



NOVA

University of Newcastle Research Online

nova.newcastle.edu.au

Waller, Amy; Chan, Sally; Chan, Carmen W. H.; Chow, Meyrick C. M.; Kim, Miyoung; Kang, Sook Jung; Oldmeadow, Christopher; Sanson-Fisher, Robert. "Perceptions of optimal end-of-life care in hospitals: A cross-sectional study of nurses in three locations". *Journal of Advanced Nursing* Vol. 76, Issue 11, p. 3014-3025 (2020).

Available from: <http://dx.doi.org/10.1111/jan.14510>

This is the peer reviewed version of the following article: Waller, Amy; Chan, Sally; Chan, Carmen W. H.; Chow, Meyrick C. M.; Kim, Miyoung; Kang, Sook Jung; Oldmeadow, Christopher; Sanson-Fisher, Robert. "Perceptions of optimal end-of-life care in hospitals: A cross-sectional study of nurses in three locations". *Journal of Advanced Nursing* Vol. 76, Issue 11, p. 3014-3025 (2020), which has been published in final form at <http://dx.doi.org/10.1111/jan.14510>.

This article may be used for non-commercial purposes in accordance with Wiley Terms and Conditions for Use of Self-Archived Versions. This article may not be enhanced, enriched or otherwise transformed into a derivative work, without express permission from Wiley or by statutory rights under applicable legislation. Copyright notices must not be removed, obscured or modified. The article must be linked to Wiley's version of record on Wiley Online Library and any embedding, framing or otherwise making available the article or pages thereof by third parties from platforms, services and websites other than Wiley Online Library must be prohibited.

Accessed from: <http://hdl.handle.net/1959.13/1443438>

Title: Perceptions of optimal end of life care in hospitals: a cross-sectional study of nurses in three locations

Author names, qualifications:

Doctor Amy WALLER PhD, BA Psych (Hons)^{1,2}

Professor Sally CHAN, PhD, FAAN³

Professor Carmen W. H. CHAN, PhD, FAAN⁴

Professor Meyrick C. M. CHOW, PhD, RN⁵

Professor Miyoung KIM⁶

Assistant Professor Sook Jung KANG⁶

Doctor Christopher OLDMEADOW⁷

Laureate Professor Robert SANSON-FISHER, PhD, M Psych, B Psych^{1,2}

Affiliations:

¹Health Behaviour Research Collaborative, School of Medicine and Public Health, Faculty of Health and Medicine, University of Newcastle, Callaghan, NSW, 2308, Australia (amy.waller@newcastle.edu.au; rob.sanson-fisher@newcastle.edu.au)

²Hunter Medical Research Institute, Kookaburra Cl, New Lambton Heights, NSW, 2305, Australia (amy.waller@newcastle.edu.au; rob.sanson-fisher@newcastle.edu.au)

³Pro Vice-Chancellor and Chief Executive Officer (UoN Singapore), The University of Newcastle, Singapore (sally.chan@newcastle.edu.au)

⁴The Nethersole School of Nursing, Faculty of Medicine, The Chinese University of Hong Kong, 7/F Esther Lee Building, Shatin, New Territories, Hong Kong SAR, China (whchan@cuhk.edu.hk).

⁵School of Nursing, Tung Wah College, 31 Wylie Road, Homantin, Kowloon, Hong Kong SAR, China (meyrickchow@twc.edu.hk)

⁶College of Nursing, Ewha Womans University, 52 Ewhayeodae-gil, Seodaemun-gu, Seoul 03760 Republic of Korea (mykim0808@ewha.ac.kr; sookjungkang@ewha.ac.kr)

⁷Clinical Research Design and Statistics Support Unit, Hunter Medical Research Institute, Kookaburra Cl, New Lambton Heights, NSW, 2305, Australia (Christopher.oldmeadow@hmri.org.au)

Corresponding author:

Dr Amy Waller

Health Behaviour Research Collaborative

University of Newcastle

Callaghan NSW 2308

Ph: +61 2 40420708; E: amy.waller@newcastle.edu.au

ABSTRACT

Aim: To examine whether nurses' location of employment, demographics, or training influences their perceptions of what constitutes optimal care for dying patients.

Design: Questionnaire-based, cross-sectional study.

Methods: Between December 2016 and June 2018, 582 registered or enrolled nurses from Australia (n=153), South Korea (n=241) and Hong Kong (n=188) employed in a variety of hospital care units rated the extent to which they agreed with 29 indicators of optimal end-of-life care across four domains: patient, family, healthcare team and healthcare system. Latent class analysis identified classes of respondents with similar responses.

Results: Top five indicators rated by participants included: 'physical symptoms managed well'; 'private rooms and unlimited visiting hours'; 'spend as much time with the patient as families wish'; 'end-of-life care documents stored well and easily accessed'; and 'families know and follow patient's wishes'. Four latent classes were generated: "Whole system/holistic" (Class 1); "Patient/provider-dominated" (Class 2); "Family-dominated" (Class 3); "System-dominated" (Class 4). Class 1 had the highest proportion of nurses responding positively for all indicators. Location was an important correlate of perceptions, even after controlling for individual characteristics.

Conclusion: Nurses' perceptions of optimal end-of-life care are associated with location, but perhaps not in the direction that stereotypes would suggest. Findings highlight the importance of developing and implementing location-specific approaches to optimise end-of-life care in hospitals.

Impact: The findings may be useful to guide education and policy initiatives in Asian and Western countries that stress that end-of-life care is more than symptom management.

Indicators can be used to collect data that helps quantify differences between optimal care and the care actually being delivered, thereby determining where improvements might be made.

Keywords

End-of-life care

Acute care

Cross-sectional studies

Nurses

Australia

South Korea

Hong Kong

INTRODUCTION

There is increasing interest in the quality of care being delivered to people at the end of life, particularly in hospital settings where the focus is often on diagnosis and treatment with a view to cure and discharge (Australian Commission on Safety & Quality in Health Care, 2015). Hospital-based nurses have key role in the care of people facing the end of their life, with a potentially unique insight into the dying process, and the potential benefits and risks associated with receiving end-of-life care in hospital (J. Adams, Bailey, Anderson, & Docherty, 2011; Anderson, Bloch, Armstrong, Stone, & Low, 2019; Sekse, Hunskår, & Ellingsen, 2018). Nurses' own attitudes and experiences of caring may influence conversations they have with patients and families regarding end-of-life care options. Nurses may also have different perceptions about end-of-life decision-making processes and care quality compared to physicians (Agustinus & Chan, 2010; McAndrew, 2018). Despite this, there are limited quantitative data regarding nurses' perceptions about what constitutes optimal end-of-life care in hospitals, with much of the literature emerging from the United States (Chan, Ng, Chan, Wong, & Chow, 2019); or focusing on critical care settings (A. Adams, Mannix, & Harrington, 2017; Bloomer, Coombs, Ranse, & Endacott, 2016; Flannery, Ramjan, & Peters, 2016; Ranse, Yates, & Coyer, 2016); or relying primarily on qualitative methods (A. Adams et al., 2017; Chan, Choi, et al., 2019; Sekse et al., 2018; Ranse, Yates, & Coyer, 2012).

