

Title Page

Include the following:

- Title of Project.

ESDP in Community Hospitals

- Principal Investigator

Diane E. Holland, PhD, RN

Team Members.

Cheryl Brandt, PhD, RN, Co-I

Vy Nguyen, Study Coordinator

Adriana Delgado, MAdm, CCRP, Study Coordinator

- Organization.

Mayo Clinic Rochester

- Inclusive Dates of Project.

05-01-2014 to 04-30-2016

- Federal Project Officer.

Denise Burgess

- Acknowledgment of Agency Support.

This project was supported by grant number R03HS022923 from the Agency for Healthcare Research and Quality. The content is solely the responsibility of the authors and does not necessarily represent the official views of the Agency for Healthcare Research and Quality.

- Grant Award Number. 5R03HS022923-02

Abstract

Purpose: Determine the predictive performance in a rural regional community hospital of a discharge planning decision support tool, the Early Screen for Discharge Planning (ESDP), developed in an urban academic medical center.

Scope: Before regional community hospitals adopt the ESDP as a decision support tool, there should be evidence that the tool performs as expected within their patient populations and settings.

Methods: Using a comparative, descriptive survey study design, a convenience sample of 222 patients identified at admission was consented. Sample characteristics and ESDP scores were collected on enrollment. High ESDP scores identify patients whose discharge plans are not routine and who would benefit from early discharge planning intervention. The Problems after Discharge Questionnaire, EuroQoL-5 Dimensions quality of life measure, length of stay, and use of post-acute services were completed after discharge. Sample demographic and clinical characteristics were summarized, and outcomes were compared between subjects with low and high ESDP scores.

Results: Over half (51.8%) of the sample had a high ESDP score compared with 23.1% in a sample of patients at an academic medical center. Patients with high ESDP scores reported more problems after discharge ($p = 0.02$), reported a lower quality of life ($p < 0.001$), had longer length of stays ($p = 0.044$), and used post-acute services more ($p = 0.006$) than patients with low ESDP scores. The difference in the average percentage of unmet needs was not statistically significant ($p = 0.12$), although high-ESDP patients reported more needs than low-ESDP patients. These findings are consistent with ESDP results in an academic medical center.

Key Words:

Patient Discharge; Hospitalization; Hospitals, Community; Hospitals, Rural

PURPOSE

The purpose of this study was to determine the predictive performance of the Early Screen for Discharge Planning (ESDP) in a regional community hospital. The central hypothesis of this study was that the ESDP differentiates between patients in regional community hospitals who would benefit from those who would not benefit from early intervention by hospital discharge planning (DP) personnel, as measured by problems and unmet continuing care needs in the first few weeks after discharge, quality of life, length of stay, and referrals to post-acute services.

We tested our central hypothesis with the following specific aims:

1. Compare the percentages of reported problems and unmet continuing care needs between patients in a regional community hospital with high ESDP scores versus those patients with low ESDP scores.

Hypothesis for Aim 1. Patients with high ESDP scores will report higher percentages of problems and unmet continuing care needs in the first few weeks after discharge than patients with low ESDP scores will.

2. Compare self-reported quality of life between patients in a regional community hospital with high ESDP scores versus those patients with low ESDP scores.

Hypothesis for Aim 2. Patients with high ESDP scores will report lower quality of life in the first few weeks after discharge than patients with low ESDP scores will.

3. Compare length of stay and number of referrals to post-acute care services between patients in a regional community hospital with high ESDP scores and those patients with low ESDP scores.

Hypothesis for Aim 3. Patients with high ESDP scores will have longer lengths of stay and more referrals to post-acute care services than patients with low ESDP scores will.

SCOPE

Background. Early identification of hospitalized patients with complex post-acute care needs maximizes the time available to design and implement a comprehensive discharge plan. Our prior work in populations of adults hospitalized in academic medical centers shows that, when hospital DP personnel are engaged early in patients' hospital stay, the timely organization, engagement, and coordination of services needed to improve continuity of care, patient safety, and resource use is enhanced; length of stay is decreased; and patients report fewer unmet needs after discharge. Conversely, when DP is not prioritized early in the hospital stay, our research confirms that patients return home with unmet needs, and subsequent readmissions increase.

