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Patient perceptions of patient-empowering nurse behaviours, patient activation and functional health status in postsurgical patients with life-threatening long-term illnesses

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Abstract

Aim

To explore the trajectory of associations between the nursing care process of patient empowerment during postsurgical hospitalization and postdischarge patient self-management outcomes, specifically patient activation and functional health status.

Background

Patient-centred care models advocate for patient empowerment in long-term illness care. Postsurgical patients with life-threatening long-term illnesses frequently feel powerless, have unmet needs, decreased functional health status and high readmission rates; however, previous studies of patient empowerment have conceptualized empowerment as an outcome primarily in outpatient settings, with little attention paid to provider processes used to empower patients during hospitalizations.

Design

A non-experimental, prospective, correlational study.

Methods

This sample consisted of 113 postsurgical cancer and cardiac patients enrolled between August 2012–February 2013. Patient perceptions of patient-empowering nurse behaviours and baseline patient activation were measured prior to discharge. Patient activation and functional health status were measured 6 weeks following discharge. Data were analysed with multiple linear regression using a simultaneous equation approach.

Results

Patients reported high perceptions of patient-empowering nurse behaviours and patient activation levels. Functional health status scores were below population norms. Patient perceptions of empowering nurse behaviours were positively associated with postdischarge patient activation, which was positively associated with mental functional health status. Length of stay was the only significant predictor of physical functional health status.

Conclusion

This study provides further quantitative evidence supporting the relationship between quality nursing care and postdischarge patient outcomes. Intentional use of patient-empowering nurse behaviours could lead to improved patient activation and functional health status in postsurgical patients with life-threatening long-term illnesses.

Why is this research needed?

- Patient empowerment has been advocated as a way to engage patients in self-management of long-term illness in emerging patient-centred models for healthcare improvement.

- Nurses can empower patients by: (1) helping patients to realize that they can and should participate in their care and treatment planning; (2) providing patients with access to information, support, resources and opportunities to learn and grow; (3) helping to facilitate collaboration with providers, family and friends; and (4) allowing patients autonomy in decision-making.
- The majority of research on patient empowerment has studied empowerment as an outcome in outpatient settings, with little attention paid to provider processes used to empower patients during a hospitalization.

What are the key findings?

- Surgical patients in this study were receptive to empowering behaviours and had high levels of activation, supporting the need for future research on the impact of patient empowerment in the inpatient setting.
- When controlling for level of patient activation prior to discharge, patient-empowering nurse behaviours were significantly associated with postdischarge patient activation level, which was significantly associated with postdischarge mental functional health status.
- Study findings add to evidence on the impact of nursing care processes on patient outcomes, specifically the impact of hospital care on outcomes following hospital discharge.

How should the findings be used to influence policy/practice/research/education?

- Patient-empowering nurse behaviours can be used to help facilitate engagement in self-management behaviour and improve functional health status through its association with patient activation and should be examined as a way to improve the cost of long-term illness care through their association with patient activation.
- The Patient Perceptions of Patient-Empowering Nurse Behaviors Scale (PPPNBS) can be used to quantitatively measure the process of empowerment from the patient's perspective in hospitalized patients.

Introduction

As the burden of long-term illness rises due to increasing prevalence and cost of care, the engagement of patients in managing their long-term illness through the process of patient empowerment has been advocated as a critical component of emerging patient-centred models for healthcare improvement (National Health Service [n.d.](#), Australian Commission on Safety & Quality in Healthcare [2010](#), Bupa [2011](#), Patient-Centered Outcomes Research Institute (PCORI) [2012](#)). The process of patient empowerment occurs within collaborative provider–patient relationships with the intention of increasing patients' capacities to take control of their illnesses (World Health Organization [2012](#)). In their many encounters with patients across the continuum of long-term illness care, nurses can empower patients by: (1) helping patients to realize that they can participate in their care and treatment planning; (2) providing patients with access to information, support, resources and opportunities to learn and grow; (3) helping to facilitate collaboration with providers, family and friends; and (4) allowing patients autonomy in decision-making (Laschinger *et al.* [2010](#), Munn [2010](#)). Engaging patients through empowering

behaviours is an important component in patient care, as interventions using empowering behaviours have been shown to reduce healthcare costs (Melnik & Feinstein [2009](#), Hibbard & Greene [2013](#)).

Patient-empowering nurse behaviours can help facilitate the engagement of patients in self-management behaviours through the development of patient activation. Activated patients have the knowledge, skills and confidence necessary to manage their long-term illnesses effectively (Hibbard *et al.* [2004](#)). Highly activated patients have demonstrated lower costs of care and predicted future costs (Remmers *et al.* [2009](#), Hibbard *et al.* [2013](#)) and higher functional health status through successful engagement in self-management behaviours (Hibbard *et al.* [2007](#), Skolasky *et al.* [2011a](#)).