Culturally appropriate studies are required to define optimal care within different countries. Studies that compare and contrast experiences between countries, care settings and institutions provide insights into factors that underlie and support the delivery of high quality end-of-life care. However, most studies in end-of-life care have been conducted in Western countries. Further, little is known about the relative contribution of socio-demographic, training and cultural factors to perceptions about what constitutes optimal care of the dying in hospital. Representative and comparative cross-location research of end-of-life care practices can help to inform improvements in care of the dying.

BACKGROUND

The terms "end-of-life care" and "palliative care" are used interchangeably in some literature. In this study, end-of-life care refers to the care of those "likely to die in the next 12 months (involving periods of exacerbated illness that may be reversible); as well as likely to die within days to weeks (where clinical deterioration is likely to be irreversible)" (Australian Commission on Safety & Quality in Health Care, 2015). In contrast, palliative care is typically tailored to assist with effects of life-limiting illnesses, but is not limited to those in the last year of life. It is defined as "an approach to treatment that improves the quality of life of patients and their families facing life-limiting illness, through the prevention and relief of suffering." (Australian Commission on Safety & Quality in Health Care, 2015).

Between one-third and two thirds of people worldwide are estimated to die in hospital (Swerisson & Duckett, 2014). However, recommendations in practice guidelines describing how to care for dying people in hospitals are largely based on expert consensus views rather than Level I evidence. Further, audits of clinical care in hospitals suggest suboptimal adherence to end-of-life care standards and guidelines, resulting in non-beneficial treatments, inappropriate hospital admissions, limited family, pastoral and palliative care involvement, and non-completion of limitations of medical order forms (Bloomer, Hutchinson, & Botti, 2019; Cardona-Morrell, Kim, Brabrand, Gallego-Luxan, & Hillman, 2017; Cardona-Morrell et al., 2016; Gaertner et al., 2017). Access to specialist palliative care is also variable. Among 150,770 older people who died in Australian hospitals, 34.4% received palliative care a median of 10 days before death (Stubbs, Assareh, Achat, & Jalaludin, 2019). Those who were older and had non-cancer diagnoses received fewer inpatient palliation days and a shorter interval between first palliative admission and death (Stubbs et al., 2019). Other studies of dying patients and their families indicate suboptimal experiences of symptom management, bereavement outcomes and communication (Donnelly, Prizeman, Coimin, Korn, & Hynes, 2018; Mayland, Mulholland, Gambles, Ellershaw, & Stewart, 2017; Virdun, Lockett, Davidson, & Phillips, 2015; Wachterman et al., 2016).

Nurses offer an important perspective about the factors that can influence quality of end-of-life care in hospital for a number of reasons. Nurses are often the link between the patient, family and healthcare team at the end of life, providing the majority of direct patient care. They have opportunities to develop relationships with patients and families that other team members may not (J. Adams et al., 2011). Nurses are also often privy to much of the discussion that takes place about treatment options, so can clarify information when there is limited understanding (Anderson et al., 2019). Despite their key role, there is a surprising lack of research focusing on nurses' perspectives of what constitutes optimal end-of-life care in hospital. Internationally, qualitative research has explored nurses' views regarding their role and responsibilities in delivering end-of-life care (McAndrew, 2018; Sekse et al., 2018). Much of the quantitative research has focused on intensive care units (Flannery et al., 2016; Ranse, et al., 2016), and the barriers and enablers to current practice (Agustinus & Chan, 2010; Carvajal et al., 2019; Chan et al., 2020). While these provide some insight into nurses' perceptions of the quality of end-of-life care being delivered, the ability to generalise the findings beyond the settings of the studies, including what represents optimal care, is limited.

The majority of studies have also been conducted in Western societies. The extent to which studies undertaken in one location can be reasonably generalised to other cultures should be questioned. Different cultures, training and health care systems may have a significant impact on how optimal end-of-life care is conceptualised and subsequently delivered. For instance, health systems in Asian and Western countries vary considerably, contributing to differences in their ranking across end-of-life domains in the Quality of Death Index, such as: palliative and healthcare environment, human resources, affordability, quality and community engagement (World Health Organisation, 2017). Internationally, lack of education and training is widely acknowledged as a significant barrier to the provision of optimal end-of-life care by healthcare providers, including nurses (Alqahtani & Mitchell, 2019; Nevin, Hynes, &

Smith, 2020; Wang & Chan, 2015). Expectations about what people perceive as 'optimal' in different countries may also be grounded in cultural stereotypes. In the Asia-Pacific region, countries such as Australia, with the majority of its population being Caucasian, view optimal end-of-life decision making as a collaborative experience involving health professionals and family members (Australian Commission on Safety & Quality in Health Care, 2015). In other parts of the Asia-Pacific region, such as South Korea and Hong Kong, it may be expected that the majority of people want to die at home surrounded by family, given the importance of family and role of filial piety. However, over 90% of deaths in Hong Kong and 75% in South Korea occur in hospital (World Health Organisation, 2017). The emphasis on family is also often assumed to shape preferences and patient–physician communication regarding family involvement in decision-making (Alden et al., 2018). In contrast, the emphasis on patient autonomy suggests advance care planning and patient choice about end-of-life care will be highly valued in Western cultures (Alden et al., 2018). Others suggest that other personal factors, including socio-demographic and disease characteristics, may override these cultural stereotypes when it comes to end-of-life care values and preferences (Alden et al., 2018; Kwon, Hattori, Lee, & Junga Kim, 2015).

While informative for policy, comparisons are largely based on the premise that care quality is defined in the same way across cultures. This is in contrast to the idea that culture may influence values and expectations, and shape the way in which certain health care systems define high-quality end-of-life care (Betancourt, Green, Carrillo, & Owusu Ananeh-Firempong, 2016; Fang, Sixsmith, Sinclair, & Horst, 2016). Few previous studies have used standardised questionnaires to elicit the views of nurses. No studies have compared the perceptions of nurses' in Western and Asian countries regarding what constitutes optimal care for people dying in the hospital. Further, the potential impact of nurses' location, socio-demographics and training on these perceptions is yet to be examined.

THE STUDY

Aim: To examine whether nurses' location of employment, demographics, or training influences their perceptions of what constitutes optimal care for dying patients.

Design and setting

A cross-sectional survey of general nurses practicing in hospitals in three locations in the Asia-Pacific region - Australia, Hong Kong and South Korea. Participants were recruited from three public metropolitan hospitals in Australia, one 1,100 bed public hospital in Hong Kong and one (privately funded) university hospital in South Korea where acute, subacute, and chronic care is provided. This study used data obtained between December 2016 and June 2018.

Participants

Eligible participants included registered nurses (defined as holding a Bachelor's degree) and enrolled nurses (defined as holding a Diploma qualification). Nurses also needed to be aged 18 years or over and providing direct patient care in acute and/or critical care wards of the participating hospitals. With the assistance of the Nurse Unit Manager (or equivalent) in each ward of the participating hospitals, members of the research team identified potentially eligible nurses. The research team member in each location responsible for managing recruitment approached eligible nurses for consent during their shift or via mail. Nurses were invited to complete an anonymous questionnaire. Questionnaires were returned directly to the research team in person or via mail.

Data collection

The questionnaire included the following items (see Appendix A).

