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Depressive symptoms and adverse outcomes from hospitalization in older adults: Secondary outcomes of a trial of falls prevention education

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ABSTRACT

Depression is common in older people and symptoms of depression are known to substantially increase during hospitalization. There is little known about predictors of depressive symptoms in older adults or impact of common interventions during hospitalization. This study aimed to describe the magnitude of depressive symptoms, shift of depressive symptoms and the impact of the symptoms of depression among older hospital patients during hospital admission and identify whether exposure to falls prevention education affected symptoms of depression.

Participants (n = 1206) were older adults admitted within two Australian hospitals, the majority of participants completed the Geriatric Depression Scale – Short Form (GDS) at admission (n = 1168). Participants' mean age was 74.7 (±SD 11) years and 47% (n = 551) were male.

At admission 53% (619 out of 1168) of participants had symptoms of clinical depression and symptoms remained at the same level at discharge for 55% (543 out of 987). Those exposed to the low intensity education program had higher GDS scores at discharge than those in the control group (low intensity vs control n = 652, adjusted regression coefficient (95% CI) = 0.24 (0.02, 0.45), p = 0.03). The only factor other than admission level of depression that affected depressive symptoms change was if the participant was worried about falling.

Older patients frequently present with symptoms of clinical depression on admission to hospital. Future research should consider these factors, whether these are modifiable and whether treatment may influence outcomes.

1. Introduction

Depression is common among older people (Bryant, Jackson, & Ames, 2009; Djernes, 2006; Solhaug, Romuld, Romild, & Stordal, 2012), and it is well understood that the risk of experiencing symptoms of depression is increased by cognitive impairment, illness and limited access to friends and family support networks (Djernes, 2006; Sheikh & Yesavage, 1986). It is not surprising then that symptoms of depression have been shown to increase in frequency and severity during times of hospitalization (Givens, Jones, & Inouye, 2009). Recent research has found that over

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two-thirds of older people undertaking inpatient rehabilitation had some form of clinically significant psychiatric comorbidity upon admission and over one-third displayed significant symptoms of depression at discharge (Gluyas, Lum, Chong, Borg, & Haines, 2011).

Clinicians currently have little guidance to identify patients at high risk of developing depressive symptoms or having worsening symptoms during their hospital admission. This is important as early identification may permit delivery of services to prevent development or worsening of depressive symptoms. Another issue of importance to clinicians is whether health interventions designed to address other geriatric issues (such as falls prevention) may have the unintended consequence of worsening depressive symptoms. Previous research has demonstrated that older adults rarely discuss falls with their health professionals (Lee, McDermott, Hoffmann, O'Connell, & Haines, 2013) and that some find this discussion very confronting, as they commonly associate falls with being old and frail (Yardley et al., 2008). It was these challenges and observations within the clinical environment that lead to the formulation of the study questions.

This study is a secondary analysis of data collected as a part of a randomized trial investigating the efficacy of two patient education strategies for the prevention of falls among older hospital inpatients. The analyses presented in this paper aim to (i) describe the magnitude symptoms of depression among older hospital patients, (ii) describe how symptoms of depression change during hospital admission, (iii) identify factors associated with worsening symptoms of clinical depression, (iv) describe the impact that symptoms of depression had on length of stay in hospital, falls, and the probability of being discharged to a residential aged care facility, and (v) determine whether provision of either of two patient education programs for the prevention of falls had an impact on change in depressive symptoms during hospital admission.

2. Method

2.1. Study design

This study was a 3-group randomized trial. There were two active intervention groups: a "*low intensity*" education program that involved providing a video and written materials discussing the prevention of falls, and a "*high intensity*" education program where the same video and written materials were provided along with face-to-face education with a health professional. The control group received usual care alone (Haines et al., 2011; Hill, Hill, et al., 2009; Hill, McPhail, et al., 2009). The secondary analysis, utilized observational data collected from participants within the RCT to address the research questions.

2.2. Participants and setting

Participants were older adults admitted to acute (orthopedic and acute-respiratory medicine) and subacute (geriatric assessment and rehabilitation) wards of the Princess Alexandra Hospital, Brisbane, Australia, and the acute (medical-surgical) and subacute (restorative–stroke rehabilitation) wards of Swan Districts Hospital, Perth, Australia. Patients were enrolled until they were discharged, transferred to a non-study ward, or died. Patients were excluded if they had previously participated in the patient education program or were too ill to provide informed consent as determined by hospital staff. A sample size of 1206 was recruited out of a possible 5162 admissions across all study wards.

2.3. Measurements

Symptoms of depression were measured using the GDS (Sheikh & Yesavage, 1986). This was administered at admission and discharge by a research assistant blinded to group allocation. The GDS was specifically developed for detecting depression in older adults and consists of 15 items. A cut-off score of six or above out of the maximum 15 indicates the presence of clinically significant depressive symptoms (Burns, Lawlor, & Craig, 2002).

The number of falls each participant sustained while in hospital was collected using three data sources as previous research has demonstrated single sources underestimate the true number of falls (Hill et al., 2010) Falls meeting the World Health Organization definition ("A fall is an event which results in a person coming to rest inadvertently on the ground or floor or other lower level"(World Health Organisation, 2010)) were included. The sources of falls data were (i) computerized incident reports, (ii) hand searching of individual patient medical notes, and (iii) weekly patient interviews (or at patient discharge if earlier than one week). Falls captured through any of these three approaches were included.

Health-related quality of life (HRQoL) was measured using the EQ-5D-3L (Rabin & de Charro, 2001). This scale measures health-related quality of life over five domains: mobility, self care, usual activities, pain and/or discomfort, and anxiety/depression. The participant rates each domain in one of the three levels of responses: no problem, some problems/moderate, or severe problems/unable. The Dolan scoring approach (Dolan, 1997) was applied creating a multi-attribute utility score with a possible range from −0.59 to 1.0; where 0 and 1 represent death and perfect health respectively.

Cognitive impairment was measured using the Short-Portable Mental Status Questionnaire (Pfeiffer, 1975). Higher scores on this the Short-Portable Mental Status Questionnaire indicate better cognitive function.

Self-perceived risk of falling and anxiety about falling were measured with a patient survey as part of baseline and discharge measures. This survey used single items "I think I will fall while in hospital" and "I am worried about falling while in hospital" respectively. A five point Likert scale (strongly agree through to strongly disagree) was used for each item.

Other demographic and outcome variables were collected from patient medical records. These included: age, gender, highest level of education, history of number of falls in the past 6 months, whether English was spoken as a first language, length of stay in hospital (measured in days), admission diagnosis, admission and discharge destination.

2.4. Procedure

Pre-study training was provided to hospital staff on study wards regarding classification of falls and procedures for recording falls on incident reports using previously developed video materials (Haines, Cornwell, Fleming, Varghese, & Gray, 2008; Hill, McPhail, et al., 2009). Patients consenting to participate in the study undertook a baseline assessment of all study measures. Participants were then allocated to one of the two intervention groups or the control group within the falls trial. Discharge measurements for health-related quality of life, depression and cognitive function were undertaken (with assistance from research assistants to administer the questionnaires) within 48 h of discharge.

2.5. Analysis

The baseline demographics between groups were explored with means, standard deviations and frequencies. Differences between the groups were analyzed using *t*-tests, chi-squared and