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Measurement of function in older adults transitioning from hospital to home: an integrative review

Daniel Liebzeit, PhD Candidate, RN-BSN *, Barbara King, PhD, RN, Lisa Bratzke, PhD, RN

University of Wisconsin-Madison School of Nursing, Madison, Wisconsin, USA

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ABSTRACT

Older adults often experience decline in functional status during the transition from hospital to home. In order to determine the effectiveness of interventions to prevent functional decline, researchers must have instruments that are reliable and valid for use with older adults. The purpose of this integrative review is to: (1) summarize the research uses and methods of administering functional status instruments when investigating older adults transitioning from hospital to home, (2) examine the development and existing psychometric testing of the instruments, and (3) discuss gaps and implications for future research. The authors conducted an integrative review of forty research studies that assessed functional status in older adults transitioning from hospital to home. This review reveals important gaps in the functional status instruments' psychometric testing, including limited testing to support their validity and reliability when administered by self-report and limited evidence supporting their ability to detect change over time.

Introduction

Adults aged 65 and older are discharged from the hospital more often than any other age group, accounting for 40% of hospital discharges in the US in 2010 ('National Hospital Discharge Survey,' 2012). Hospitalizations are consequential for older adults, as about 50% will experience functional decline.[1–4] For the purpose of this review, functional decline refers to a decline in activities of daily living (ADLs) or instrumental activities of daily living (IADLs). In addition, up to 50% of older adults do not recover their pre-hospitalization functional status during their first 30–90 days back home.[1,3–5] Older adults experiencing functional decline after discharge to home are particularly vulnerable because they may have less physical support than those discharged to rehabilitation centers, assisted living, or long-term care. Additionally, transitional care models developed to support older adults transitioning from hospital to home have not included functional status as a primary study variable.[6–9] Therefore, the transition between hospital and home is a critical interval during which older adults experience high rates of functional decline.

To determine the effectiveness of interventions to prevent functional decline, researchers must have instruments that are reliable and valid for use with older adults.[10] Reliability refers to repeatability or consistency of scores on an instrument.[11] Validity indicates that a tool is measuring what it is intended to measure.[11] Currently, there is considerable variability in how functional status is measured in older adults.[12] The instruments most commonly used to measure ADLs or IADLs were developed several decades ago to assess function by direct observation of patient performance in those undergoing rehabilitation for musculoskeletal conditions.[13–15] However, these instruments have subsequently been applied to many different groups of older adults (e.g., community-based, hospital-based, and across many diagnoses). Additionally, functional status instruments are commonly administered by self-report, rather than by observation of performance. Therefore, it is important to understand whether instruments used to measure functional status have had sufficient psychometric testing to validate their utility as self-report measures in various groups of older adults.

Given the high rates of functional decline among older adults transitioning from hospital to home, it is important to have instruments that are reliable and valid for measurements taken at once older adults return home, i.e., a community-dwelling population. Additionally, older adults transitioning from hospital to home are unique in that many remain in a stage of acute illness and are in a transitional phase. Hence, instruments must be able to track changes in function throughout that transitional phase, and evaluators should be able to compare repeated measures over various time points for interventions targeting this transition from hospital to home. Therefore, an instrument's test-retest reliability, i.e., consistency from one time to another, and sensitivity to change over time must be established to study such a population. Without proper testing of the

* Corresponding author. University of Wisconsin-Madison School of Nursing, 1215 Cooper Hall, 701 Highland Ave, Madison, Wisconsin 53705, USA. Tel.: +7157010679; fax: (608) 262-5523.
E-mail address: daniel.liebzeit@wisc.edu (D. Liebzeit).

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instrument's validity, reliability, and sensitively to change, i.e. psychometric testing, it is unclear whether the instruments are consistently detecting actual changes in function.[10] Thus, the purpose of this integrative review is to: (1) summarize the research uses and methods of administering functional status instruments, i.e., instruments measuring ADLs or IADLs, when investigating older adults transitioning from hospital to home, (2) examine the development and existing psychometric testing of the instruments, and (3) discuss gaps and implications for future research.

