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Abstract

Aim

To explore the quantitative and qualitative literature on the impact of nurse-led post-discharge telephone follow-up (TFU) call interventions on patient outcomes.

Background

Adverse patient outcomes such as post-discharge problems, premature contact with health systems, inability to self-manage conditions, and hospital readmissions all have a financial impact on health care systems as well as the health and well-being, and satisfaction of patients.

Design

A mixed-study systematic review.

Review Methods

A systematic search of CINAHL, Ebsco, PubMed, Quest and Cinch-Health databases was undertaken using the key terms “nurs*”, “nurse-led”, “nurse initiated”, “discharge”, “hospital”, “telephone”, “follow-up”, and “telephone follow-up” to identify relevant original peer-reviewed studies published between 2010 and 2016. Ten articles were selected for inclusion. The selected papers were critically appraised. A sequential explanatory approach with a convergent synthesis was used to report findings following PRISMA guidelines.

Results

The findings demonstrate that nurse-led TFU interventions have the potential to improve patient outcomes. The studies suggest patient satisfaction with TFU is one of the strongest positive outcomes from the interventions. However, the results do not support improvement in patient readmission or mortality.

Conclusions

Of the 10 studies reviewed, only two were methodologically strong limiting the conclusions that can be drawn from the current research on this topic. Telephone follow-up interventions improve patient satisfaction, and have the potential to meet patient information and communication needs, improve self-management and follow-up appointment attendance and reduce post-discharge problems. Further research is required to explore patients' perceptions of the most useful content of TFU calls, the efficacy of TFU calls, and nurses' perceptions and experiences of conducting TFU interventions.

Relevance to clinical practice

When conducted by a nurse, these interventions have the potential to enhance post-discharge care to patients and meet care needs. Patients perceive TFU as acceptable and are satisfied with this form of post-discharge care.

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

- Adverse patient outcomes post-discharge have an impact on the health and well-being, and satisfaction of patients as well as a financial impact on health care systems.

- This review adds clarity and strengthens the evidence base for the use of TFU to improve patient transitions from hospital to home and provide ongoing support and high- quality care.
- New understandings of the components of TFU that patients value can assist nurse managers to develop appropriate TFU scripts and checklists to ensure patients' care needs are met.
- This review identifies that the provision of psychosocial care may increase the effectiveness of TFU and should be considered when developing such interventions.

Systematic review registration number: CRD42017083694

Keywords: Follow-up calls, systematic review, patient discharge, patient readmission, patient satisfaction, telephone calls.

Introduction

Patients are being discharged from hospital earlier and with more acute conditions requiring post-discharge care instructions to become increasingly complex (Dudas, Bookwalter, Kerr & Pantilat, 2002). The transition from hospital to home can be an anxious and stressful time for patients and carers (Lalor et al., 2015) and studies have shown that a substantial proportion of hospital patients do not understand their post-discharge care plan (Horwitz et al., 2013; Makaryus & Friedman, 2005; O'Leary et al., 2010). One intervention that has the potential to enhance the transition from hospital to home and improve patient outcomes is the use of post-discharge telephone follow-up (TFU) calls.

TFU is perceived as a positive intervention conducted by a variety of hospital-based personnel to exchange information, provide aftercare advice, to manage symptoms, to aid early recognition of complications, and as a means of providing reassurance and easing the transition from hospital to home (Mistiaen & Poot, 2006). TFU is also advocated as a cost-effective measure to improve patient health outcomes, increase patient satisfaction, and reduce unplanned readmissions (Gonçalves-Bradley et al., 2017; Hamar et al., 2017).

A variety of objectives for conducting TFU and endpoints of TFU calls have been reported including: improving quality and continuity of care, enhancing patient safety, reducing adverse events, clarifying patient understanding of discharge care instructions, seeking patient feedback about their experience of care, and addressing any concerns about their experience or their recovery (Schuller, Lin, Gamm & Edwardson, 2015).

Several reviews have examined the outcomes of TFU interventions. A Cochrane review examined 33 studies of 5110 medical and surgical patients to evaluate the effectiveness of TFU by a hospital-based health professional (nurses, doctors, pharmacists) on psychosocial and physical health outcomes, including activities of daily living, self-care abilities, self-efficacy and independence. The review found inconclusive evidence of the effects of TFU (Mistiaen & Poot, 2006). Almost all the studies were reported to be of low methodological quality, and overall there were no differences found between TFU and control groups. In most studies, TFU was conducted by a nurse, however in 11 studies TFU was provided by other hospital-based health professionals.

Cusack and Taylor (2010) reported the results of a literature review of mainly nurse-led TFU calls to determine the potential use of TFU as an alternative to face-to-face clinical follow up appointments. The review included 11 studies of adult patients with cancer discharged from the hospital. Cusack and Taylor were primarily interested in whether TFU met cancer patient needs, the methods used for TFU, and the consequences of TFU. The results of the review were mainly positive and Cusack and Taylor concluded that TFU is a safe, cost effective and acceptable intervention for this population. TFU was found to be equally effective with face-to-face appointments, and few differences were found between the two methods of post-discharge care. Follow-up by a consistent person that was known to the patient prior to discharge, access to a health professional for any queries between planned appointments, and remaining in the comfort and convenience of their own home were regarded as positive aspects of TFU. However, different sample sizes and patient characteristics resulted in difficulty determining an ideal structure for a telephone clinic and the review lacked clear information about the ideal time for commencement, frequency and duration of TFU.

Hanson and colleagues focused on interventions, including TFU calls, to reduce 30-day readmissions in 33 studies of surgical and medical patients (Hanson, Young, Hinami, Leung & Williams, 2011). They found no consistent evidence of a singular intervention reducing readmission rates. Many of the studies were of low methodological quality and it is not clear how many of the studies used nurse-led TFU interventions.

In their systematic review, Bahr, Solverson, Schlidt, Hack, Smith and Ryan (2014) described TFU interventions designed to ease patients' transition from hospital to home and improve patient outcomes (readmission, emergency department use and patient satisfaction). The review included studies ($n = 19$) of medical-surgical patients discharged from at least a 24

hour stay in hospital who received a TFU call from a nurse, pharmacist, other hospital staff or research team member, as a singular intervention, within 30 days of discharge. Outcomes focused on three areas: Patient outcomes – satisfaction, medication, follow-up appointment attendance, self-care knowledge, and physical and psychosocial wellbeing; Health care provider outcomes: beneficial feedback to healthcare staff; and System outcomes – readmission rates, emergency department use, unscheduled service use, adverse events and cost. Bahr et al. (2014) reported the evidence to be inconclusive because there were negative and positive findings for most assessed outcomes, and the effects of TFU were inconsistent across studies. Patient satisfaction improved in two of six studies, medication compliance improved in one of three studies, higher rates of scheduled appointment attendance was reported in the two studies that measured this outcome, but this was likely due to a reminder included in the TFU call. The one study that measured self-care knowledge found no difference between groups, and only one of three studies reported an improvement in patient physical or psychosocial wellbeing. No change was found in hospital readmission rates in any of the reviewed studies ($n = 7$), a decrease in emergency department visits was reported in one of four studies, and an increase in unscheduled service use was reported in two of four studies. Patient satisfaction with Pharmacist-led TFU calls that focused only on medication had more positive outcomes than studies in which medication was one of many areas of concern. However, the range of different study types and purposes, and the wide variation in the structure of the phone calls were limitations in drawing conclusions. Additionally, no consideration was given to patients that may be at higher risk of readmission, and methodological quality of the studies was low.

