-term condition in an individual (Wolff *et al.*, 2002). A cross-sectional survey involving 162 464 community residents in southern China found that 11.1% of the total study population had two or more long-term conditions (Wang *et al.*, 2014). Another study found that the prevalence of MCCs was much higher in older adults living in urban areas in China (49.4%; Gu *et al.*, 2017).

Having MCCs is highly associated with poor health outcomes such as function loss, disability, and decreased quality of life (QoL; Marengoni *et al.*, 2011).

MCCs are also a challenge for quality health care. Patients with MCCs may undergo multiple tests, experience more hospitalizations, and have an increased risk of adverse drug events (Vogeli *et al.*, 2007). General medical spending and total out-of-pocket spending on health care increase with the number of long-term conditions (Wang *et al.*, 2014). Psychological distress also increases with the number of long-term conditions, suggesting that living with MCCs might affect patients' psychological well-being, not just their physical well-being (Gunn *et al.*, 2012).

Despite many studies concerning MCCs, there is a paucity of research comparing the mental health of people living in urban areas with MCCs compared with that in rural areas. The twin realities that China's MCCs population is increasing and China has the world's fastest ageing population, may predict a surge in the prevalence of MCC in the future. Increased knowledge regarding urban and rural differences in MCCs including mental health problems may contribute important information to the discussion on policy development and facilitate supportive programmes to manage health issues for this group. Comparisons in mental health between urban and rural areas may help to understand the urban–rural disparities and draw more attention to patients with MCCs because there is a significant relationship between the number of health conditions and psychological distress (Holden *et al.*, 2010).

The current work aims to contribute to evidence about urban–rural differences in mental health among Chinese patients with MCCs, which may have potential implications for mental health practice and policy. The authors hypothesized that patients in rural areas in China will report more psychological distress and poorer mental health than their urban counterparts as they have less access to quality healthcare and medical resources (Li *et al.*, 2018).

## AIMS

The present study aimed to identify differences in mental health between urban and rural patients with MCCs.

## METHODS

### Design

A cross-sectional survey was undertaken in a northern part of Anhui province, China, between November 2017 and May 2018.

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## Sample

A total of 351 Chinese adults with MCCs participated in the survey. The inclusion criteria were as follows: individuals who had MCCs, defined as more than one long-term condition, were cognitively capable of completing the questionnaire, voluntarily joined the study and could speak Chinese.

This study used insurance type to identify whether participants lived in urban or rural areas. Currently, there are three different types of government insurance schemes in China. These include Urban Residents Basic Medical Insurance (URBMI), Urban Employees Basic Medical Insurance (UEBMI), and the New Rural Cooperative Medical Scheme (NRCMS) (Sun *et al.*, 2017). URBMI covers self-employed people, children, students, and older adults on a voluntary basis. UEBMI is compulsory at the employee level and is financed by the employee, employer, and government. URBMI and UEBMI are only available for urban residents, whereas NRCMS is only available for rural residents (665 million in 2015; National Health & Planning Commission, 2015a, 2015b). Both URBMI and UEBMI are administered by the Ministry of Human Resources and Social Security of China. The NRCMS is administered by the National Health and Family Planning Commission. The NRCMS is a voluntary insurance scheme for people living in rural areas (670 million in 2015; National Health & Planning Commission, 2015a, 2015b). Further, commercial health insurance can be purchased voluntarily by individuals as a supplementary insurance cover. The use of insurance types to identify whether the participants lived in urban or rural areas has been used in a prior study in China (Cai *et al.*, 2018). Participants were excluded if there was no precise record regarding the medical insurance scheme or residence location.

## Recruitment

The primary investigator designed and displayed posters for recruitment in outpatient clinics at the hospital. Patients interested in participating in the study approached the primary investigator by phone, email, or in person. Those interested in participating in the study were provided with a participant information statement and were asked to sign a consent form and then complete a self-reported questionnaire.

## Data collection

The first author obtained informed consent and administered the survey. The questionnaire took about

15 min to complete. Residential address and medical insurance information were obtained from their medical record.

### Instruments

The questionnaire comprised questions about socio-demographic characteristics, clinical factors, and two standardized instruments to measure quality of life and anxiety and depression.

#### *Socio-demographic and clinical measures*

Participants were asked to provide socio-demographic information including age, gender, education, income, employment, and marital status. Clinical data included the number, type, and duration of MCCs.

#### *Medical Outcomes Study 12-item Short-Form version 2 (SF-12v2)*

The SF-12v2 was used to measure the physical and mental health status of patients with MCCs (Ware *et al.*, 2005). The SF-12v2 has been translated into Chinese and validated in China (Cronbach's alpha for physical component = 0.67; Cronbach's alpha for mental component = 0.60; Lam *et al.*, 2013). The SF-12v2 has 12 items assessing eight domains: body pain (BP), general health (GH), vitality (VT), social functioning (SF), physical functioning (PF), mental health (MH), role physical (RP), and role emotional (RE). The SF-12v2 scale scores were calculated by summation of the related item scores and transformed to a range from 0 to 100 based on the standard scoring algorithm (Ware *et al.*, 2005). A higher score indicates better-perceived health. The physical component score (PCS) and mental component score (MCS) were derived from the above domains by calculation (Bruun, 2016). This study considered the MCS as the main indicator of the mental health of patients with MCCs.

#### *Hospital Anxiety and Depression Scale (HADS)*

The HADS is a widely used scale to measure an individual's level of anxiety and depressive symptoms (Zigmond & Snaith, 1983). This scale includes 14 items: seven items measure symptoms of anxiety (HADS-A) and the other seven items measure symptoms of depression (HADS-D). Each item is scored from 0 to 3, giving a total score ranging from 0 to 21. The HADS has been translated into Chinese and shown to be reliable (Cronbach's alpha equalling 0.86 and in the domain of anxiety 0.77 and for depression 0.82; Leung *et al.*, 1999).

### Data analysis

Univariate analysis (e.g., means and standard deviations) was used to analyse socio-demographic characteristics of the participants and levels of self-reported health. Independent *t*-tests or Mann-Whitney U-tests were used for continuous variables according to the distribution of data. The Bonferroni procedure was performed to adjust the significance level of hypothesis tests because of multiple tests (Salkind, 2010). A *P*-value of 0.0045 was set as a borderline result in terms of statistical significance. Then, stepwise linear regression was used to explore the significance of socio-demographic, clinical, and psychological distress factors in interpreting the variation in mental health total score between rural and urban populations. All data were entered, managed, and performed using IBM SPSS Statistics version 25 (Armonk, New York).

### Ethical considerations

Ethical approval to undertake this study was obtained from the Human Research Ethics Committee (HREC) of the University of Newcastle, Australia (H-2017-0378) and the participating hospital in China. This study adhered to the ethical standards set out by the Research Ethics Committee. Eligible participants were informed of the aim of the study that participation was voluntary and that they could withdraw from the study at any time without this decision affecting their current treatment. Written informed consent was obtained before the survey was administered and participants were informed that their information would be anonymous that no personal data would be identified and all information would be kept confidential. Questionnaires were assigned a serial number. A list of resources including a hotline phone number of health advice about long-term diseases and referral to a medical psychologist was offered to all participants.