Methods

Search strategy

The authors conducted an integrative review from August 2016 through July 2017 in CINAHL, PUBMED, Cochrane Library, and Web of Science for peer-reviewed English original research studies that assessed functional status in older adults transitioning from hospital to home. The following search terms were used in combination to identify articles: (1) *functional status OR functional decline OR activities of daily living OR functional loss OR functional recovery OR functional independence* OR *functional outcomes,* (2) *hospitalized OR hospitalization OR hospital,* (3) *discharge OR transition*, and (4) *older adults*. Search terms used to narrow results included: *NOT stroke, NOT fracture,* and *NOT dementia*. Additional references were sought by reviewing bibliographies of selected articles. All publication years were included through July 2017 to obtain a comprehensive understanding of how instruments have been used to measure functional status, both recently and historically.

Inclusion criteria

Articles were included if: (1) functional status, i.e., an individual's participation in ADLs IADLs, was included as one of the primary study variables, (2) a standardized instrument was used to measure functional status, and (3) older adults' functional status was measured during the transition from hospital inpatient stay to home. To qualify as the transition from hospital inpatient stay to home, authors must have measured functional status at least one time during the first 90 days after hospital discharge.

Articles were excluded from the review if they assessed functional status only for patients with a specific condition or disease. Examples of such articles that were deemed as not being applicable to the general population include those focusing on patients suffering from stroke, Rheumatoid Arthritis, Parkinson's disease, or Dementia. In these cases, condition or disease-specific functional status instruments were unique and the results could not be applied to the larger population of older adults transitioning from hospital to home. Articles that did not focus on adults aged 65 and older were also excluded from this review.

Data extraction and synthesis

Data were extracted from the retrieved articles related to purpose of the research study, study design, sample, and instrument used to measure functional status. Each functional status instrument identified in this review was examined for evidence related to development and psychometric testing.

Risk of bias

The ROBIS tool was used to identify concerns in the review process and judge risk of bias in reviews.[16] Concerns related to the review process are categorized into: study eligibility criteria, identification and selection of studies, data collection and study appraisal, and synthesis and findings.[16] The objectives of the review and eligibility criteria were defined by authors prior to review. Therefore, concern regarding specification of study eligibility criteria is low.[16] All three authors (DL, LB, and BK) were involved in study identification and selection. Several databases, a variety of search terms, and additional methods (including bibliography review) were used to identify articles for potential inclusion. Therefore, concern regarding identification and selection of studies is low.[16] All study characteristics that were pre-determined to be relevant for the review were collected for use in this synthesis. Authors attempted to provide level of detail regarding study characteristics in the results for readers to be able to interpret the results on their own. Risk of bias was assessed formally. Therefore, concerns regarding data collection and study appraisal are low.[16] Last, the synthesis included all studies that were determined eligible by authors (DL, LB, and BK) using pre-determined criteria. The instruments used to measure functional status were also reviewed using pre-determined methods. The pre-determined plan for synthesis of results was able to adequately achieve the aims of this review. Therefore, the concerns regarding synthesis and findings are low.[16] Given that concerns in conducting a review, outlined above, were addressed and selected publications were relevant to the authors' research questions, the risk of bias in this review is considered low.[16]

Results

Search results

Five hundred seventeen publications were identified by title through the database searches. Twenty-five additional publications were identified through bibliography review. Two hundred eight publications remained after duplicate records were removed. Each of the 208 publications was screened by abstract (by DL, LB, and BK) resulting in exclusion of 129 records not meeting inclusion criteria. The remaining 79 publications were reviewed in full for eligibility. Forty publications were determined to be eligible and included in this review. See Fig. 1 for more specific information related to reasons for exclusion from this review.[17]

Instruments used to measure functional status

From this review, the instruments used to measure functional status in older adults transitioning from hospital to home include: the Katz ADL, the Barthel Index, the Lawton and Brody Instrumental Activities of Daily Living (IADL), and the ADL Summary Scale.

Katz ADL

The Katz ADL was the most common instrument used to measure functional status in older adults transitioning from hospital to home (see Table 1). This instrument tracks progressive loss of abilities seen in hospitalized patients,[18] and was developed based on observations of hospitalized patients with hip fracture. It was found useful for deciding treatment and progress of ill individuals and has been used to assess other chronically ill populations age 40 and older.[14] The instrument includes six items: bathing, dressing, going to toilet, transferring, continence, and feeding. Scoring of items is binary with 1 point given for independence and none given if the individual is dependent on supervision or assistance.

In publications focused on older adults transitioning from hospital to home, modified versions of Katz ADL were used more than the original version. The modified versions of the Katz ADL include various items from the original instrument, as well as additional items such as ambulation or walking. For instance, the modified Katz-1 includes five items from the original Katz ADL: