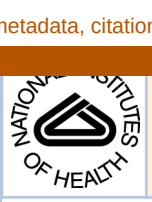

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Targeting Hospitalized Patients for Early Discharge Planning Intervention

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Abstract

Aims: The purpose of the study was to describe the ability of an evidence-based discharge planning decision support tool to identify and prioritize patients appropriate for early discharge planning intervention. Specifically we aimed to determine whether patients with a high Early Screen for Discharge Planning (ESDP) score report more problems and continuing care needs in the first few weeks after discharge than patients with low ESDP scores.

Background: Improved methods are needed to efficiently and accurately identify hospitalized patients at risk for complex discharge plans.

Design: A descriptive cross-sectional study was designed using a quality health outcomes framework.

Methods: The ESDP was administered to 260 adults hospitalized in an academic health center who returned home after discharge. Problems and continuing care needs were self-reported on the Problems After Discharge Questionnaire – English Version, mailed 6 to 10 days after discharge.

Results: Patients with high ESDP scores reported significantly more problems (mean 16.3 [standard deviation ±8.7]) than those with low scores (12.2 [±8.4]). Within the Problems After Discharge Questionnaire subscales, patients with high ESDP scores reported significantly more problems with personal care, household activities, mobility, and physical difficulties than patients with low screen scores. Significantly more of the patients with a high ESDP score received consults to a Discharge Planner and referrals for post acute services than patients with low screen scores.

Conclusion: The ESDP is effective as a decision support tool in identifying patients to prioritize for early discharge planning intervention.

Relevance to clinical practice: Use of an evidence-based discharge planning decision support tool minimizes biases inherent in decision making, promotes efficient use of hospital discharge

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Contributions:

Study design: DH, GK, KB; data collection and analysis: DH, GK, KB; and manuscript preparation: DH; final approval for publication: DH, GK, KB.

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planning resources, and improves the opportunity for patients to access community resources they need to promote successful recovery after hospitalization.

Keywords

clinical decision support; discharge planning; Early Screen for Discharge Planning; health care delivery

INTRODUCTION

Inadequate transitions across care settings lead to suboptimal outcomes, such as new or worsening symptoms, unplanned rehospitalizations, medical errors, and other adverse events, especially in older adults (Forster *et al.* 2003, The National Academies Press 2003, Greenwald *et al.* 2007, Kripalani *et al.* 2007, Weinberg *et al.* 2007). Hospital discharge planning (DP) is an essential care process for managing care transitions from the hospital to the community. The DP process includes assessment of the patient's present needs, anticipation of continuing care needs, and implementing resources to meet continuing care needs and ensure continuity of care (Rorden & Taft 1990). Successful DP is made possible when processes, the availability of relevant information, and DP role responsibilities complement each other (Holland & Harris 2007).

Persons at risk for adverse outcomes after hospital discharge often have multiple health, functional, and social care needs (Coleman 2003). Several studies and literature reviews have indicated that many patients encounter various problems and unmet needs in the first few weeks after hospital discharge, including difficulty with activities of daily living, emotional problems, knowledge deficits, insufficient help, uncertainty and anxiety, and a need for more information than was received during the hospital stay (Bull 2000, Naylor 2002, Parker *et al.* 2002, Parkes & Shepperd 2004, Mistiaen *et al.* 2007). Adverse outcomes have been linked to unidentified, and therefore, unmet continuing care needs (Mistiaen *et al.* 2007). Inconsistent DP assessment practices and decision making call for improved methods to efficiently and accurately identify patients at risk for adverse outcomes after discharge (Bowles *et al.* 2003, Bowles *et al.* 2008, Holland *et al.* 2012).

BACKGROUND

A DP decision support tool was developed and tested to differentiate between patients who are likely to receive formal hospital DP services and those who are not (Holland *et al.* 2006, Holland & Hemann 2011). This tool, referred to as the Early Screen for Discharge Planning (ESDP), was developed from 24 potential variables identified from a review of the DP literature. Logistic regression was used to identify the resulting subset of four variables (age, disability, living situation prior to hospitalization, and self-reported walking limitation) that were significantly associated with a consultation to a hospital Discharge Planner. These regression coefficients were used to create a simple scoring algorithm that reflected the likelihood that a given patient would receive attention and DP services from a Discharge Planner (score range, 023). A receiver operating characteristics curve was used to select a single threshold score to serve as the cut point. Patients with the cut point score of 10 or greater should be prioritized to receive attention from a Discharge Planner early in their hospital stay.