The majority of research on patient empowerment has studied empowerment as an outcome in outpatient settings (Chen & Li [2009](#), Herbert *et al.* [2009](#)). Little attention has been paid to provider processes used to empower patients during a hospitalization. Postoperative patients with life-threatening long-term illnesses, such as cancer and cardiac disease, face multiple illness-related transitions associated with the recovery from their surgery and taking on the role of managing their life-threatening long-term illness on hospital discharge (Schumacher & Meleis [1994](#), Kralik *et al.* [2004](#)).

Background

Several published studies have examined the relationship between empowering behaviours and self-management of long-term illness in outpatient and long-term care settings. Interventions using an empowering approach in the outpatient setting have been associated with increased confidence in self-management and problem-solving ability in individuals with long-term illnesses, such as cancer, diabetes, heart failure, obesity and hypertension (Chen & Li [2009](#), Munn [2010](#), Suter *et al.* [2011](#)). Empowering behaviours have also been associated with improved quality of life in people with cancer (Bakitas *et al.* [2009](#)) and nursing home patients in Taiwan (Tu *et al.* [2006](#)).

Patient activation can be viewed as a precursor to the engagement in self-management behaviours, as the components of patient activation (knowledge, skills and confidence) are factors that influence the process of self-management behaviour (Ryan & Sawin [2009](#)). Higher patient activation has been linked to higher functional status, adherence to self-management behaviours and lower costs of care (Mosen *et al.* [2007](#), Hibbard *et al.* [2013](#)). Functional health status, used as a measure of quality of life, is a useful outcome measure to evaluate an individual's physical and psychological adjustment to long-term illness (Stanton *et al.* [2007](#)) and has been identified as a nurse-sensitive outcome (Doran [2011](#)).

Various patient characteristics or illness factors may influence patients' perceptions of patient-empowering nurse behaviours. Younger patients may prefer a more active role in their care (Deber *et al.* [2007](#)) or place a higher value on empowering behaviours than older patients. Patients from a lower socioeconomic status (SES) and non-Caucasian patients may have lower perceptions of patient-empowering nurse behaviours because of feelings of powerlessness and lower levels of education (Ross & Mirowsky [2002](#), Lubetkin *et al.* [2010](#)) and trust (Halbert *et al.* [2006](#)). The amount of time since diagnosis of a long-term illness may have an impact on a patient's ability to perceive or be receptive to empowering behaviours, as some patients may experience disarray closer to time of diagnosis, but over time may successfully incorporate their long-term illness into their lives (Kralik [2002](#), Aujoulat *et al.* [2007](#)). Lastly, a longer length of stay may affect patient perceptions of patient-empowering nurse behaviours through greater opportunity for interaction with the nursing staff.

Patients with life-threatening long-term illnesses, such as cancer and cardiac disease, frequently experience heightened feelings of powerlessness following surgery (Taylor *et al.* [2010](#), Barnason *et al.* [2012](#)). During the discharge transition, they are suddenly expected to take responsibility for the management of a long-term illness while still experiencing the physical and psychological effects of surgery (Lapum *et al.* [2011](#)) and a loss of control over their bodies and identities (McCorkle *et al.* [2011](#), Okamoto *et al.* [2011](#)). The transition from postsurgical hospitalization to self-management postdischarge is threatened by unmet discharge needs (McMurray *et al.* [2007](#)) and decreased functional health status (Hodgson & Given [2004](#), Elliott *et al.* [2006](#)). Postsurgical cancer and cardiac patients have high readmission rates secondary to inadequate self-management ability (Slamowicz *et al.* [2008](#), Martin *et al.* [2011](#)).

Theoretical framework

The design for this study was guided by an integrated model using two explanatory theories: Meleis's Transitions Theory (Meleis *et al.* [2000](#)) and The Individual and Family Self-Management Theory [IFSMT] (Ryan & Sawin [2009](#)) to address the relationship between patient-empowering nurse behaviours and patients' engagement in long-term illness self-management. Transitions Theory provides a conceptualization of the trajectory experienced by patients with life-threatening long-term illnesses as they progress from surgical intervention to long-term illness management. In this trajectory, patients shift to self-management of their illness. Using the conceptual-theoretical-empirical structure format (Fawcett [1999](#)), concepts of the two theories were represented as concepts relevant to study aims and operationalized as study variables (Table [1](#)). The two theories use different concept labels to denote the contextual patient and illness factors that influence the patient's trajectory and both theories evaluate outcomes, referred to as patterns of response (Transitions Theory) and proximal outcomes (IFSMT). Transitions Theory includes the concept of nursing therapeutics in promoting positive outcomes, while the IFSMT identifies the patient process components (knowledge and beliefs, self-regulation skills and abilities, social facilitation) towards which patient-empowering nursing behaviours can be targeted. The study concepts representing nursing therapeutics and self-management processes are operationalized in a measure of patient perceptions of patient-empowering nurse behaviours, with subscales addressing the self-management process components.