Crocker and colleagues reviewed three randomized controlled trials of nurse-led TFU to general medical patients ($n = 1,765$) and concluded that TFU alone is not effective in reducing readmissions (Crocker, Crocker & Greenwald, 2012). Although Crocker and colleagues analysed risk of bias in study design, the rating of the studies was not reported. Stolic, Mitchell and Wollin's (2010) review of 24 studies of nurse-led TFU of patients ($n = 8,330$) with cardiac disease had both positive and mixed results. Studies with stronger designs and greater methodological rigour ($n = 7$) reported positive effects for all outcomes measured (readmission rates and mortality ($n = 1$), rehabilitation program attendance ($n = 1$), risk factor behaviour ($n = 4$) and quality of life ($n = 1$)). Eight studies reported mixed results with some positive findings (risk factors ($n = 2$), quality of life ($n = 1$), psychological status ($n = 4$), self-efficacy ($n = 2$) and resource use ($n = 2$)) and no differences detected (quality of life ($n = 2$), psychological status ($n = 3$), smoking self-efficacy ($n = 1$), health care use ($n = 1$), and patient satisfaction ($n = 2$)). Nine studies of low methodological quality reported no significant differences in any outcomes measured (risk factors ($n = 2$), rehabilitation program attendance ($n = 1$), quality of life ($n = 4$), psychological status ($n = 2$), complications or resources use ($n = 4$), and patient satisfaction ($n = 2$)).

In summary there is considerable research addressing post-discharge follow-up telephone calls but given that these studies have not conclusively or consistently demonstrated the benefits of TFU calls, and the methodological quality of the majority of studies was low, it was considered timely to review the most recent evidence of nurse-led telephone follow-up call interventions to improve patient outcomes and satisfaction. It is possible that researchers have learned from the limitations of previous studies and thus more recent research efforts may include better designed studies allowing a more definitive conclusion regarding the effect of TFU on patient outcomes.

Aims and Methods

Aims

The aim of this mixed studies review was to establish the most recent evidence about the efficacy and acceptance of nurse-led post-discharge telephone follow-up call interventions.

A secondary aim was to identify patient outcomes being measured and achieved, to better inform clinical practice in the management of discharged patients, and to make suggestions for further research.

The research questions were:

1. What are patients' perceptions and experiences of nurse-led TFU calls?
2. What effect does nurse-led TFU calls have on patient outcomes?

The specific objectives were to 1) examine the characteristics of studies that have evaluated the outcomes of nurse-led TFU calls, 2) to ascertain the study design quality of such studies, and 3) to review the reported acceptance and efficacy of this intervention. This mixed study review intends to develop an aggregated synthesis of qualitative and quantitative evidence in order to draw conclusions and recommendations useful for practice and policy decision making. This study updates the most recent literature review on TFU calls post-discharge made by hospital-based personnel that were not a component of a larger intervention (Bahr et al., 2014). However, this review examines contemporary literature focusing only on telephone follow-up calls made by nursing personnel. The focus solely on nurse-led TFU calls is based on previous reviews of the literature that indicate that the purpose and content of TFU calls made by a pharmacist or a doctor is different compared with nurse-led TFU calls.

Design

A systematic review of primary research was conducted. Systematic literature reviews are frequently used in health research to identify knowledge gaps and to guide best practice (Moher et al., 2015; Shamseer et al., 2015). They are considered to be of a high standard for synthesising health care evidence due to their methodological rigor (Moher et al., 2015). The approach was based on the systematic review methods recommended by the Joanna Briggs Institute Reviewer's Manual (2014) methodology for mixed methods systematic reviews to systematically distil and integrate data from different sources in order to draw reliable conclusions about a given topic. A sequential explanatory approach with a convergent synthesis was used as a means of integrating quantitative and qualitative evidence (Joanna Briggs Institute Reviewers Manual, 2014). In-depth parallel syntheses of the quantitative and qualitative data were undertaken, then results were aggregated into a final combined narrative synthesis (Joanna Briggs Institute Reviewers Manual, 2014; Pluye & Hong, 2014).

Prior to conducting the literature search, the research team collaborated to develop a research protocol in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses Protocols (PRISMA-P) guidelines for systematic literature reviews (Moher et al., 2015). The literature review protocol has been registered in PROSPERO (CRD42017083694). Given that the most recent TFU review examined literature dated up until 2009, the aim of the review was to identify the strengths and limitations in the most recent evidence of the application and outcomes of nurse-led TFU calls, from 2010 onwards, in order to inform future interventions.

During the initial literature search, the researchers noted considerable inconsistency in the definition of nurse-led TFU calls. For the purpose of this review, a working definition and inclusion/exclusion criteria were developed. Post-discharge TFU calls were defined as a call made by a nurse, including a registered nurse, clinical nurse consultant, or specialist nurse, to an adult inpatient discharged from a minimum overnight stay in hospital, within 7 days of discharge, for the purpose of improving the transition from hospital to home, or improving compliance with medication and follow-up appointments, or addressing any problems or new symptoms, or reducing readmissions, or improving patient satisfaction. The telephone call must have included some, but not necessarily all, of the following elements: assess the wellbeing of patients, clarify the patients' understanding of discharge care instructions, clarify that the patient has filled medication prescriptions, has made any follow up appointments recommended, and address any immediate concerns regarding the patient experience or their concerns about new symptoms that may indicate a problem in their recovery.

Inclusion and exclusion criteria

Studies were considered for inclusion if they met the following criteria: English language qualitative and quantitative studies published in a peer-reviewed journal, adult patients who were admitted and stayed at least overnight in hospital, a telephone call made by a nurse within 7-days post-discharge, studies in which either the TFU was the only intervention, or its effect could be analysed separately. Exclusion criteria included patients admitted to the emergency department, patients having same day procedures, and TFU calls made outside of the 7-day period.

Search Procedure

A systematic electronic literature search (CINAHL, Ebsco, PubMed, Quest and Cinch-Health) was conducted in collaboration with a university librarian. Search terms included combinations of “nurs*”, “nurse-led”, “nurse initiated”, “discharge”, “hospital”, “telephone”, “follow-up”, “telephone follow-up”, NOT survey, and NOT pharmacy. In addition to electronic database searches, searches using Google Scholar and scanning of citations were utilised to locate additional articles.

Article abstracts were reviewed to determine relevance and if necessary, full text articles were retrieved for closer examination of the inclusion and exclusion criteria. Two authors independently reviewed the initially selected full-text articles against the inclusion/exclusion criteria, and any discrepancies were discussed until a consensus decision was reached.