The diagnostic accuracy of the ESDP proved satisfactory in a separate validation study (Holland *et al.* 2006) and is indicated by a positive likelihood ratio of 2.88 [0.69/0.24] and a negative likelihood ratio of 0.41 [0.31/0.76]). A likelihood ratio combines the sensitivity and specificity of a screen into one number (Lang & Secic 2006). In the case of the ESDP, a

patient with a score of 10 or greater is almost three times more likely to receive attention from a Discharge Planner sometime during their stay. There is little chance that a patient with a score less than 10 will be seen. The tool consists of four clinically sensible variables available from routine hospital admission data.

While the ESDP has proven to be a successful indicator of the likelihood of DP consultation, the question remains whether patients with a high ESDP score are those with multiple continuing care needs such as difficulties with activities of daily living, knowledge deficits, uncertainty or anxiety. If this association could be established, it would strengthen the evidence for the application of the ESDP as part of the DP process, with potential for broader influence in decision making in other care processes beyond the discharge planning process.

With respect to the DP process, a standardized screen that identifies patients early in the hospital stay at risk for complex discharge plans due to multiple continuing care problems may improve the efficiency, accuracy, and consistency in deploying hospital DP resources. The purpose of the study was to describe the ability of an evidence-based discharge planning decision support tool to identify and prioritize patients appropriate for early discharge planning intervention. Specifically we aimed to determine whether patients with a high ESDP score report more problems and continuing care needs in the first few weeks after discharge than patients with low ESDP scores.

METHODS

Using a quality health outcomes framework (Holland & Harris 2007), we designed descriptive cross-sectional study. Patients were enrolled in the study within 24 hours of admission. Problems and continuing care needs were measured using a questionnaire mailed to each patient 6 to 10 days after discharge.

In accordance with the DP model in the study setting, the role of staff nurses (RNs) included assessments of their patients' current needs and anticipation of future continuing care needs. In general these assessments were brief and included three or four questions to evaluate 1) the patient's capacity for independence, 2) the possibility of the patient being cared for in the environment from which he or she entered the hospital, and 3) the likelihood of the patient needing formal post acute services such as home healthcare. On the basis of the RNs' individual decision making, a Discharge Planner (RN or Social Worker [SW]) may or may not have been consulted during the patient's hospital stay. At the time of the study, assessments by Discharge Planners at the study site were also not standardized.

The study was conducted on four nursing units (2 medical and 2 surgical) in a hospital of more than 800 beds affiliated with a large Midwest academic medical center. The medical center's catchment area contains 18 counties in two states. According to census data, the region's population is predominantly white, with cultural groups such as Somali, Hispanic or Latino, and Southeast Asian representing approximately 10% (U. S. Census Bureau 2002).

The study sample included 260 adult cognitively intact patients who were sequentially admitted to one of the four nursing units, were discharged from the same unit, and who returned to their home in the community. Cognitive impairment was determined by responses to a 6-item screener for cognitive impairment (Callahan *et al.* 2002). Patients were ineligible for the sample if they were cognitively unable to self-report needs and problems experienced after discharge. Enrolled patients were also excluded from final analysis if they were discharged to facility care instead of their homes in the community. An oversampling of 20% was planned because of the expectation that some patients would be lost to follow-

up due to death, rehospitalization, facility placement after discharge, or choice to decline further involvement in the study. To enhance the potential to generalize the results, the sample was stratified on the basis of 2005 national estimates of age categories for hospitalized adults (18-44 years, 31.5%; 45-64 years, 27%; 65-84 years, 32%; and ≥85 years, 9.5%) (MedPac 2007).

Sample size was powered to determine whether a difference existed in the numbers of problems after discharge between patients with a high ESDP score and those with a low score. The observed sample of 45 patients with a high ESDP score, out of 195 patients, provided 80% power to detect at 5% significance the effects sizes for two-sample *t* tests as low as the moderate value of 0.48. Therefore, the sample was sufficiently powered to detect clinically meaningful differences.

After approval from the institutional review board was received, potential participants were identified using a daily, computer-generated admission list for each of the four nursing units. Initial review for inclusion criteria (age, indications of cognitive status, expected return to the community) occurred through access to the electronic hospital record. After cognitive status was verified with the 6-item screener, patients were enrolled in the study within 24 hours of admission and monitored through medical record review until discharge. The ESDP was administered by a research assistant soon after the patient was enrolled in the study. Caution was taken not to interrupt usual DP practice in the study setting. The ESDP scores were not shared with any hospital care provider. No institutional DP practice changes occurred during the study data collection period.

