



Hospital readmission risks in older adults following inpatient subacute care: A six-month follow-up study

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ABSTRACT

Background: High rates of unplanned hospital readmissions are a burden on healthcare systems and individuals. This study examined factors at, and after initial hospital discharge and their associations with unplanned hospital readmission for older adults up to six months post-discharge from subacute care.

Methods: Older subacute care patients were surveyed prior to discharge, and assessed monthly post-discharge for six months. Data included the Geriatric Depression Scale, Phone-Fitt sub-scales, Friendship Scale, modified Lubben Social Network Scale, unplanned hospital readmission, self-reported physical capacity and falls in the last month were collected. Regression analyses were used to examine relationships between unplanned hospital readmission and variables that may predispose this outcome.

Results: Participants (n = 311) completed the baseline assessment. N = 218 (70%) completed all at six-month post-discharge. Eighty-nine (29%) participants shared 143 readmissions. Those with cancer history (adjusted OR [95% CI]) (1.97 [1.15, 3.39]), neurological disease other than stroke (2.95 [1.32, 6.57]) and dependence on others to assist in bending tasks (1.94 [1.14, 3.29]) at initial discharge were associated with readmission within six months post-discharge. Those who fell in the last month (adjusted OR [robust 95% CI]) (2.28 [1.43, 3.64]), being less physical active (0.98 [0.96, 0.99]), and dependence on others in moving around residence (2.63 [1.37, 5.06]) after initial discharge were associated with a readmission in the next month within six months post-discharge.

Conclusion: Trials investigating the effectiveness of strategies to reduce falls, build physical capacity, increase physical activity level, and connection with health care services after discharge to prevent readmission are warranted.

1. Introduction

High rates of unplanned hospital readmission are a burden on healthcare systems and individuals. Worldwide ageing population places an increase in demand on health care services. Increased risks of hospital admissions and subsequent readmissions are prevalent in the older population (García-Pérez et al., 2011; Roland, Dusheiko, Gravelle, & Parker, 2005). A study in the United States reported that approximately 21% of older patients who had a primary discharge diagnosis of heart failure were readmitted to the hospital within 30 days post-discharge (Hernandez, Greiner, Fonarow, & et al., 2010). Research is relatively scarce in hospital readmissions following subacute care. A

study found almost 12% of older patients discharged from subacute rehabilitation were readmitted to the hospital within 30 days (Ottenbacher, Karmarkar, Graham, & et al., 2014).

Hospital readmissions for preventable conditions post-discharge consume many health care resources. These include increased emergency hospital admissions (Roland et al., 2005), reduced hospital bed capacity, delayed in admitting emergency department patients due to bed blocks (Forero, McCarthy, & Hillman, 2011). It also poses a tremendous financial cost to the public health care system and private health insurers (Friedman & Basu, 2004; Hamar et al., 2017). Older adults in particular, are susceptible to adverse outcomes from hospitalisations. Functional decline (Sager & Rudberg, 1998), dependence in

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walking (Mahoney, Sager, & Jalaluddin, 1998), falls (Oliver, Healey, & Haines, 2010), reduced quality of life (Hoenig & Rubenstein, 1991), complications (Creditor, 1993) and increased risks of discharge to nursing homes (Lamont, Sampson, Matthias, & Kane, 1983) are well documented. Transitioning from acute to subacute care institutional settings represents longer hospitalisation which may further increase the risks of these outcomes (Creditor, 1993). Unplanned hospital readmission may point to deficiencies in hospital treatment or community follow-up care, or both (GoncalvesBradley, Lannin, Clemson, Cameron, & Shepperd, 2016; Naylor et al., 2004). Other factors may also contribute to the rapid readmissions post-discharge.

Currently, most studies have only investigated unplanned hospital readmissions for up to 30-days following discharge or focussed on the relationships between in-patient or hospital level characteristics and unplanned readmissions post-discharge (Elkassabany, Passarella, Mehta, Liu, & Neuman, 2016). Little research has explored unplanned readmissions beyond 30 days or factors after initial discharge from subacute care that may contribute to unplanned hospital readmissions.

This study aimed to examine 1) factors at initial hospital discharge and their associations with unplanned hospital readmission within six months following discharge and 2) factors after hospital discharge and their associations with unplanned hospital readmission in the next month within six months following discharge from subacute or in-patient rehabilitation.

2. Methods

2.1. Design

This was a prospective cohort study conducted as a part of a broader, mixed methods investigation of psychological morbidity in older adults who have been discharged from hospital (Lalor et al., 2015). This paper focusses on unplanned hospital readmission within six months following discharge from hospital and its association with demographic and other variables encompassing a range of health domains likely to predispose to unplanned readmissions over the follow-up period.