There are two key decision points in the DP process. The first is systematic screening to identify persons whose hospital discharge plans are not routine. This has long been recommended as a critical first step in the DP process.^{1,2} For decades, the Medicare Conditions of Participation has emphasized identifying "at an early stage all patients likely to suffer adverse health consequences on discharge if there is not adequate planning."² This implies that the subset of patients whose discharge plans are not routine (e.g., their discharge plans include multifaceted, complex post-hospital care needs that may require coordination between hospital- and community-based care providers) should be identified by hospital staff.³ This type of specialized DP services requires comprehensive evaluation beyond the scope of the direct-care staff roles. Therefore, referrals are made for additional involvement by DP experts whose roles frequently involve coordination of complex care across settings (e.g., DP nurses and social workers).⁴

The second key decision point in the DP process establishes whether formal post-acute services will be necessary to successfully meet the patient's continuing care needs. Despite the abundance of studies related to DP, researchers of screening tools have focused exclusively on this second point, and little attention has been given to early identification of patients whose discharge plans will benefit from specialized DP services. Without early identification of patients who would benefit from involvement of DP experts, the experts are not engaged in a timely fashion, resulting in continuing care needs that are not satisfactorily met. Although DP is a hospital process universally available to all patients, not all patients require the services of a DP expert. A screen that supports this first key decision is essential for matching patient needs with service delivery – getting the right services to the right patients at the right time. Furthermore, outcomes related to the second decision may very well be dependent on the first key decision – whether or not expert DP personnel become involved in the planning and implementation of the patient's discharge plan.

There are a few empirically based screens identified in the DP literature that focus on the second decision point (use of post-acute services). Some limitations to their use in practice exist due to exclusion in their development of certain types of hospitalized adults, such as surgical patients, nonverbal patients, patients on intensive care units, and patients less than 55 years or 85 years older.⁵⁻⁸ The Blaylock Risk Assessment Screen (BRASS) was developed to identify only elderly hospitalized patients at risk for longer lengths of stay and more frequent re-admissions.⁶ The Discharge Decision Support System was designed specifically to predict hospitalized adults 55 years or older for whom a referral to post-acute services was recommended.⁵ Two other screens with endpoints of interest to DP exist, although they have not been designed specifically as DP decision tools. The Hospital Admission Risk Profile (HARP) was developed as an instrument to stratify adult patients age 65 years or older at hospital admission according to the risk of developing a new activity of daily living (ADL) disability.⁹ Evans and Hendricks designed a screen almost three decades ago in a sample of veterans to identify adult patients at risk of longer lengths of stay, nursing home placement, and re-admission.⁷ The focused endpoints of these screens are linked to the second DP decision point rather than to the early involvement of hospital DP experts to assist in the DP process.

The BOOSTing Care Transitions program¹⁰ recognized that there are no externally validated tools to risk-stratify adult patients transitioning out of the hospital. They compiled a 'user-friendly' risk tool of seven variables: use of problem medications, depression, specific principal diagnoses, polypharmacy, poor health literacy, absence of support, and hospitalization in the last 6 months.¹⁰ The BOOST protocol suggests that, if any one of these factors exists, risk-specific interventions should be considered. A problem with the tool is that nearly every hospitalized patient screens in.

In contrast, the Early Screen for Discharge Planning (ESDP), consisting of a limited number of characteristics readily available early in the hospital stay, was developed and validated as a DP screen with the specific purpose to support the first critical decision point – engaging expert DP personnel early in the hospital stay. The ESDP was designed to target appropriate use of a costly, scarce resource, internal DP experts, so patients most in need of expert DP assistance get the help they need.⁴

The ESDP was specifically designed as a decision support tool to help hospital clinical staff efficiently activate DP experts to target the subset of adult patients (18 years or older) whose discharges include multifaceted, complex post-hospital care needs that require the immediate attention of expert DP services for in-depth evaluations as well as coordination between hospital- and community-based care providers when appropriate.⁴ This allows for DP resources to be leveraged to patients who may need

complex DP, whether or not they need formal post-acute services. For example, a patient with significant care needs may have a strong family/informal support system that is able to provide all the care that is needed. However, they still need expertise with planning to successfully meet complex care needs.

It is well known that differences in institution-specific attributes (bed size, teaching status, rural/urban location) and patient characteristics (age, severity of illness, socioeconomic status, functional status) can create variability in the performance of predictive models.^{11,12} Academic medical centers are larger, mostly tertiary care centers with ready access to multiple subspecialists and specialized technology. They are often located in urban areas. Community hospitals are smaller, usually with a focus on primary outpatient care, limited inpatient care, and very limited subspecialty care. How a clinical decision tool performs varies based on the nature of the individuals being measured and the circumstances within which they are being assessed.¹³ Before adopting a decision support tool, there should be evidence that the support tool performs as expected within populations and settings of interest.¹⁴ The proposed study was designed to determine whether the ESDP, developed and initially tested in academic medical centers, can also identify patients in community hospitals who would benefit from focused, in-depth evaluations with early involvement of specialized DP services. This is the next logical step toward widespread dissemination and the ability to test interventions to meet the post-acute care needs of patients during this vulnerable period after hospital discharge.