Optimal end-of-life care: Participants were asked for their views about what constitutes optimal end-of-life care for people dying in hospitals. The 29 indicators covered four domains, including: dying patient (12 indicators); families of dying patients (6 indicators);

health care teams (7 indicators); and the hospital/health care system (4 indicators). For each indicator, participants indicated the extent to which they agreed with each of the indicators on a 5-point Likert scale ranging from 'strongly agree' to 'strongly disagree' (*see Table 2 for full list of indicators by domain*).

Nurse characteristics: Self-reported age (years), gender (female/male), highest education qualifications, time since qualified as nurses (years), average number of hours worked per week, specialty, palliative care/hospice education, and the number of dying patients cared for in the last 6 months were involved.

Ethical considerations

The [blinded for peer review] Human Research Ethics Committee (H-2018-0112) and the ethics committees of the participating health services in Australia (16/12/14/4.09); South Korea (IRB: 125-13) and Hong Kong (KW/FR-17-036(109-01)) approved the study.

Participants were provided with a Study Recruitment Package that included a participant information statement and a copy of the questionnaire. These materials explained the study purpose and potential risks and benefits of the study. Participants were also informed that participation was voluntary and they could withdraw from the study at any time. To minimise potential coercion, participants were able to complete the questionnaire in their own time at a location convenient to them, and return it anonymously to the research team. The return of the questionnaire implied consent.

Data analysis

Statistical analyses were programmed using SAS software v9.4 (SAS Institute, Cary, North Carolina, USA) and R (R Foundation for Statistical Computing, Vienna, Austria). The explanatory variables (nurse characteristics, location) were summarised and compared using the appropriate descriptive statistics including chi square tests for frequencies and percentages and t-test and Kruskal-Wallis tests for continuous variables (*see Table 1*).

Nurses' responses to each of the 29 optimal care indicators in the questionnaire (study outcomes) were dichotomised into two categories (1) strongly agree/agree and (2) unsure/disagree/strongly disagree (see Table 2). Latent class analysis (LCA) was then conducted on the 29 indicators. Models were compared for relative fit using two information criteria: the Akaike (AIC) and Bayesian (BIC). Selection of the number of latent classes in the final model relied on minimizing the value of the BIC, as well as interpretability. The best fitting model was chosen for further analysis. After removing missing values, there were 525 complete cases for the multivariable LCA regression. Statistical significance of explanatory variables was based on odds ratios when comparing to class 1. Crude latent class regressions for each explanatory variable were undertaken with odds ratios with 95% CIs. Multivariable LCA regressions were then conducted on complete cases, odds ratios with 95% CIs, numbers and percentages of each explanatory variable within estimated latent classes. Some explanatory variables were collapsed due to low cell counts in the final model. Explanatory variables included: location, age (years), gender, nursing years (years), nursing role (front-line nurse, other), education (Bachelor, other), and number dying patients cared for in last 6 months (none, 1-5, 5+).

Validity, reliability and rigour

The initial questionnaire broad domains and individual items were developed based on the findings of systematic reviews of the literature describing quality end-of-life care in hospital (De Roo et al., 2013; Robinson, Gott, Gardiner, & Ingleton, 2016; Virdun et al., 2015; Virdun, Luckett, Lorenz, & Phillips, 2018; Waller, Dodd, Tattersall, Nair, & Sanson-Fisher, 2017; World Health Organisation, 2017). Clinical practice guidelines in end-of-life care and national end-of-life care standards for hospitals were also reviewed and included as potential items in the initial questionnaire (Australian Commission on Safety & Quality in Health Care, 2015; Clayton, Hancock, Butow, Tattersall, & Currow, 2007; National Institute for Clinical Excellence, 2015). Further, items from questionnaires that had been developed and administered previously in the literature were also considered for inclusion [blinded for peer

review]. The questionnaire was then circulated to eight experienced nurses as well as a panel of experts in palliative care, nursing, behavioural science, geriatric medicine, and oncology. Three consultation rounds of feedback on suggested questionnaire domains and corresponding items occurred. The questionnaire was initially developed in English. The questionnaire underwent backwards and forward translation into Korean by bilingual persons. The questionnaire was further pilot-tested with 10 nurses from each location and feedback led to further refinement. The final English version of the questionnaire was administered to Australian and Hong Kong nurse participants, while the translated Korean version was administered to the South Korean participants (Appendix A).

RESULTS

Sample.

A total of 582 nurses returned a completed questionnaire (45% of 340 eligible Australian respondents 21% of 895 eligible Hong Kong respondents; and 96% of 251 eligible Korean respondents). The characteristics of participants are summarised in Table 1. The sample included nurses from Australia (n=153, 26% of all nurses), South Korea (n=241, 42% of all nurses) and Hong Kong (n=188, 32% of all nurses). Nurses were predominantly female (n=524; 91%), employed as front-line nurses (n=482; 84%) and had cared for at least one dying patient in the preceding six months (n=449; 78%).

[Table 1 here]

Nurses' agreement regarding indicators of optimal end-of-life care delivered in hospital.

Table 2 presents agreement on indicators for the whole sample, as well as for nurses recruited in each location separately. Across the whole sample, the five indicators most frequently rated as '**strongly agree**' included: '*Physical symptoms managed well*' (Indicator 1; patient domain); '*Private rooms and/or unlimited visiting hours for families of dying*

patients' (Indicator 27; health system domain); *'Spend as much time with patient as they wish, including immediately after death'* (Indicator 18; family domain); *End-of-life care documents stored in a place easily accessed by care teams'* (Indicator 26; health system domain); and *'Know and follow patient's end-of-life wishes when making decisions on patient's behalf'* (Indicator 14; family domain) (see Appendix B for whole sample all response options).

The five indicators least frequently rated as '**strongly agree**' included: *"24 hour a day, 7 days a week access to specialist palliative care"* (Indicator 5; patient domain); *'Designate a primary contact for each patient'* (Indicator 21; health team domain); *'Have clearly defined roles and responsibilities in end-of-life care for different team member'* (Indicator 20; health team domain); *'Reach consensus about prognosis, goals of care and treatment options before discussing with patient/family'* (Indicator 19; health team domain); *'Have conflict or disagreements about care identified and managed well'* (Indicator 15; health team domain).

[Table 2 here]

Model selection

Latent class analysis identified four distinct classes of respondents, the conditional probability of a positive response (i.e. strongly agree/agree) for each indicator was plotted by Class (Figure 1) to aid assigning descriptive labels to these classes. Classes represented the following proportions: "Whole system/holistic" (Class 1) 50% (95% CI 0.46 to 0.55), "Patient/provider-dominated" (Class 2) = 26% (95% CI 0.21 to 0.30), "Family-dominated" (Class 3) = 18% (95% CI 0.14 to 0.21) and "System-dominated" (Class 4) = 6% (95% CI 0.04 to 0.08), respectively.

[Figure 1 here]

“Whole system/holistic” (Class 1) had a higher proportion of strongly agree responses for all 29 indicators compared to all other Classes. When compared to Class 1 and Class 2, Class 3 had a lower probability of a positive response to patient-focused indicators (i.e. Indicator 3, 4, 5, 7, 8, 9, 10, 12), as well as health care team and hospital/system-focused indicators (i.e. Indicators, 24, 25, 27 and 28) (see Table 2 for list of indicators).