The study was approved by Monash Health (MH/12182B) and Peninsula Health Human Research Ethics Committee (HREC/13/PH/51). Consent to participate was obtained from patients who met the inclusion criteria.

2.2. Participants

Participants in this study were older adults aged ≥ 65 years who were admitted to subacute or inpatient rehabilitation wards of Monash Health and Peninsula Health in Victoria, Australia between 2013 and 2014. Older subacute care patients who had at least an overall two-week length of stay in hospital from the initial acute care admission were eligible to participate. A minimum of two weeks was selected as it was reasoned that the surgery or illness that precipitated this hospitalisation would have been a significant health event, and would likely result in a period of subacute care or in-patient rehabilitation prior to discharge. Patients were excluded if they had significant cognitive impairment (defined as a score of > 13 on the 6-item Cognitive Impairment Test) (Brooke & Bullock, 1999), hearing or speech impairment sufficient to prevent a conversation as this would have impeded collection of measurements. Participants were also excluded if their discharge destination following hospitalisation was another hospital or a nursing home.

2.3. Survey instruments

The selection of survey items and questionnaires for this part of the study was based on a range of health outcomes and constructs that might contribute to an unplanned hospital readmission following the

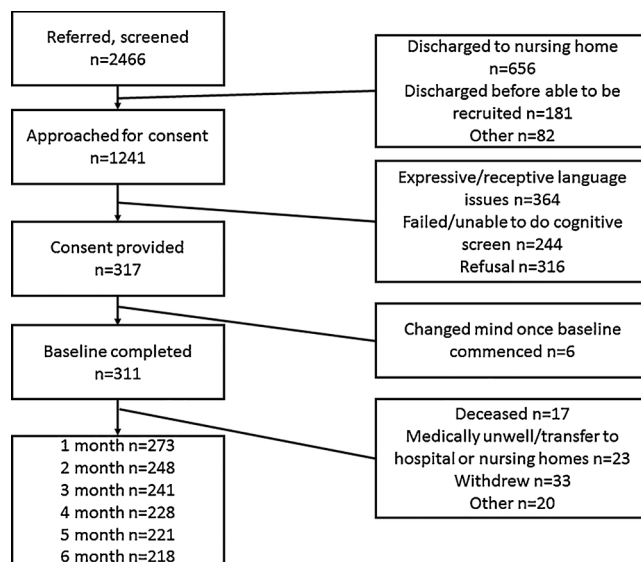


Fig. 1. Participant flow through the study.

index admission. Potential risk factors were selected from the literature and the data set from the broader study (Lalor et al., 2015). Predisposing risk factors covered demographic, social and individual characteristics (Anderson & Newman, 1973). Medical and functional risk factors that may contribute to an unplanned readmission directly, for example falls, physical incapacity (Jonathan, 1999) and illness (Galloway et al., 2016) or indirect factors, for example depressive symptoms (Albrecht et al., 2014) or social isolation were identified.

The validated Geriatric Depression Scale-Short Form (GDS-SF) (Yesavage & Sheikh, 1986) was used to assess symptoms of depression. A score > 5 is suggestive of depression and those with a score > 10 –15 almost always have clinically diagnosed depression.

The validated Phone-FITT subscales (Gill, Jones, Zou, & Speechley, 2008) were used to measure household and recreational activities with higher scores indicating greater participation in that category of physical activity.

The validated Friendship Scale was used to measure self-perceived social isolation in older adults (Hawthorne, 2006). A total score of 19–24 indicates high acuity, 16–18 moderate acuity and 0–15 low acuity of friendship.

A modified version of the validated Lubben Social Network 6-item Scale (LSNS) was used to measure self-reported social engagement of family and friends (Lubben, 1988). Two items, one regarding social network of family and another regarding friends were used in the study. Each item is scored 0–5 with a higher score indicating more social engagement.

Closed questions were used to collect data on unplanned hospital readmission since last assessment and the occurrence of self-reported falls in the last month. An unplanned hospital readmission was defined as an unscheduled stay at any inpatient facility or emergency department. A fall was defined as an event which resulted in the person coming to rest inadvertently on the ground, floor or other lower level (WHO, 2018). Participants were asked to self-report their physical capacity using a Likert scale of “can do without difficulty”, “can do but with difficulty” and “cannot do without someone else” on four physical activities: getting on and off public transport without assistance from someone else; walking up and down stairs without a handrail or assistance from someone else; bending and picking up an object from the floor without the assistance from someone else and moving about their usual place of residence without assistance from someone else. Participants were classified as being culturally and linguistic diverse if they had any two of these criteria: spoke a main language other than English at home, were born overseas or identified themselves with a specific

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