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Development of a Measure of Nurse Vigilance from the Patient's Perspective:

A Content Validity Study

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Honors Research Project

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Abstract

Problem: Since the landmark Institute of Medicine report, *To Err is Human*, was published in 1999, patient safety has become a major concern in healthcare systems. Although attention is being given to patient safety and preventing patient morbidity and mortality, experts indicate that little progress has been made in decreasing healthcare errors. Vigilance is a phenomenon often identified in the literature as a means to promote patient safety and well-being. **Purpose:** The aim of this study was to establish content validity in a newly developed instrument designed to measure nurse vigilance from a patient perspective. **Method:** Generated 130 items and following a card sort reduced that to 70 items. Four steps were completed to design the instrument: 1) A pool of 70 items was developed from five domains of vigilance, previously established from research: knowledge, connectedness, hope, going beyond the call of duty, and shared vigilance, as well as a domain to reflect quality patient outcomes such as safety and quality care. The domains were derived from a qualitative study of patient, family, and nurse experiences of vigilance and existing research literature; 2) An expert panel, consisting of eight professionals with knowledge about vigilance, quality, and safety was identified and they were asked to rate items for content validity; 3) A content validity survey was developed to rate each individual item according to the expert analysis of the relevance to its proposed domain of vigilance. 4) Using Statistical Package for the Social Sciences (SPSS) 21, items were analyzed for internal consistency and content validity. **Results:** Statistical evidence and theoretical relevance guided the individual items to be retained as well as eliminated, which led to the delineation of a 35-item instrument. The instrument demonstrated an adequate degree of reliability with an alpha of 0.982, and an acceptable total CVI rating of 0.83.

Background

In 1999 the Institute of Medicine (IOM) estimated that nearly 44,000-88,000 patient deaths occurred each year in the United States due to medical errors (IOM, 2000). The report urged the healthcare community to respond and find ways to improve patient safety and quality of care. Despite years of research, there has not been appreciable progress made in significantly reducing errors (Leape, 2009). The conceptualization of harm as well as the response to and prevention of errors must be broader (Vincent, 2014). Ways to improve care must include patients and family as stakeholders in their own safety; healthcare providers need to include them in decision-making to promote patient centered care (PCC). PCC is considered essential to improving patient safety and quality (IOM, 2001; Patient-Centered Primary Care Collaborative, 2009).

The concept of vigilance is one phenomenon that frames harm in a broader context, has the potential to reduce errors, and involves patients in their own care. According to Kooken (2008), vigilance is the degree to which an interactive (between persons) process of knowledgeable watchfulness exists in healthcare in response to threats. Nurse vigilance appears related to patient satisfaction and safe outcomes for patients (Ebright, Patterson, Chalko, & Render, 2003). Although vigilance is recommended in thousands of research abstracts as a solution to various problems, when articles are reviewed, there is no information on how to operationalize vigilance, no definition of the term, nor any evidence that being vigilant is a successful response to any of the problems for which it is recommended. Little research has been conducted specifically on vigilance as a concept of primary interest. An investigation of how to use vigilance in healthcare has potential to improve patient safety and outcomes.

Literature Review

Many stakeholders have investigated and made suggestions to improve patient safety and quality of care. For example, The Joint Commission recommended the Speak Up initiative (Joint Commission, 2008). This program encouraged patients to take an active role in their care and partner with their healthcare providers through speaking up if they were concerned about their care or saw healthcare providers doing something wrong, such as not washing their hands when they entered the patient room. This program has been reported to be a successful patient education tool; however no research evidence was included with that claim (AHC Media LLC, 2010).

The IOM has been quite involved in defining patient safety and errors. Patient safety was defined as “the prevention of harm to patients” (Aspden, Corrigan, Wolcott, & Shari, 2004) and was also “indistinguishable from the delivery of quality care” (IOM, 2001, p. 5). IOM placed the emphasis for safe care on a system of care delivery that: (1) prevents errors; (2) learns from the errors that do occur; and (3) is built on a culture of safety that involves health care professionals, organizations, and patients. The Agency for Healthcare Research and Quality (AHRQ) expands upon the definition of prevention of harm: “freedom from accidental or preventable injuries produced by medical care” (Mitchell, 2008, p. 7).