Context. Patients were recruited from the MHS-Eau Claire hospital daily admission lists. All adult patients were reviewed for study eligibility by the study coordinator within 24-48 hours of admission (48 hours if admitted over the weekend). The sample was limited to adults who were returning home in the community, because the investigators were primarily interested in the problems and unmet needs encountered after discharge during the recovery period at home. To enhance the generalizability of the results, the sample was stratified based on 2010 national estimates of age categories for hospitalized adults.¹⁵

Setting. The sample was accrued from inpatients receiving care in Mayo Clinic Health System-Eau Claire (MCHS-EC), Wisconsin. The hospital in Eau Claire has 304 beds, averages about 10,500 adult admissions annually, and employs approximately 220 physicians. It is located in Eau Claire County, which is categorized as a small metro county, and the local population stands at just under 100,000 per the 2011 Census Bureau estimate. The study co-investigator, Dr. Brandt, served as site investigator. At the time of the study at MCHS-EC, the DP policy applied to Social Services and Case Management, and the Discharge Procedure policy applied to the Department of Nursing. According to that policy, coordination of DP is communicated to members of other disciplines in the core care team during Core Care rounds and via documentation. In addition to DP, Case Managers have utilization review responsibilities as well. No standardized screening tool is referenced in the DP policy. No DP decision support was currently used.

Participants. The study targeted adults hospitalized for a variety of medical and surgical conditions in a rural regional community hospital that is part of a large health system in the Midwest. A convenience sample of 222 patients was selected from the hospital admission lists. All adult patients were reviewed for study eligibility by the study coordinator within 24-48 hours of admission (48 hours if admission occurred over the weekend). The sample was limited to adults who were returning home in the community, because the investigators were primarily interested in the problems and unmet needs encountered after discharge during the recovery period at home. Inclusion criteria were age 18 years or older; able to read and speak English; and returning home in the community after discharge. Patients

discharged to facility care, including jail or prison, and pregnant women were excluded. Both of these groups of patients present with different sets of discharge needs than the usual population of adults hospitalized for medical or surgical reasons and returning home to the community. Because problems and unmet needs are self-reported, patients with dementia identified in the medical record were also excluded.

METHODS

Study Design. A comparative, descriptive survey design was used to address the specific aims.

Data Sources/Collection Procedures. Following IRB approval, the site investigator and study coordinator were trained in study procedures by Dr. Holland in person using role playing and case studies from our prior work until 100% agreement was achieved among the investigators and the study coordinator. Inter-rater reliability was assessed on the first five patients enrolled and randomly checked once per month by the site investigator. The goal of 100% agreement was achieved. Fidelity to the intervention was monitored weekly in the first month and then monthly thereafter, assuring that the data were collected as outlined in study procedures. Fidelity to study procedures was enhanced through close contact with the PI by weekly meetings via visual and audio conferencing between the site personnel and Dr. Holland.

Subject Recruitment. The study coordinator received daily lists of admissions. The patient was approached to explain the study, after inclusion criteria were reviewed by discussion with clinicians and confirmed by record review and after consent was obtained. A script was used by the study coordinator with the patient to review the study information and provide informed consent.

Data Collection Procedures. Upon enrollment, sample characteristics and the ESDP data were collected via in-person interview and medical record review by the study coordinator. On enrollment, patients and clinicians were asked whether the patient would be discharged back home to the community. Discharge disposition was monitored throughout the hospitalization. If the patient's post-acute disposition changed to facility care, the survey was not mailed. The patient's All-Patient Refined Diagnosis-Related Group Severity of Illness (APR DRG SOI) was obtained after discharge from an administrative database.

The survey was either mailed 1 week after discharge or was completed by a phone call according to patient preference. The survey consisted of the Problems after Discharge Questionnaire-English Version (PADQ-E)¹⁶ and the five-item EQ5-D quality of life measure.¹⁷ Patients were also asked about any post-acute services they received after hospital discharge, to verify the referral to services received. Data were entered into the web-based REDCap® database. The PI monitored the data entry for quality and timeliness.

Measures.