Quality appraisal

Each of the selected studies were reviewed for research rigour and quality, and risk of bias, using the Effective Public Health Practice Project [EPHPP] (2009) quality assessment tool for quantitative studies and the Critical Appraisal Skills Programme [CASP] (2013) checklist for qualitative studies. Two reviewers independently appraised the studies, the results were discussed, and a consensus decision reached about the quality and rigour of each study.

Data abstraction and synthesis

A standardised data extraction tool was developed to record information about the selected studies. Numerical data were extracted from quantitative studies to establish evidence of the outcomes of nurse-led TFU calls, and textual data were extracted from qualitative studies to

identify the impact on patient outcomes of nurse-led TFU calls. Then all data were synthesised in evidence tables (Table 1 and 2). The extracted data included detailed information about the populations, methods used, interventions, and outcomes of significance to the review question and objectives.

Each parallel synthesis included study outcomes, quality appraisal, and risk of bias. Summaries of the evidence were presented as separate syntheses. The quantitative and qualitative syntheses were then integrated. First, the quantitative findings were converted into textual descriptions. These converted findings were assembled alongside the synthesised findings generated from the qualitative analysis. The textual descriptions and synthesised findings were then pooled to generate a mixed study synthesis that represents the aggregation of themes and the development of conclusions. Meta-analysis was not feasible for this review due to the heterogeneity of study designs, methods, populations, TFU interventions and outcomes measured. The Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) checklist was used to report findings (Supplementary File 1).

Results

The literature search and review were conducted in October-November, 2017. Initially, 719 articles were retrieved from the search. After duplicates were removed and initial screening, 44 full-text articles were independently reviewed by two authors (Figure 1). There were 34 articles excluded based on the inclusion and exclusion criteria. Ten articles met the inclusion criteria which focused on nurse-led TFU calls within 7-days of discharge from hospital and were included in this review. A final literature search was conducted in November 2018 for studies published in 2017/18, and 19 articles were screened against the inclusion/exclusion criteria, but no further articles were included.

Sample sites

Of the 10 studies, nine were single site studies, and one study utilised seven sites (Zhang et al., 2013). Four studies were conducted in the USA (Gaines-Dillard, 2015; Hannan, 2012; Miller & Schaper, 2015; Tang, Fujimoto & Karliner, 2014), three were conducted in China (Li, Gan, Zhang, Wang, Zhang, & Qi, 2014; Zhang, Wong, You & Zheng, 2012; Zhang et al., 2013), two were conducted in Denmark (Lavesen, Ladelund, Frederiksen, Lindhardt & Overgaard, 2016; Szöts Konradsen, Solgaard, Bogø & Østergaard, 2015) and one was conducted in Italy (Clari, Frigerio, Ricceri, Pici, Alvaro & Dimonte, 2015).

Sample sizes

A total of 3693 participants were included in this review. Three studies had less than 100 participants (Gaines-Dillard, 2015; Szöts et al., 2015; Zhang et al., 2012), five studies had between 100 and 500 participants (Clari et al., 2015; Hannan, 2012; Lavesen et al., 2016; Li et al., 2014; Zhang et al., 2013), and two studies had 790 and 1806 participants (Tang et al., 2014; Miller et al., 2015 [respectively]).

Four quantitative studies reported power calculations. Two studies that reported using power calculations to estimate the required sample size indicated sufficient sample sizes were attained (Hannan, 2012; Zhang et al., 2013). The other two studies that reported using power analysis indicated the required sample size was attained but not retained due to participants not receiving the intervention (unable to contact), dropping out or lost to follow-up (Clari et al., 2015; Lavesen et al., 2016). Four quantitative studies did not report conducting a power analysis (Gaines-Dillard, 2015; Li et al., 2014; Miller & Schaper, 2015; Tang et al., 2014), although Gaines-Dillard (2015) indicated that her study was likely underpowered to detect

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differences. One of the two qualitative studies reported an adequate sample size due to reaching data saturation (Zhang et al., 2012) while the other did not report on sample size (Szöts et al., 2015).

Research design

Eight studies used a quantitative design and two used a qualitative approach. Sampling bias in convenience samples is likely to occur due to the sample not being representative of the general population. Nine of the 10 studies used convenience sampling. Only one study (qualitative) selected a random sample from a larger convenience sample (Zhang et al., 2012). Four studies used a two-group randomised controlled trial post-test design (Clari et al., 2015; Hannan, 2012; Lavesen et al., 2016; Zhang et al., 2013). Three studies used a two-group case-control post-test design (Gaines-Dillard, 2015; Li et al., 2014; Miller & Schaper, 2015), and one study used a three-group case-control post-test design (Tang et al., 2014). Two studies used a qualitative design (Szöts et al., 2015; Zhang et al., 2012). Szöts et al. analysed case reports from telephone follow-up consultations ($n = 104$) and individual interviews ($n = 10$), while Zhang et al. analysed the content of 25 audio-recorded TFU calls made to 12 patients.

Study quality and rigor

Quality appraisal results are presented in Tables 3 and 4. Of the four randomised controlled trials, two were assessed as methodologically strong (Clari et al., 2015; Zhang et al., 2013), one as moderate due to selection bias and a lack of information about blinding (Hannan, 2012), and one as weak due to a lack of information about blinding and use of a data collection tool that had not been psychometrically tested for reliability and validity (Lavesend

et al., 2016). The four case-control studies were assessed as methodologically weak due to not controlling for confounders, three used data collection tools that were not assessed for validity and reliability (Li et al., 2014; Miller & Schaper, 2015; Tang et al., 2014), and one did not report withdrawals and drop-outs (Gaines-Dillard, 2015).

The two qualitative studies were assessed as being of moderate quality due to a lack of information about the relationship between the researcher and participants (Szöts et al., 2015; Zhang et al., 2011) and limited information about consideration of ethical issues (Szöts et al., 2015).

The quality of the studies is reported alongside study outcomes to allow the results of trials and other studies to be compared and contrasted as appropriate.

Characteristics of the samples

The selected studies included participants from the following areas: surgical (Clari et al., 2015; Li et al., 2014; Szöts et al., 2015; Zhang et al., 2012, 2013), medical/surgical (Miller et al., 2015; Tang et al., 2014), accident trauma (Gaines-Dillard, 2015), maternity (Hannan, 2012), and pulmonary and infectious diseases (Lavesen et al., 2016).

Characteristics of TFU calls

Calls were made either by registered nurses, senior nursing staff or nurse specialists including: registered nurses (Gaines-Dillard, 2015; Szöts et al., 2015), primary health care practice nurses (Tang et al., 2014), senior orthopaedic nurses (Clari et al., 2015; Li et al., 2014), advanced practice nurses (Hannan, 2012), respiratory nurses (Lavesen et al., 2016),

associate chief nurses and supervisor nurses (Li et al., 2014), clinical nurse leaders (Miller et al., 2015), and enterostomal nurses (Zhang et al., 2012, 2013).

Initial calls were made between 24 hours and 7 days post-discharge (days 1-3, $n = 2$; days 1-4, $n = 1$; day 2, $n = 1$; day 3, $n = 1$; day 4, $n = 1$; days 3-7, $n = 4$).