In the current healthcare system both quality care and patient safety are extremely important because errors are difficult to prevent (Reason, 2005). Hospitals have been characterized as complex adaptive systems which are constantly changing, making it necessary for persons to adapt to changing conditions (Lewin, 2005). Adaptation to such changing conditions are best responded to when everyone in healthcare works together, including patients and families. When good relationships are established among patients, nurses, and family,

quality care is possible because nurses, patients, and family members work together (Ebright, 2004). Outcomes, such as patient safety, become the products of relationships between nurses, patients, and families (Ebright, Patterson, Chalko, & Render, 2003). The type of relationship in which the nurses, patients, and families come together to watch over and share observations about the patient can be characterized as shared vigilance.

The term vigilance retains its roots in the defense industry (Buckner & McGrath, 1963) where it was conceptualized as a response to stimulus; for example, how quickly a radar operator could spot a potential threat based on radar signals. However, in more recent qualitative studies, vigilance is presented as a very complex phenomenon (Delaney & Johnson, 2006; Gramling, 2004; Rubarth, 2003; Schreiber & Macdonald, 2010; Shaw, 2004,). Further division of the concept occurs in the different ways the majority of healthcare research presents vigilance versus how patients and families perceive vigilance. Healthcare professionals tend to measure vigilance in terms of task performance, such as how quickly call lights are answered or as a measure of how fatigued nurses feel (Howard, Gaba, Smith, Weinger, Herndon, Keshavacharya, & Rosekind, 2003; Scott, Rogers, Hwang, & Zhang, 2006). Families and patients view vigilance differently, on an ever-changing continuum (Carr, 1998; Gramling, 2004; Rubarth, 2003; Schreiber & Macdonald, 2010) and with complex, yet subtle behaviors associated with being vigilant. Eggenberger, Krumwiede, Meiers, Bliesmer, and Earle (2004), observed family vigilance emerge as a process used to protect neutropenic cancer patients. Family monitoring for symptoms and advocating for effective management were seen as indicators of vigilance among family members (Eggenberger et al., 2004).

The only known model of nursing vigilance was suggested by Meyer and Lavin (2005). Originally, Meyer (2002) researched women suffering from migraine headaches and concluded

that vigilance emerged as a process that allowed preservation of self (Meyer, 2002). The patients in this study relied on trust and if they deemed their healthcare provider trustworthy, they allowed them to be vigilant on their behalf (Meyer, 2002). Meyer (2002) concluded that vigilance was viewed on a continuum by patients and not as a series of transactional tasks. From this study, Meyer and Lavin (2005) proposed a model of nursing vigilance, however, the model was not derived from data from nurses, nor was it tested as a model in nursing.

Kooken (2008) conducted a comprehensive concept analysis of vigilance. From this analysis, an initial model of vigilance was constructed. Next, an empirical phenomenological qualitative study was carried out in which patients with cancer (n=7), their family members (n=6), and nurses (n=7) were interviewed about their experiences with vigilance. Data were collected and analyzed individually using an adapted version of Colaizzi's method (Kooken & Haase, 2013). From the analysis, theme categories, clusters, and themes were derived (Kooken, 2008). The overall results of this study indicated that vigilance is a complex phenomenon with many indicators depending on whether the data were from patients, families, or nurses. Originally, 10 theme categories were identified as shared among the three groups, meaning they conceptualized some of vigilance as a common experience whether the person was a patient, family member, or nurse. However, in the original research, the research team chose the five most compelling theme categories to further explore. "These five categories offer groundbreaking evidence for vigilance as a complex and interactive phenomenon (Kooken, 2008, p. 210). The five commonalities explored further in the original research were knowledge, hope, connectedness, going beyond the call of duty, and shared vigilance (Kooken, 2008). From these study findings the original model of vigilance was modified to incorporate results from the patient's perspective (see Appendix A).