The Early Screen for Discharge Planning (ESDP) The PI, Dr. Holland, developed and prospectively validated the ESDP tool using two large, independent samples of adults hospitalized for either medical or surgical reasons in an academic medical center.¹⁸ The study identified four variables available from routine hospital admission clinical data (walking limitation, age, living alone prior to admission, and level of disability) that exhibit high sensitivity and specificity (AUCs were .82 and .84) in identifying patients who should receive targeted attention from a DP expert. Possible scores ranged from 0 to 23. Based on previous studies, a score of 10 or more (high ESDP score) prompts the hospital clinician to notify the DP expert to conduct a focused, in-depth evaluation of patient's post-acute care needs. The ESDP takes 1-3 minutes to complete. The study coordinator collected the ESDP data after consenting the patient.

Problems After Discharge Questionnaire-English Version (PADQ-E) The PADQ-E is a structured questionnaire constructed for DP research.¹⁶ The instrument measures important patient factors often overlooked that contribute to poor post-acute recovery experience and that are recognized as important factors likely to impact readmission.¹⁹⁻²¹ A problem is defined as any worry, limitation, concern, or difficulty reported by the patient. An unmet need is a need for help identified by the patient that is reported to be inadequately met. In total, 36 items span seven domains: personal care, household activities, mobility, equipment, instructions, physical function, and psychosocial function. Problems and unmet needs are reported both as 'any at all' and as the average number reported (overall and for each domain). Internal consistency of the subscales, measured by Cronbach's alphas, ranged from 0.74 to 0.91.¹⁶ The PADQ-E takes approximately 15-20 minutes to complete. It is reliable whether self-administered or completed by interview.

Quality of Life The EuroQoL-5D (EQ-5D)¹⁷ is a standardized instrument for use as a measure of health status. The EQ-5D comprises five dimensions of health (mobility, self-care, usual activities, pain/discomfort, anxiety/depression) with three levels (some, moderate, extreme problems).²² Applicable to a wide range of health conditions and treatments, it provides a simple descriptive profile and a single index value for health status that can be used in the clinical and economic evaluation of healthcare.^{17,23,24} The EQ-5D is cognitively simple, taking only a few minutes to complete.

Length of Stay Hospital length of stay was obtained from an administrative database and verified by the study coordinator.

Referral to Post-Acute Services Referrals to post-acute services, such as home healthcare, were obtained by medical record review. Receipt of post-acute services, as indicated by referral, was verified by patient self-report 1 week after discharge.

Data Analysis.

Descriptive statistics were used to summarize sample demographic and clinical characteristics and describe the data by groups. Continuous variables were summarized with means, standard deviations, medians, and ranges; categorical variables were summarized using frequency counts and percentages. Demographic and clinical features were compared between participants who completed the study, those lost to follow-up, and those whose discharge disposition changed from home to facility care. Additionally, comparisons of demographic and clinical features were made between participants with low (<10) and high (≥ 10) ESDP scores using two-sample t, Wilcoxon rank sum, chi-square, Fisher exact, and Cochran-Armitage trend tests, as appropriate.

Aim 1 was to compare the percentages of reported problems and unmet continuing care needs between patients in regional community hospitals with high ESDP scores (≥ 10) and those patients with low ESDP scores. The percentages of problems and unmet needs were described using means, medians, standard deviation, and range for the two groups (low and high ESDP scores). Comparisons of the percentages of reported problems and unmet needs between participants with low and high ESDP scores were evaluated using two-sample t or Wilcoxon rank sum tests, as appropriate.

Aim 2 was to compare self-reported quality of life between patients in regional community hospitals with high ESDP scores (≥ 10) and those patients with low ESDP scores. Quality of life following hospital discharge was described using frequency counts and percentages for the two groups (low and high ESDP scores) for each of the five EQ-5D dimensions of health (with each dimension scored as no problems, some problems, or severe problems). These dimensions were compared between participants with low and high ESDP scores using Cochran-Armitage trend tests.

Aim 3 was to compare length of stay and number of referrals to post-acute care services between patients in regional community hospitals with high ESDP scores (≥ 10) and those patients with low ESDP scores. Hospital length of stay and the number of referrals to post-acute services were described using means, medians, standard deviation, and range for the two groups (low and high ESDP scores). These features were compared between participants with low and high ESDP scores using two-sample t and Wilcoxon rank sum tests, as appropriate.

All tests were two sided, and $p < 0.05$ was considered statistically significant. Statistical analyses were performed using SAS 9.3 statistical software (SAS Inc., Cary, North Carolina).