## RESULTS

### Socio-demographic and clinical variables

Socio-demographic and clinical data for the participants are presented in Table 1. There were 347 eligible participants in this study (female:  $n = 173$ , 49.9%), ranging in age from 23 to 95 (mean:  $58.5 \pm 15.1$ ) years. Four participants were excluded, as their insurance status could not be determined. Urban participants accounted for 68.6% of the total participants ( $n = 238$ ). Compared

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**TABLE 1:** Socio-demographic and clinical characteristics of the participants with multiple chronic conditions from Anhui province China (n = 347)

Characteristics	Total (n = 347)		Urban (n = 238)		Rural (n = 109)		P-value
Age (years), mean (Standard deviation)	58.5 (15.1)		59.5 (14.9)		57.8 (13.8)		0.145
Gender	n	%	n	%	n	%	
Male	174	50.1	124	52.1	50	45.9	0.282
Female	173	49.9	114	47.9	59	54.1	
Marital status							
Never Married	10	2.9	7	2.9	3	2.8	0.645
Married	317	91.4	216	90.8	101	92.7	
Divorced	4	1.2	3	1.3	1	0.9	
Widowed	15	4.3	11	4.6	4	3.7	
Separated	1	0.3	1	0.4	0	0	
Education							
Elementary school	69	19.9	12	12.2	57	52.3	0.000***
Middle school	116	33.4	76	31.9	40	36.7	
High school	99	28.5	89	37.4	10	9.2	
College/University	63	18.2	61	25.6	2	1.8	
Monthly income <sup>†</sup> (Yuan)							
Below ¥ 2000	156	45.0	75	31.5	81	74.3	0.000***
¥ 2001–5000	175	50.4	148	62.2	27	24.8	
Above ¥ 5000	16	4.6	15	6.3	1	0.9	
Employment							
Currently employed	65	18.7	79	33.2	32	29.4	0.478
Unemployed	46	13.3	159	66.8	77	70.6	
Number of MCCs							
2	286	82.4	192	80.7	94	86.2	0.176
3	54	15.6	39	16.4	15	13.8	
4	7	2.0	7	2.9	0	0	
Duration of MCCs (years)							
0–1	70	20.2	50	21	20	18.3	0.324
2–5	111	32.0	68	28.6	43	39.4	
6–10	98	28.2	69	29.0	29	26.6	
>10	68	19.6	51	21.4	17	15.6	
Five most commonly diagnosed long-term conditions							
Cardiovascular conditions	289	83.3	202	84.9	87	79.8	N/A
Endocrinologic conditions	157	45.0	113	47.5	44	40.4	
Musculoskeletal conditions	69	19.9	49	20.6	20	18.3	
Gastrointestinal conditions	63	18.2	46	19.3	17	15.6	
Cerebrovascular conditions	36	10.4	28	11.8	8	7.3	

\*\*\* $P < 0.001$ .<sup>†</sup>1 US dollar = 6.9 Chinese Yuan. MCCs, multiple chronic conditions.

with participants living in rural areas, urban participants had a higher education level ( $P < 0.001$ ) and better monthly income ( $P < 0.001$ ). Most participants had

two long-term conditions, which did not differ by location (80.7% for urban participants vs. 86.2% for rural participants,  $P = 0.176$ ).

### Differences in anxiety, depression, and MCS between urban and rural participants

The health and psychological data for the participants are presented in Table 2. A cut-off score of above 8 indicates a possible case of anxiety or depression or both (Bjelland *et al.*, 2002). For urban participants, the prevalence of potential cases was 30.7% for depression and 30.7% for anxiety. For rural participants, these percentages were 42.2% for potential cases of depression and 40.3% for anxiety. There were significant differences between the urban and rural participants in anxiety ( $t = -3.37$ ,  $P < 0.05$ ) and depression ( $t = -3.53$ ,  $P < 0.001$ ).

The mean scores of MCS were  $46.13 \pm 10.80$  and  $41.23 \pm 11.16$  for urban participants and rural participants, respectively. Based on the criteria of MCS for the normal population ( $50 \pm 10$ ) (Lam *et al.*, 2016), both urban and rural participants reported impaired mental health using MCS. Participants from urban areas had significantly higher MCS than those from rural areas ( $t = 3.89$ ,  $P < 0.001$ ), indicating better mental health.

### Stepwise regression models for mental health by areas

Regression results (Table 3. Results of stepwise multiple regression analysis) showed that being employed and having a higher educational level were associated with higher MCS score for urban participants; however, symptoms of anxiety were negatively associated with MCS ( $P < 0.001$ ). Among rural counterparts, participants who had more long-term conditions ( $P < 0.01$ ) and more symptoms of anxiety ( $P < 0.001$ ) predicted lower MCS. All regression models were adjusted for age and gender.

## DISCUSSION

Due to the growing prevalence of MCCs in China, investigating the mental health of patients with MCCs from urban areas in comparison with those from rural areas will help increase understanding of the inequalities in mental health between these two groups and can serve as a reference for allocating medical resources and healthcare services for people with

**TABLE 2:** Health status and psychological distress by areas of participants with multiple chronic conditions from Anhui province China (n = 347)

Variables	Total (n = 347)			Urban (n = 238)			Rural (n = 109)			t	P
	Means	SD	Range	Means	SD	Range	Means	SD	Range		
Health status											
MCS	44.59	11.14	15.77–68.05	46.13	10.80	15.77–68.05	41.23	11.16	17.00–66.32	3.89	0.000**
Psychological distress											
Anxiety	8.13	3.56	0–21	7.70	3.57	0–19	9.06	3.38	1–21	–3.37	0.001**
Depression	7.40	3.39	0–20	6.97	3.36	0–18	8.33	3.28	1–20	–3.53	0.000**

\*\*P &lt; 0.01;

\*\*\*P &lt; 0.001. MCS, mental component score; SD, standard deviation.

MCCs. These findings support the hypothesis that Chinese patients with MCCs living in rural areas are significantly worse off in terms of mental health and psychological distress in comparison with participants based in urban areas. More long-term conditions and symptoms of anxiety were associated with worse mental health in rural participants. Unemployment, lower educational levels, and more symptoms of anxiety were associated with worse mental health in urban participants.

Significant urban–rural differences in mental health and psychological distress were identified in this study. Past studies on long-term health conditions support these findings (Guo *et al.*, 2018; Zhang *et al.*, 2016) although there has been no previous published study related to MCCs. For example, Zhang *et al.* (2016) undertook a large survey on health-related quality of life (HRQoL) among patients with hypertension in northern China and found that rural participants reported more problems in four domains – mobility, general activities, pain, and anxiety and depression – compared to their urban peers. As suggested by the

World Health Organization (2014), unfavourable social, economic, and environmental circumstances are major risks for mental illnesses. People living in rural areas may face a greater range of stressors compared with people living in major cities (National Rural Health Alliance, 2017), such as fewer jobs, lower incomes, and more vulnerability to natural hazards.

In China, it is known that urban residents enjoy more socioeconomic benefits, such as more medical resources, better education facilities, and a better living environment (Jain-Chandra *et al.*, 2018). Compared with residents of urban areas, Chinese rural residents may have to cope with lagging socio-demographic development, lower education levels, fewer job opportunities, poor access to health services, poor health and social infrastructure, environmental hazards, and economic hardships, which could be detrimental factors for people's physical and mental health (Fang *et al.*, 2009). Previous research found that the utilization of mental health services such as hospitalization expenses, length of stay, and frequency of hospitalization was lower in rural residents than in urban residents in China (Xu *et al.*, 2018).

Although rural residence is usually considered to be a risk factor for mental health, evidence for this association is inconclusive worldwide. Prior research illustrated that there were considerable urban–rural differences in mental health, with mental illnesses being more common in urban populations (Dekker *et al.*, 2008; Kovess-Masféty *et al.*, 2005; Paykel *et al.*, 2000; Szabo, 2018). For example, the European Study of the Epidemiology of Mental Disorders (ESEMeD 2000 Study) found that the urban populations reported higher levels of mental health disorders (depressive disorders and anxiety disorders) compared with rural populations (Kovess-Masféty *et al.*, 2005). One possible explanation for the differences might be due to more

**TABLE 3:** Results of Stepwise multiple regression analysis for mental health measured by the SF-12v2 mental component score (n = 347)

Populations	Variables	df	Beta	R <sup>2</sup>	F	P
Urban	Employment	3	–0.124	0.200	20.716	0.047*
	Education		0.137			0.028**
	Anxiety		–0.408			0.000***
Rural	Number of	2	–0.268	0.238	17.900	0.002**
	MCCs					
	Anxiety		–0.442			0.000***

\*P &lt; 0.05;

\*\*P &lt; 0.01;

\*\*\*P &lt; 0.001. MCCs, multiple chronic conditions.

adverse urban social environments. Those studies took place in developed countries where individuals living in urban areas may encounter more stressors, such as crimes, economic burden, and environmental pollution, than their rural counterparts (McKenzie *et al.*, 2013). However, the findings of the current study regarding differences in mental health between rural and urban patients in China are consistent with those of a prior study based in Pakistan (Mirza & Jenkins, 2004). Thus, it seems that the degree of difference in mental health between MCCs patients in urban areas and those in rural areas might depend on whether the specific areas involved in the studies concerned are developed or less developed countries.