Table 1. Relationships of Meleis' Transitions Theory^a and the Individual and Family Self-Management Theory^b to Study Variables and Measures.

Meleis' transitions theory concepts	Nature of the transition	Transition conditions	Nursing therapeutics			Patterns of response
	Context	Risk & Protective Factors	Process of Self-Management			
Individual and Family Self-Management Theory Concepts	Condition-Specific	Physical/Social Environment; Individual/Family factors	Knowledge & Beliefs	Self-Regulation Skills & Abilities	Social Facilitation	Proximal Outcomes
Theoretical Study Concepts	Illness Factors	Patient Characteristics	Patient-Empowering Nurse Behaviours a. Initiation b. Access to Information c. Access to Resources d. Access to Opportunities to Learn and Grow e. Access to Support f. Informal Power g. Formal Power			Patient Activation Functional Health Status
Empirical Indicators	a. Length of time since initial diagnosis b. Type of Illness (Cancer vs. cardiac disease) c. Length of Stay d. Hospital Unit	a. Age b. Race c. SES d. Pre-discharge PAM-13	Patient Perceptions of Patient-Empowering Nurse Behaviours Scale (PPPNBS)			13-item Patient Activation Measure (PAM-13) [‡] SF-36 v.2 [§] -Mental component summary measure (MCS) -Physical component summary measure (PCS)

^a Meleis *et al.* (2000), Schumacher and Meleis (1994).

^b Ryan and Sawin (2009).

^c Hibbard *et al.* (2005).

^d Ware (n.d.).

The study

Aim

The aim of this study was to explore the trajectory of associations between the nursing care process of patient empowerment during postsurgical hospitalization and postdischarge patient self-management outcomes, specifically patient activation and functional health status. The following hypotheses were tested:

- Patient characteristics and illness factors will have significant associations with patient perceptions of patient-empowering nurse behaviours;
- Patient characteristics, illness factors and patient perceptions of patient-empowering nurse behaviours will have significant associations with 6-week postdischarge patient activation; and
- Patient characteristics, illness factors, patient perceptions of patient-empowering nurse behaviours and 6-week postdischarge patient activation will have significant associations with functional health status (physical and mental) 6 weeks postdischarge.

Design

A non-experimental, prospective, correlational design was used in this study. Patient characteristics, illness factors and patient perceptions of patient-empowering nurse behaviours were measured during the postsurgical hospitalization. Patient activation and functional health status were measured 6 weeks following hospital discharge through a telephone interview. Six weeks postdischarge marks a transitional period from postoperative recovery to living with and managing a life-threatening long-term illness (Taylor *et al.* 2010), making it an appropriate time to measure patient activation and functional health status.

Sample

The target sample was postsurgical patients with life-threatening long-term illnesses. The study was conducted on two surgical units at a Magnet-designated academic medical centre in the Midwestern USA: one unit cares for cardiac surgical patients, including those having surgery for coronary, congenital or valvular heart disease and one unit cares for surgical oncology patients, including those having surgery for gastrointestinal and lung cancers. While cancer and cardiac patients experience different treatments and disease courses, they share the experience of transition from surgical intervention to long-term illness self-management, the focus of this study.

An a priori power analysis using G*Power 3 (Faul *et al.* 2010) estimated the required sample size of 114 participants for a multiple linear regression model (hypothesis 3) with a fixed effect for diagnosis, power of 0.8, a medium effect size ($f^2 = 0.15$), an alpha of 0.05 and eight predictors. Oversampling due to an estimated attrition rate of 30% gave a target enrolled sample size of 163.

A convenience sample was selected using the following inclusion criteria: (1) at least 18 years of age; (2) able to speak and read English; (3) had surgery during the present hospitalization for a cancer or cardiac diagnosis; (4) stayed at least 2 nights in the hospital; and (5) had telephone availability for postdischarge data collection. Patients who were enrolled in palliative or hospice care, had a documented cognitive deficit or developmental delay or were discharged to a rehabilitation facility were excluded from this study. All eligible patients present in the units during selected days for data collection were approached for participation.

A total of 250 patients were screened, 179 patients were eligible and 164 consented. Of the 164 patients, 144 completed all the pre-discharge measures and 127 completed the 6-week discharge interview. The 17 patients lost to follow-up did not differ from the rest of the sample on patient characteristics and illness factors. Consistent with PAM-13 scoring recommendations, fourteen patients who answered 'strongly agree' for every item were excluded from the final sample. The excluded patients also did not significantly differ from the remaining sample on patient characteristics and illness factors. The final sample had 113 patients.