RESULTS

Sample Demographic and Clinical Characteristics

Overall, 222 adult patients were enrolled in the study. All but one patient was White and non-Hispanic. Gender in the sample was relatively evenly split, with 46.9% men and 53.2% women. The sample was stratified based on the 2010 national estimates of age categories for hospitalized adults.¹⁵ The overall average age was 61.7 ± 16.9 years. This was higher than the sample from an academic medical center (average age, 49.7 ± 22.6 years)²⁵ Over half (115/222, 51.8%) had an ESDP score of 10 or greater, compared with 23.1% in the academic medical center sample.²⁵ Thirty-one patients (13.9%), when enrolled early in their hospital stay, planned on returning to their home in the community but ultimately were transferred to a nursing facility at time of discharge. Forty-three (19.3%) did not return the questionnaires and were lost to follow-up; 148 (66.7%) completed the study, exceeding the number required by the a priori power calculation (138). Patients lost to follow-up were on average younger and had a lower ESDP score than those who completed; patients whose disposition changed to facility placement were on average older, with higher ESDP scores (see Table 1).

Principal Findings

Aim 1. Problems and unmet continuing care needs (see Table 2).

The hypothesis for Aim 1 was partially supported. Patients with high ESDP scores had overall, on average, a statistically significantly higher percentage of problems after discharge than patients with low ESDP scores (34.1 ± 18.9 , 26.3 ± 15.6 ; $p = 0.02$). This finding is consistent with results of the ESDP when used in an academic medical center.²⁵ Of the five subscales of problem categories in the PADQ-E, high-ESDP-scoring patients had significantly more problems with personal cares (20.6 ± 24.9 , 6.8 ± 17.8 ; $p < 0.001$), household activities (52.6 ± 40.4 , 27.6 ± 35.6 ; $p < 0.001$), and mobility (34.0 ± 31.8 , 15.7 ± 23.8 ; $p < 0.001$). Finally, although high-ESDP-scoring patients reported more physical complaints and psychological complaints on the PADQ-E, the differences between high-ESDP- and low-ESDP-scoring patients were not statistically significant ($p = 0.07$ and $p = 0.14$, respectively).

Although, overall, the average percentage of unmet needs of high-ESDP-scoring patients was higher than that of low-ESDP-scoring patients, the difference was not statistically significant ($p = 0.12$). This finding is consistent with results of the ESDP when used in an academic medical center.²⁵ Patients with high ESDP scores also had, on average, higher percentages of unmet needs in four of the five subscale problem categories of the PADQ-E. An exception existed for the personal care subscale, for which high-ESDP-scoring patients reported, on average, a slightly lower percentage of unmet needs versus low-ESDP-scoring patients (1.3 ± 6.8 , 1.9 ± 10.2 ; $p = 0.66$).

Aim 2. Self-reported quality of life (see Table 3).

The hypothesis for Aim 2 was supported. Patients with high ESDP scores had, on average, statistically significantly lower EQ-5D scores across all five dimensions (mobility, $p \leq 0.001$; self-care, $p = 0.006$; usual activities, $p = 0.006$; pain/discomfort, $p < 0.001$; anxiety/depression, $p = 0.029$) as well as a lower health Index raw score overall ($p < 0.001$). High-ESDP-scoring patients also had, on average, lower scores on the summary health index of the EQ-5D ($p = 0.051$). Comparisons of self-reported quality of life between patients with high and low ESDP scores had not previously been measured and represent new knowledge regarding the differences between patients with high and low ESDP scores.

Aim 3. Length of stay and referrals to post-acute care services (see Table 4).

The hypothesis for Aim 3 was supported. Patients with high scores on the ESDP had, on average, statistically significantly longer length of stays than low-scoring patients (5.0 ± 6.1 , 3.7 ± 1.8 ; $p = 0.044$). A statistically significantly greater percentage of patients with high scores on the ESDP used post-acute services compared with patients in the low-ESDP-scoring group (34 [30.6%], 15 [14.4%]; $p = 0.006$). Differences in lengths of stay and use of post-acute services were consistent with those of patients hospitalized in academic medical centers^{26,27}

Discussion. The ESDP performed as predicted, as evidenced by the statistically significantly higher percentage of overall reported problems on the PADQ-E after discharge by patients with high ESDP scores. High-scoring patients had significantly more reported problems on three of the five subscales of the PADQ-E. Also, patients with high ESDP scores reported statistically significantly lower quality of life, as measured by the five dimensions of the EQ-5D. Last, high-scoring patients had longer lengths of stay and greater use of post-acute services at statistically and clinically significant levels.