For those living in rural and remote areas, there may also be differences in subgroups, such as age or gender. For example, Caldwell *et al.* (2004) compared the prevalence of mental illnesses and utilization of health services by place of residence, age, and gender and found that young males living in rural and remote areas of Australia had higher suicide rates compared with their metropolitan counterparts. Future research could achieve clarification by taking into consideration age, gender, and place of residence.

Independent factors contributing to mental health were ascertained in the present study by regression analysis including employment status, education, number of MCCs, and anxiety. Employment provides a steady income and a sense of worth and social engagement and has been associated with better self-reported psychological well-being (McKee-Ryan *et al.*, 2005). Individuals with higher education levels might have a better sense of control, which makes them more adaptive (Williams, 1990). A higher education level is also associated with more knowledge and skills, which leads to stable jobs with higher income and allows people to accumulate wealth (Zajacova & Lawrence, 2018). The current study indicated that education level is positively associated with the mental health of urban MCCs patients, suggesting that a higher education level may be helpful in the management of psychological well-being. This conclusion is supported by a prior study, which indicated that the number of long-term conditions is associated with increased occurrence of psychological distress (Could *et al.*, 2016). The present study also found that a greater number of long-term conditions are associated with poorer mental health of those living in rural areas. This finding indicates the disadvantageous impacts of MCCs on individuals' health (Makovski *et al.*, 2018) and revealed that rural participants might be more

vulnerable to long-term health conditions due to insufficient medical support, socioeconomic disadvantage, and health risks (e.g., high rates of smoking; Wang *et al.*, 2015). Past studies have shown that economic hardship is a major cause of psychological distress (Brown *et al.*, 2017); however, this study did not observe an association between monthly income and psychological distress possibly because all participants were covered by national insurance schemes, which covered the cost of treatment.

Findings of this study suggest that a higher level of anxiety is significantly associated with worse mental health. This indicates that suffering from MCCs might cause more disease-related worries and physical discomfort and, in turn, more anxiety. This finding is consistent with a past study, which found more symptoms of anxiety are related to lower QoL (Blakemore *et al.*, 2014). A meta-analysis reported that managing anxiety could be beneficial for promoting QoL in patients with long-term conditions (Hofmann *et al.*, 2014). However, unlike previous studies that identified the predictors of both anxiety and depression (Moubayed *et al.*, 2015), this study has not observed an association between depression and QoL. This might reflect several factors. The HADS and SF-12v2, both validated in patients with long-term conditions, have not been used in studies of MCCs patients before. Rural participants might have had difficulty understanding the questions regarding negative moods due to low literacy. The interaction between anxiety and depression could be complex and, hence, too difficult to be measured using a single scale. As a result, further research could consider using a combination of well-validated scales such as the Zung Self-Rating Anxiety Scale (SAS) and the Beck Depression Inventory (BDI), which may provide a clearer picture. A clinical diagnostic interview is also necessary to make an accurate diagnosis of anxiety and depression.

### Limitations

This study could not determine causal relationships due to the cross-sectional design. The researched population was recruited from a tertiary hospital in North Anhui, China, suggesting that the findings may not be representative of other areas of China. The findings were collected by self-reported questionnaires, so the respondents may have been affected by social desirability bias, deficient knowledge about health, and memory recall. There is a huge rural-to-urban migration taking place in contemporary China. Generally, this migration

is impermanent and does not change the migrants' official residence record. In this study, this significant migrant group was not identified. Future studies should include this migrant population as they may be more vulnerable to health-related problems (Yang, 2014). Differences in mental health between urban and rural patients in the current study might be affected by the heterogeneity of MCCs as determined by factors such as illness trajectory, severity of conditions, healthcare plans, prescribed medications, and self-management. Thus, recognizing clusters of MCCs and giving more consideration to possible impact factors may be a potential solution to greater understanding of MCCs in future.

### RELEVANCE FOR CLINICAL PRACTICE

Multidisciplinary teams for mental health including healthcare professionals and workers in community settings play important roles in mental health promotion, mental illness prevention, early detection, assessment, treatment, rehabilitation, and recovery for people with a complex array of mental health needs. Nurses comprise the single largest group of the mental healthcare workforce across countries (30–50%) (World Health Organization, 2018a). However, there are limited mental healthcare nurses in China currently. The total number of mental health professionals per 100 000 population working in mental health facilities in 2015 was 1.37, including 0.52 physicians, 0.57 nurses, and 0.28 other professionals (National Health & Planning Commission, 2016). There were 3,241,469 registered nurses (RNs) working in all types of medical institutions in China in 2015, whereas RNs based in mental health facilities only accounted for 1.76% (57 198) of the total, which was relatively low (4.07 per 100 000 population) compared with the average of upper middle-income countries (6.83 per 100 000 population) and the average of high-income countries (23.49 per 100 000 population; World Health Organization, 2018a). Chinese mental health experts have advocated that postgraduate nursing curriculum in universities in China should be updated with mental health knowledge and skills and further nursing students should be trained in mental health settings (Xu *et al.*, 2017). Due to the insufficient numbers of nursing specialists in mental health in China, further training programmes such as the Psychiatric-Mental Health Specialist Nurse (PMH-SN) and Psychiatric-Mental Health Advanced Practice Registered Nurse (PMH-APRN) programmes

should be encouraged to strengthen the current nursing workforce.

Importantly, this study extends current evidence on long-term conditions, addressing the importance of providing psychological support for patients with MCCs in rural areas. Policies that reduce social inequalities are crucial. For example, local government should improve health services and increase medical resources for rural areas. Policies should highlight the importance of redressing economic insecurity, through such measures as the creation of jobs, the implementation of a minimum wage, and the provision of relevant assistance programmes, which not only serve the MCCs population but also contribute to financial growth.

Case management is one of the key approaches that provides continuing support for people with long-term mental conditions in community health care (Dieterich *et al.*, 2017). Community nurses can be case managers for people with mental health issues. While the state of community mental health care in China is progressing, most patients with long-term mental illness still stay in mental healthcare facilities for long periods of time. Mental health care mostly relies on specialized facilities. Thus, it is important to establish an integrated community-based mental healthcare system. For example, since 2004, China started the '686 Program', which aimed to promote management and treatment for mental illness in hospital and community settings. From 2005 to 2015, this programme has provided an evidence-based model that contributes to the community of mental health care in China, offering training for all types of personnel who provide services for people with mental illnesses; over 25 100 personnel have received the training (Good & Good, 2012).

Routine assessment of potential symptoms of anxiety and depression of MCCs patients will help ensure patients with MCCs receive appropriate support services in a timely manner. The findings that symptoms of anxiety may predict poor mental health demonstrate that healthcare professionals need to integrate psychological interventions with patients' current treatment plans. Some healthcare models, such as peer support, which is proposed as an effective approach to manage long-term conditions and promote health (World Health Organization, 2008), should be introduced and facilitated. A current report on support services showed that a community-based peer support programme for persons with severe mental illness was feasible and has been effectively undertaken in China (Fan *et al.*, 2018).

# CONCLUSION

This study highlights the differences in mental health between patients with MCCs living in urban areas and those in rural areas of China. The levels of reported mental health and psychological distress varied, with rural participants experiencing worse mental health than their urban counterparts. Unemployment status, lower educational level, more long-term health conditions, and a higher degree of anxiety were related to worse mental health. The findings emphasize the importance of mental health in the population of people with MCCs and raise an important question about how patients from rural areas should be helped to maintain or improve their psychological well-being. Also, those findings will be helpful for the development of mental health work in other countries and areas with similar circumstances to those of China.