Measures

Patient characteristics and illness factors

Patient characteristics (age, socioeconomic status [SES], race, pre-discharge patient activation) were collected from patients at the time of enrolment, usually the day before discharge. SES was calculated using Hollingshead 4-Factor Index of Social Status (Hollingshead 1975). Pre-discharge patient activation was measured with the PAM-13 (described below). Illness factors were collected directly from the

patient (time since initial diagnosis) and from medical records (length of stay and diagnosis). Additional patient characteristics (gender, education level, marital status, living alone and prior hospitalizations for the same diagnosis) and illness factors (stage of cancer or heart failure, surgical procedure) were collected for sample description.

Patient perceptions of patient-empowering nurse behaviours

Patient perceptions of patient-empowering nurse behaviours were measured with the Patient Perceptions of Patient-Empowering Nurse Behaviors Scale (PPPNBS). The PPPNBS was developed based on a concept analysis of empowerment (Jerofke [2013](#)) and patient empowerment model of Laschinger *et al.* ([2010](#)), supporting its content validity. After review by five experts, the final 45-item scale consisted of seven subscales: (1) Initiation (five items); (2) Access to Information (seven items); (3) Access to Support (10 items); (4) Access to Resources (six items); (5) Access to Opportunities to Learn and Grow (five items); (6) Informal Power (5 items); and (7) Formal Power (seven items). Items were rated by patients on an 11-point Likert scale, with 0 meaning 'not at all'–10 meaning 'a great deal', higher scores indicating more positive perceptions of patient-empowering nurse behaviours.

Patient activation

Pre-discharge and 6-week postdischarge patient activation was measured with the 13-item Patient Activation Measure (PAM-13). Originally consisting of 22 items, the PAM-13 measures patients' self-reported knowledge, skill and confidence for self-management of their health or long-term illness (Hibbard *et al.* [2004](#)). Scores on the PAM-13 account for 92% of the variance in the 22-item instrument (Hibbard *et al.* [2005](#)). The PAM-13 can be used with a wide array of patients. Items are scored on a 4-point scale (1 = strongly disagree, 4 = strongly agree). Patients are assigned a total raw score ranging from 13–52, which is recalibrated to an activation score of 0–100, with higher scores indicating higher activation. The calibrated activation score can also be categorized into four levels of patient activation: (1) level 1: does not yet believe active participation in self-management is important; (2) level 2: lacks confidence and knowledge necessary to be an active participant; (3) level 3: begins to take action, but may lack confidence or skills necessary to support active participation; (4) level 4: has adopted new behaviours, but has difficulty maintaining behaviours during times of stress (Hibbard *et al.* [2007](#)).

Functional health status

The SF-36 was used to measure functional health status. The SF-36 consists of 36 items, eight subscales and two summary measures. The items of the SF-36 ask individuals to recall their experiences over the prior 4 weeks. The mental component summary measure (MCS) includes vitality, social functioning, role-emotional and mental health subscales; the physical component summary measure (PCS) includes physical functioning, role-physical, bodily pain and general health subscales (Ware & Sherbourne [1992](#)). MCS and PCS raw scores are transformed to a standardized scale (mean 50, sd 10). The MCS and PCS measures were used in analyses as a measure of mental and physical functional health status. The SF-36 has demonstrated its ability to detect group differences in both physical and mental health status (Ware *et al.* [1994](#)).

Validity/reliability

The PAM-13 and SF-36 have been widely used in previous studies with patients with long-term illnesses and have been validated and tested for reliability by several studies (Shmueli [1998](#), Hibbard *et al.* [2005](#), Skolasky *et al.* [2011a](#), Ware *n.d.*). Preliminary psychometric testing of the PPPNBS was conducted with

28 postsurgical patients prior to this study, resulting in a Cronbach's alpha reliability estimate of 0.97 for the total scale and between 0.65–0.93 for subscales. Minor item revisions were made to clarify wording. In this study, Cronbach's alpha for the total scale was 0.98 and all subscales exceeded 0.70.

In this study, Cronbach's alpha reliability estimate for pre-discharge PAM-13 was 0.85 and for 6-week postdischarge PAM-13 was 0.87; Cronbach's alpha reliability estimates for the subscales comprising the MCS measure were between 0.77–0.89 and for the PCS measure were between 0.79–0.91.

Data collection

Data were collected between August 2012–February 2013. Informed consent was obtained prior to the day of discharge, at which time the contact information form, enrolment form and pre-discharge PAM-13 were completed. The PPPNBS was placed in patients' charts and was given to patients by either their nurse or the research staff within 4 hours before discharge. The PPPNBS was returned in a sealed envelope. If patients were discharged without completing the PPPNBS, they were contacted by the research staff within 2 days of their discharge and the PPPNBS was completed over the telephone. Six patients' (5.3%) data were obtained by this mechanism. Six weeks following discharge, patients were contacted for a telephone interview, at which time the postdischarge PAM-13 and SF-36 (MCS and PCS) were completed.

Ethical considerations

Institutional Review Board (IRB) approval was obtained from university and hospital institutional review boards.

