Psychometric Analysis of the Patient Perceptions of Patient-Empowering Nurse Behaviors Scale (PPPNBS) in Patients with Chronic Illness

This project involves (check all that apply):
- ☑ Human Subjects
- ☐ Vertebrate animals
- ☐ Recombinant DNA
- ☐ Radioactive Materials

Does this SFF/RRG application request graduate student support? ☑ Yes ☐ No

Name: Teresa Jerofke, PhD, RN, APNP-BC

Department: Nursing

Phone: 414-288-3867 Email: teresa.jerofke@marquette.edu

Academic Rank: ☑ Assistant Professor ☐ Associate Professor ☐ Full Professor

MU Hire Date: 8/19/13

Have you searched for external funding? ☑ Yes ☐ No

If yes, explain how you searched for external funding (even if your efforts were not successful)

What other support are you currently receiving?

Limited Start-up Funds

Applicant signature and date

Teresa Jerofke 9/25/13

Chair/Unit Administrator signature and date

Maurice E. O'Brien 9/25/13
Psychometric Analysis of the Patient Perceptions of Patient-Empowering Nurse Behaviors Scale (PPPNBS) in Patients with Chronic Illness

Abstract

Engagement of patients in chronic illness self-management through patient empowerment is a crucial component of patient-centered models to improve health care by decreasing human and economic burden. Nurses can empower patients through behaviors that: (1) help patients engage in their care; (2) provide access to information, support, resources, and opportunities for engagement; (3) facilitate collaboration; and (4) respect autonomy. The 45-item Patient Perceptions of Patient-Empowering Nurse Behaviors Scale (PPPNBS) was constructed to measure patient perceptions of empowering nurse care processes. The PPPNBS demonstrated acceptable validity and reliability when used with post-surgical patients, but has not yet been tested with non-surgical, chronically-ill patients. The purpose of this study is to examine the validity and reliability of the PPPNBS in non-surgical, chronically ill patients and then broaden the psychometric analysis of the instrument by combining the non-surgical and previous surgical sample. The study will replicate the design used in the previous study with 143 surgical patients and will include 157 non-surgical, chronically-ill patients. Reliability and construct [contrasted groups], concurrent, and predictive validity of the PPPNBS will be tested with the non-surgical sample and the combined surgical and non-surgical sample using measures of patient activation and functional health status. Confirmatory factor analysis will be conducted with the combined sample of 300 patients. Evaluating the psychometrics of the PPPNBS across a broad range of adult patient populations is needed to examine its robustness and refine this patient-centered measure of nurse-empowering behaviors for use in future intervention studies to improve health outcomes in chronic illness.
Project Description

a) Background

As the prevalence of chronic illness rises, the engagement of patients in chronic illness self-management through the process of patient empowerment has been advocated as a critical component of emerging patient-centered models for healthcare improvement (U.S. Department of Health and Human Services, 2012; World Health Organization, 2012). Self-management behaviors are defined as learned behaviors that patients purposefully engage in (Ryan & Sawin, 2009) to manage the physical, emotional, and lifestyle-altering effects of their illnesses (Lorig & Holman, 2003). Patients with chronic illnesses frequently experience feelings of powerlessness (Aujoulat, Luminet, & Decache, 2007) secondary to complex treatments, symptoms from the illness, lack of social support, and decreased quality of life (McCorkle et al., 2011; Okamoto, Wright, & Foster, 2011). Feelings of powerlessness negatively impact patients’ engagement in self-management behaviors and their functional health status. Nurses can empower patients and decrease the human and economic burden of chronic illness by: (1) helping them actively engage in their care; (2) providing them access to information, support, resources, and opportunities for engaged participation; (3) facilitating collaboration with providers, family, and friends; and (4) respecting autonomy (Laschinger, Gilbert, Smith, & Leslie, 2010).

Patient-empowering nurse behaviors lead to engaged or ‘activated’ patients, defined as patients who have the knowledge, skills, and confidence necessary to manage their chronic illnesses effectively (Hibbard, Stockard, Mahoney & Tusler, 2004). Post-surgical patients with cancer and cardiac disease who had higher perceptions of patient-empowering nurse behaviors during their hospitalization had significantly higher levels of patient activation after discharge (Jeroefke, Weiss, & Yakusheva, in press). Highly activated patients also demonstrated lower costs of care (Hibbard, Greene, & Overtan, 2013) and higher functional health status (Hibbard, Mahoney, Stock, & Tusler, 2007; Skolasky, Mackenzie, Wegener, & Riley, 2011). Jeroefke et al. (in press) demonstrated a statistically significant positive relationship between post-discharge patient activation and the mental dimension of functional health status in post-surgical patients. There was not, however, a relationship detected between patient activation and the physical dimension of functional health status, perhaps related to post-operative pain and activity limitations. Prior research has demonstrated that race, age, time since diagnosis, and length of stay may impact patient perceptions of empowerment (Deber, Kraetschmer, Urowitz, & Sharpe, 2007; Halbert, Armstrong, Gandy, & Shaker, 2006; Jeroefke et al., in press; Krulik, 2002).