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## 11. PUBLISHED ARTICLE

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## Patients' experiences of coping with multiple chronic conditions: A qualitative descriptive study

Cheng Cheng MSc, PhD candidate, Lecturer<sup>1,2</sup>  | Jie Bai MSN, RN, Lecturer<sup>2</sup> |  
Cong-Yan Yang BSN, RN, Head nurse<sup>3</sup> | Ming Li BSN, RN, Head nurse<sup>4</sup> | Kerry Inder PhD,  
RN, Associate Professor<sup>1</sup> | Sally Wai-Chi Chan PhD, RN, Professor<sup>5</sup>

<sup>1</sup>School of Nursing and  
Midwifery, University of Newcastle,  
Callaghan, NSW, Australia

<sup>2</sup>Department of Nursing, Bengbu Medical  
College, Bengbu, Anhui, China

<sup>3</sup>Department of Nursing, The First Affiliated  
Hospital of Bengbu Medical College,  
Bengbu, Anhui, China

<sup>4</sup>Department of Neurology, The First  
Affiliated Hospital of Bengbu Medical  
College, Bengbu, Anhui, China

<sup>5</sup>University of Newcastle Singapore,  
Singapore, Singapore

### Correspondence

Cheng Cheng, RW2-56 Richardson Wing,  
University Drive, Callaghan, NSW 2308  
Australia.  
Email: ccheng1@uon.edu.au

### Abstract

**Objective:** To explore the experiences of how Chinese adults cope with multiple chronic conditions in everyday life.

**Background:** Having multiple chronic conditions is stressful, requiring people to make physical and mental adaptations. There is little evidence exploring how people cope with multiple chronic conditions, especially in an Asian context.

**Design:** A qualitative descriptive design was employed. The Consolidated criteria for reporting qualitative research (COREQ) was used to report this study.

**Methods:** This study was conducted in a tertiary referral and teaching hospital in Bengbu, Anhui, China, between August and October 2018. A purposive sample of 14 people with multiple chronic conditions, aged between 32 and 75 years, completed a demographic questionnaire and semi-structured face-to-face interviews. The interviews were digitally recorded and transcribed verbatim. Qualitative content analysis guided data analysis.

**Results:** Four distinctive themes comprising subthemes were developed from participants' narratives pertaining to coping with multiple chronic conditions: (a) appraising multiple chronic conditions, (b) addressing multiple chronic conditions management, (c) maintaining psychological well-being and (d) fulfilling a social role. Illustrative quotations were cited to support each theme.

**Conclusions:** This study underscores that people cope with multiple chronic conditions in everyday life by using a compendium of coping strategies. As one of the influencing factors, culture dominates the ways of coping at different levels among people with multiple chronic conditions. These findings expand the current literature on coping based on an Asian perspective and inform further cross-culture research on this topic.

**Relevance to clinical practice:** Healthcare professionals should understand peoples' experiences of coping with multiple chronic conditions to provide more holistic and dynamic health care to address their actual needs. Healthcare professionals should be acquainted with how culture impacts individuals' coping and develops culture-tailored supportive programmes such as family-based interventions, to promote the health of people with multiple chronic conditions.

## KEYWORDS

coping, multiple chronic conditions, qualitative research

## 1 | INTRODUCTION

Multiple chronic conditions (MCCs), also known as multimorbidity, refer to the coexistence of two or more long-term health conditions, which include physical and psychological health conditions (e.g. diabetes), ongoing symptoms (e.g. chronic back pain), sensory loss (e.g. vision loss) and alcohol and substance abuse (National Institute for Health & Care Excellence, 2016). MCCs affect all age groups but tend to increase with age. A past review indicated that the prevalence of MCCs ranged from 20%–30% in the whole population to 55%–98% in the older adult population globally (Marengoni et al., 2011). With improved health care and better living conditions, it can be expected that people are generally living longer with MCCs and may spend more time in poor health. MCCs are linked with more healthcare utilisation and costs (Wang, Si, Cocker, Palmer, & Sanderson, 2018), resulting in a considerable economic burden for the healthcare system. A systematic review found that the annual out-of-pocket expenditure (OOPe) on medications associated with 0 to 1, 2 and more than 3 chronic conditions increased by 2.7 times, 5.2 times and 10.1 times, respectively (Sum et al., 2018). Thus, MCCs represent a significant challenge for present and further healthcare services.

Multiple chronic conditions have a significant impact on people's lives. MCCs are highly associated with physical limitations (Calderon-Larranaga et al., 2018), negative moods (Read, Sharpe, Modini, & Dear, 2017) and poor quality of life (QoL) (Shad et al., 2017). MCCs also pose massive burdens to people's families. Qualitative research depicted that people with MCCs often perceived being 'falling apart' due to the burden of MCCs (Mason et al., 2016).

Caring for people with MCCs is challenging. A common issue for health care is that pharmacological and nonpharmacological treatments might be burdensome for people with MCCs. People with MCCs are at risk of polypharmacy, inconsistent health suggestions and adverse drug events (Boyd & Fortin, 2010; Calderón-Larrañaga et al., 2012). Health care for MCCs can become uncoordinated and fragmented. This is related to the lack of integration among specialist health services of different health conditions, healthcare delivery at different levels and by different healthcare professionals (Døssing & Burau, 2015).

Some healthcare models are developed to support people with MCCs. For example, Australia developed a framework for managing MCCs through a patient-centred approach. The framework highlighted the importance of effective communication and coordination in healthcare provision. People with MCCs and healthcare professionals need to work together to negotiate priorities and evaluate the outcomes of health care (Harris, Dennis, & Pillay, 2013). In Europe, the multimorbidity care model was designed and developed by a collaborative research project (Joint Action on Chronic Diseases and Promoting Healthy Ageing across the Life Cycle, JA-CHRODIS). This integrative model focuses on five

**What does this paper contribute to the wider global clinical community?**

- Further attention should be given to individuals' adaptation to multiple chronic conditions due to the increasing prevalence of multiple chronic conditions and the manifold impacts of multiple chronic conditions on peoples' lives.
- Healthcare professionals should learn from peoples' experiences of coping with multiple chronic conditions that may vary across countries. Evidence-based knowledge can serve as a foundation for health care and guide the formation of a clinical environment within different cultural contexts.
- Healthcare professionals need to move forward in building appropriate coping-based interventions that reduce barriers of day-to-day life and maximise the benefits of the healthcare plan among people with multiple chronic conditions.

healthcare domains: healthcare delivery, decision-making and self-management, technology application and social resources (Palmer et al., 2018).

## 2 | BACKGROUND

Management of MCCs requires people to adapt physically and mentally (Wister et al., 2016). Coping, as one of the psychological variables that explain adaptations to disease, is suggested to be a significant tool to look after psychological health (Cox et al., 2018) and physical health (Ito & Matsushima, 2017). Many studies have demonstrated the significant role of coping in buffering the outcomes of stressful scenarios such as living with chronic conditions (Aldwin & Park, 2004; Carlson, 2016; Traa, De Vries, Bodenmann, & Den Ouden, 2015). According to the transactional model of stress and coping (Lazarus & Folkman, 1984), coping refers to a process where people make conscious and/or unconscious efforts to respond to stressful situations, which exceed their available resources and jeopardise their well-being. The stress and coping theory describes how people evaluate and cope with stressful situations. First, people assess the stressor they face. This process is known as 'primary appraisal', which helps people to know the importance of the stressor. Then, people perform 'secondary appraisal' to see if they have enough resources to manage the stressor. Both of these appraisals affect their 'coping efforts', which determine people's physical and mental

health outcomes. The coping process includes either problem-based or emotion-based coping. Problem-based coping refers to ways of dealing with stressful events while emotion-based coping refers to ways of managing negative emotional responses. Meaning-focused coping was added in Folkman's later work (Folkman, 2008). This process of coping refers to an individual person's personal beliefs, values and existential goals to focus on the positive aspects in order to sustain his or her coping process. There are no 'good' or 'bad' coping strategies however some may be more effective than others for different people. Adopting appropriate and effective coping strategies is significant for people with MCCs to maintain a good QoL (Livneh, 2016). Many factors such as demographic characteristics, the trajectory of diseases, health care and culture may influence the adoption of different coping strategies (Folkman & Nathan, 2011).