Data analysis

Analyses were conducted using SPSS version 18.0 (SPSS Inc., Chicago, IL, USA) and Stata version 11.0 (StataCorp 2009a). Variables used in analyses were checked for normality using graphs and extreme outliers were winsorized (Tabachnick & Fidell 2007) to the next highest or lowest number. Missing data on the PPPNBS and PAM-13 were mean substituted if more than 70% of item responses were completed. Descriptive statistics were calculated for sample description and for patient characteristics, illness factors, PPPNBS, PAM-13, MCS and PCS.

Predictors of PPPNBS, postdischarge PAM-13 and SF-36 (MCS and PCS) were analysed by two separate systems of three simultaneous multiple linear regression equations. This estimation model allowed for testing of direct and indirect relationships among variables that appear in more than one equation, while adjusting the estimates for correlated standard errors among the equations (Davidson & MacKinnon 1993). To reflect the sequential nature of the relationships, outcome variables in one equation became predictor variables in the subsequent equation, while accounting for the presence of all other variables. This approach allowed the researcher to evaluate the independent contribution of each predictor to the outcome (StataCorp 2009b). A significance level of $P < 0.05$ was used for all analyses. All equations were calculated with robust standard errors and fixed effect for diagnosis (which also controlled for nursing unit). Because of the broad range of time since diagnosis, a fixed effect for new diagnosis (diagnosed less than 1 year prior) was included.

In the first equation of the first system, PPPNBS total score was the explanatory variable and patient characteristics (age, SES, race, pre-discharge PAM-13) and illness factors (days since initial diagnosis, type of illness and length of stay) were the predictors (equation 1, hypothesis 1). In equation 2

(hypothesis 2), 6-week postdischarge PAM-13 was the explanatory variable and PPPNBS total score was added to the predictors from equation 1. In equation 3 (hypothesis 3), MCS was the explanatory variable and patient characteristics, illness factors, PPPNBS total score and postdischarge PAM-13 were the predictor variables. In the second system of equations, PCS replaced MCS (equation 4; hypothesis 3) as the explanatory variable and the predictor variables remained the same.

Results

Description of the sample

Characteristics of the sample are presented in Table 2. The 113 patients used in analyses included 50 females (44%) and 63 males (56%). The sample included a range of ages from 24–87, with a mean age of 57.6 (sd 12.7). Seventy-one per cent of patients were married and 12% lived alone. The Hollingshead 4-Factor Index of Social Status mean score (SES) was greater than the scale's median value of 37, with 45% of the sample reporting that they were college graduates. The sample was primarily Caucasian (84%) with 9% being African American. Eighty-three per cent of the sample reported a pre-discharge patient activation level categorized as level 3 or level 4. There were 27 cardiac (24%) and 86 (76%) people with cancer in the study, each hospitalized on their respective units.

Table 2. Sample Characteristics (*N* = 113).

Patient demographics	N	%	Mean	sd
Age			57.6	12.7
Socioeconomic Status*			44.6	13.7
Race				
White	95	84.1		
African American	10	8.8		
Asian	1	0.9		
Hispanic	3	2.7		
Other	4	3.5		
Total pre-discharge PAM-13			68.0	12.5
Illness Factors				
Time Since Initial Diagnosis				
0–60 days	27	23.9		
61–180 days	38	33.6		
181–365 days	13	11.5		
>365 days	35	31.0		
Length of Stay (days)			6.5	3.3
Type of Illness				
Cancer	86	76.1		
Cardiac Disease	27	23.9		
Additional Sample Descriptors				
Level of pre-discharge PAM-13				
One	6	5.3		
Two	13	11.5		
Three	30	26.5		
Four	64	56.6		

Stage of Cardiac Disease [†]			
I	6	22.2	
II	16	39.3	
III	4	14.8	
IV	1	3.7	
Stage of Cancer [‡]			
I	12	14.0	
II	21	24.4	
III	16	18.6	
IV	37	43.0	
Number of comorbidities			2.1 1.7
Gender			
Male	63	55.8	
Female	50	44.2	
Highest Completed Level of Education			
<High school	3	2.7	
High school	25	22.1	
Some College (at least 1 year)	34	30.1	
/Specialized Training			
College Graduate	28	24.8	
Graduate Degree	23	20.4	
Marital Status			
Married	80	70.8	
Single	17	15.0	
Divorced	8	7.1	
Other	8	7.1	
Live alone			
No	100	88.5	
Yes	13	11.5	

Patient demographics	N	%	Mean	SD
Prior hospitalization for same diagnosis				
No	72	63.7		
Yes	41	36.3		

^a Hollingshead (1975) 4-Factor Index of Social Status.

^b NYHA Heart Failure Classification System (American Heart Association 2013).

^c AJCC 7th edition (Edge *et al.* 2010).