Multivariable LCA regression

Location emerged as an important correlate of class even after controlling for nurses’ characteristics (Table 3 and 4). Compared to Australian nurses, nurses from South Korea were significantly more likely to belong to Class 2 (OR=7.78; 95% CI 2.92 to 20.71) and Class 3 (OR=25.76; 95% CI 5.43 to 122.13). Nurses in Hong Kong were significantly more likely to belong to Class 2 than belong to Class 1 (OR=3.64; 95% CI 1.36 to 9.75).

[Table 3 here]

[Table 4 here]

DISCUSSION

This novel cross-location comparison study presents nurse-reported data on indicators of optimal end-of-life care across four broad domains. Four latent classes were generated, including: “Whole system/holistic” (Class 1); “Patient/provider-dominated” (Class 2); “Family-dominated” (Class 3); “System-dominated” (Class 4). Class 1 had a higher probability of a positive response to all indicators compared to the remaining three classes. Location emerged as an important correlate, even after controlling for nurse characteristics.

Location was associated with nurses' ratings of the importance of patient-related indicators.

Compared to Class 1, having “24 hour a day, 7 day a week access to specialist palliative care” had a significantly lower probability of a positive response in Classes 2, 3 and 4. This is not surprising, as these profiles were comprised almost exclusively of South Korea and Hong Kong nurses, where specialist palliative care is relatively under-developed (Clark et al., 2020). Only an estimated 1.4% of people with non-cancer and 10% of those with a cancer diagnosis receive palliative care in South Korea (Shin et al., 2016). Specialist palliative care is strongly established in Australia in comparison (Australian Institute of Health & Welfare, Welfare, 2018).

Similar trends were found for other patient indicators (Indicator 3,4,7,8,9,12). These differences may reflect different perspectives regarding the concept of patient autonomy. Asking patients about their concerns is emphasised in Australian practice and policy documents (e.g. (Australian Commission on Safety & Quality in Health Care, 2015) In South Korea and Hong Kong, discussion of death at the bedside could be considered taboo, with death perceived to be a ‘family issue’ (Park et al., 2018). In these family-based systems, norms such as filial piety and familial relationships are stressed more than patient autonomy (Park et al., 2018).

Similarities and differences in perceptions did not always accord with cultural stereotypes.

Consistent with previous research (Alden et al., 2018), differences in perceptions were not always in the direction that cultural stereotypes would suggest. Classes dominated by nurses from South Korea and Hong Kong had a lower probability of a positive response to some family-related indicators, compared to Class 1 which was dominated by Australian nurses. These included: ‘Families receiving information about bereavement support’, ‘Spending as much time with the patient as they wish’, and ‘Being supported to perform

cultural/religious practices' (Indicators 16, 17 and 18). The relative underdevelopment of bereavement support in these countries, as well as nursing manpower shortage and lack of relevant knowledge to provide appropriate care may be attributable factors. Some perceive family members may become upset or reluctant to discuss issues related to bereavement and religious practices. Opinions about the dying process may be shaped by the culture, but the availability of services and other health system factors also appear to play a role.

There was also a lower probability of positive responses to provider and system indicators in Class 3, including: resolving conflict/disputes, education and training for providers and time to discuss and deliver care in line with patient preferences (Indicators 24,25,28). In Hong Kong and South Korea, some nurses feel they lack adequate power or ability to settle disputes and influence decision-making. Similarly, patients' preferences could be somehow neglected due to nurses' lack of time and conforming to their work paradigm.

Despite these differences, there was agreement among nurses about some indicators of optimal care, irrespective of training, socio-demographics, and location. Managing patients' physical symptoms (Indicator 1) was ranked highest overall. Patients, families and health care providers consistently identify pain-free status as a core feature of quality end-of-life care (Meier et al., 2016). A systematic review across 15 countries found that 38% of end-of-life care quality indicators pertain to symptom management (Virdun, Luckett, Lorenz, & Phillips, 2018). Despite this, there is a large body of literature describing often suboptimal symptom management in hospitals for dying patients (Bloomer et al., 2019; Cardona-Morrell et al., 2017; Donnelly, et al., 2018; Mayland et al., 2017; Stubbs et al., 2019; Virdun et al., 2015; Wachterman et al., 2016). For instance, more than three-quarters of 57,000 inpatient decedents from the United States reported pain in the last month of life, and over half reported frequent uncontrolled pain (Meier et al., 2016). Higher levels of grief, worse bereavement adjustment and depression may occur when family members perceive a loved one experiences uncontrolled pain (Donnelly et al., 2018; Mayland et al., 2017).

Families knowing and following patient wishes and having accessible end-of-life documentation was positively endorsed (Indicators 14, 26). Involving families throughout the decision-making process can support them to choose care that aligns with loved ones' wishes, and reduce emotional distress associated with rushed decisions (Sudore et al., 2017). While most healthcare professionals state they would use end-of-life documents to guide treatment for people who lack capacity (Cartwright, et al., 2014; Moore, et al., 2020), this requires documents to be legally valid and available at the time of decision making (Friedewald & Cleasby, 2017; Moore, et al., 2020). However, written documentation supporting clear and concise communication is often lacking in hospital records (Bloomer et al., 2019). A recent Australian audit report an advance care directive (ACD) prevalence of 15.7% in hospitals (Detering et al., 2019), and low concordance between self-reported completion and document presence in records (Buck et al., 2019). Fewer than 5% of South Koreans have ACDs and most decisions are made by families and physicians (Shin et al., 2016). In Hong Kong, the absence of statutory or case law on ACD status means common law documents can be superseded by other legislation (Wang & Chan, 2015). Suggested strategies to improve the accessibility of documents include education and e-health record systems (Buck et al., 2019). To improve uptake, 'whole community' approaches that integrate community education, intervene with professionals across healthcare and legal settings, and mobilise support from influential groups and local government may hold promise (Waller, Sanson-Fisher, Ries, & Bryant, 2018).

Overall, nurses valued access to private rooms/unlimited visiting hours and the availability of facilities to allow families to spend as much time with the patients as they wish even after death (Indicators 27 and 18). Previous studies of nurses working in critical care and general wards have also emphasised the potential impact that hospital environment can have on end-of-life care experiences. Private rooms can promote more personalised contact and fewer care interruptions; as well as improve sleep and interactions (Brereton et al., 2012;

Sagha Zadeh et al., 2018) However, current resource availability means many will die in shared rooms (Brereton et al., 2012). Concerns about isolation and patient safety in single rooms have also been reported (Brereton et al., 2012; Ranse et al., 2016). Environmental modifications, such as room layouts that promote: physical proximity to others, visual access, positive sensory stimulation and adequate space may improve quality of life and satisfaction with care; and reduce patient loneliness (Sagha Zadeh et al., 2018).

LIMITATIONS

Despite the large sample size and response rates similar to previous questionnaire studies undertaken with nurses, the current study has several limitations. Differences were found among nurses from the three locations, in terms of socio-demographic characteristics and training. For pragmatic reasons, nurses perceptions of the quality of care being actually delivered in these settings was not assessed. Comparing perceived differences between optimal care and the care actually being delivered can help to identify where improvements might be made, thereby increasing the probability that optimal care of the dying is achieved. The need for similar studies to be replicated in other Western and Asian countries is acknowledged. The need to replicate in other private hospitals to quantify any potential differences due to funding models is also acknowledged. Previous studies have reported that aspects of end-of-life care, such as rates of completion of limitation of medical treatment forms, written entries indicating poor prognosis and goals of care, end-of-life decision making and family involvement, referral to palliative care and pastoral care personnel and family presence at death, may be lower for patients admitted to public compared to private hospitals (Bloomer et al., 2019).