Structure and content of TFU calls

Six of the ten studies (Clari et al., 2015; Lavesen et al., 2016; Li et al., 2014; Miller et al., 2015; Szöts et al., 2015; Zhang et al., 2012) reported length of the telephone follow-up calls, which ranged from a mean of five minutes (Clari et al., 2015) to 20-30 minutes (Li et al., 2014). It is noteworthy that only one study reported nurses' preparation time (mean = 6 minutes) prior to making the telephone call and documentation time (mean = 12 minutes) after the telephone call (Lavesen et al., 2016). Nine of the ten studies used some type of guide for the TFU calls. It is unclear whether nurses in Li et al.'s (2014) study used a guide and did not mention it, or no guide was used. Guides ranged from a checklist (Szöts et al., 2015), to scripted questions (Gaines-Dillard, 2015; Tang et al., 2014), structured questionnaires (Miller et al., 2015; Zhang et al., 2013) and manuals or protocols (Clari et al., 2015; Hannan, 2012; Lavesen et al., 2016; Zhang et al., 2012). TFU calls consisted of questions to assess the patient's health, nutrition, mobility, pain, symptoms, self-care ability, activities of daily life, homecare, medication and follow-up appointments. Nurses also provided education, knowledge, emotional support and were available to answer patients' questions or address their concerns. In addition, they facilitated appointments and referrals.

Quantitative outcomes of TFU calls

Patient satisfaction

Patient satisfaction was evaluated in four quantitative studies, including two high quality and two weak quality, and all reported a positive outcome for this measure. Two high quality studies (Clari et al., 2015; Zhang et al., 2013) found that patients who received a TFU call post-discharge were more satisfied than patients who did not. Lavesen et al. (2016) reported 93% of patients agreed that awareness of the TFU gave them a sense of security at discharge, however a comparison of satisfaction between intervention and control groups was not reported. Gaines-Dillard (2015) reported patient satisfaction increased by 10% compared with historical controls.

Readmission and contact with health system

Hospital readmissions were evaluated in six of the 10 studies, with only one low quality study reporting a positive outcome. Miller et al. (2015) found a significant reduction in 0 to 7-day readmissions in the intervention group but no difference in 30-day readmission rates. Four studies (Clari et al., 2015; Hannan, 2012; Lavesen et al., 2016; Tang et al., 2014), one high quality, one moderate and two low, found no difference in readmission rates between patients who received a TFU call and those who did not. Gaines-Dillard (2015) descriptively reported a combined return rate to the ED and 30-day readmission rates with little difference observed between TFU patients (11.2%) and historical controls (13.8%).

Post-discharge problems

Two high quality quantitative studies evaluated post-discharge problems and reported a positive outcome for this measure (Clari et al., 2015; Zhang et al., 2013). A significant reduction was found in reported problems of patients who received a post-discharge TFU call compared to those who did not.

Follow-up appointment attendance

One low quality study examined follow-up appointment attendance and reported a positive outcome for this measure (Tang et al., 2014). Patients who received a TFU call or scripted telephone message had a significantly higher attendance rate compared with those who did not receive a TFU call.

Self-management

Four studies evaluated self-management after discharge, and all reported a positive outcome for this measure. One high quality study (Zhang et al., 2013) reported significantly higher perceptions of self-management in patients who received TFU compared with those who did not at 3-months post-discharge, but not at baseline or 1-month post-discharge. One low quality study (Lavesen et al., 2016) found TFU patients had significantly higher perceptions of self-management at 30 days post-discharge compared with patients who did not receive a TFU call. One low quality study (Li et al., 2014) reported that patients' compliance with discharge instructions was significantly better at three- and six-months post-discharge in the TFU group compared with patients who did not receive TFU. Gaines-Dillard's (2015) low quality study reported patients found TFU helpful in terms of being able to ask questions about medication, convalescence, injuries and wound care management.

Communication

Two low quality studies evaluated communication with healthcare professionals and reported positive outcomes. One study (Lavesen et al., 2016) found patients who received the TFU intervention perceived a significantly greater ability to communicate with health professionals compared with patients who did not. One study (Gaines-Dillard, 2015) reported patient communication with nurses improved by 10% in the TFU group compared with historical controls.

Other outcomes

Three of the four other measures showed a positive outcome. Hannan's (2012) moderate quality study examined maternal perceptions of health and perceived stress. There was no difference in perceived stress between the two groups at one-month post-discharge, but patients who received the TFU intervention had significantly lower perceived stress at two-months post-discharge compared with those who did not receive TFU. There were no differences in maternal perceptions of health at day three post-discharge, however, patients who received TFU reported significantly greater perceptions of health at one and two months post-discharge compared with the control group.

Li et al.'s (2014) low quality study evaluated the Harris Hip Score (measurement of hip joint function) at discharge, and three- and six-months post-discharge. There was no difference between groups at discharge, however intervention patients had significantly higher scores at three and six-months.

Lavesen et al.'s (2016) low quality study compared mortality at 30-days and 84-days post-discharge between the TFU group and the control group. There was a trend towards lower mortality rates in the intervention group at day 30 (1.9%) compared with the control group (3.4%), and at day 84 in the TFU group (5.6%) compared with those who did not receive TFU (12.5%), but it did not reach statistical significance.

Zhang et al.'s (2013) high quality study measured ostomy adjustment between those who received TFU and those who did not. There was no difference at baseline but there was a significantly greater adjustment in the intervention group at three months compared with the control group.

Although not discussed or compared, Tang et al. (2014) reported that 3% (11/371) of problems uncovered during TFU calls related to psychosocial needs.

Qualitative outcomes of TFU calls

Patient satisfaction

Szöts et al. (2015) reported that knee arthroplasty patients perceived TFU as supportive and appreciated the provision of information and counselling about problems and concerns in the early recovery period. Patients were reassured that their recovery was consistent with the normal course of recovery which relieved the psychological burden of uncertainty. Patients also reported feeling a sense of security from knowing they would be contacted by a health professional in the near future and perceived that the hospital was interested in their health and recovery. TFU was valued as an opportunity to share any concerns with a health

professional who was willing to listen and take their problems and worries seriously. TFU was also reported to relieve loneliness and a sense of isolation while their mobility was restricted.

Zhang et al. (2012) found that TFU calls satisfied patients' need for information about stoma pouch care. Around 17% of the content of TFU calls focused on the physical aspects of stoma pouch care, while less than 4% focused on psychosocial adaptation. Zhang et al. note that it is unclear whether patients were reluctant to talk about psychosocial concerns which may be attributable to Chinese culture, or whether nurses may have focused on physical aspects and neglected psychosocial concerns. Patients found access to the enterostomal nurse useful in supporting their care and proactive in meeting their needs.

Post-discharge problems

Zhang et al. (2012) reported that colostomy patients were able to discuss stoma-related problems with the nurse conducting the TFU call and the nurse provided information, education, support and referral to the surgeon if necessary. The nurse was also able to provide information and support in areas of resuming daily living such as bathing, diet, sitting, sleeping, getting dressed and driving, and the areas of chemotherapy, pain and medical fees if needed.