Time since initial diagnosis (in years) was significantly higher for cardiac patients than for people with cancer ($t(26.72) = 3.03, P = 0.005$); however, time since initial diagnosis was not a significant predictor in any of the equations. Cardiac and people with cancer did not differ significantly by age, SES, race, pre-discharge PAM-13, LOS and illness type.

Patients reported high perceptions of patient-empowering nurse behaviours, with a mean PPPNBS total score of 381.5 (sd 59.6, range 134–450) and item mean of 8.5 (sd 2.0) out of 10. patients' 6-week postdischarge PAM-13 scores were skewed towards higher activation (mean = 68.8, sd 12.5, Range 41.7–91.6), with the majority of patients reporting level 4 activation (56%). Three per cent of patients

were in level 1, 12% in level 2 and 29% in level 3. Both MCS (mean = 49.8, sd 9.6, Range 20.2–66.0) and PCS (mean = 41.7, sd 8.8, Range 20.6–62.8) measures were below the general population norm (mean = 50.0) (Ware *u.d.*). There was not a significant change ($t(112) = -0.60, P = 0.55$) between pre-discharge PAM-13 (mean = 68.0, sd 12.5) and 6-week postdischarge PAM-13 (mean = 68.8, sd 12.5) for the total sample, but there was a significant increase between pre-discharge PAM-13 (mean = 55.9, sd 7.1) and 6-week postdischarge PAM-13 (mean = 63.5, sd 12.2) in those patients in levels 1–3 at baseline ($t(48) = 4.63, P < 0.001$). Seventy per cent of patients who were in level 4 of patient activation pre-discharge remained in level 4, 6 weeks postdischarge.

Predictors of PPPNBS, PAM-13 and SF-36

The results of the simultaneous equation models (equations [1–4]) are presented in Table 3. Patient characteristics and illness factors were not significant predictors of PPPNBS (equation 1; hypothesis 1). Patient characteristics, illness factors and PPPNBS explained 30.6% of 6-week postdischarge PAM-13 variance (equation 2; hypothesis 2). Race, pre-discharge PAM-13 and PPPNBS were significantly associated with 6-week postdischarge PAM-13. A one point increase on the PPPNBS (scale range of 450 points) was associated with a 0.04 ($P = 0.02$) point increase on the 6-week postdischarge PAM-13 and Caucasian patients scored, on average, 6.8 points higher ($P = 0.03$) on the 6-week postdischarge PAM-13 than non-Caucasian patients. patients' pre-discharge PAM-13 was significantly associated with their 6-week postdischarge PAM-13 ($B = 0.42, P < 0.001$).

Table 3. Results for Simultaneous Equation Estimation ($n = 113$).

	Equation 1 PPPNBS					Equation 2 6-week Postdischarge PAM-13				
	B	SE	95% CI		$P > z$	B	SE	95% CI		$P > z$
			Lower	Upper				Lower	Upper	
6-Week Postdischarge PAM-13										
PPPNBS					0.04	0.02	0.01	0.08	0.02	
Race	14.88	14.99	-14.50	44.27	0.32	6.82	3.05	0.83	12.80	0.03
Pre-discharge PAM-13	0.88	0.47	-0.04	1.80	0.06	0.42	0.09	0.24	0.59	<0.01
LOS	0.08	1.54	-2.94	3.11	0.96	-0.24	0.24	-0.71	0.23	0.31
R ²	0.10					0.31				
	Equation 3 MCS					Equation 4 PCS				
	B	SE	95% CI		$P > z$	B	SE	95% CI		$P > z$
			Lower	Upper				Lower	Upper	
6-Week Postdischarge PAM-13	0.27	0.08	0.11	0.43	<0.01	0.11	0.08	-0.04	0.27	0.16
PPPNBS	0.00	0.02	-0.03	0.03	0.96	-0.01	0.02	-0.04	0.02	0.42
Race	0.27	2.45	-4.52	5.07	0.91	1.84	2.25	-2.56	6.25	0.41
Pre-discharge PAM-13	0.10	0.08	-0.05	0.25	0.19	0.06	0.08	-0.10	0.23	0.46
LOS	0.03	0.27	-0.49	0.56	0.90	-0.54	0.24	-1.00	-0.07	0.02
R ²	0.27					0.15				

The model was estimated using the simultaneous equations method with robust standard errors. Estimates are from linear regressions. Only significant predictors are displayed. All equations also included controls for age, socioeconomic status, type of illness [cancer, cardiac], time since initial diagnosis [in days] and new diagnosis [yes/no].

PPPNBS, Patient Perceptions of Patient-Empowering Nurse Behaviors Scale; PAM-13, 13-item Patient Activation Measure; MCS, Mental Component Summary Measure; PCS, Physical Component Summary Measure. Bolded values represent significant predictors in the model.

