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Reliability and validity of the patient activation measure in hospitalized patients

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ABSTRACT

Objective: The purposes of this paper are to describe the internal consistency reliability and construct validity of the PAM-13 for hospitalized cardiology and oncology patients and to examine the predictors of low patient activation in the same population.
Methods: We evaluated the internal consistency reliability of the PAM-13 in the inpatient setting. Construct validity of the PAM-13 was then assessed using two approaches: expected known-groups differences between patients with planned and unplanned admissions PAM-13 levels and convergence of PAM-13 levels with other measures.
Results: The PAM demonstrated adequate internal consistency overall (Cronbach $\alpha = 0.81$). Patients with unplanned admissions were more likely to have low activation than patients with planned admissions (adjusted OR = 5.7, $p = 0.008$). The PAM-13 was modestly correlated ($p < 0.001$) with each of the PROMIS Global Health components used in this study (global, physical and mental health).
Conclusion: This study demonstrates the PAM-13 is a reliable and valid measure for use in the inpatient hospital setting and that type of admission (planned versus unplanned) is an important predictor of patient activation.
Practice implications: By measuring patient activation with the PAM-13, clinicians and researchers can provide tailored communication and care strategies to meet patient's needs.

1. Introduction

The concept of "patient engagement" has become increasingly important in recent years [1]. Patient engagement is a construct that includes self-efficacy, behavior, and knowledge, and has been shown to predict a variety of health behaviors [2]. Engaging patients in their care is the focus of many public- and private-sector initiatives and programs [3–5]. There is no single definition of patient engagement, nor is there a universally agreed-upon tool for measuring this concept. To date, the most frequently used instrument for measuring patient engagement is the Patient Activation Measure (PAM) [6–9].

The PAM-13 is a 13-item self-reported measure designed to assess patients' knowledge, skills and confidence in managing their health. The PAM-13 also describes the extent to which patients are informed and involved in their healthcare [6]. The PAM-13 has been validated in multiple outpatient populations including multi-morbid older adults and multiple sclerosis patients, and in relation to employee health characteristics [10–12]. It has strong psychometric properties, with high internal consistency and construct validity [10–12]. Recent studies involving the PAM have found that higher patient activation levels were correlated with improved health outcomes over time including better clinical indicators (e.g., not being obese, having high-density lipoprotein and triglycerides in normal ranges), more healthy behaviors, better self-management, greater use of

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preventive screening tests, and lower use of costly healthcare services [13,14].

While the PAM has become a widely used tool in outpatient care settings, its applicability to patients in the hospital is not well established [15]. Validating the PAM-13 in the inpatient setting is important as there are over 35 million hospital admissions each year [16] and interventions to impact patient engagement in the hospital are becoming more commonplace [8,17–19]. The purposes of this paper are 1) to describe the psychometric properties (internal consistency reliability and construct validity) of the PAM-13 for hospitalized cardiology and oncology patients with planned and unplanned admissions; and 2) conduct an exploratory analysis to examine the predictors of low activation in the same population.

2. Methods

2.1. Study design

We first evaluated the internal consistency reliability of the PAM-13 in the inpatient setting. The construct validity of the PAM-13 was then assessed using two approaches: expected known-groups differences of PAM-13 levels and convergence of PAM-13 levels with other measures.

The purpose of validation using known-group differences was to systematically evaluate whether the PAM-13 instrument would discriminate between two known groups (unplanned admissions versus planned admissions) expected to differ on the constructs that the instrument is intended to measure [20–22]. These groups were chosen based on the hypothesis that patients with a planned hospitalization would have a higher PAM level (reflecting higher activation) than patients with an unplanned admission. The rationale behind this assumption was that patients who have planned admissions are more likely to be actively managing their healthcare and have been able to schedule the procedures and treatments for their care ahead of their admission. We believed these patients would be different than those admitted through the emergency department with an unplanned admission for an emergent problem. Additionally, we hypothesized that this difference would be apparent among both cardiology and oncology patients.