Self-management

Zhang et al. (2012) found that TFU provided patient education about stoma self-care and resuming normal living, encouraged patients to be independent and discouraged caregiver-dependent behaviours. Nurses were able to reinforce patient confidence and appropriate self-care behaviours.

Synthesis of quantitative and qualitative findings

The outcomes identified in both the quantitative and qualitative sub-reviews were placed side-by-side in a table and a statement of the synthesised findings was developed (see Supplementary File 2). These statements were then expanded to provide context and detailed descriptions of the combined results. Two main themes emerged; *Transition from hospital to home* and *Staying well*.

Transition from hospital to home

Post-discharge can be a time of adjustment and transition, and a time when patients feel most vulnerable. Easing this transition, contact with nursing staff left patients feeling more satisfied with the care they received and a greater sense of security at discharge. The sense of security influenced patients' perceptions that the hospital extended care and concern for their wellbeing even after discharge. Patients valued the provision of information, education and counselling through TFU to assist them with their recovery. During phone calls, patients were able to discuss any concerns they had which relieved feelings of anxiety and isolation during recovery.

Staying well

TFU gave nurses the opportunity to provide patient education and encouragement to be independent, and to reinforce patient confidence that they could undertake self-care. Through this ongoing contact, patients were able to access information, education and support when needed, particularly in areas of pain, ongoing treatment, regaining mobility and resuming daily living activities. Most post-discharge problems were effectively managed and resolved during phone calls, while the need for clinical follow-up was identified and arranged in a timely manner.

Patients perceived they were better able to self-manage their care, comply with discharge instructions and to get the information they needed about medication, convalescence, injuries and wound care management. Patients who were able to communicate with nurses had lower stress, higher perceptions of health, and greater adjustment and function, particularly in the months following discharge.

Discussion

A systematic review of the literature was undertaken to establish the most recent evidence about the efficacy and acceptance of nurse-led post-discharge telephone follow-up call interventions. Of the 10 studies reviewed, only two were methodologically strong, indicating that the state of the science has not improved significantly since the last review (Bahr et al., 2014). This limits the conclusions that can be drawn from the synthesis of the findings from the included studies.

The results indicate that nurse-led telephone follow-up calls may be an effective intervention in terms of patient satisfaction, reducing post-discharge problems, enhancing self-management, increasing follow-up appointment attendance, and improving perceptions of communication with healthcare providers. Although the following measures were evaluated in only one study each, positive results were reported in maternal perceptions of health and stress, hip joint function, and ostomy adjustment. However, there was no difference in readmission rates and mortality rates between intervention and control groups in the selected studies. Overall, this review has highlighted that TFU calls have the potential to be an effective intervention in most domains of patient outcomes. This potential for positive outcomes reflect those of Cusack and Taylor (2010) and Stolic, Mitchell and Wollin's (2010) methodologically strong studies. However, given the methodological limitations of the reviewed studies, there is insufficient evidence to reach a conclusion regarding the effectiveness of TFU as a form of post discharge intervention. These review findings emphasise the need for more rigorous research into the efficacy and acceptance of TFU interventions.

The wide variation in the purpose, design, content, and procedure of nurse-led TFU interventions reflects different patient populations, individual hospital intervention procedures and outcomes measured. It is likely that the protocols and procedures for TFU interventions are operationally very clear but remain poorly reported in the literature. The different structure in TFU call interventions included a focus on patient assessment over the phone, reiterating discharge follow-up instructions, arranging follow-up appointments, care transitioning from hospital to home, and self-management advice and education. This difference in structure, design and purpose of TFU calls is reflected in differences in the results of each study, and a lack of homogeneity is also reflected in the results. What remains

unclear is what guided the structure of the TFU interventions - hospital policy or patients' clinical needs. More clarity around the structure and purpose of TFU interventions is needed in future research on this topic, which may improve the consistency and the reliability of the studies' findings.

There is a strong imperative to follow-up discharged patients because if patients fail to recognise the onset of new symptoms or complications, or follow discharge instructions, they are likely to have post-discharge problems, be less able to self-manage their care, be less satisfied with post-discharge care, less likely to attend follow-up appointments and be more susceptible to hospital readmission (Harrison, Hara, Pope, Young, & Rula, 2011; Willard, 2009). While patients are satisfied with TFU and other outcomes as measured in this study, previous literature indicates the intervention can impact adversely on nurses' ability to care for current hospitalised patients due to low staff numbers and time limitations (Beaver, Williamson & Chalmers, 2010; NSW Nurses & Midwives' Association, 2017; Zheng, Zhang, Qin, Fang & Wu, 2013). Reported difficulties nurses experience with TFU interventions are language barriers (Zheng et al., 2013), low patient response rates (D'Amore, Murray, Powers & Johnson, 2011), time consuming, and patient irritation or anger (Dewar, Scott & Muir, 2004). The perceptions and experiences of nurses conducting TFU interventions is an area that has received very little attention to date and future research should focus on this important component of TFU interventions.

Only three of the interventions discussed or noted the provision of psychosocial care and support to patients post-discharge and one of the studies suggested that nurses may be uncomfortable providing this type of care. This indicates an area that needs to be addressed to increase the effectiveness of TFU interventions.

Limitations

This literature review only examined contemporary peer-reviewed literature and the inclusion criteria of nurse-led telephone interventions within seven days of discharge may have excluded relevant studies. Due to the diversity in study methodology, patient groups, and outcome measures, we were unable to conduct a meta-analysis. Sub-group analyses of studies was considered however the heterogeneity of studies was a limiting factor. The purpose, focus and intensity of TFU interventions varied widely, as did the outcomes measured, making it difficult to compare studies, which is a key limitation. For example, patient satisfaction data was collected through qualitative interviews in two studies, by a single question using a Likert-type scale in three studies, and by the Hospital Consumer Assessment of Health Providers and System (HCAHPS) survey in one study. Without consistent assessment, it is difficult to inform relevance to practice. The target populations also varied extensively, with some populations at higher risk of readmission and post-discharge problems than others.

Conclusions

Follow up telephone call interventions have many potential benefits including improved patient satisfaction, self-management and patient outcomes, however this review has strongly emphasised the need for research studies that are methodologically rigorous and use valid and reliable tools to assess patient outcomes. Future research should examine patients' perceptions of the most useful content of TFU calls, the provision of psychosocial care, and perceptions and experiences of nurses conducting TFU interventions.

Relevance to clinical practice

Interventions to improve patients' transition from hospital to home, and improve patient outcomes post-discharge, are becoming more common. This review indicates that while the evidence is not strong, TFU could be helpful for patients and a time and cost effective intervention to improve patient care and outcomes post-discharge.