Patient characteristics, illness factors, PPPNBS and 6-week postdischarge PAM-13 explained 27% of the variance in MCS (equation 3; hypothesis 3). A one point increase on the 6-week postdischarge PAM-13 (scale range of 100 points) was directly associated with a 0.27 point ($P < 0.001$) increase on the MCS measure. Patient characteristics, PPPNBS and 6-week postdischarge PAM-13 were not significant

predictors of PCS (equation 4; hypothesis 3). Only length of stay was a significant predictor of PCS. Each 1 day increase in length of stay was associated with a 0.54 point ($P = 0.02$) decrease in the PCS measure.

Discussion

The results of this study provide preliminary evidence of a path of association from patient perceptions of patient-empowering nurse behaviours during acute care hospitalization to patient activation at 6 weeks postdischarge to the mental component of functional health status. These findings are consistent with previous studies, which have demonstrated a significant association between the method in which nursing care is delivered during hospitalization and patient outcomes after discharge (Suhonen *et al.* [2007](#), Weiss *et al.* [2007](#)).

Controlling for level of patient activation prior to discharge, patient-empowering nurse behaviours were significantly associated with postdischarge patient activation levels. Although the coefficient was small, we believe that these findings provide support for the contribution of patient-empowering nurse behaviours to patient participation in self-management behaviours during a stressful transition period following a surgical procedure for a life-threatening long-term illness. While the PAM-13 was not used to measure self-management directly in this study, it was used as a precursor to engagement in self-management behaviours, as knowledge, skill and confidence are necessary components in the process of patient self-management. The findings in this study are consistent with previous studies, which have shown improved knowledge, confidence, ability to self-manage, autonomy, self-capacity building and purposeful participation in patients exposed to interventions incorporating an empowering approach (Munn [2010](#)). Future studies should focus on tailoring patient-empowering nurse behaviours to baseline patient activation levels, as previous studies have demonstrated that tailored interventions improve patient activation levels and engagement in self-management behaviours in patients with long-term illness (Ryan & Lauver [2002](#), Hibbard *et al.* [2009](#), Shively *et al.* [2013](#)).

There have been numerous studies that have found significant positive associations between confidence levels in self-management and functional health status in individuals with a long-term illness (Weng *et al.* [2010](#), Yoo *et al.* [2011](#)) and between patient activation levels, mental functional health status (Green *et al.* [2010](#)) and depressive symptoms (Hibbard *et al.* [2007](#), Skolasky *et al.* [2008](#)). While there was a significant positive association between 6-week postdischarge patient activation level and mental functional health status in this study, both outcome measures were collected at the same time. Future studies should measure functional health status and postdischarge patient activation at different time points to validate the sequential nature of the influence of patient activation on functional health status or vice versa.

Interestingly, patient perceptions of patient-empowering nurse behaviours and patient activation were not significant predictors of physical functional health status. Factors such as activity restrictions and pain following surgery may have had an impact on a patient's PCS measure (Hodgson & Given [2004](#)). The SF-36 measure asked patients to recall their general health over the last 4 weeks. Previous studies that have shown a positive association between patient activation levels and physical functional health status were conducted with medical patients who did not have the same restrictions and pain as postsurgical patients (Hibbard *et al.* [2007](#), Green *et al.* [2010](#)). In future studies, increasing the measurement interval to allow for recovery from surgery and the 4-week recall period used in the SF-36,

or measuring a baseline physical functional health status before the surgery, may produce a more accurate assessment of physical functional health status after discharge.

The patients in this study had high patient activation levels, with 57% of the sample being in level 4 at baseline and 56% being in level 4, 6 weeks postdischarge, whereas previous studies found that between 17.2% and 41.4% were in level 4 (Hibbard & Cunningham [2008](#), Skolasky *et al.* [2011a](#), Shively *et al.* [2013](#)). Patients were predominantly Caucasian and well educated, factors that have been associated with higher patient activation levels in previous studies (Hibbard *et al.* [2005](#), [2008](#), Alegria *et al.* [2008](#), Lubetkin *et al.* [2010](#)). Replicating this study in individuals with lower baseline activation may generate different results, given that pre-discharge activation level was a significant predictor of 6-week postdischarge activation.

Meleis' Transitions Theory and the IFSMT provided useful theoretical frameworks to evaluate the relationships between patient perceptions of patient-empowering nurse behaviours, patient activation and functional health status (Meleis *et al.* [2000](#), Ryan & Sawin [2009](#)). The study findings supported the proposition by Meleis *et al.* ([2000](#)) that nursing therapeutics, represented by patient-empowering nurse behaviours, can have an impact on patterns of response, measured as 6-week postdischarge patient activation and functional health status. Conceptualizing nursing therapeutics from the perspective of the patient's experience, with empowering nursing behaviours targeted towards three process domains of self-management theory (Ryan & Sawin [2009](#)), provided a mechanism for integrating patient-centred care concepts into the study model. The notion that transition is a process over time was evident in the improvements in patient activation and mental functional health status as early postsurgical outcomes. The lack of concurrent measurable improvement in physical functional status may indicate that, in this patient population, physical functional status improvements may be later outcomes.