CONCLUSIONS

This study provides new evidence regarding nurses' perceptions of optimal end-of-life care delivered to people dying in hospitals across multiple jurisdictions and health care systems. There is a need to improve end-of-life care education in both pre-service and in-service

education to enhance nurses' knowledge and skills in providing end-of-life care. Communication skills in conversing with patients and family members on end-of-life matters, is a critical component in end-of-life education program. Education could also empower nurses to settle disputes and influence decision-making. Hospitals need to develop clinical guidelines supporting clear and concise communication on the use of end-of-life documents. Findings demonstrated the influence of location on nurses' perceptions irrespective of individual characteristics and training. This suggests that models of optimal care should not be generalised across different countries. Economic, cultural and legal differences between countries may play a role, and findings highlight the importance of developing and implementing location-specific approaches to optimise care delivered to people dying in hospitals.

Declarations.

Authorship

Author 1, Author 2 and Author 8 (Location 1) conceived the study and questionnaire, and contributed to data acquisition, analysis and interpretation of study findings. Author 3 and 4 (Location 2) and Author 5 and 6 (Location 3) contributed to the study design, data acquisition and interpretation of study findings. Author 7 contributed to statistical analysis and interpretation of the data. All authors have read and approved the final version to be published and agree to be accountable for this work.

Funding

This study was undertaken with in-kind support from the following institutions: [blinded for peer review]. The [blinded for peer review] is the coordinating centre, under the co-leadership of Author 2 and 8. The authors would also like to acknowledge infrastructure support from [blinded for peer review] and funding from the National Health and Medical Research Council ACcORD program (1095078) and Australian Research Council DECRA (150101262).

Declaration of conflicts of interest

The authors declare there is no conflicts of interest.

Research ethics and patient consent.

The [REDACTED] [blinded for peer review] Human Research Ethics Committee (H-2018-0112) and the ethics committees of the participating health services in Australia (16/12/14/4.09); South Korea (IRB: 125-13) and Hong Kong (KW/FR-17-036(109-01) approved the study.

Data management and sharing.

The datasets for the current study are available from the authors on reasonable request.

Acknowledgements

The authors would like to acknowledge the time and effort provided by the nurses who took part in this research, as without their assistance, this research would not be possible. The authors are grateful for all the hard work and assistance of multiple research personnel, including [blinded for peer review] for recruitment; and [blinded for peer review] for data entry and cleaning.

Appendix A. Supplementary material Questionnaire

Supplementary material related to this article can be found, in the [url]

Appendix B. Supplementary data

Supplementary material related to this article can be found, in the [url]

References

- Adams, A., Mannix, T., & Harrington, A. (2017). Nurses' communication with families in the intensive care unit – a literature review. *Nursing in Critical Care*, 22(2), 70-80. doi:10.1111/nicc.12141
- Adams, J., Bailey, D., Anderson, R., & Docherty, S. (2011). Nursing roles and strategies in end-of-life decision making in acute care: a systematic review of the literature. *Nursing Research and Practice*, 2011. doi:10.1155/2011/527834
- Agustinus, S., & Chan, S. (2010). Factors affecting the attitudes of nurses towards palliative care in the acute and long term care setting: a systematic review. *JBI Library of Systematic Reviews*, 8(34 Suppl), 1-23. doi:10.11124/01938924-201008341-00025
- Alden, D. L., Friend, J., Lee, P. Y., Lee, Y. K., Trevena, L., Ng, C. J., . . . Limpongsanurak, S. (2018). Who decides: Me or we? Family involvement in medical decision making in Eastern and Western countries. *Medical Decision Making*, 38(1), 14-25. doi:10.1177/0272989x17715628
- Alqahtani, A. J., & Mitchell, G. (2019). End-of-life care challenges from staff viewpoints in emergency departments: systematic review. *Healthcare (Basel)*, 7(3). doi:10.3390/healthcare7030083
- Anderson, R. J., Bloch, S., Armstrong, M., Stone, P. C., & Low, J. T. (2019). Communication between healthcare professionals and relatives of patients approaching the end-of-life: A systematic review of qualitative evidence. *Palliative Medicine*, 33(8), 926-941. doi:10.1177/0269216319852007
- Australian Commission on Safety & Quality in Health Care. (2015). *National Consensus Statement: essential elements for safe and high-quality end-of-life care*. Sydney, NSW. Retrieved from: <https://www.safetyandquality.gov.au/sites/default/files/migrated/National-Consensus-Statement-Essential-Elements-for-safe-high-quality-end-of-life-care.pdf>
- Australian Institute of Health & Welfare. (2018). *Palliative care services in Australia*. AIHW: Canberra. Retrieved from: <https://www.aihw.gov.au/reports/palliative-care-services/palliative-care-services-in-australia/contents/summary>
- Betancourt, J. R., Green, A. R., Carrillo, J. E., & Owusu Ananeh-Firempong, I. (2016). Defining cultural competence: a practical framework for addressing racial/ethnic disparities in health and health care. *Public Health Reports*, 118 293-302. doi: 10.1093/phr/118.4.293.
- Bloomer, M., Coombs, M., Ranse, K., & Endacott, R. (2016). How nurses prepare families for treatment withdrawal in intensive care: Results of an Australasian survey. *Australian Critical Care*, 29(2), 112. doi:10.1016/j.aucc.2015.12.006
- Bloomer, M., Hutchinson, A., & Botti, M. (2019). End-of-life care in hospital: an audit of care against Australian national guidelines. *Australian Health Review*, 43(5), 578-584. doi:<https://doi.org/10.1071/AH18215>
- Brereton, L., Gardiner, C., Gott, M., Ingleton, C., Barnes, S., & Carroll, C. (2012). The hospital environment for end of life care of older adults and their families: an integrative review. *Journal of Advanced Nursing*, 68(5), 981-993. doi:10.1111/j.1365-2648.2011.05900.x
- Buck, K., Detering, K. M., Pollard, A., Sellars, M., Ruseckaite, R., Kelly, H., . . . Nolte, L. (2019). Concordance between self-reported completion of advance care planning documentation and availability of documentation in Australian health and residential aged care services. *Journal of Pain & Symptom Management*, 58, 264-274. doi:10.1016/j.jpainsymman.2019.04.026
- Cardona-Morrell, M., Kim, J., Brabrand, M., Gallego-Luxan, B., & Hillman, K. (2017). What is inappropriate hospital use for elderly people near the end of life? A systematic review. *European Journal of Internal Medicine*, 42, 39-50. doi:10.1016/j.ejim.2017.04.014
- Cardona-Morrell, M., Kim, J., Turner, R. M., Anstey, M., Mitchell, I. A., & Hillman, K. (2016). Non-beneficial treatments in hospital at the end of life: a systematic review on extent