There has been an increasing number of studies investigating coping in the context of MCCs. Coventry, Small, Panagioti, Adeyemi, and Bee (2015) systematically reviewed and synthesised qualitative findings regarding the experience of MCCs and offered three elements for facilitating effective self-management for those suffering from MCCs, management of medicines and moods, and available resources, and self-preservation. Rosbach and Andersen (2017) synthesised qualitative literature on the burden of treatment in people with MCCs. Their findings identified the different components in the burden of treatment and indicated the burden was related to the workload of demands, the capacity and the context. People with MCCs used strategies such as prioritizing different treatments to routinise their everyday lives. However, there is a paucity of primary studies regarding how Asian people cope with MCCs or that have considered the experience of coping with MCCs cross-culturally (Cheng, Inder, & Chan, 2018). Lazarus and Folkman (1984) considered that coping is a dynamic process impacted by various factors such as culture, external support and life experiences. Knowledge regarding coping with MCCs can help to understand the ways that people deal with complex stressors resulting from MCCs and may assist in developing appropriate interventions with adjustments to meet psychological needs and achieve effective self-management. Through a qualitative inquiry, researchers are able to obtain deep insights into people's perceptions of their MCCs to explore the experience of living with MCCs (Creswell, Hanson, Clark Plano, & Morales, 2007).

China has undergone a health shift from communicable to non-communicable diseases in recent decades. It is expected that the prevalence of chronic diseases is projected to increase by 40% by 2030 in China (World Health Organization, 2015). Meanwhile, China is facing an ageing crisis with projection that older adults (over 60 years old) will increase from 12% in 2010 to 28% in 2040 (World Health Organization, 2015). Increasing ageing populations and the increase in chronic conditions predict a rise in the number of people with MCCs.

The prevalence of MCCs has been investigated by several population-based studies in China. A cross-sectional study based in north-eastern China showed that almost a quarter of adults had MCCs (Wang et al., 2015). Evidence from the China Health and Retirement Longitudinal Study (CHARLS) indicated that nearly half of middle-aged and older participants in the urban area reported having MCCs

(Chen, Cheng, Zhuang, & Broad, 2018). Recent research has shown a high prevalence of MCCs in China, indicating that there is a potential increase in problems concerning MCCs, which may impact on people's health (Wang et al., 2014).

Despite the growing number of people suffering from MCCs in China, people with MCCs receive little attention in the current healthcare service provision (Chen et al., 2018). Few studies have assessed the ways in which people describe and perceive everyday experiences of coping with MCCs. There is a paucity of research that has investigated the experiences of people with MCCs in China. This study aimed to explore the experiences of coping with MCCs in China. By utilizing a qualitative approach, the findings of this study will contribute to understanding and theorizing coping of MCCs in Asian contexts and will expand the current knowledge about cultural consequences on coping.

### 3 | METHODS

#### 3.1 | Design

The current study employed a qualitative descriptive design, which is suggested as an appropriate method of choice to obtain 'straight descriptions of phenomena', and provide 'comprehensive summary of an event in the everyday terms of those events' (Sandelowski, 2000). This design is appropriate to facilitate an exploration of people's experiences of coping with MCCs from their own stories. The Consolidated criteria for reporting qualitative research (COREQ) (Tong, Sainsbury, & Craig, 2007) was followed throughout the research process to maximise the rigour of the analysing process and the trustworthiness of the findings (See File S1).

#### 3.2 | Sample and setting

This study took place from August to October 2018, in a tertiary referral and teaching hospital in Bengbu, Anhui, China. Recruitment flyers were posted and distributed by clinical nurses at the study venue. Individuals interested in participating in the research approached the first author by phone, mail or in person. This study used a purposive sampling technique to recruit participants. A general practitioner at the study venue helped to confirm the eligibility of people with MCCs. The inclusion criteria were (a) Chinese adults (≥18 years old) who had more than one chronic condition and (b) can communicate in the language of Mandarin. People who were not able to understand the informed consent or had difficulties complying with the research procedures were excluded. In qualitative research, data saturation is often used as a sampling principle (Morse, 2015). This meant recruitment would be stopped when no new information was found. In this study, data saturation was reached at the 14th interview.

#### 3.3 | Data collection

An interview booklet including a demographic data sheet and a clinical data sheet were developed. The demographic sheet collected

information on age, gender, marital status, employment and educational background. The clinical sheet obtained information regarding MCCs such as type and duration. Semi-structured questions were developed by the first author based on findings from a past review (Cheng et al., 2018). An expert panel including two academic scholars and two clinical nurses helped to refine the interview questions by close reading (Castillo-Montoya, 2016). Through the reading, the first author asked the panel members putting themselves in the place of the potential interviewees. This work helped to identify how interviewees might understand the interview questions. Pilot interviews ( $n = 2$ ) were conducted to test the essentials of the interviews such as procedure, consent, data recording, venue and timing. In this study, coping was defined as the strategies that Chinese adults used to manage their chronic conditions and the associated impacts.

Before the interviews, potential participants were informed of the study objectives. Written informed consent was obtained. All interviews were conducted in a quiet and comfortable meeting room at the study venue so that the interviewees could share their stories without disruption. The interview schedule was arranged according to the participants' preferences. The participants' demographic and clinical data were obtained before the interview. Each participant spent approximately 5 min completing the demographic and clinical sheets.

Participants were asked to answer questions such as 'Please describe the chronic conditions you are experiencing?' and 'How did you cope with these conditions or cope with the impact these conditions have on your life?' If the interviewees had difficulty in understanding the interview questions, several approaches were used to improve understanding and prompt a response: (a) using probing questions. Examples of probing questions were 'How do the chronic conditions impact your life...?', 'How do you manage your chronic conditions?', 'What is the biggest problem you have encountered in trying to cope with your chronic conditions?', and 'What types of information or skills do you think would be most beneficial for you?'; (b) allowing for more time for reflection, and (v) rephrasing questions by using simple words. The duration of the interviews ranged from 30 to 55 min. All interviews were digitally recorded. Field notes were taken during the interview.

### 3.4 | Data analysis

Demographic and clinical data were summarised by descriptive statistics. Recordings were transcribed verbatim by the first author. Qualitative content analysis with hand coding was used to analyse the data. Qualitative content analysis is a systematic way to describe the phenomenon and could be applied using an inductive or deductive method (Hsieh & Shannon, 2005). Inductive content analysis is used when there is little knowledge available for the current research questions while deductive content analysis is used to examine a past theory or model (Elo & Kyngäs, 2008). As this was the first study exploring the experiences of Chinese people with MCCs, an inductive approach with three analytical phases: preparation, organizing and reporting was undertaken (Elo & Kyngäs, 2008). The first phase, 'preparation', began with selecting the unit of analysis which refers to various objects of the specific research (e.g. a group of individuals) or a research theme. In this

study, the unit of analysis was the transcribed interviews of Chinese adults with MCCs. The next step in the preparation phase is to make sense of the obtained data by reading through the data several times to improve understanding and familiarity with the content. The second phase is 'organization' where the researchers conducted initial open coding, developed themes and abstract descriptions. Open coding involved making notes and headings to describe the data when reading through it. After the open coding, the researchers started to reduce the lists of categories by grouping those similar and dissimilar categories into higher order categories. The last phase 'abstraction' refers to the development of an overall description of the research questions by collapsing the categories. The conflicts in grouping and generating categories were discussed by the researchers until consensus reached. Finally, the researchers examined and reported the findings.