Problems and continuing care needs were self-reported in patient responses on the Problems After Discharge Questionnaire – English Version (PADQ-E), mailed to each patient 6 to 10 days after discharge (Holland *et al.* 2011b). To improve the return rate, a research assistant called each patient approximately 5 days after hospital discharge to remind the patient that the PADQ-E would arrive in the mail shortly. The patients were asked to complete the PADQ-E and return it (in a stamped envelope provided) on the same day they received it, if possible. They received a $10 remuneration to further encourage their participation.

The PADQ was developed on the basis of a theoretical framework of continuing care needs and problems of elderly persons after hospital discharge (Mistiaen *et al.* 1999). Problems are defined as troubles, worries, limitations, concerns, inconveniences, or difficulties, and were measured with questions such as “Were you able to [take a shower or bath] by yourself during the past week?” Subscales include informational needs (medications, activity level, appointments), personal care (shower/bathe, dress/undress), mobility (toileting, stairs), ability to manage household activities (prepare food, grocery shop, do laundry), ability to follow instructions and directions, and physical and emotional difficulties (Mistiaen & Evers 1997, Duijnhouwer & Mistiaen 1999). The English version (PADQ-E) was translated and tested for use in a population of recently hospitalized adults of all ages (Holland *et al.* 2011b). The Cronbach α for the PADQ-E subscales in the current study ranged from 0.75 to 0.91. Additional sociodemographic and health characteristics of patients to describe the sample were collected through medical record review using an investigator-developed tool.

Sample characteristics were analyzed with descriptive statistics. Group differences (high or low ESDP score) were compared with *t* tests, and adjusted for unequal variance when appropriate. Frequency data were compared with χ^2 tests or Fisher exact tests where appropriate. All data were analyzed with statistical software (SAS Version 9.2; SAS Institute, Inc, Cary, North Carolina).

RESULTS

Of the 260 patients enrolled in the study, 25 were transferred from the study unit before discharge, or their discharge disposition was facility placement, rendering them ineligible. Of the remaining 235 patients, 195 returned the PADQ-E after hospital discharge for a 75% response rate overall. Table 1 compares responders and nonresponders. Characteristics of nonresponders only differed from responders in education level and reason for admission. Responders were more highly educated than nonresponders ($p = .01$). More nonresponders than responders were admitted for medical reasons than for surgical reasons ($p = .03$).

The mean (standard deviation) age of patients who returned a PADQ-E was 55.7 (±20.2) years, and the range was 18-98 years. Most responders (95.9%) were white and stayed an average of 5.0 (±5.7) days in the hospital. Forty-one (21.0%) lived alone before hospital admission. Only 19 (9.7%) were seen by a hospital Discharge Planner, and only 15 (7.7%) were referred to community-based services after discharge (See Table 1).

Participants were divided into two groups on the basis of the predetermined cut point of ESDP scores of 10 or greater (a “high” score). Forty-five (23.1%) had a high ESDP score. Table 2 compares the problems of the two groups as reported on the PADQ-E. Patients with high ESDP scores reported significantly more problems (mean [standard deviation], 16.3 [8.7]) than those with low scores (12.2 [8.4]; $p < .01$). Within the subscales, patients with high ESDP scores reported more problems with personal care ($p = .02$), household activities ($p < .01$), mobility ($p = .01$), and physical difficulties ($p = .01$) than patients with low ESDP scores. Furthermore, significantly more of the patients with a high ESDP score received consults to a DP RN or SW ($p< .01$) and referrals for community-based services ($p = .049$).

DISCUSSION

The need for improved methods to support hospital DP is recognized in two national reviews of DP practice (Parker *et al.* 2002, Phillips *et al.* 2004). The results of this study provide further evidence for use of the ESDP in the hospital DP process to support decision making in the critical step of identifying patients who should be targeted to receive early intervention from hospital Discharge Planners. The categories of reported problems—especially mobility, household activities, and personal care—are consistent with those reported in older adults after hospitalization and patients who are referred to home healthcare (Bowles 2000, Siebens *et al.* 2000). Identifying patients with many of these issues early in the hospital stay maximizes the time available to Discharge Planners to identify resources willing and able to meet continuing care needs and ensure continuity of care. Patients with mobility, household activities, and personal care problems may also benefit from referrals to physical and occupational therapy during the hospital stay.