Prior work in populations of adults hospitalized in academic medical centers shows that, when hospital DP personnel are engaged early in patients' hospital stay, the timely organization, engagement, and coordination of services needed to improve continuity of care, patient safety, and resource use are enhanced, length of stay is decreased, and patients report fewer unmet needs after discharge.^{18,26-30} Based on the findings of this study, integrating the ESDP into regional community hospital DP processes appears to result in many of the same corresponding system and patient benefits.

Limitations. Results of this study must be interpreted with the understanding that there were limitations. The study was conducted in one setting using one model of DP care. Results may not be applicable to other settings with other DP care models. The demographics of the study sample may not reflect community hospital patients in other geographic areas. These limitations restrict broad generalizability of study findings, but the results provide important preliminary findings for subsequent studies. Further study is needed to evaluate the ESDP in community hospital settings in a range of geographic areas with more diverse patient populations.

Conclusions. The specific central hypothesis of this study was that the ESDP differentiates between patients in regional community hospitals who would benefit and those who would not benefit from early intervention by hospital DP personnel, as measured by problems and unmet continuing care needs in the first few weeks after discharge, quality of life, length of stay, and referrals to post-acute services. The results of this study provide preliminary evidence that the ESDP differentiates between patients in regional community hospitals who would benefit and those who would not benefit from early intervention by hospital DP personnel. The confirmation of this hypothesis, through the results of this study, provides evidence to support the integration of the ESDP into regional community hospital DP processes, with the expectation that many of the same corresponding system and patient benefits are realized as when used in academic medical centers.

Significance.

Systematic screening to identify persons whose hospital discharge plans are not routine has long been recommended as the critical first step in the DP process.^{1,31} A screen that supports this first key decision is essential for matching patient needs with service delivery – getting the right services to the right patients at the right time. The ESDP was developed with this specific purpose for the DP process. The evidence from this study supports its use in regional community hospitals as well as in academic medical centers, making it a useful decision support tool for healthcare delivery systems.

Implications.

Evidence has been gained from this study that contributes to improvement in the quality and consistency of DP decisions, supporting an approach that is focused on patients most in need of specialized DP services. This focused DP approach can increase the time available to DP personnel to complete a comprehensive assessment and implement a discharge plan for patients most likely to have substantial post-acute needs. Moreover, this approach can be utilized in community hospitals, where the majority of patients receive their care.

7. LIST OF PUBLICATIONS and PRODUCTS (Bibliography of Outputs from the study)

Manuscripts are in development and, at this time, nearly ready for submission.

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Table 1: Group differences in sample demographic and clinical characteristics.

| Characteristic | Overall (N=222) | Completed Study (N=148) | Lost to Follow-up (N=43) | Disposition changed to facility placement (N=31) | P-value ¹ | P-value ² |
|--------------------------------|---------------------------------|---------------------------------|---------------------------------|--------------------------------------------------------|----------------------|----------------------|
| | | | Mean \pm SD Median (Range) | | | |
| Age in years | 61.7 \pm 16.9 61.5 (23-93) | 62.6 \pm 15.7 63.5 (23-93) | 51.4 \pm 16.6 51 (29-90) | 71.6 \pm 16.4 78 (36-91) | <0.001 | <0.001 |
| Number of co-morbid conditions | 4.8 \pm 3.8 4.0 (0-17) | 4.6 \pm 3.6 4.0 (0-15) | 4.2 \pm 3.4 4.0 (0-15) | 6.71 \pm 4.7 6.0 (0-17) | 0.045 | 0.648 |
| Number of medications | 9.2 \pm 5.6 9.0 (0-27) | 8.7 \pm 5.4 8.0 (0-25) | 9.4 \pm 5.4 9.0 (0-25) | 11.2 \pm 6.9 10.0 (0-27) | 0.218 | 0.504 |
| APR-DRG-SOI Score* | 2.2 \pm 0.8 2.0 (1-4) | 2.1 \pm 0.8 2.0 (1-4) | 2.2 \pm 0.8 2.0 (1-4) | 2.5 \pm 0.9 3.0 (1-4) | 0.053 | 0.426 |
| ESDP | 9.8 \pm 5.4 10.0 (0-21) | 9.7 \pm 5.3 9.0 (0-20) | 8.6 \pm 5.6 7.0 (0-21) | 12.2 \pm 4.6 11.0 (0-20) | 0.011 | 0.202 |
| ESDP Group | | | N (%)** | | 0.026 | 0.863 |
| | < 10 | 107 (48.2) | 76 (51.3) | 23 (53.5) | 8 (25.8) | |
| | \geq 10 | 115 (51.8) | 72 (48.7) | 20 (46.5) | 23 (74.2) | |
| Sex | | | | | 0.071 | 0.061 |
| | Male | 104 (46.9) | 72 (48.7) | 14 (32.6) | 18 (58.0) | |
| | Female | 118 (53.2) | 76 (51.4) | 29 (67.4) | 13 (42.0) | |