To date, there is no validated or tested model of vigilance in healthcare (Kooken, 2008). Mahoney, Jones, Coon, Mendelsohn, Gitilin, and Ory (2003) created a scale that measured caregiver vigilance in patients with Alzheimer's disease, but this scale was not reliable and only measured the vigilance of the familial caregiver, not a nurse. An instrument with high reliability and validity has not yet been introduced to measure the vigilance of nurses.

Problem

While there are many instruments to measure patient perspectives about satisfaction and quality of care (Solberg, Asche, & Averbeck, 2008), there is no instrument that is used to measure patient perspectives of nurse vigilance. Such an instrument could be used to quantify nurse vigilance and determine what tasks and attitudes make nurses appear more vigilant from patients' perspectives. A reliable and valid instrument may provide correlations between nurse vigilance and quality patient outcomes and patient safety.

Purpose

The aim of this study was to establish content validity in a newly developed instrument designed to measure nurse vigilance from a patient perspective.

Method

Assessing content validity is one of the most critical steps in instrument development. Validity refers to the degree of accuracy and appropriateness of inferences made from scores (Beck & Gable, 2001). The content validity index (CVI) measures the degree to which the items of an instrument adequately represent the universe of content for the concept being measured (Polit & Beck, 2010). The first step in a CVI study is the creation of the statements that users will rate on the instrument. Statements are created to reflect a domain of the phenomenon to be measured. The delineation of the domains usually comes from qualitative data sources (Beck &

Gable, 2001); in this case the domains are based on Kooken's (2008) research. After the domains have been chosen, both conceptual and operational definitions must be created for each individual domain (Beck & Gable, 2001). After the definitions are created, then statements can be generated under each domain that relate to what the domain is trying to measure.

Next, a group of experts is selected who rate each of the statements on a four-point relevance scale to determine how appropriately the statements relate to the domain and its definition. The domains used for this study were: knowledge, hope, connectedness, going beyond the call of duty, shared vigilance, and a sixth section was generated to measure patient safety and quality care. After the experts rank the statements, a CVI calculation is performed to assess how relevant each statement is to the domain. Then the decisions are made about which statements to keep and which to remove based on the CVI calculation and theoretical constructs.

Twenty statements were created in each of the five original domains and thirty-five statements for the patient safety and quality domain were generated. According to DeVillis (2003), as many items as possible should be developed. Statements were designed to prompt patients to rank their nurses on a likert-type scale to assess whether or not nurses possessed the attributes under that domain. For example, under the knowledge domain a statement on the questionnaire was "My nurses give me valuable information about things that may be threats to my health". The domains guided the development of the statements and whenever possible, patient quotes from the Kooken (2008) study were used to derive statements from the deidentified research transcripts.

Due to the large number of statements under each domain, a card sort was completed to reduce redundancy among the statements. The card sort consisted of putting each statement on an individual piece of paper and examining them one domain at a time. The individual pieces of

paper were grouped as similar statements or kept singly if no other statement was similar. For example, the statement “my nurses seem to know what they are doing” was redundant with the statement “my nurses seem to know what’s going on”; the latter statement was retained because it was based on a patient quote. Discussions about items and their wording occurred among the research team during the card sort. Items were examined for consistency with the domain and its definition, as well as the model of vigilance. For example, one statement under the knowledge domain that was eliminated was “My nurses are well informed about my medications”. This statement was narrow in its conceptualization of knowledge and was eliminated. Although the model incorporates medication error as part of patient outcomes, just because a nurse is knowledgeable about the medication, there is not necessarily a corresponding reduction in medication errors as they are caused from multiple variables. Additionally, some items were reworded on reexamination because they were not in a language the majority of patients might easily understand. For example, under the connectedness domain, the following statement was reworded from “My nurses care for my emotional health as well as my physical health” to “My nurses do special things for me I would never expect them to do”. The reworded statement more clearly reflected statements from patients in the original research about ways in which nurses helped patients feel connected with them.