Strengths and limitations

Strengths of this study include linking nursing behaviours during hospitalization with patient outcomes following discharge using a theory-guided approach. Examining the experience of two different patient types captured a broad range of postsurgical experiences. Using simultaneous equation modelling to test the complete sequential path of influence from nurse behaviours during hospitalization to patient activation and to functional health status 6-weeks postdischarge, in a prospective design, was also a significant methodological strength.

There were limitations in the design. This study was conducted at one academic Magnet-designated hospital in the USA. This designation recognizes exemplary nursing practice, strong leadership and empowered professionals (American Nurses Credentialing Center (ANCC) [2011](#)). The study sample was a convenience sample of predominantly Caucasian participants and was heterogeneous in inclusion of cancer and cardiac patients with numerous diagnoses of varying severities. The sample was not of adequate size for subgroup analyses by diagnosis or severity. The follow-up period was 6 weeks in duration, which represented a point in time related to surgical recovery, but not the completion of transition to long-term illness management. Replication at other sites using a random, cohort or stratified sampling approach is recommended for future studies to achieve a more representative sample. Lengthening the follow-up period in future studies would allow the researchers to measure more distal outcomes.

The process of patient empowerment was measured with the PPPNBS, a patient-reported measure of nursing behaviours. The instrument asked patients to recall the patient-empowering behaviours of the nursing staff, so that the unique contribution of nursing care to patient activation and functional health status could be determined. Difficulty differentiating nurses from other health care providers or focusing on one nurse who may have been particularly empowering or disempowering, may have influenced patient responses. The PPPNBS has demonstrated acceptable reliability and validity in pilot testing and in this study; however, it should be subjected to comprehensive testing with other patient populations, including non-surgical patients.

In this non-intervention study, PPPNBS was measured in the context of usual care practices. Future studies should include both direct measures of deliberate use of patient-empowering nurse behaviours by nurses as well as patient perceptions. Patient perceptions of nurse behaviours are an important patient-reported outcome measure of patient experience and are consistent with healthcare priorities for improving patient-centred care.

The outcome variables used in the analysis were negatively skewed and normality was not achieved using logarithmic and square root transformations. The simultaneous equation modelling proceeded using robust standard errors with recognition of the need for cautious interpretation in the presence of violation of the normality assumption. In addition, patient activation and functional health status were not measured prior to the hospitalization or exposure to patient-empowering nurse behaviours; therefore, the impact of the surgery and patient-empowering nurse behaviours on change in patient activation and functional health status was not known. Overall, this study looked at associations between variables and not causality. While some other known factors that have an impact on the outcome variables are included in the modelling of associations, all competing explanations were not fully specified in the model and further research will be needed to explore the relationships in more depth.

Conclusion

Examining the relationship of patient reports of patient-empowering nurse behaviours with patient activation and functional health status 6-weeks postdischarge provides further quantitative evidence supporting the relationship between quality nursing care and postdischarge patient outcomes. Patient empowerment is an important concept to nursing because nurses are responsible for discharge preparation and ensuring that patients have the skills and knowledge they need before discharge to navigate their way through their transition from hospital to home (Foust [2007](#), Weiss *et al.* [2007](#), Nosbusch *et al.* [2011](#)). Patient empowerment should be practised not only in outpatient settings but also in inpatient settings, as postsurgical patients with life-threatening long-term illnesses demonstrated that they are receptive to patient-empowering nurse behaviours.

Nurses should be educated about the importance of being intentional in their methods of delivering care to postsurgical patients through patient-empowering nurse behaviours with the goal of promoting patient activation. Nurses should not only provide education about long-term illness self-management but also encourage patients to be active participants in their care, while offering them access to information, support, resources, opportunities to build on prior knowledge and skills, helping them to establish collaboration with other providers and family or friends and giving them flexibility and autonomy in decision-making. Patient-empowering nurse behaviours can be used to facilitate

engagement in self-management behaviour, improve functional health status and ultimately improve the cost of long-term illness care through improved patient activation. Measuring patient activation level at admission should be considered as a method to assist in tailoring patient-empowering nurse behaviours to patients' baseline knowledge, skill and confidence in self-management, to significantly have an impact on patient activation, engagement in self-management behaviours, functional health status and healthcare use following hospital discharge.

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Conflict of interest

No conflict of interest has been declared by the authors.

Author contributions

All authors have agreed on the final version and meet at least one of the following criteria [recommended by the ICMJE (http://www.icmje.org/ethical_1author.html)]:

- substantial contributions to conception and design, acquisition of data, or analysis and interpretation of data;
- drafting the article or revising it critically for important intellectual content.

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