| | | | | | | | |
|---------------------------------|------------|------------|-----------|-----------|--|--------|--------|
| Ethnicity (N: 220) | | | | | | 0.136 | NA |
| White non-Hispanic | 219 (99.5) | 147 (100) | 43 (100) | 29 (96.7) | | | |
| Latino or Hispanic | 1 (0.5) | 0 (0) | 0 (0) | 1 (3.3) | | | |
| Race | | | | | | 0.191 | 0.305 |
| White | 211 (95.1) | 143 (96.6) | 40 (93.0) | 28 (90.3) | | | |
| Black | 0 (0) | 0 (0) | 0 (0) | 0 (0) | | | |
| Asian | 1 (0.5) | 1 (0.7) | 0 (0) | 0 (0) | | | |
| American Indian/ Alaskan Native | 5(2.3) | 3 (2.0) | 1 (2.3) | 1 (3.2) | | | |
| Other | 5(2.3) | 1 (0.7) | 2 (4.7) | 2 (6.5) | | | |
| Education (N: 212) | | | | | | 0.480 | 0.870 |
| High School Incomplete | 14(6.6) | 11 (7.5) | 3 (7.0) | 0 (0.0) | | | |
| High School Complete | 81(38.2) | 52 (35.6) | 15 (34.9) | 14 (60.9) | | | |
| Post High School | 117(55.2) | 83 (56.9) | 25 (58.1) | 9 (39.1) | | | |
| Type of Admission | | | | | | 0.015 | 0.007 |
| Medical | 163(73.4) | 100 (67.6) | 38 (88.4) | 25 (80.7) | | | |
| Surgical | 59(26.6) | 48 (32.4) | 5 (11.6) | 6 (19.3) | | | |
| Insurance (N: 221) | | | | | | <0.001 | <0.001 |
| Medicare (with anything else) | 114(51.6) | 78 (52.7) | 14 (32.6) | 22 (73.3) | | | |
| Medicaid (only) | 26(11.8) | 10 (6.8) | 13 (30.2) | 3 (10.0) | | | |
| Self-pay | 5(2.3) | 2 (1.3) | 2 (4.6) | 1 (3.3) | | | |
| Private Insurance | 76(34.4) | 58 (39.2) | 14 (32.6) | 4 (13.3) | | | |

P-value¹ represents a comparison among the completed, lost to follow-up, and disposition changed to facility placement groups.

P-value² represents a comparison between the completed and lost to follow-up groups.

*APR-DRG-SOI = All Patient Refined Diagnosis Related Group Severity of Illness

**Percentages may not equal 100 due to rounding.

Table 2: PADQ-E Subscale and total score differences in percentages of reported problems and unmet continuing care needs between High and Low Scoring ESDP patients.*