After the card sort, items in the first five domains were reduced from 20 items to 10, and in the safety/quality domain items were reduced from 35 to 20 items. This results in a reduction of the overall instrument went from 135 items to 70 items, before being distributed to the expert panel. In order to collect the CVI information, a packet was created to distribute to the expert panel (see Appendix B). The packet gave instructions on how to fill out the relevance scale and also gave background on nurse vigilance and the delineation of the five domains and the patient

safety/quality domain. For each domain a definition was given to guide the experts in the decision whether or not the statement was or was not relevant. Each expert was asked to rank the individual statements based on a relevance scale (see Figure 1). The research team chose the four-item relevance scale because it was the scale that was advocated by Davis (1992) and is frequently used in instrument development research.

Figure 1. Relevance Scale

Not Relevant 1	Somewhat Relevant 2	Relevant 3	Very Relevant 4
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Sample

The expert panel in this CVI study was selected based on their experiences in patient safety and quality care professional roles. A request was sent to ten experts and eight experts agreed to participate; however, only seven experts completed the relevance scale ratings. Experts' identities were kept confidential in accordance with this IRB-approved study. Seven members of the panel had earned their Doctor of Philosophy in Nursing (PhD) and one is completing her PhD. Three of the panel members were very familiar with Kooken's (2008) research on vigilance. The remaining experts had experience in patient safety through research, academic, or clinical positions, or through service such as serving on the Quality and Safety Education Nursing (QSEN) board of directors. Seven experts is a desired number of expert raters. The appropriate amount of expert raters is typically between five to ten (Polit & Beck, 2010).

Data Analysis

After the responses were collected from experts, the data from the relevance scale was analyzed using on SPSS 21 and both reliability and validity were assessed. The reliability of the

statements both individually and together was examined. The Cronbach's alpha measures the internal consistency of the extent to which items measure the same trait (Polit & Beck, 2010). The reliability of each domain as well as the instrument as a whole was calculated. Next a CVI was run on each item, each domain, and the instrument as a whole. The CVI measures the degree to which the items of an instrument adequately represent the universe of content for the concept being measured (Polit & Beck, 2010).

Results

Completed packets were received from seven of the experts. The eighth expert did not finish rating the entire packet, so this person's ratings were not included in the analysis. This expert stated that she had difficulty completing the packet because of disagreement with the theoretical model. She did not elaborate further, nor offer any comments to improve the model or statements. There were a total of 490 ratings on 70 items from seven experts. The data were collected over several weeks, with multiple reminders sent to the experts to return their packets.

Data of 70 items

Cronbach's alpha statistics were run to signify the reliability of the instrument as a whole and each domain individually. The instrument had a high degree of reliability ($\alpha = 0.948$). As seen in Table 1, all of the individual domains had high alphas, greater than 0.7, which is what is deemed reliable for a new instrument (Polit & Beck, 2010).

Table 1
70-item Reliability and CVI Statistics

Domain	Cronbach's alpha	CVI
Knowledge	0.948	0.79
Hope	0.971	0.7
Connectedness	0.943	0.73
Going Beyond the Call of Duty	0.953	0.76
Shared Vigilance	0.914	0.76
Patient Safety and Quality Care	0.968	0.75
Instrument as a whole	0.990	0.75

Content validity indices were run on all 70 items to determine the degree to which the experts believed that they were relevant to the domain definition. Twenty-five of the items received a 0.8 CVI or above, which is an ideal rating. Twenty-seven items ranged from 0.72 to 0.80 and eighteen items were rated below a 0.72 CVI (see Appendix C).

Content validity indices were also calculated for the domains and the instrument as a whole. The CVI for the 70-item instrument was 0.75 and each domain fell below a 0.8 rating (see Table 1). This finding was expected because the next step in the study is to determine which items to keep based on statistical analysis and theoretical relevance. Since the goal of the instrument was to establish a parsimonious tool with an even distribution of items among the five domains, the research team decided that five items would be retained in the categories of knowledge, hope, connectedness, going beyond the call of duty, and shared vigilance. Ten items were retained in the patient safety and quality care domain. More items were retained in this category because it was not a part of Kooken's (2008) original research and will need to be tested to verify the connection to vigilance.