The majority of instruments used in empowerment research measure outcomes of empowerment such as knowledge, self-efficacy, autonomy, and purposeful participation (Anderson, Funnell, Fitzgerald, & Marrero, 2000; Herbert, Gagnon, Rennick, & O’Loughlin, 2009; Munn, 2010) rather than patient perceptions of the process of empowerment. Conceptualizing empowerment solely as an outcome fails to recognize the contribution of nursing care to the process of patient empowerment and the patient-centeredness of its approach. The Patient Perceptions of Patient-Empowering Nurse Behaviors Scale (PPPNBS) was constructed using an integrated model of work empowerment proposed by Laschinger et al. (2010) and a concept analysis of empowerment (Jeroefke, in press) to measure patient perceptions of patient-empowering nurse behaviors in an acute care setting. The PPPNBS demonstrated acceptable validity and reliability in surgical patients with cancer and cardiac disease, but has not yet been tested in non-surgical patient populations (Jeroefke et al., in press). Non-surgical patients may have a different experience during the transition from hospital to home because
they do not have acute post-surgical issues such as wound care, incisional pain, and activity restrictions (Leegaard, Naden, & Fagermoen, 2008).

The purpose of this study is to examine the validity and reliability of the PPPNBS in a population of non-surgical, chronically ill patients and then broaden the psychometric analysis of the instrument by combining the non-surgical and previous surgical sample. Evaluating the psychometrics of the PPPNBS across a broad sample of adult patients will determine its robustness and assist in refining this patient-centered measure of nurse behavior for use in future intervention studies to improve patients' engagement in chronic illness self-management behaviors and subsequent healthcare outcomes.

b) Specific Research Objectives

This study has the following aims: (1) Examine the validity and reliability of the PPPNBS in non-surgical patients with a chronic illness; (2) Examine the validity and reliability of the PPPNBS in a combined heterogeneous sample of non-surgical and surgical patients with a chronic illness (3) Perform confirmatory factor analysis on the PPPNBS using data from the combined sample. Aim 1 will answer the following research questions using a sample of non-surgical patients: (1) Does the PPPNBS demonstrate acceptable reliability ($\alpha \geq .70$)?; (2) Does the PPPNBS correlate with pre-discharge patient activation scores, demonstrating concurrent validity; (3) Does the PPPNBS measured at discharge predict patient activation and functional health status six-weeks post-discharge, demonstrating predictive validity?; (4) Are there differences in PPPNBS scores based on race, age, time since initial diagnosis, or length of hospitalization? Aim 2 will answer research questions one through four using a combined non-surgical and surgical sample. Aim 3 will answer the following research question: (5) Is the a-priori theoretically-derived factor structure of the PPPNBS confirmed by factor analysis?

c) Work Plan

Design, Setting and Sample. For this non-experimental, prospective, correlational, psychometric study, a convenience sample of 143 non-surgical patients will be recruited from a local medical center (see letter of support) to expand the size and scope of the prior surgical study (157 patients). A combined total of 300 patients who completed the PPPNBS is necessary for confirmatory factor analysis in aim 3 (Tabachnick & Fidell, 2007). Power analysis indicated that a sample size of 143 non-surgical patients exceeded 80% power at $p<.05$ for analyses in aim 1 and a combined sample size of 300 exceeded 80% power at $p<.05$ for analyses in aim 2. The inclusion criteria are: (1) English-speaking; (2) 18 years of age or older; (3) diagnosis of a chronic illness including cancer, cardiac disease, hypertension, diabetes, and chronic obstructive pulmonary disease (COPD); (4) length of stay of at least 2 nights; (5) discharge to home; (6) not enrolled in palliative or hospice care unless for pain management only; and (7) no cognitive or development delays (determined by asking the nursing staff during patient eligibility screening). A total of 169 non-surgical patients will be enrolled to account for an expected 15% loss to follow-up (Jeroftke et al., in press).