Participants were approached by telephone to clarify unclear statements if necessary. The first author translated themes, sub-themes and quotations from Chinese to English. A bilingual (Chinese/English) author with expertise supervised the whole procedure to assure the validity of the content.

### 3.5 | Rigour

To improve trustworthiness, the researchers enhanced credibility by adopting purposive sampling to represent a range of experiences regarding coping with MCCs. A reflective diary was kept throughout the interview process, and memos of preliminary analyses were taken. The interview questions were designed by an international team including experienced qualitative researchers, and the interview questions were refined by consulting a panel of academic and clinical experts. The findings were discussed and reviewed by all the authors (two bilingual speakers) to reach an agreement. Illustrative quotes from the transcripts were used to support the findings. Transferability was improved by providing a thick description of the phenomenon such as research setting, participants' background and verbatim statements.

### 3.6 | Ethics considerations

This study was approved for implementation by the human research ethics committee of the University (H-2017-0378) and the study venue. Participants were informed that all data would be anonymous and that their names would not be associated with any data reporting or publication. They were informed that the health services where they currently received care would not be influenced by whether they take part in the interview. They could stop the interview or withdraw from the study at any time without reason.

## 4 | RESULTS

### 4.1 | Sample characteristics

All 14 participants (57% Female,  $n = 8$ ) were married. More than half had three chronic conditions ( $n = 8$ , 57%). The most common conditions were hypertension (systolic blood pressure  $\geq 140$  mmHg and/or

diastolic blood pressure  $\geq 90$  mmHg), type 2 diabetes (fasting plasma glucose  $\geq 7.0$  mmol/L) and nonalcoholic fatty liver disease. Sample characteristics are presented in Table 1.

#### 4.2 | An overview of major themes

Four major themes consisting of subthemes emerged from the participants' statements of coping with MCCs. The participants reported that their experiences of suffering from the consequences of MCCs for day-to-day life were complex as the multifarious nature of MCCs. Those consequences resulted in a series of challenges that influenced many spheres of daily life. To deal with MCCs, the participants developed a range of coping strategies. Quotations from the transcripts were used to illustrate the theme and the gender, age and MCCs of each participant were identified.

#### 4.3 | Appraising MCCS

The first theme is 'Appraising MCCs', which refers to how people made appraisals based on the perceived impacts of MCCs and the associated challenges. This theme covers three subthemes.

##### 4.3.1 | Prioritise conditions

People with MCCs usually evaluated their coexisting chronic conditions and repeatedly expressed concerns about the conditions with the

greatest physical impacts. No patient considered two or more conditions as equals. Almost all people were able to elaborate on their experiences concerning a single condition rather than 'the whole situation I have'. A patient reported his prioritisation of treating three chronic conditions.

I do not care about it (hyperlipidemia) because I cannot feel it. I think we should treat my hypertension and diabetes first...

(Male, 60s, hypertension, diabetes, hyperlipidemia, fatty liver diseases)

##### 4.3.2 | Consequences of MCCs

As identified by most participants, the most common and serious issues were physical limitations associated with their MCCs. The typical descriptions were provided by participants with limited mobility and painful disorders. For example, a patient emphasised 'terrible' experiences of Ménière's disease:

Having MCCs is physically uncomfortable for me. Lots of symptoms: tiredness, dizziness, out of sorts, drenched in sweat. Drugs can't control them.

(Female, 70s, Ménière's disease, diabetes, vision impairment and hypertension)

Another participant remembered the pains when gout came on suddenly.

(Gout) hurts, really hurts, it hurts too much to get out of bed...

(Male, 40s, gout, hyperlipidemia and fatty liver disease)

##### 4.3.3 | Challenges associated with MCCs

Challenges happen at any phase of coping with MCCs. From the view of participants, a challenge could mean a hardship, a difficulty and a dilemma. Participants viewed health care as fragmented. Some expressed a need for better communication between health professionals and themselves. A typical example was that a patient expressed some worries about long-term care after discharge.

We did not receive any further support or service. We had to rely upon ourselves. People (patients and their caregivers) do not have any knowledge about care for MCCs. It will be helpful if nurses could provide some self-care training.

(Female, 60s, stroke and hypertension)

Optimal health outcomes in MCCs hinge on good self-management. Adherence to medications and lifestyle modification might be the greatest challenge in a patient's daily life. For example, a patient described struggles with following a prescription.

**TABLE 1** Sample characteristics (n = 14)

Sample characteristics	Frequency (%)
Age (years)	
30–39	3 (21.4)
40–49	3 (21.4)
50–59	3 (21.4)
60–69	3 (21.4)
More than 70	2 (14.3)
Gender	
Male	8 (57.1)
Female	6 (42.9)
Employment	
Full-time	5 (35.7)
Self-employed	4 (28.6)
Retired	5 (35.7)
Educational level	
Primary	3 (21.4)
Secondary	8 (57.2)
Tertiary	3 (21.4)
Duration of MCCs (Years)	
1–4	4 (28.6)
5–9	5 (35.7)
More than 10	5 (35.7)

If I could adhere to regular medical check-ups, probably I do not get sick. When I took medications as prescribed, I felt okay, everything was fine, and then I stopped the pills... I took them again when I felt uncomfortable. Sometimes I was too busy to take the medicine. Sometimes, I just forgot to do it. I thought that it was okay as my body could endure it (hypertension)...soon I got used to it (non-adherence)... I have tried three times to quit smoking. I can do nothing about it. I am a taxi driver, sometimes I am tired, and (smoking) is a way to relax for me...

(Male, 50s, hypertension, heart disease and stroke)

Some people talked about the difficulties of maintaining a healthy lifestyle.

Sometimes I did exercise, but rarely. For example, sometimes I did press-ups at home. On a whim, I tried to control my diet...two days or three days? (Because) I do not have much time to do it.

(Male, 30s, hypertension and fatty liver disease)

#### 4.4 | Addressing MCCS management

'Addressing MCCs management' stands for the people's efforts to manage a source of stressful events. The participants presented a strong desire to keep MCCs under control by employing various strategies to treat their chronic conditions. Those strategies include taking medications, choosing alternative therapies, changing lifestyles and seeking informational support.

*Taking medications* prescribed by doctors was the most common way of managing chronic conditions. All participants detailed their prescriptions.

To treat hypertension, currently, I take Diovan (medicine name) and Shihuida (medicine name), one pill every morning. That is, one Diovan, and one Shihuida. I take the medication like this every day...

(Male, 60s, diabetes, hypertension, and fatty liver disease)

Apart from medications prescribed by doctors, people reported seeking additional treatments. Traditional Chinese Medicine (TCM) was suggested by TCM physicians as a component of treating MCCs. Some participants reported replacing prescription drugs with TCM or using TCM as a supplement.

He (Doctor of TCM) told me that I had a lot of "dampness" (refers to the water retained in the body) inside my body. My body was not able to remove these fluids so they were gathering together increasingly. I had to vomit all the fluids. He prescribed some Chinese herbal medicine for me. After several times of taking

herbs, probably after more than half a year, I felt better, I stop to vomit. I think it works.

(Female, 70s, Ménière's disease, diabetes, vision impairment, and hypertension)

Opinions differed about whether to choose TCM as a therapy with some participants questioning the effect of TCM.

I met two patients, one of them said that taking TCM medications have cured his diabetes..., I do not believe it. I said the diabetes is a worldwide health problem. Can it be cured by taking some TCM drugs?

(Male, 60s, diabetes, hypertension and fatty liver disease)

Health products as a supplementary treatment were reported by some participants.

Health is important. You cannot take care of your body until it becomes weak. You should do something when you know the risks. As I have told you before, we should spend the money on prevention instead of treatment. For example, do fitness and take vitamin supplements. The efforts that we spend on prevention (fitness and vitamin supplements) far outweigh what we spend on treating the diseases. This is a view of what I always say: health supplements are very important. Frankly speaking, it is too late when you spend money on medications and visiting a doctor.