Because it is a deliberative process, DP incorporates determining the patient’s capacity for self-care, anticipating future care needs, determining patient and family preferences, identifying resources necessary and available to meet continuing care needs, and educating patients and caregivers to prepare them for a successful recovery (Volland 1988). The current lengths of hospital stay have decreased the available time to complete this process successfully while increasing the complexity of care needs at the point of discharge. For example, at the study site a rapid recovery care path for some surgeries prescribe discharge of a patient with a new ostomy on postoperative day 2. Early identification of patients with multiple problems leading to further complexities in their discharge plan is critical.

Shortened lengths of stay compress the time available to meet multiple care priorities, while staff nurses continue to focus on meeting the patient’s physiological needs and performing necessary interventions (e.g., wound care treatments, medication administration, education)

(Rhudy *et al.* 2010). However, even if staff nurses possessed enough time to complete more comprehensive DP assessments, evidence shows that RNs tend to overestimate both the patient's abilities, home environment, self-care capabilities, and the availability of skilled caregivers (Bowles *et al.* 2002). Staff RN's typically have a high tolerance of risk and ambiguity (Clemens & Hayes 1997), and lack knowledge about which patients might be appropriate candidates for post acute services. Patients who "look fine" or are able to convince nurses that they have no needs contribute to missed consults to hospital Discharge Planners (Bowles *et al.* 2003). All of these factors support the need for an evidence-based standardized DP decision support tool to help staff nurses and others identify patients early in the hospital stay who should be prioritized for intervention by hospital Discharge Planners (Arenth & Mamon 1985, Mamon *et al.* 1992, Prescott *et al.* 1995, Reilly *et al.* 1996, Clemens & Hayes 1997, Potthoff *et al.* 1997, Bowles *et al.* 2002, Bowles *et al.* 2003, Greenwald *et al.* 2007, Lubell 2007, Bowles *et al.* 2008).

The present study has limitations. It was confined to one academic medical center in the Midwest. The sample included only patients who were cognitively intact and discharged to home. Results may vary in hospitals of different sizes, in different locations, and with patients of different ethnic backgrounds. While the study sample excluded patients with cognitive impairments, patients who are cognitively intact are at greater risk for missed consults to Discharge Planners.

CONCLUSION

Proactive DP through early identification of patients with multiple post acute needs is essential for successfully managing care transitions. Use of an evidence-based decision support tool minimizes biases inherent in decision making, promotes efficient use of hospital DP resources, and improves the opportunity for patients to access the community resources they need to promote successful recovery after hospitalization. The study further contributes to our understanding of fundamental post acute issues faced by patients and their families.

RELEVANCE TO CLINICAL PRACTICE

Planning to meet multiple continuing care needs calls for teamwork in assembling and interpreting extensive and complex information (Holland *et al.* 2011a). Early mobilization of available team members has the potential for improving continuity of care, patient safety, and resource use, and it may impact patient and clinician satisfaction with the DP process (Kripalani *et al.* 2007). Instituting evidence-based DP decision support tools can alert hospital clinicians to focus on patients with multiple continuing care needs at risk for complex discharge plans.

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ABBREVIATIONS

DP	discharge planning
DPN	discharge planning nurse
ESDP	Early Screen for Discharge Planning

PADQ-E	Problems After Discharge Questionnaire
RN	registered nurse
SW	social worker