Instruments. Patient perceptions of patient-empowering nurse behaviors will be measured prior to discharge using the PPPNBS, a 45-item scale with 7 subscales: Initiation, access to information, access to support, access to resources, access to opportunities for engaged participation, informal power, and formal power. All of the questions are on an 11 point Likert scale with 0 meaning “not at all” and 10 meaning “a great deal”, with higher scores indicating higher perceptions of empowerment. Cronbach’s alpha reliability estimates in the sample of post-surgical patients were between .79 and .93 for subscales and .98 for the total scale (Jeroftke et al., in press).
The 13-item Patient Activation Measure (PAM13) will be used to measure patient activation pre and six-weeks post-discharge. The PAM13 is not condition-specific and can be used with a wide array of patients to measure their knowledge, skill, and confidence in self-management behaviors (Hibbard, Mahoney, Stockard, & Tusler, 2005). In the prior study, Cronbach’s alpha reliability estimate for pre-discharge PAM-13 was .85 and for six-week post-discharge PAM-13 was .87 (Jerofke et al., in press).

The SF36 will be used to measure functional health status six-weeks post-discharge using a four-week recall period. The SF36 consists of 36 items, 8 subscales, and 2 summary measures. Factor analysis has confirmed that the two summary measures (mental component summary [MCS] and physical component summary [PCS]) account for 80-85% of the variance in the eight subscales (Ware & Gandek, 1998). MCS and PCS raw scores are transformed to a standardized scale (mean 50, SD 10) and will be the measures of interest in this study. In the prior study, Cronbach’s alpha reliability estimates for the subscales comprising the MCS measure were between .77 and .89 and for the PCS measure were between .79 and .91 (Jerofke et al., in press).

Data collection. Demographic data collected for the purposes of validity testing (known groups comparisons) include age, race, length of time since initial diagnosis of the chronic illness, and length of stay. Demographic data collected for the sole purpose of sample description includes number of comorbidities, prior hospitalization for the same chronic illness, gender, socioeconomic status (Hollingshead, 1975), and stage of cancer or cardiac disease if applicable. Patients will be asked to self-report prior hospitalization for the same chronic illness, length of time since initial diagnosis of their chronic illness, their age, gender, race, and education level. Stage of cancer or cardiac disease (if applicable), admitting diagnosis, number of comorbidities, type of chronic illness, and length of stay will be found through chart review.

Using the same procedures from the prior study with surgical patients, as described in Jerofke et al. (in press), informed consent will be obtained prior to the day of discharge, at which time contact and demographic information will be collected and the pre-discharge PAM13 will be completed. The PPPNBS will be placed in patients’ charts and will be given to patients by either their nurse or the research staff within four hours before discharge. The PPPNBS will be returned in sealed envelopes and placed in collection boxes. If patients are discharged without completing the PPPNBS, they will be contacted by the research staff within two days of their discharge and the PPPNBS will be completed over the telephone. Medical record reviews will be conducted by the researcher and research assistants. Patients will be contacted by phone by either the research assistants or researcher at six-weeks post-discharge in order to complete the post-discharge PAM13 and SF36 through a scripted telephone interview.

Analysis. Analyses will be performed using SPSS. Case mean substitution, using the patient’s subscale mean, will be used for missing values on the PPPNBS if less than 30% of the subscale’s items are missing (Shrive, Stuart, Quan, & Ghali, 2006). A patient’s total mean value will be imputed for missing values in the PAM13 when fewer than 30% of values are missing.

For aim 1, question 1 will be examined in the non-surgical sample by calculating Cronbach’s alpha reliability coefficients for each subscale and total PPPNBS scores. Question 2 will be analyzed by calculating Pearson’s correlation coefficient for PPPNBS total score and pre-discharge PAM 13. Question 3 will be examined with three different linear regression equations: PPPNBS total score as the predictor variable and PAM13, MCS, and PCS at six-weeks post-discharge as the dependent variables, using fixed effects for unit and diagnosis. Fixed effects for unit will be used because the degree of structural empowerment on each individual nursing unit may impact patient-empowering behaviors of nurses on that unit (Laschinger et al., 2010). Fixed
effects for diagnosis will be used because the PPPNBS has not been used in this population before. Question 4 will be examined using one-way ANOVAs for known-group comparisons. Race (three most frequent race groups plus other) and quartiles of age, length of time since initial diagnosis, and length of stay will be the independent variables and PPPNBS score will be the dependent variable. For aim 2, research questions 1, 2, and 4 will be analyzed identically as they were in aim 1, but with the combined sample. Question 3 will be examined in the same way, but patient type (surgical versus non-surgical) will be added as a fixed effect. For aim 3, question 5 will be examined by conducting a confirmatory factor analysis with maximum likelihood estimation using the combined sample of surgical and non-surgical patients.