References

- Australian Institute of Health and Welfare (2017). *Admitted patient care 2015-16: Australian hospital statistics* (pp.19 – 225). Canberra.
- Australian Institute of Health and Welfare (2016). *National Healthcare Agreement: PI 18 – selected potentially preventable hospitalisations, 2015*. Retrieved from <http://meteor.aihw.gov.au/content/index.phtml/itemId/559032>
- Bahr, S. J., Solverson, S., Schlidt, A., Hack, D., Smith, J. L., & Ryan, P. (2014). Integrated Literature Review of Postdischarge Telephone Calls. *Western Journal of Nursing Research*, 36(1), 84-104. doi:10.1177/0193945913491016
- Beaver, K., Williamson, S., & Chalmers, K. (2010). Telephone follow-up after treatment for breast cancer: views and experiences of patients and specialist breast care nurses. *Journal of Clinical Nursing*, 19(19-20), 2916-2924.
- Clari, M., Frigerio, S., Ricceri, F., Pici, A., Alvaro, R., & Dimonte, V. (2015). Follow-up telephone calls to patients discharged after undergoing orthopaedic surgery: double-blind, randomised controlled trial of efficacy. *Journal of Clinical Nursing*, 24(19-20), 2736-2744.

Cusack, M., & Taylor, C. (2010). A literature review of the potential of telephone follow-up in colorectal cancer. *Journal of Clinical Nursing*, 19(17-18), 2394-2405.

D'Amore, J., Murray, J., Powers, H., & Johnson, C. (2011). Does telephone follow-up predict patient satisfaction and readmission? *Population Health Management*, 14(5), 249-255.

Dewar, A., Scott, J., & Muir, J. (2004). Telephone follow-up for day surgery patients: patient perceptions and nurses' experiences. *Journal of PeriAnesthesia Nursing*, 19(4), 234-241.

Dudas, V., Bookwalter, T., Kerr, K. M., & Pantilat, S. Z. (2002). The impact of follow-up telephone calls to patients after hospitalization. *Disease-A-Month*, 48(4), 239-248.

Hamar, G. B., Coberley, C., Pope, J. E., Cottrill, A., Verrall, S., Larkin, S., & Rula, E. Y. (2017). Effect of post-hospital discharge telephonic intervention on hospital readmissions in a privately insured population in Australia. *Australian Health Review*. doi: 10.1071/AH16059

Harrison, P. L., Hara, P. A., Pope, J. E., Young, M. C., & Rula, E. Y. (2011). The Impact of Postdischarge Telephonic Follow-Up on Hospital Readmissions. *Population Health Management*, 14(1), 27-32. doi:10.1089/pop.2009.0076

Holland, P. J., Tham, T. L., & Gill, F. J. (2018). What nurses and midwives want: Findings from the national survey on workplace climate and well-being. *International Journal of Nursing Practice*. doi: 10.1111/ijn.12630

Horwitz, L. I., Moriarty, J. P., Chen, C., Fogerty, R. L., Brewster, U. C., Kanade, S., ... & Krumholz, H. M. (2013). Quality of discharge practices and patient understanding at an academic medical center. *JAMA Internal Medicine*, 173(18), 1715-1722.

Jayakody, A., Bryant, J., Carey, M., Hobden, B., Dodd, N., & Sanson-Fisher, R. (2016).

Effectiveness of interventions utilising telephone follow up in reducing hospital readmission within 30 days for individuals with chronic disease: a systematic review.(Report). *BMC Health Services Research*, 16(1). doi:10.1186/s12913-016-1650-9

Joanna Briggs Institute (2014). The Joanna Briggs Institute reviewer's manual: 2014 edition/Supplement. Methodology for JBI mixed methods systematic reviews. Australia: The Joanna Briggs Institute.

Keiding, N. (2005). Historical Controls in Survival Analysis. Encyclopedia of Biostatistics. 4. Doi: 10.1002/0470011815.b2a11036

Lalor, A. F., Brown, T., Robins, L., Lee, D. C. A., O'Connor, D., Russell, G., ... & Haines, T. P. (2015, June). Anxiety and depression during transition from hospital to community in older adults: Concepts of a study to explain late age onset depression. *Healthcare*, 3, 478-502. doi: 10.3390/healthcare3030478

Lavesen, M., Ladelund, S., Frederiksen, A. J., Lindhardt, B. Ø., & Overgaard, D. (2016). Nurse-initiated telephone follow-up on patients with chronic obstructive pulmonary disease improves patient empowerment, but cannot prevent readmissions. *Danish Medical Journal*, 63(10).

Li, L. L., Gan, Y. Y., Zhang, L. N., Wang, Y. B., Zhang, F., & Qi, J. M. (2014). The effect of post-discharge telephone intervention on rehabilitation following total hip replacement surgery. *International Journal of Nursing Sciences*, 1(2), 207-211.

Makaryus, A. N., & Friedman, E. A. (2005). Patients' understanding of their treatment plans and diagnosis at discharge. *Mayo Clinic Proceedings*, 80(8), 991-994.

Miller, D. A., & Schaper, A. M. (2015). Implementation of a follow-up telephone call process for patients at high risk for readmission. *Journal of Nursing Care Quality*, 30(1), 63-70.

Mistiaen, P., & Poot, E. (2006). Telephone follow-up, initiated by a hospital-based health professional, for postdischarge problems in patients discharged from hospital to home. *Cochrane Database of Systematic Reviews*, (4).

Moher, D., Shamseer, L., Clarke, M., Ghersi, D., Liberati, A., Petticrew, M., ... & Stewart, L. A. (2015). Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015 statement. *Systematic Reviews*, 4(1), 1.

New South Wales Health. (2015). *Managing length of stay and unplanned readmissions in NSW public hospitals* (p. 9). Sydney: Audit Office of New South Wales. Retrieved from:
http://www.audit.nsw.gov.au/ArticleDocuments/358/01_Managing_Length_of_Stay_Hospital_Readmission_Full_Report.pdf.aspx?Embed=Y

NSW Nurses & Midwives' Association (2017). John Hunter Hospital nurses and midwives put patient safety first. Media Release. Retrieved from <http://www.nswnma.asn.au/wp-content/uploads/2017/10/NSWNMA-Media-Release-171017-John-Hunter-Hospital-nurses-and-midwives-put-patient-safety-first.pdf>

O'Leary, K. J., Kulkarni, N., Landler, M. P., Jeon, J., Hahn, K. J., Englert, K. M., & Williams, M. V. (2010). Hospitalized patients' understanding of their plan of care. *Mayo Clinic Proceedings*, 85(1), 47-52.

Pluye, P. & Hong, Q.N. (2014). Combining the power of stories and the power of numbers: Mixed methods research and mixed studies reviews. *Annual Review of Public Health*, 35, 29-45.

Schuller, K. A., Lin, S. H., Gamm, L. D., & Edwardson, N. (2015). Discharge phone calls: A technique to improve patient care during the transition from hospital to home. *Journal for Healthcare Quality*, 37(3), 163-172.

Shamseer, L., Moher, D., Clarke, M., Gherzi, D., Liberati, A., Petticrew, M., ... Stewart, L. A. (2015). Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015: Elaboration and explanation. *BMJ*, 349, g7647. doi: <https://doi.org/10.1136/bmj.g7647>.