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Table 1

Demographic Characteristics of the 40 Nonresponders and 195 Responders

Variable[a]	Nonresponders	Responders	*p* Value*
Sex (*n* = 235)			
Male	16 (40.0)	92 (47.2)	.41
Female	24 (60.0)	103 (52.8)	
Age, mean (SD) years (*n* = 235)	49.7 (22.6)	55.7 (20.2)	.09
(range)	(18-91)	(18-98)	
Age categories, years (*n* = 235)			
18-44	18 (45.0)	58 (29.7)	.18
45-64	10 (25.0)	58 (29.7)	
65-84	7 (17.5)	60 (30.8)	
≥85	5 (12.5)	19 (9.7)	
Race/Ethnicity (*n* = 235)			
White	37 (92.5)	187 (95.9)	.19
Black	0	2 (1.0)	
Hispanic	2 (5.0)	1 (0.5)	
Unknown	0	3 (1.5)	
Other	1 (2.5)	2 (1.0)	
Lived alone before hospital admission (*n* = 234)			
No	30 (76.9)	159 (81.5)	.50
Yes	9 (23.1)	36 (18.5)	
ESDP score, mean (SD) (*n* = 234)	6.4 (4.9)	6.8 (4.8)	.68
Highest education level (*n* = 234)			
≤8th grade	2 (5.1)	7 (3.6)	.01
Some high school	4 (10.3)	8 (4.1)	
High school degree or GED	11 (28.2)	74 (37.9)	
Some college	19 (48.7)	53 (27.2)	
4-y college degree	1 (2.6)	26 (13.3)	
Postgraduate study	2 (5.1)	27 (13.8)	
Length of stay, mean (SD) days (*n* = 234)	6.4 (7.7)	5.0 (5.7)	.30
(range)	(1-32)	(1-51)	
Employment status (*n* = 234)			
Employed	18 (46.2)	94 (48.2)	.15
Unemployed	9 (23.1)	22 (11.3)	
Retired	8 (20.5)	64 (32.8)	
Disability	4 (10.3)	11 (5.6)	
Unknown	0	4 (2.1)	
Medical/surgical care (*n* = 233)			
Medical	24 (63.2)	86 (44.1)	.03
Surgical	14 (36.8)	109 (55.9)	
Consultation with DPN/SW (*N* = 260)			

Variable[a]	Nonresponders	Responders	*p* Value[*]
No	59 (90.8)	176 (90.3)	.90
Yes	6 (9.2)	19 (9.7)	
Referral made for post acute services (*N* = 260)			
No	62 (95.4)	180 (92.3)	.57
Yes	3 (4.6)	15 (7.7)	

Abbreviations: DPN, discharge planning nurse; ESDP, Early Screen for Discharge Planning; SW, social worker; GED, General Education Development.

[a]Values are presented as number and percentage of patients unless stated otherwise.

[*]*t* Test with equal or unequal variance or χ^2 or Fisher exact test.

Table 2

Differences in Numbers of Problems/Unmet Needs Among Responders With Low and High Screen Scores

Problems and Unmet Needs	Responders[a]		
	Low Screen Score (*n* = 150)	High Screen Score (*n* = 45)	*p* Value*
Problems	12.2 (8.4) (10.8-13.5)	16.3 (8.7) (13.7-18.9)	< .01
Unmet needs	4.3 (5.3) (3.4-5.2)	4.9 (4.4) (3.6-6.2)	.51
Unmet information needs	2.9 (3.2) (2.4-3.4)	3.5 (3.2) (2.6-4.5)	.23
Personal care problems	0.5 (1.0) (0.3-0.7)	1.1 (1.5) (0.6-1.5)	.02
Unmet personal care needs	0.1 (0.5) (0-0.2)	0.1 (0.5) (0-0.3)	.52
Household activities problems	2.6 (2.7) (2.1-3.0)	3.9 (2.8) (3.0-4.7)	< .01
Unmet household activities need	0.3 (1.1) (0.2-0.5)	0.3 (1.0) (0-0.6)	.83
Mobility problems	1.3 (1.6) (1.1-1.6)	2.0 (1.5) (1.5-2.4)	.01
Unmet mobility needs	0.1 (0.5) (0-0.2)	0.1 (0.3) (0-0.2)	.32
Equipment problems	0.1 (0.4) (0-0.2)	0.3 (0.9) (0-0.6)	.21
Instructions problems	0.3 (0.8) (0.1-0.4)	0.2 (1.0) (0-0.5)	.95
Physical problems	2.8 (1.8) (2.5-3.1)	3.6 (2.1) (3.0-4.3)	.01
Unmet physical difficulty needs	0.4 (0.9) (0.3-0.6)	0.5 (1.1) (0.1-0.8)	.74
Psychological problems	1.7 (1.8) (1.4-2.0)	1.7 (1.9) (1.1-2.2)	.82
Unmet psychological difficulty needs	0.4 (1.3) (0.2-0.7)	0.4 (1.0) (0-0.7)	.66
Consult with DPN or SW, No. (%) †	8 (5.3)	11 (24.4)	.001
Referral for post acute services, No. (%)	8 (5.3)	7 (15.6)	.049

Abbreviations: DPN, discharge planning nurse; SW, social worker.

[a] Values are presented in mean (SD) (95% confidence interval) unless specified otherwise.

* *t* Test with equal or unequal variance or χ^2 or Fisher exact test