**Anticipated problems.** Distribution of questionnaires within four hours prior to discharge requires assistance of staff nurses. Prior research procedures for staff education and reminder cards in patient charts were effective 95% of the time (Jerofke et al., in press). Completing the study forms may result in patients raising additional questions about their care, at which time they will be directed to contact their providers. The telephone interview will be conducted at a time convenient for patients to minimize loss to follow-up. Study recruitment is not expected to be problematic, as 157 surgical patients were enrolled in the prior study over a six-month period.

**Work Plan.** The RRG Funds will be used to support the research assistant, purchase licenses for PAM13 and SF36, and purchase supplies. While receiving SFF Funds, time will be devoted to assisting the research assistants with recruitment, data collection, and data entry. Figure 1 presents a timeline of project activities.

Figure 1. Timeline of Activities

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d) **Relationship to Research Goals**

I recently completed my dissertation study and related publications (Jerofke, in press; Jerofke et al., in press) on patient empowerment. The results indicated that post-surgical patients who had higher perceptions of patient-empowering nurse behaviors while hospitalized had higher measures of patient activation post-discharge, which were associated with higher mental but not physical health status. This study will examine the validity and reliability of the PPPNBS in a non-surgical sample and will use the combined samples of medical and surgical patients to assess the robustness of the instrument. Once the factor structure of the PPPNBS is confirmed in this study, item reduction can be used to refine the instrument to decrease patient burden and increase usability for future research testing interventions to increase patient empowerment. This study will also clarify the relationships between patient empowerment, patient activation, and mental and physical functional health status in patients with chronic illness. The focus on patient-centered self-management is consistent with national priority objectives including those of the new Patient Centered Outcomes Research Institute. The long-term objective is to submit a federal funding application (e.g. NINR, AHRQ, or PCORI) to study the impact of patient-empowering nurse behaviors on patient outcomes such as engagement in certain self-management behaviors, length of stay, and readmission rates.
References


Hibbard, J.H., Greene, J., & Overton, V. (2013). Patients with lower activation associated with higher costs; delivery systems should know their patients’ scores. *Health Affairs, 32*(2), 216-222.


Ware, J. E., & Gandek, B. (1998). Overview of the SF-36 Health Survey and the International Quality of Life Assessment (IQOLA) Project. Journal of Clinical Epidemiology, 51(11), 903-912.

# SFF/RRG PROJECT BUDGET

**Name(s):** Teresa Jerofke, PhD, RN, APNP-BC

**Department(s):** Nursing

**Project Title:** Psychometric Analysis of the Patient Perceptions of Patient-Empowering Nurse Behaviors Scale (PPPNBS) in Patients with Chronic Illness

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## SFF/RRG BUDGET TABLE

*Double click on the table, and then add your budget figures:*

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<th>Funds Requested from Other Sources</th>
<th>Source of Other Funds</th>
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**TOTAL RRG REQUEST, if applicable**

| | $6,000.00 | $0.00 |

**TOTAL COR REQUEST (SFF + RRG):**

| | $11,500.00 |

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## RRG PROJECT BUDGET JUSTIFICATION

On a separate sheet under the heading "RRG Project Budget Justification," describe **each item you listed in the RRG portion of the budget table**. The description should enable reviewers to understand a) how the cost of each item was computed, and b) how the budget items relate to your project objectives.

**NOTE:** Awardees will be notified before winter break. RRG funds may be spent in an 11-month period. Awardees must provide spending plans for two fiscal periods: 1) Start Date of February 1 – 6/30 (current fiscal year), and 2) 7/1 – 12/31 (next fiscal year). RRG funds are bound by fiscal year budgeting restraints. Awardees will be required to provide carefully crafted and accurate spending plans for these two periods. Funds budgeted in any fiscal period must be spent in that fiscal year or they will no longer be available. Awardees will work with ORSP staff to administer their awards.