- of the problem. *International Journal of Quality Health Care*, 28(4), 456-469. doi:10.1093/intqhc/mzw060
- Cartwright C, et al. (2014). Medical practitioners' knowledge and self-reported practices of substitute decision making and implementation of advance care plans. *Internal Medicine Journal*, 44(3), 234-239. doi: 10.1111/imj.12354.
- Carvajal, A., Haraldsdottir, E., Kroll, T., McCormack, B., Errasti-Ibarrondo, B., & Larkin, P. (2019). Barriers and facilitators perceived by registered nurses to providing person-centred care at the end of life. A scoping review. *International Practice Development Journal*. 9(2) doi.org/10.19043/ipdj.92.008
- Chan, C. W. H., Choi, K. C., Chan, H. Y. L., Wong, M. M. H., Ling, G. C. C., Chow, K. M., . . . Sham, M. M. K. (2019). Unfolding and displaying the influencing factors of advance directives from the stakeholder's perspective: A concept mapping approach. *Journal of Advanced Nursing*, 75(7), 1549-1562. doi:10.1111/jan.14017
- Chan, C. W. H., Chow, M. C. M., Chan, S., Sanson-Fisher, R., Waller, A., Lai, T. T. K., & Kwan, C. W. M. (2020). Nurses' perceptions of and barriers to the optimal end-of-life care in hospitals: A cross-sectional study. *Journal of Clinical Nursing*, 29(7-8), 1209-1219. doi:10.1111/jocn.15160
- Chan, C. W. H., Ng, N. H. Y., Chan, H. Y. L., Wong, M. M. H., & Chow, K. M. (2019). A systematic review of the effects of advance care planning facilitators training programs. *BMC Health Services Research*, 19(1), 362. doi:10.1186/s12913-019-4192-0
- Clark, D., Baur, N., Clelland, D., Garraida, E., López-Fidalgo, J., Connor, S., & Centeno, C. (2020). Mapping levels of palliative care development in 198 countries: the situation in 2017. *Journal of Pain & Symptom Management*, 59(4), 794-807.e794. doi:10.1016/j.jpainsymman.2019.11.009
- Clayton, J. M., Hancock, K. M., Butow, P. N., Tattersall, M., & Currow, D. C. (2007). Clinical practice guidelines for communicating prognosis and end-of-life issues with adults in the advanced stages of a life-limiting illness, and their caregivers. *Medical Journal of Australia*, 186(12 Suppl), S77, S79, S83. doi: 10.5694/j.1326-5377.2007.tb01100.x
- De Roo, M. L., Leemans, K., Claessen, S. J., Cohen, J., Pasman, H. R., Deliens, L., & Francke, A. L. (2013). Quality indicators for palliative care: update of a systematic review. *Journal of Pain & Symptom Management*, 46(4), 556-572. doi:10.1016/j.jpainsymman.2012.09.013
- Detering, K. M., Buck, K., Ruseckaite, R., Kelly, H., Sellars, M., Sinclair, C., . . . Nolte, L. (2019). Prevalence and correlates of advance care directives among older Australians accessing health and residential aged care services: multicentre audit study. *BMJ Open*, 9(1), e025255. doi:10.1136/bmjopen-2018-025255
- Donnelly, S., Prizeman, G., Coimin, D. O., Korn, B., & Hynes, G. (2018). Voices that matter: end-of-life care in two acute hospitals from the perspective of bereaved relatives. *BMC Palliative Care*, 17(1), 117. doi:10.1186/s12904-018-0365-6
- Fang, M. L., Sixsmith, J., Sinclair, S., & Horst, G. (2016). A knowledge synthesis of culturally- and spiritually-sensitive end-of-life care: findings from a scoping review. *BMC Geriatrics*, 16(1), 107. doi:10.1186/s12877-016-0282-6
- Flannery, L., Ramjan, L. M., & Peters, K. (2016). End-of-life decisions in the intensive care unit (ICU): Exploring the experiences of ICU nurses and doctors – A critical literature review. *Australian Critical Care*, 29(2), 97-103. doi:https://doi.org/10.1016/j.aucc.2015.07.004
- Friedewald, M. I., & Cleasby, P. A. (2017). Advance care directive documentation: issues for clinicians in New South Wales. *Australian Health Review*. doi:10.1071/ah16205
- Gaertner, J., Siemens, W., Meerpohl, J. J., Antes, G., Meffert, C., Xander, C., . . . Becker, G. (2017). Effect of specialist palliative care services on quality of life in adults with advanced incurable illness in hospital, hospice, or community settings: systematic review and meta-analysis. *British Medical Journal*, 357, j2925. doi:10.1136/bmj.j2925
- Kwon, I., Hattori, K., Lee, K.-b., & Junga Kim, C. (2015). End-of-Life decisions: a survey of the perspectives of people in Korea, China, and Japan. *Acta bioethica*, 21, 173-182.

- doi:10.4067/S1726-569X2015000200003
- Mayland, C. R., Mulholland, H., Gambles, M., Ellershaw, J., & Stewart, K. (2017). How well do we currently care for our dying patients in acute hospitals: the views of the bereaved relatives? *BMJ Supportive & Palliative Care*, 7(3), 316-325.
doi:10.1136/bmjspcare-2014-000810
- McAndrew, N. S. (2018). Nurses and physicians bring different perspectives to end-of-life decisions in intensive care units. *Evidence Based Nursing*, 21(3), 85-85.
doi:10.1136/eb-2018-102902
- Meier, E. A., Gallegos, J. V., Thomas, L. P., Depp, C. A., Irwin, S. A., & Jeste, D. V. (2016). Defining a good death (successful dying): literature review and a call for research and public dialogue. *American Journal of Geriatric Psychiatry*, 24(4), 261-271.
doi:10.1016/j.jagp.2016.01.135
- Moore, N., Detering, K.M., Low, T., Nolte, L., Fraser, S., & Sellars, M. Doctors' perspectives on adhering to advance care directives when making medical decisions for patients: an Australian interview study. *BMJ Open* 2019;9:e032638. doi: 10.1136/bmjopen-2019-032638
- National Institute for Clinical Excellence. (2015). *Care of dying adults in the last days of life [NG31]*. NICE, London. Retrieved from:
<https://www.nice.org.uk/guidance/ng31/chapter/Recommendations>
- Nevin, M., Hynes, G., & Smith, V. (2020). Healthcare providers' views and experiences of non-specialist palliative care in hospitals: A qualitative systematic review and thematic synthesis. *Palliative Medicine*, 0(0), 0269216319899335.
doi:10.1177/0269216319899335
- Park, S. Y., Phua, J., Nishimura, M., Deng, Y., Kang, Y., Tada, K., & Koh, Y. (2018). End-of-life care in ICUs in East Asia: A comparison among China, Korea, and Japan. *Critical Care Medicine*, 46(7), 1114-1124. doi:10.1097/ccm.0000000000003138
- Ranse, K., Yates, P., & Coyer, F. (2012). End-of-life care in the intensive care setting: A descriptive exploratory qualitative study of nurses' beliefs and practices. *Australian Critical Care*, 25(1), 4-12. doi:10.1016/j.aucc.2011.04.004
- Ranse, K., Yates, P., & Coyer, F. (2016). End-of-life care practices of critical care nurses: A national cross-sectional survey. *Australian Critical Care*, 29(2), 83-89.
doi:10.1016/j.aucc.2015.07.001
- Robinson, J., Gott, M., Gardiner, C., & Ingleton, C. (2016). The 'problematisation' of palliative care in hospital: an exploratory review of international palliative care policy in five countries. *BMC Palliative Care*, 15(1), 64. doi:10.1186/s12904-016-0137-0
- Sagha Zadeh, R., Eshelman, P., Setla, J., Kennedy, L., Hon, E., & Basara, A. (2018). Environmental design for end-of-life care: an integrative review on improving the quality of life and managing symptoms for patients in institutional settings. *Journal of Pain & Symptom Management*, 55(3), 1018-1034.
doi:10.1016/j.jpainsymman.2017.09.011
- Sekse, R. J. T., Hunskår, I., & Ellingsen, S. (2018). The nurse's role in palliative care: A qualitative meta-synthesis. *Journal of Clinical Nursing*, 27(1-2), e21-e38.
doi:10.1111/jocn.13912
- Shin, D. W., Lee, J. E., Cho, B., Yoo, S. H., Kim, S., & Yoo, J. H. (2016). End-of-life communication in Korean older adults: With focus on advance care planning and advance directives. *Geriatric Gerontology International*, 16(4), 407-415.
doi:10.1111/ggi.12603
- Stubbs, J. M., Assareh, H., Achat, H. M., & Jalaludin, B. (2019). Inpatient palliative care of people dying in New South Wales hospitals or soon after discharge. *Internal Medicine Journal*, 49(2), 232-239. doi:10.1111/imj.14074
- Sudore, R. L., Lum, H. D., You, J. J., Hanson, L. C., Meier, D. E., Pantilat, S. Z., . . . Heyland, D. K. (2017). Defining advance care planning for adults: A consensus definition from a multidisciplinary Delphi panel. *Journal of Pain & Symptom Management*, 53(5), 821-832.e821. doi:10.1016/j.jpainsymman.2016.12.331
- Swerisson, H., & Duckett, S. (2014). *Dying Well*. Grattan Institute, Sydney. Retrieved from