Stolic, S., Mitchell, M., & Wollin, J. (2010). Nurse-led telephone interventions for people with cardiac disease: a review of the research literature. *European Journal of Cardiovascular Nursing*, 9 (4), 203-217

Swannell C. (2013). Readmission rates too high. *MJA InSight*, 2. Available at: <https://www.mja.com.au/insight/2013/2/readmission-rates-too-high>

Szöts, K., Konradsen, H., Solgaard, S., Bogø, S., & Østergaard, B. (2015). Nurse-led telephone follow-up after total knee arthroplasty—content and the patients' views. *Journal of clinical nursing*, 24(19-20), 2890-2899.

Tang, N., Fujimoto, J., & Karliner, L. (2014). Evaluation of a primary care-based post-discharge phone call program: keeping the primary care practice at the center of post-hospitalization care transition. *Journal of general internal medicine*, 29(11), 1513-1518.

Vashi, A. A., Fox, J. P., Carr, B. G., D'Onofrio, G., Pines, J. M., Ross, J. S., & Gross, C. P. (2013). Use of hospital-based acute care among patients recently discharged from the hospital. *Jama*, 309 (4), 364-371.

Willard, M. (2009). Outsourcing discharge follow-up calls keep nurses at the bedside. HealthLeaders Media. Retrieved from <http://www.healthleadersmedia.com/nurse-leaders/outsourcing-discharge-follow-calls-keep-nurses-bedside>

Zhang, J. E., Wong, F. K., You, L. M., & Zheng, M. C. (2012). A qualitative study exploring the nurse telephone follow-up of patients returning home with a colostomy. *Journal of Clinical Nursing*, 21(9-10), 1407-1415.

Zhang, J. E., Wong, F. K. Y., You, L. M., Zheng, M. C., Li, Q., Zhang, B. Y., ... & Liu, J. L. (2013). Effects of enterostomal nurse telephone follow-up on postoperative adjustment of discharged colostomy patients. *Cancer Nursing*, 36(6), 419-428.

Zheng, M. C., Zhang, J. E., Qin, H. Y., Fang, Y. J., & Wu, X. J. (2013). Telephone follow-up for patients returning home with colostomies: Views and experiences of patients and enterostomal nurses. *European Journal of Oncology Nursing*, 17(2), 184-189.

Figure legends

Figure 1 PRISMA Flowchart

Table 1 Study and sample characteristics and outcomes measured

| Author | Country & population | Study Design | Site & sample | Intervention | Outcomes measured |
|-----------------------|---|--|-----------------------------------|--------------|--|
| Clari et al. (2015) | Italy 219 orthopaedic surgery patients | Double blind RCT 2 groups, post-test only | Single site Convenience sample | TFU | Number of post-discharge problems Number of health care services accessed Patient satisfaction |
| Gaines-Dillard (2015) | USA 59 motorcycle trauma patients | Case-control study 2 groups, post-test only | Single site Convenience sample | TFU | ED visits Readmission rates Patient satisfaction |
| Hannan (2012) | USA 139 low-income first time mothers | RCT 2 groups, post-test only | Single site Convenience sample | TFU | Emergency room visits Maternal health Infant health Healthcare costs |
| Lavesen et al. (2016) | Denmark 224 COPD patients | RCT 2 groups, post-test only | Single site Convenience sample | TFU | Health status Disease management Readmission rates Mortality |
| Li et al. (2014) | China 237 hip replacement surgery patients | Case-control study 2 groups, post-test only | Single site Convenience sample | TFU | Compliance behaviour Harris hip score |
| Miller et al. (2015) | USA 1806 patients at high risk for readmission | Case-control study 4 groups, post-test only | Single site Convenience sample | TFU | Readmission rates |
| Szöts et al. (2015) | Denmark 54 total knee arthroplasty patients 10 patient interviews | Qualitative descriptive study | Single site Convenience sample | TFU | Patient satisfaction |
| Tang et al. (2014) | USA 790 discharged patients | Case-control study 3 groups, post-test only | Single site Convenience sample | TFU | Number of problems F/u appt. attendance Readmission rates |
| Zhang et al. (2012) | China | Qualitative | Single site | TFU | Description of TFU |

| | | | | | |
|---------------------|------------------------------------|------------------------------------|-------------------------------|-----|--|
| | 25 colostomy patients | exploratory study | Random selection | | content |
| Zhang et al. (2013) | China 103 colostomy patients | RCT 2 groups, post-test only | 7 sites Convenience sample | TFU | Stoma adjustment levels Stoma self-efficacy Complications Patient satisfaction |

Table 2 TFU calls post-discharge: Evidence

| First author, year | Objective | Design and sample | Intervention | Outcomes |
|-----------------------|--|---|--|---|
| Clari et al. (2015) | To evaluate the effectiveness of an educational TFU intervention after patients underwent low- or medium-intensity orthopaedic surgery. | Double blind RCT (2 groups: usual care plus telephone call, usual care). Sample: <i>N</i> = 219 orthopaedic surgery patients | Usual care plus telephone call after discharge from senior orthopaedic nurse 24-96 hours after discharge – questioned about overall health, 11 predefined problems experienced, premature contact with health system, and satisfaction with TFU. | No difference: Premature contact with health care system 7-15 day readmission Significant difference: Frequency of problems reported Received more useful information Patient satisfaction |
| Gaines-Dillard (2015) | To evaluate the use of TFU because it relates to improved patient outcomes. HCAHPS survey instrument | Case-control study (2 groups: Intervention, historical control). Sample: <i>N</i> = 59 Motorcycle trauma patients | Telephone call by nurse 3-7 days after discharge – questioned about problems, convalescence, medication, follow-up arrangements, and satisfaction with TFU, ED visits and readmissions. | Descriptive findings: Increased patient satisfaction Improved communication Improved knowledge of care instructions Satisfaction with TFU 30-day readmission |
| Hannan (2012) | To examine the effects of a low-cost telephone intervention provided by APNs for the first 2 months post birth in low income first time mothers and their healthy full-term infants. | RCT (2 groups: usual care plus telephone call, usual care). Sample: <i>N</i> = 139 Low income first time mothers | Usual care plus telephone calls after discharge from APN on days 3, 7, 14, 21, 28 and week 8 – questioned about infant health concerns and maternal health. Health care charges (emergency room visits, urgent care visits, hospitalisations) were calculated. | No difference: Day 3 perceived stress 1-month perceived stress Day 3 maternal perceptions of health Infant immunisation rates Infant weight gain Morbidity 60-day readmission Significant difference: 2-month perceived stress 1-month maternal perceptions of health 2-month maternal perceptions of health |