*Application Kit 13-14*
RRG Project Budget Justification

**Total RRG Project Costs ($6000)**

**Total Other Personnel Salary ($4845)**
Research Assistant ($4845): 2 Marquette University senior nursing students or graduate nursing students will be hired as research assistants (RA). After training in the research protocol, the RA will assist with recruitment, enrollment, data collection, follow-up phone calls, and data entry. Estimated 5 hours/week per RA for 28.5 weeks at $17/hr = $4845

**Licenses ($1079.20)**
PAM13 (used to measure patient activation before and after discharge)
License for up to 500 participants is $750 (cannot obtain license for fewer participants)

SF36 (used to measure mental and physical functional health status after discharge)
License for 170 participants is $329.20

**Supplies ($75.80)**
Binders, clipboards, file folders, pens, post-its, cardstock for reminder cards, copying costs
Teresa A. Jerofke, PhD, RN, APNP-BC
7815 Livingston Ave
Wauwatosa, WI 53213
teresa.jerofke@marquette.edu
(262)442-3696

Academic Preparation

**PhD in the Science of Nursing**, College of Nursing, Marquette University,
Milwaukee, WI, May 2013
Advisor: Dr. Marianne Weiss

**Masters in the Science of Nursing**, College of Nursing, Marquette University,
Milwaukee, WI, May 2008
Concentrations: Acute Care Nurse Practitioner
Advisor: Dr. Kerry Kosmoski-Goepfert

**Bachelors in the Science of Nursing**, College of Nursing, Marquette University,
Milwaukee, WI, *Summa Cum Laude* December 2004
Advisor: Dr. Marilyn Bratt

Professional Experience

**Assistant Professor**, August 2013 – present
Marquette University, Milwaukee, WI

**Acute Care Nurse Practitioner**, June 2011-June 2013
Froedtert Hospital/Medical College of Wisconsin – Surgical Oncology

**Clinical Instructor**, January 2011-May 2011
Marquette University, Milwaukee, WI

**Research Assistant, January** 2010 – May 2011

**Acute Care Nurse Practitioner**, February 2009 – January 2011
Froedtert Hospital/ Medical College of Wisconsin – Cardiothoracic Surgery

**Acute Care Nurse Practitioner May** 2008- February 2009
Milwaukee Neurological Institute

**Pediatric Staff Nurse**, 2005 - 2008
Children’s Hospital of Wisconsin – Pediatric Intensive Care Unit

**Research Assistant, August** 2006 - May 2007
Faculty in College of Nursing, Marquette University, Milwaukee, WI

**Research Assistant**, January 2003 - January 2005
Dr. Marianne Weiss at Marquette University, Milwaukee, WI

**Certification and Licensure**

Advanced Practice Nurse Prescriber in Wisconsin – Sept 2008 - present

Board Certified Acute Care Nurse Practitioner - Aug 2008 - present

Wisconsin RN - February 2005 - present

BLS certified – 2002 - present

**Published Research**


**Presentations**

**Regional**


*SFF/RRG Jerofke, T.*
Memorandum

September 17, 2013

Teresa Jerofke, PhD, RN, APNP-BC
Assistant Professor
Marquette University, College of Nursing
P.O. Box 1881
Milwaukee, WI 53201-1881

Dear Dr. Teresa Jerofke:

As the Chief Nursing Officer of Wheaton Franciscan- St. Joseph, I am pleased to support your study entitled, "Psychometric Analysis of Patient Perceptions of Patient-Empowering Nurse Behaviors Scale (PPPNBS) in Patients with Chronic Illness" for consideration for funding through Marquette University. WF-St Joseph is excited to serve as the site for this study and will provide access to medical nursing units for the project once IRB approval is obtained. When the study is ready to be conducted, I will put you in touch with unit leaders to make specific arrangements for data collection. I understand that you will be collecting data related to patient characteristics, illness factors, patient activation, and patient perceptions of patient-empowering nurse behaviors directly from patients and through chart review.

This research offers great potential for understanding and quantifying patients’ perceptions of nurse empowering behaviors and their relationship to patient activation and functional health status. This study will provide an opportunity to test the validity and reliability of a newly constructed instrument in a medical chronically-ill population. Once the instrument is refined, it can be used in future intervention studies to improve health outcomes in chronic illness. There is great interest in improving the activation of patients given the growing number of individuals with chronic illnesses and the drive for cost containment of care. The focus on patient-centered self-management is consistent with national priority objectives. In addition, higher patient activation measures have been linked to higher functional status, quality of health care, satisfaction of care, quality of life, adherence to health maintenance and self-management behaviors, and fewer physician visits. This study provides the potential to link nursing therapeutics to patient outcomes.

As a Magnet hospital, we value the conduct of research that investigates nursing practice and nurses’ impact on patient outcomes. We look forward to having you in our hospital to conduct your research and we eagerly await your results. If you have any additional questions, feel free to contact me at any time.

Sincerely,

Sharon Baughman, MSN, RN
Senior Vice President Patient Care Services