| | ESDP<10 | ESDP≥10 | P-value |
|------------------------------------------|---------------------------------|---------------------------------|----------------|
| | Mean Percentage \pm SD | | |
| | Median (Range) | | |
| PADQ-E Information Needs | 36.3 \pm 30.9 26.9 (0-100) | 30.7 \pm 31.7 23.1 (0-100) | 0.12 |
| Personal Care Problems | 6.8 \pm 17.8 0 (0-80) | 20.6 \pm 24.9 20 (0-100) | <0.001 |
| Personal Care Unmet Needs | 1.3 \pm 6.8 0 (0-40) | 1.9 \pm 10.2 0 (0-80) | 0.66 |
| Household Activities Problems | 27.6 \pm 35.6 0 (0-100) | 52.6 \pm 40.4 57.1 (0-100) | <0.001 |
| Household Activities Unmet Needs | 4.1 \pm 16.1 0 (0-100) | 3.0 \pm 13.3 0 (0-100) | 0.65 |
| Mobility Problems | 15.7 \pm 23.8 0 (0-100) | 34.0 \pm 31.8 20 (0-100) | <0.001 |
| Mobility Unmet Needs | 2.4 \pm 9.8 0 (0-60) | 1.4 \pm 6.2 0 (0-40) | 0.79 |
| | N (%) | | |
| Equipment Problems (N=77)† | 7 (33.3) | 7 (12.5) | 0.048 |
| Problems Following Instructions (N=142)† | 5 (7.0) | 9 (12.7) | 0.26 |
| | Mean Percentage \pm SD | | |
| | Median (Range) | | |
| Physical Complaints | 38.3 \pm 20.5 40 (10-90) | 43.8 \pm 17.9 50 (10-80) | 0.07 |
| Physical Complaints Unmet Needs | 5.1 \pm 13.1 0 (0-60) | 3.2 \pm 8.2 0 (0-40) | 0.96 |
| Psychological Complaints | 17.1 \pm 26.1 0 (0-100) | 22.8 \pm 27.3 14.3 (0-100) | 0.14 |
| Psychological Complaints Unmet Needs | 4.0 \pm 15.7 0 (0-85.7) | 2.4 \pm 14.4 0 (0-100) | 0.18 |

| | | | |
|-------------------------|-------------------------------|-------------------------------|------|
| Total Score | 26.3 ± 15.6 25.3(2.1-73.5) | 34.1 ± 18.9 32.7(2.0-79.6) | 0.02 |
| Total Unmet Needs Score | 12.1 ± 11.8 10.4 (0-63.3) | 10.0 ± 10.6 6.2 (0-49.0) | 0.12 |

*PADQ-E = Problems After Discharge Questionnaire – English Version

ESDP = Early Screen for Discharge Planning

†Summarized for the subset of patients using aids or equipment and the subset of patients following instructions or directions, respectively.

Table 3: Differences in EQ-5D Scores (Quality of Life) between high and low ESDP scoring patients*

| | ESDP<10 | ESDP \geq 10 | P-value |
|----------------------------------|---------------------------------|---------------------------------|---------|
| | N (%)** | | |
| Mobility N: 147 | | | <0.001 |
| No Problems | 61(80.3) | 33(46.5) | |
| Some Problems | 15(19.7) | 38(53.5) | |
| Severe Problems | 0(0) | 0(0) | |
| Self-Care N: 148 | | | 0.006 |
| No Problems | 71(93.4) | 56(77.8) | |
| Some Problems | 5(6.6) | 16(22.2) | |
| Severe Problems | 0(0) | 0(0) | |
| Usual Activities N: 148 | | | 0.006 |
| No Problems | 45(59.2) | 29(40.3) | |
| Some Problems | 29(38.2) | 33(45.8) | |
| Severe Problems | 2(2.6) | 10(13.9) | |
| Pain/Discomfort N: 148 | | | <0.001 |
| No Problems | 42(55.3) | 21(29.2) | |
| Some Problems | 33(43.4) | 47(65.3) | |
| Severe Problems | 1(1.3) | 4(5.6) | |
| Anxiety/Depression N: 148 | | | 0.029 |
| No Problems | 64(84.2) | 49(68.1) | |
| Some Problems | 10(13.2) | 23(31.9) | |
| Severe Problems | 2(2.6) | 0(0.0) | |
| | Mean \pm SD | | P-Value |
| | Median (Range) | | |
| Health Index Raw Score | 0.9 \pm 0.14 0.84(0.4-1.0) | 0.8 \pm 0.18 0.80(0.3-1.0) | <0.001 |
| Summary Health Index | 77.2 \pm 16.6 80(30-100) | 70.6 \pm 20.6 75(4-100) | 0.051 |

*EQ-5D = EuroQoL-5Dimensions

ESDP = Early Screen for Discharge Planning

** Percentages may not equal 100 due to rounding

Table 4: Differences in length of stay and use of formal post-acute services between high and low ESDP scoring patients*

| N = 215 | | ESDP<10 | ESDP≥10 | P-value |
|------------------------|-----------|-------------------|----------------|---------|
| | | Mean ±SD | | |
| Length of Stay in Days | | Median (Range) | | 0.044 |
| | | | 3.7 + 1.8 | |
| | 3.0 (1-9) | 3.0 (1-60) | | |
| Post-acute Services | | N(%)** | | 0.006 |
| | | Yes | 15(14.4) | |
| | No | 89(85.6) | 77(69.4) | |

*ESDP = Early Screen for Discharge Planning

**Percentages may not equal 100 due to rounding