| | | | | |
|-----------------------|---|---|---|---|
| | | | | Health care charges |
| Lavesen et al. (2016) | To explore whether telephone follow-up after discharge may reduce readmission rates, lower mortality and improve disease management in patients with chronic obstructive pulmonary disease (COPD). | RCT (2 groups: usual care plus telephone calls, usual care). Sample: <i>N</i> = 224 COPD patients | Usual care plus telephone calls after discharge from experienced respiratory nurses on day 2 and day 30 – questioned about experiences with hospitalisation, symptom management, medication, follow-up arrangements, home care, and any needs or problems. | No difference: 30-day readmission 84-day readmission Mortality Satisfaction with TFU Significant difference: Perceptions of management of COPD Communication with health professionals |
| Li et al. (2014) | To determine the effect of post-discharge telephone intervention with both patients and family caregivers on patient compliance with doctors' advice and rehabilitation progress in total hip replacement patients. | Case-control study (2 groups: Usual care, trained family supervisor, plus telephone calls, usual care). Sample: <i>N</i> = 237 Total hip replacement surgery patients | Usual care, trained family supervisor, plus telephone calls after discharge from associate chief nurses, supervisor nurses, and senior nurses including orthopaedic specialists on days 3-7, 1 month and 3 months - questioned about compliance with discharge instructions, received individualized health education and guidance including exercise, cautions in daily life, and regular examination. | No difference: Compliance behaviour at discharge 1-month Compliance behaviour Harris Hip Score at discharge Significant difference: 3-month compliance behaviour 6-month compliance behaviour 6-month Harris Hip Score |
| Miller et al. (2015) | To improve understanding of aftercare | Case-control study (4 groups: telephone call by CNL, service | CNL telephone call 24-72 hours after discharge – questioned about medications, nutrition, pain, bowel | No difference: 30-day readmission Significant difference: |

| | | | | |
|---------------------|---|---|--|--|
| | instructions and decrease readmissions. | telephone contact or patient clinic call, patient clinic visit, no follow-up). Sample: <i>N</i> = 1806 High risk medical/surgical patients | activity, mobility, signs and symptoms of problems, follow-up visits, and compliance with discharge instructions. | 0-7-day readmission |
| Szöts et al. (2015) | To unfold the content of the TFUs according to the structure for nursing status as defined by the VIPS model, and to explore the patients' views of the TFUs conducted. | Qualitative descriptive study (2 groups: usual care plus telephone calls, usual care). Sample: <i>N</i> = 104 case reports, 10 interviews Total knee arthroplasty patients | Usual care plus telephone calls after discharge from nurses on day 4 and day 14 – questioned about communication, cognition/development, breathing/circulation, nutrition, elimination, sleep, pain/perception, skin/integument, sexuality/reproduction, activity, psychosocial/spirituality/culture, care, treatment and observation of the wound and the operated limb, management of painkillers, and exercise. 3-month post-surgery interview – questioned about importance of scheduled TFU, content of TFU, timing of the TFU, telephone as a means of follow-up and other sources of advice | Descriptive findings: TFU perceived as a supportive intervention TFU provides adequate information and counselling |
| Tang et al. (2014) | To measure the number and type of problems uncovered by the primary care nurse through phone calls in the immediate post-discharge period, | Case-control study (3 groups: telephone call, telephone message, missed encounter). Sample: <i>N</i> = 790 Medicine service patients | PHC practice nurse telephone call within 72 hours of discharge – questioned about new or uncontrolled symptoms, medication issues, homecare, referral, equipment, psycho-social needs, and appointment issues. | No difference: 30-day readmission Significant difference: Follow-up appointment attendance |

| | | | | |
|---------------------|--|---|---|--|
| | and to evaluate the program's impact on follow-up appointment attendance and 30-day readmission rates. | | | |
| Zhang et al. (2012) | To explore and describe the content of telephone intervention conversations conducted by an enterostomal nurse with patients discharged home with a colostomy. | Qualitative exploratory study (1 group: descriptive Sample: <i>N</i> = 12 Colostomy patients | Enterostomal nurse telephone call on days 3-7 and days 14-20 – questioned about overall condition, stoma self-care, and appropriate behaviours. | Descriptive findings: TFU addressed patient concerns and provided education about stoma care/self-care, resuming normal living and general postoperative problems. |
| Zhang et al. (2013) | To evaluate the effect of enterostomal nurse telephone follow-up on the adjustment levels and other related outcomes of discharged colostomy patients. | RCT (2 groups: usual care and telephone calls, usual care) Sample: <i>N</i> = 103 Colostomy patients | Enterostomal nurse telephone call on days 3-7, days 14-20, and days 23-27 – questioned about general clinical status, discomfort, stoma complications, stoma self-care ability, emotional condition, and self-efficacy. | No difference: Baseline OAS (ostomy adjustment scale) scores 1-month OAS scores Baseline SSES (stoma self-efficacy) scores 1-month SSES scores Baseline satisfaction with care Significant difference: 3-month OAS scores 3-month SSES scores 1-month satisfaction with care 3-month satisfaction with care Number of stoma complications |

Table 3 Quality appraisal of quantitative studies

| Author | Design & Data Collection | Selection bias | Study design | Confounders | Blinding | Data collection methods | Withdrawals & drop outs | Final score |
|-------------------------|--------------------------|----------------|--------------|-------------|----------|-------------------------|-------------------------|-------------|
| Lavesend, et al. (2016) | RCT | Strong | Strong | Strong | Weak | Weak | Moderate | Weak |
| Gaines-Dillard (2015) | Case-control study | Moderate | Moderate | Weak | Moderate | Moderate | Weak | Weak |
| Hannan (2012) | RCT | Moderate | Strong | Strong | Moderate | Weak | Strong | Moderate |
| Li, et al. (2014) | Case-control study | Moderate | Moderate | Weak | Moderate | Weak | Strong | Weak |
| Tang, et al. (2014) | Case-control study | Moderate | Moderate | Weak | Moderate | Weak | Moderate | Weak |
| Zhang, et al. (2013) | RCT | Strong | Strong | Strong | Moderate | Strong | Strong | Strong |
| Clari, et al. (2015) | Double blind RCT | Strong | Strong | Strong | Strong | Strong | Strong | Strong |
| Miller & Schaper (2015) | Case-control study | Moderate | Moderate | Weak | Moderate | Weak | Strong | Weak |

Table 4 Quality appraisal of qualitative studies

| Authors | | Szots et al. (2015) | Zang et al. (2011) |
|--------------------------|---|--|---|
| Design & Data collection | | Exploratory study to evaluate patients' views of telephone follow-up (TFU) intervention Interviews with 10 patients and content analysis of 104 TFU consultations | Exploratory study to describe the content of telephone follow-up intervention Content analysis of telephone follow-up conversations with 12 patients |
| CASP evaluation criteria | 1. Was there a clear statement of the aims of the research? | Yes | Yes |
| | 2. Is a qualitative methodology appropriate? | Yes | Yes |
| | 3. Was the research design appropriate to address the aims of the research? | Yes | Yes |
| | 4. Was the recruitment strategy appropriate to the aims of the research | Yes | Yes |
| | 5. Was the data collected in a way that addressed the research issue | Yes | Yes |
| | 6. Has the relationship between researcher and participants been adequately considered? | Can't tell | Can't tell |
| | 7. Have ethical issues been taken into consideration? | Can't tell | Yes |
| | 8. Was the data analysis sufficiently rigorous? | Yes | Yes |
| | 9. Is there a clear statement of findings? | Yes | Yes |
| | 10. How valuable is the research? | Moderately valuable | Moderately valuable |



PRISMA 2009 Flow Diagram

Identification
Screening
Eligibility
Included