We examined convergent validity by correlating the PAM-13 levels with quality of life measures, specifically, the Patient Reported Outcomes Measurement Information System (PROMIS) Global Health short form scores [23]. We conjectured that participants with higher activation levels would also have higher mental and physical quality of life scores. Our hypothesis was that these quality of life measures would be positively correlated with the PAM-13 level. This hypothesis was based on prior findings of modest correlation between the PAM-13 and a multiple sclerosis quality of life measure ($r = 0.42$) [10].

We also conducted an exploratory analysis to examine predictors of low activation according to PAM-13 levels and scores. We tested for differences by age, education, health literacy and primary clinical service lines (oncology and cardiology) based on prior literature [7,10,11,24]. We then compared the PAM-13 levels found in this inpatient study to those previously reported in other settings.

2.2. Subjects

We performed the evaluation of known-group differences based on data collected from 100 participants continuously recruited from cardiology and oncology units at a large, urban, academic medical center. This sample size was chosen based on previous literature regarding validation of measures [25]. Criteria for inclusion were 18 years or older and English speaking. Exclusion criteria were inability to perform the interview in English, and severe cognitive or psychiatric impairment. Participants were compensated $10 for their time, typically around 15 min. Participants provided written informed consent, and were instructed that their participation was completely voluntary, there were no right or wrong answers, and they were free to skip any questions if they did not feel comfortable answering them. Additionally, they were informed that participation would have no bearing on their clinical care. These steps were taken to ensure the survey was administered without undue influence from the investigators. The research protocol and written informed consent form describing the study and compensation were approved by the medical center's Institutional Review Board.

In total, 50 cardiology participants (25 planned and 25 unplanned admissions) and 50 oncology participants (25 planned and 25 unplanned admissions) were recruited from July to October 2015. On the cardiology service, recruitment for planned admissions was conducted among those patients with a known disease (e.g., aortic stenosis) undergoing a planned heart valve repair or replacement (e.g., a transcatheter aortic valve replacement). Unplanned cardiology participants came through the hospital's emergency department and were diagnosed with ST-segment elevation myocardial infarction, non-ST segment elevation myocardial infarction, or acute coronary syndrome. On the oncology unit, the planned-admission participants came in for chemotherapy or another planned treatment. Unplanned oncology participants came through the hospital's emergency department and were admitted with diagnoses such as fever and respiratory failure.

2.3. Data collection

Each participant's admission status of planned versus unplanned was collected by reviewing the electronic health record (EHR). Data were collected by surveying each participant and storing the results in a secure database. Participants elected whether to be asked the questions orally by the research coordinator, or to respond directly to the survey using a tablet computer provided to them by the research coordinator.

2.4. Measures

2.4.1. Sample characteristics

Sample characteristics were collected through a demographic form completed at enrollment. These questions included information on age, gender, race, ethnicity, education level, and technology use. Technology-use questions asked about the patient's experience using the internet ("Do you access the internet?"; yes or no), what devices they used to access the internet ("How do you access the internet (select all that apply)"; desktop, laptop, smartphone, tablet, other), and how much they used the internet on a daily basis ("Typically, how much do you use the internet on a given day?"; less than 30 min, 1–2 h, 3–4 h, 5 or more hours). Income was measured with the question, "*Financially, would you say you are . . . comfortable; have enough to make ends meet; or do not have enough to make ends meet?*" as traditional questions using numerical income scales have been fraught with a wide range of bias [26] and random error [27].

2.4.2. Patient activation

Patient activation, was measured using the PAM-13. The responses to each of the 13 items range from 1 (strongly disagree) to 4 (strongly agree). Scores were calculated by summing the responses, weighted to a scale of 0–100, and then converting the score to a PAM level (1–4) using the PAM scoring spreadsheet. The

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