(Male, 40s, gout, hyperlipidemia and fatty liver disease)

Participants described trying to exercise and change dietary habits to build a healthy lifestyle. The exercise format included attending an exercise training class, jogging, visiting a local fitness gym.

I've kept exercising for a long time. I like brisk walking. I usually walk after dinner every day, about 40 minutes, sometimes one hour.

(Female, 40s, hypertension and diabetes)

Some participants had positive perspectives on lifestyle changes.

The most important thing is keeping your health. Doing exercise is a way to keep healthy. Life is meaningless if you lose health.

(Male, 40s, gout, hyperlipidemia, and fatty liver disease)

Information seeking is a way to know illness better. A distinctive example is that a participant reported seeking information about caring MCCs by using the internet.

After the diagnosis of MCCs, in order to relieve my pain (gout) and treat it well, I tried to get more information on the internet, for example, Baidu (a Chinese searching engine)...

(Male, 40s, gout, hyperlipidemia and fatty liver disease)

More than half of the participants described 'a story of friends' or 'someone I knew before'. They described what they can learn from the 'stories' and how they perceived the 'stories'.

For example, one of my friends, he managed his diabetes very well in the beginning. After one or two years, he thought it (diabetes) was unimportant...he didn't take it seriously. After some time, his blood sugar went up again and he felt uncomfortable with his heart, something wrong with his heart. Then he took an examination. Last time I saw him, he said he was rushed to a tertiary hospital for quadruple-bypass surgery due to diabetic complications. From his story, I think most patients will manage diabetes well at the very beginning because they feel fear. After some time, some of them may think they could control it so they let down their guard... Any patient cannot let down the guard.

(Male, 60s, diabetes, hypertension, and fatty liver disease)

#### 4.5 | Maintaining psychological well-being

'Maintaining psychological well-being' involves efforts that reduce negative emotional moods regarding stress such as fear, anxiety, depression and frustration. Most participants reported experiencing negative moods when diagnosed with chronic conditions and encountered some functional loss, but they tried to maintain their moods by reappraising the stressor in a positive light and comparing with others. This theme includes two subthemes.

*Accepting the reality* means that people adapt themselves to the current situations and the uncontrollable changes. Most participants reported being capable of multiple, simultaneous life changes, resulting in positive representations of health. For example, a patient stated the experiences of enduring what happened.

I am mentally very strong. (The reason for having MCCs is that you have done something wrong), you have to admit your faults and have to be realistic. You have to endure what you could. The key point is that you have to manage yourself when you are sick.

(Male, 50s, hypertension, heart disease and stroke)

*Positive reframing* represents that people view the life changes regarding MCCs more positively. For example, a patient stated the ways of transforming think. She thought that her body was a good shape because she still kept mobility.

There were some stressful feelings, but I am optimistic. (Because) I do not have any physical restrictions. I sleep well and eat well. It is a chronic condition rather than an injury causing physical limitations. If one day I suffer from stroke and I cannot move, that will be a big problem...Now I think I am still young...

(Female, 30s, cancer and fatty liver disease)

#### 4.6 | Fulfilling a social role

The theme of 'fulfilling a social role' refers to people's efforts in building responsibility towards others and keeping their autonomy. People expressed their willingness to have a routine life to the most possible extent. Two subthemes were identified.

##### 4.6.1 | Being a family member

Most reported managing MCCs meant a lot to their family. Some participants stressed that they had to manage their conditions well as they were responsible for maintaining their family.

I am 50 years old, I am the 'the cornerstone' of his family, I have to take care of my parents and my children. I will do it (manage MCCs) for my family rather than for myself.

(Male, 50s, hypertension, heart disease and stroke)

##### 4.6.2 | Being a friend

Most participants described interactions with their friends and emphasised what they obtained from those interactions. For example, a patient who was active in some informal groups (e.g. Online diabetes forum) described the experiences with "Tang You" (friends with diabetes). He shared his experiences of living a meaningful life by helping others.

...I met some patients with diabetes usually. We called us "Tang You". Sometimes met other patients with hypertension. I would like to ask about their conditions and share my stories. Everyone is different, so the conditions are different...I thought, sharing my experiences of treatment and management such as lifestyle modification and medications for hypertension will be helpful for someone else.

(Male, 60s, diabetes, hypertension, and fatty liver disease)

## 5 | DISCUSSION

The current study used a qualitative interviewing approach to explore experiences of coping for people with MCCs. All participants were Chinese and married, varying in terms of age, education and

employment. The stories of the participants revealed that they were living actively while coping with MCCs, although they cited worries about how MCCs impacted them. For those participants, experiences of coping helped develop an array of strategies to address symptoms of chronic health conditions, psychological well-being and social roles by dynamic appraisals of life changes resulting from MCCs.

The theme 'appraising MCCs' indicates a personal evaluation of what is happening caused by MCCs. Lazarus (2012) suggests that this appraisal is a negotiation between two elemental parts: (a) aspiration of perceiving what is occurring; (b) aspiration of making the best of what is occurring. First, it is not surprising that people develop their own perceptions in response to MCCs. Prior research on illness perceptions considered five domains: identity, timeline, causes, consequences and controllability (Lau & Hartman, 1983). This study found that people with MCCs mainly focused on three domains including consequences of MCCs, identity (priority in conditions) and controllability (coping), showing that people with MCCs might hold different perceptions compared to people with a single chronic condition, even though both have an incurable lifelong process potentially filled with distressing moments. The overriding concern of people with MCCs was impaired health status. The combined impacts of coexisting chronic conditions modified the perceptions of people with MCCs such as identity, cause and timeline (Gibbons et al., 2013). Second, narrative accounts of people showed how they prioritised a collection of complex conditions for self-management. Research indicated that people's prioritisation among several chronic conditions with management practices were dynamic and might be supportive for accommodating their MCCs (Morris, Sanders, Kennedy, & Rogers, 2011). In line with a past review (Bratzke et al., 2015), prioritisation of MCCs appeared to be a specific day-to-day task experienced by people with MCCs who had to uphold a balance between their chronic conditions. Furthermore, this study found that people predominantly constituted priorities by targeting individual conditions that impact a lot, but the potential effects of the prioritisation were not identified. Thus, several questions then arise for further research: How does this prioritisation impact self-management of MCCs? What can healthcare professionals learn from this prioritisation? How do healthcare professionals set up a collaborative healthcare plan integrated with clinical concerns and statements of the people?

Living with MCCs is a lifelong process that needs long-term treatment. This treatment could be thought of as a burden. However, treatment is a crucial component for illness management and better health status for people with MCCs. One of the biggest issues for people with MCCs was adherence to medications. Medication adherence is associated with many factors such as sociodemographic characteristics, the relationship between people and doctors, disease-related factors and medication factors (Vlasnik, Aliotta, & DeLor, 2005). Our participants attributed their nonadherence to 'I forgot to take it' and 'I think I am fine'. These explanations might indicate that people misunderstood their health regarding MCCs and an inability to participate in disease self-management (Pages-Puigdemont et al.,

2016). Key reasons for nonadherence to treatments among MCCs population are varied, including differences in clinical variables (Kim, Bennett, Wallace, Fahey, & Cahir, 2018), medication beliefs (Schüz et al., 2011), fragmented care (Green, Hawley, & Rask, 2007) and synergistic effects between chronic conditions (Calderón-Larrañaga et al., 2019). Participants in this study did not report issues of managing multiple prescriptions nor adverse effects. However, they liked to control immediate symptoms and slow the perceived most severe condition. This finding also reiterated that people with MCCs prioritised their chronic conditions.