- <https://grattan.edu.au/wp-content/uploads/2014/09/815-dying-well.pdf>
- Virdun, C., Lockett, T., Davidson, P. M., & Phillips, J. (2015). Dying in the hospital setting: A systematic review of quantitative studies identifying the elements of end-of-life care that patients and their families rank as being most important. *Palliative Medicine*, 29(9), 774-796. doi:10.1177/0269216315583032
- Virdun, C., Lockett, T., Lorenz, K. A., & Phillips, J. (2018). National quality indicators and policies from 15 countries leading in adult end-of-life care: a systematic environmental scan. *BMJ Supportive & Palliative Care*, 8(2), 145-154. doi:10.1136/bmjspcare-2017-001432
- Wachterman, M. W., Pilver, C., Smith, D., Ersek, M., Lipsitz, S. R., & Keating, N. L. (2016). Quality of end-of-life care provided to patients with different serious illnesses. *JAMA Internal Medicine*, 176(8), 1095-1102. doi:10.1001/jamainternmed.2016.1200
- Waller, A., Dodd, N., Tattersall, M. H. N., Nair, B., & Sanson-Fisher, R. (2017). Improving hospital-based end of life care processes and outcomes: a systematic review of research output, quality and effectiveness. *BMC Palliative Care*, 16(1), 34. doi:10.1186/s12904-017-0204-1
- Waller, A., Sanson-Fisher, R., Ries, N., & Bryant, J. (2018). Increasing advance personal planning: the need for action at the community level. *BMC Public Health*, 18(1), 606-606. doi:10.1186/s12889-018-5523-5
- Wang, C.-W., & Chan, C. L. W. (2015). End-of-life care research in Hong Kong: a systematic review of peer-reviewed publications. *Palliative & Supportive Care*, 13(6), 1711-1720. doi:10.1017/S1478951515000802
- World Health Organisation. (2017). *Global Atlas of Palliative Care at the End of Life*. Retrieved from Geneva: <http://www.thewhpc.org/resources/global-atlas-on-end-of-life-care>.

Table 1: Characteristics of nurses (n=582)

Characteristics	Australia (n=153)	Hong Kong (n=188)	South Korea (n=241)	Total (N=582)	P-value ¹
Age					
mean (SD)	43.7 (12.6)	36.7 (14.9)	30.6 (5.9)	36.0 (12.4)	<0.0001
median (min, max)	46.0 (21.0, 70.0)	40.0 (0.0, 62.0)	29.0 (23.0, 49.0)	33.0 (0.0, 70.0)	
Years as nurse					
mean (SD)	18.8 (13.6)	16.2 (12.0)	6.8 (5.7)	12.9 (11.6)	<0.0001
median (min, max)	16.0 (0.3, 53.0)	19.5 (0.0, 43.0)	4.8 (0.1, 26.0)	9.0 (0.0, 53.0)	
Characteristics	N (%)	N (%)	N (%)	N (%)	P-value
Gender					0.0007
Female	136 (92%)	158 (85%)	230 (95%)	524 (91%)	
Male	12 (8.1%)	28 (15%)	11 (4.6%)	51 (8.9%)	
Missing	5	2	0	7	
Nursing role					<0.0001
Nurse unit/ward manager	15 (10%)	32 (17%)	16 (6.7%)	63 (11%)	
Front line nurse	109 (73%)	152 (82%)	221 (92%)	482 (84%)	
Nurse educator	6 (4.0%)	2 (1.1%)	1 (0.4%)	9 (1.6%)	
Other	19 (13%)		1 (0.4%)	20 (3.5%)	
Missing	4	2	2	8	
Education level					<0.0001
Bachelors degree	61 (41%)	109 (58%)	186 (78%)	356 (62%)	
Diploma	15 (10%)	14 (7.5%)	30 (13%)	59 (10%)	
Post-graduate degree	42 (28%)	28 (15%)	24 (10%)	94 (16%)	
Other	31 (21%)	36 (19%)		67 (12%)	
Missing	4	1	1	6	
Number dying patients cared for in last 6 months					<0.0001
None	23 (16%)	74 (39%)	30 (13%)	127 (22%)	
1-5	68 (46%)	57 (30%)	140 (58%)	265 (46%)	
6-10	30 (20%)	31 (16%)	38 (16%)	99 (17%)	
11-20	15 (10%)	12 (6.4%)	23 (9.6%)	50 (8.7%)	
21-30	3 (2.0%)	1 (0.5%)	4 (1.7%)	8 (1.4%)	
More than 30	9 (6.1%)	13 (6.9%)	5 (2.1%)	27 (4.7%)	
Missing	5	0	1	6	

¹ Chi square tests used for comparisons of frequencies and percentages; T-test and Kruskal-Wallis tests used for comparison of continuous variables.