This study found that coping strategies adopted by people with MCCs interacted with chronic conditions management, psychological preservation and maintenance of social roles. Despite different labels in categorizing coping, the emerged strategies were congruent with past studies (Cheng et al., 2018; Löffler et al., 2012), which categorised coping strategies in the context of MCCs into three levels: practically, referring to the management of conditions; emotionally, referring to positive reframing; and socially, referring to the preservation of autonomy. In comparison, our participants displayed more particular skills, such as using TCM medications. Complementary and alternative therapies have been little investigated in the area of coping with MCCs. As this study was based in China, using TCM medicine and visiting a TCM doctor would be easy to obtain in general. Lee, Lin, Wrensch, Adler, and Eisenberg (2000) suggested the reason that Chinese women with breast cancer were more likely to use herbal therapies than white or black peers was the prevalent use of herbal therapies by Chinese. Participants in the present study reported using TCM because these drugs took effect sometimes. What is more, a review of complementary and alternative medicine (Bishop, Yardley, & Lewith, 2007) showed that the participants in the present study might be trying to control their conditions by means of what they knew before. They considered TCM as a part of self-management where they could be a decision maker.

Paralleled with past research in which the importance of family was noted (Ridgeway et al., 2014), this study found that coping at the family level might play a significant role in promoting health among people with MCCs. Traditional Chinese cultures value the collectivist orientation, which considers that the foundation of Chinese society is the family unit. Individuals make sense of their roles within the family context where individual issues are usually considered as family issues (Mak & Chan, 1995). The family will support an individual to overcome difficulties when it is necessary. Chinese families suggest that it is harmonious and honourable to be gathered as a unit when facing life changes (Mak & Chan, 1995). This was a study based in mainland China and all participants were married thus it is reasonable to apply a family perspective to understand the significance of family in an individual's coping. In the present study, participants expressed 'I would like to do it for my family' rather than 'I do it for myself'. Collectively, this finding provided insights into the role of the family played in the personal coping process and how individuals experience this kind of 'engagement', which refers to common stresses and mutual needs between participants and their family members. The present study

paid close attention to personal experiences but the indicators of family functions such as family relationships, unity and roles were not explored. A future study could investigate how an individual and family cope with MCCs as a joint group.

Coping with MCCs is an adaptive process consisting of professional support and social influence. Those contextual factors might have a direct and/or an indirect impact on people's coping. This study found that most participants described how they were impacted by 'a story of one of my friends' when seeking informational support, reflecting the important role of social networks played in influencing people's coping experiences. In the Chinese context, social networks are often conceptualised as forms of relationships by which individuals are able to achieve specific objectives (Duran Bell, 2000). Those relationships can be classified into (a) affective (relationships with family members and significant others); (b) instrumental (relationships with those for a practical aim); and (c) Guanxi or connections (relationships that include both affective and instrumental components; Bond & Hwang, 1986). This study suggested narratives of 'a friend's story' as experiences of making use of Guanxi, in which the people developed a personal trust and a strong relationship with someone in the cases they have the same background. Making use of Guanxi might provide a buffer against adverse life events. For example, people might set 'a friend' as an example to improve a coping strategy (e.g. following the advice about exercise to lose weight) and validate an understanding about MCCs (e.g. sharing the therapies and feelings by internet forums). What is more, the subtheme of 'being a friend' indicated that the people valued and wanted to contribute to Guanxi through interactions with ones who had similar chronic conditions. This finding implied the development of Guanxi, in which a patient was not merely acting as a recipient, but exchanged favours to maintain the relationship (Ellis, 2009).

Support from social networks are proved to be helpful for individuals who are at risk of chronic physical and psychological health problem because it can improve one's social identity, offer information and inspiration and help a person to go through stressful situations (Shilling et al., 2013). It is no doubt that social network is a significant factor to explain adaptations to stressful life events (Brisette, Scheier, & Carver, 2002) and health behaviour-related outcomes (Laranjo et al., 2015). However, social relationships can consist of both positive and negative components, concurrently (Ahn, Kim, & Zhang, 2016). As suggested by a past study (Vassilev, Rogers, Kennedy, & Koetsenruijter, 2014), it is inappropriate to consider that network support develops in a cumulative way (e.g. the more providers, the more support), and engaging in the social network may have a negative influence (Gallant, Spitze, & Grove, 2010). People's stories regarding involvement in social networks might represent their needs for formal social supports. This study did not identify negative examples of social networks. A plausible explanation is that our participants may subjectivise their experiences as they inclined to say an 'I have coped well' story. Nevertheless, it is necessary to examine support from multiple sources in the future. Collectively, those findings of social networks supported previous works that culture shapes a person's

coping by influencing both the person and the surrounding environment (Chun, Moos, & Cronkite, 2006).

## 6 | STRENGTHENS AND LIMITATIONS

This is the first published qualitative research on coping with MCCs in mainland China. Using a qualitative design, this study presented a theoretical underpinning to explain experiences of MCCs. Participants varied in demographic and clinical characteristics, allowing for multiple perspectives. A culture-based discussion recognised the important role of the family and the social networks in shaping people's coping experiences.

One of the major limitations was that participants were purposively recruited from a single hospital in East China, thus the findings may not represent other areas of China. Findings might not be representative of people who live alone or in residential aged care. Due to regional disparities in China, health care for MCCs and people's perspectives on health and disease are varied limiting the generalisability of the findings. As coping changes over time, knowledge of changes in coping can be obtained if interviews are undertaken based on the disease trajectory. Participants volunteered, therefore they may be motivated to share their stories more than other people, suggesting better coping than other people with MCCs. Differences in coping between genders nor take into consideration the trajectories of MCCs. Coping strategies that emerged from this study need to be further explored by both qualitative and quantitative research methods.

## 7 | CONCLUSION

This qualitative descriptive study illustrates how Chinese adults cope with MCC in day-to-day life. Key findings highlight the ways that people appraise MCCs and adopt ways of coping to make sense of their daily life, and also emphasise the significance of family and social networks in coping for Chinese adults. This work is as a first step in filling the practical knowledge gap about stress and health among Chinese populations with MCC and contributes to the present knowledge on cross-culture coping. Well-designed, comprehensive interventions with consideration of individuals' needs in the context of a particular culture may reduce the suffering of people with MCCs.

## 8 | RELEVANCE TO CLINICAL PRACTICE

The current traditional disease-oriented specialisation in the health-care system is inadequate to manage the healthcare concerns of people with MCCs. People with MCCs have different health concerns when compare to people with single one chronic condition. There is a need to redesign the healthcare system in accordance with local resources and demands focusing on the management of MCCs. Some high-income countries such as the UK and Australia have

established clinical guidelines and developed policies to address care of people with MCCs (Chandraratne, Pathirathna, Harrison, & Siriwardena, 2018). China, as a developing country with significant regional inequality, still lacks an effective healthcare model for people with MCCs. Thus, management of MCCs required more attention from health policymakers, healthcare professionals and their educators, and healthcare service researchers. The top priority for healthcare services is to adjust the current healthcare delivery and allocate healthcare resources to support people with MCCs.

A multi-disciplinary, integrated approach focusing on patient empowerment strategies such as self-management during care delivery could help people and their families to cope and manage their MCCs. People with MCCs may have difficulty in accommodating all treatments and management recommendations so that collaborative priority setting in a comprehensive healthcare plan should be considered. People with MCCs should be engaged in organizing priorities of treating MCCs and aspects of self-management. Dynamic assessment and monitoring of patient priorities will help guarantee optimal health care in which people can obtain continuous support as MCCs may change over time. With integrated care and good self-management, people with MCCs can live well and continue to have a good quality of life.

Healthcare professionals need an in-depth understanding of the psychological needs of people with MCCs. Healthcare professionals could facilitate psychoeducation programmes and patient peer support groups to enhance people's understanding of their health conditions, promote their coping and psychological well-being, as well as peer support among people with MCCs. Healthcare professionals should be aware that people cope differently in different social contexts. A better understanding of coping may be gained from effective communication between healthcare professionals and people with MCCs based on the knowledge of their cultural backgrounds.

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#### CONFLICT OF INTEREST

The authors declare that there is no conflict of interest regarding the publication of this study.

#### ORCID

Cheng Cheng  <https://orcid.org/0000-0002-5829-6014>

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#### SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section at the end of the article.

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