Table 2: The proportion of nurses who ‘strongly agree’ required for optimal end-of-life care in hospitals, by location and overall (NB: top ten for each location and whole sample in bold)

Indicator or number	Domain	Indicator of optimal care	Australia (n=153)		Hong Kong (n=188)		South Korea (n=241)		Total (N=582)	
			%	Rank	%	Rank	%	Rank	%	Rank
1	Patient	Physical symptoms (e.g. pain, dyspnoea, fatigue) managed well	79.6%	1	38.8%	1	14.1%	11	39.2%	1
2	Patient	Participated in decision-making in line with preference and capacity	74.3%	8	25%	12	13.7%	12	33.2%	9
3	Patient	Realistic ‘goals of care’ and treatment plans discussed with patient/family as early as possible in admission	78.8%	2	28.7%	7	5.8%	29	32.2%	12
4	Patient	Participated in advance care planning	73.7%	10	28.7%	7	12%	18	33.6%	8
5	Patient	24 hour a day, 7 day a week access to specialist palliative care	57.6%	24	8.5%	29	10.8%	25	22.2%	29
6	Patient	Honest information communicated sensitively with appropriate people present (e.g. <i>family, senior doctor, nurse</i>)	75.7%	6	23.4%	17	8.7%	26	31%	15
7	Patient	Emotional concerns identified and managed well (<i>e.g. depression, anger, anxiety</i>)	74.3%	8	30.9%	3	12%	18	34.4%	6
8	Patient	Spiritual and/or religious concerns identified and managed well	66.9%	18	25%	12	11.6%	21	30.3%	17
9	Patient	Practical concerns (e.g. <i>legal issues, financial benefits</i>) identified and managed well	59.2%	23	23.9%	15	7.9%	27	26.5%	23
10	Patient	Alternatives to hospital-based care discussed, as preferred by the patient (<i>e.g. home, hospice, RACF</i>)	72.4%	11	26.1%	10	11.6%	21	32.2%	13
11	Patient	Access to allied health care providers as needed (<i>e.g. social worker, psychologist, pastoral care</i>)	71.1%	12	25%	12	14.5%	10	32.7%	10
12	Patient	Multiple discussions with care team about end-of-life options to allow them to consider information before deciding	67.5%	16	22.3%	18	12.9%	15	30.2%	18
13	Family	Participate in decision-making in line with preference and capacity	56.6%	25	21.8%	19	12.5%	16	27.1%	22
14	Family	Know and follow patient’s end-of-life wishes when making decisions on patient’s behalf	77%	5	30.9%	3	13.4%	13	35.8%	5
15	Family	Have conflict or disagreements about care identified and managed well	55.3%	26	17.6%	28	14.6%	7	26.3%	25
16	Family	Receive information about how to access bereavement support	62.5%	20	23.9%	15	7.5%	28	27.2%	21
17	Family	Be supported to include cultural/religious practices if their wish (<i>e.g. traditional medicine, foods, ceremonies, healing</i>)	64.5%	19	19.1%	24	13%	14	28.5%	20

Indicator number	Domain	Indicator of optimal care	Australia (n=153)		Hong Kong (n=188)		South Korea (n=241)		Total (N=582)	
			%	Rank	%	Rank	%	Rank	%	Rank
18	Family	Spend as much time with the patient as they wish, including immediately after death	78.3%	3	25.5%	11	18.4%	3	36.4%	3
19	Healthcare team	Reach consensus about prognosis, goals of care and treatment options before discussing these with the patient/family	55.3%	26	21.3%	20	10.8%	23	25.9%	26
20	Healthcare team	Have clearly defined roles and responsibilities in end-of-life care for different team member	52%	28	18.6%	25	14.6%	8	25.7%	27
21	Healthcare team	Designate a primary contact for each patient, who can be contacted by the family with questions or concerns	50.7%	29	20.2%	22	10.8%	23	24.3%	28
22	Healthcare team	Be able to voice concerns or different views to other members of team and act on patient preference	59.9%	22	18.1%	26	11.7%	20	26.4%	24
23	Healthcare team	Information about patient preferences, GOC, limitations of treatment for admission available to all team members	67.1%	17	21.3%	20	15.4%	6	30.9%	16
24	Healthcare team	Have adequate education and training in end-of-life care and communication skills	70.4%	13	29.3%	6	14.6%	8	34%	7
25	Healthcare team	Have time to discuss care options and deliver care in line with patient preferences	69.1%	14	26.6%	9	12.5%	16	31.9%	14
26	System	End-of-life care documents (<i>e.g. advance directives, DNR orders</i>) stored in a place easily accessed by care teams	75.5%	7	31.4%	2	15.8%	5	36.4%	4
27	System	Private rooms and/or unlimited visiting hours for families of dying patients	77.3%	4	30.3%	5	20.7%	1	38.5%	2
28	System	Clear processes for resolving disputes between care teams about end-of-life care and decision-making situations	62.3%	21	18.1%	26	18.3%	4	29.7%	19
29	System	Appropriate staffing levels that include a mix of senior and junior doctors and nurses	68.2%	15	20.2%	22	19.5%	2	32.4%	11

Table 3: Odds ratios with 95% CIs of multivariable LCA regression for 4 class latent model.

Latent Class (Class 1 reference category)				
Variable	Category	Class 2	Class 3	Class 4
Location	Hong Kong	3.64 (1.36 to 9.75)	2.14 (0.47 to 9.87)	7.06 (0.03 to 1897.57)
	South Korea	7.78 (2.92 to 20.71)	25.76 (5.43 to 122.13)	73.68 (0.29 to 18646.20)
Age		0.99 (0.94 to 1.05)	0.99 (0.93 to 1.06)	0.88 (0.63 to 1.25)
Gender	Male	0.57 (0.19 to 1.70)	0.42 (0.07 to 2.38)	1.60 (0.14 to 18.48)
Nursing role	Other	1.18 (0.50 to 2.77)	0.86 (0.26 to 2.79)	1.17 (0.10 to 13.56)
Nursing years	Years	0.97 (0.92 to 1.03)	0.99 (0.93 to 1.04)	1.08 (0.77 to 1.52)
Education	Other	0.94 (0.50 to 1.79)	0.72 (0.30 to 1.69)	1.28 (0.19 to 8.64)
Number dying patients	1-5	0.74 (0.34 to 1.63)	0.89 (0.33 to 2.35)	2.14 (0.14 to 33.99)
	>5	0.54 (0.24 to 1.21)	0.78 (0.28 to 2.18)	1.92 (0.15 to 25.20)

Table 4: Number and proportions in estimated latent classes from the multivariable model

Latent Classes N (%)						
Variable	Category	Class 1	Class 2	Class 3	Class 4	Total
Location	Australia	114 (0.46)	14 (0.11)	6 (0.06)	1 (0.02)	135 (0.26)
	Hong Kong	91 (0.37)	51 (0.39)	11 (0.11)	6 (0.14)	159 (0.30)
	South Korea	44 (0.18)	65 (0.50)	87 (0.84)	35 (0.83)	231 (0.44)
Gender	Female	220 (0.88)	120 (0.92)	101 (0.97)	36 (0.86)	477 (0.91)
	Male	29 (0.12)	10 (0.08)	3 (0.03)	6 (0.14)	48 (0.09)
Nursing role	Frontline	202 (0.81)	113 (0.87)	96 (0.92)	38 (0.90)	449 (0.86)
	Other	47 (0.19)	17 (0.13)	8 (0.08)	4 (0.10)	76 (0.14)
Education	Bachelors	132 (0.53)	86 (0.66)	80 (0.77)	30 (0.71)	328 (0.62)
	Other	117 (0.47)	44 (0.34)	24 (0.23)	12 (0.29)	197 (0.38)
Number dying patients	None	54 (0.22)	35 (0.27)	17 (0.16)	3 (0.07)	109 (0.21)
	1-5	102 (0.41)	63 (0.48)	56 (0.54)	24 (0.57)	245 (0.47)
	>5	93 (0.37)	32 (0.25)	31 (0.30)	15 (0.36)	171 (0.33)