Data of 35-item instrument

After initial calculations, decisions were made regarding the 27 items that ranged from 0.72 to 0.80 and items were either retained or deleted related to their theoretical relevance to vigilance. Reliability statistics were re-run on the final 35-item instrument. The instrument again had a high reliability with an $\alpha = 0.982$. As seen in Table 2, all of the domain alphas remained above the desired 0.7.

Inter-rater reliability was run on the individual items and the 35-item instrument as a whole. This reliability was calculated by taking the total number of raters who ranked an item either a three or four and dividing that by the total number of raters (Landis & Koch, 1977). As

evidenced in Appendix D, all of the items had an inter-rater reliability above the desired 0.7 (Landis & Koch, 1977).

Table 2
35-item Reliability and CVI Statistics

Domain	Cronbach's alpha	CVI
Knowledge	0.825	0.89
Hope	0.918	0.74
Connectedness	0.866	0.8
Going Beyond the Call of Duty	0.927	0.8
Shared Vigilance	0.856	0.91
Patient Safety and Quality Care	0.970	0.83
Instrument as a whole	0.982	0.83

The CVI ratings for the individual domains were re-calculated for the 35-item instrument (see Table 2). All of the domains, with the exception of hope, increased CVI ratings to above the desired 0.8. The hope domain had a CVI of 0.74, which was an increase of .04 from the original. The instrument as a whole had an acceptable CVI rating of 0.83. These ratings were predicted to improve, as many of the items not deemed statistically relevant were removed.

There was one qualitative comment from an expert that related to item 6 (my nurses are pulling for me) in the hope domain. This expert was concerned patients might take this literally and think that the nurse is physically pulling them in some way. Additional analysis will need to be conducted to examine the performance of this item. Another example, although this item was not retained, was that one reviewer pointed out that under the connectedness domain, the statement indicated "I can joke with my nurses" the term 'joking' may not be interpreted the same by patients depending on cultural and social norms. However, this item had a low statistical score so it was not retained. Other comments that the experts had were focused particularly on the domain of hope. Two of the experts commented that they did not see how hope and being hopeful connects to nurse vigilance. Due to this, in their subsequent ratings of

the hope scale that their items were rated less relevant when compared to the way in which they rated other domains.

Any items below a CVI rating of 0.72 were immediately discarded because of poor statistical performance (Polit & Beck, 2010). Twenty-four statements were kept that had a CVI rating of 0.8 or above. One item with a 0.8 score was eliminated, due to redundancy. In order to keep the final number retained in each domain at five, item one was eliminated (When I notice a change in my condition, so do my nurses) even though its CVI rating was a 1, because of its redundancy to item ten (My nurses are always on the lookout for things that could threaten my health). Retaining a set number of items leaves enough items for future analysis and keeps the instrument parsimonious. Fewer items will reduce patient burden when filling out the instrument. In the patient safety and quality care domain 10 statements were retained, nine of which were rated above 0.8. This domain contained a wider array of considerations that reflected patient outcomes in the model regarding patient safety and quality care, so more items were kept to reflect the broader concepts reflected by items.

After retaining statistically acceptable items, 27 items fell below 0.8, but at 0.72, and needed to be sorted according to their theoretical relevance to vigilance and the domains. Items that were at 0.72 were discussed to make decisions about retention or deletion. In the knowledge domain, item seven was retained (My nurses teach me things about my condition that are important to know), and item nine (My nurses teach my family important things about my condition) was retained based on theoretical relevance. In order for patients or family members to participate as partners in vigilance nurses must teach them important things about their condition (Kooker, 2008). Patient education is one of the specific roles that nurses are expected to master (Potter & Perry, 2013). Educating patients is critical to measure because it can be used

to assess whether or not nurses are giving patients all of the tools they need to successfully participate in their own care (IOM, 2001; Patient-Centered Primary Care Collaborative, 2009). Additionally, teaching the family about the patient condition is critical because the family is responsible for the patient care upon discharge, so education of the family is a vital component of vigilance.

In the hope domain items four (My nurses ask me about my hopes and dreams), five (My nurses have a positive attitude about my health), six (My nurses are pulling for me), and eight (My nurses notice if I am feeling down) were retained for theoretical reasons. Statement four was retained because asking a person about their hopes and dreams is a proactive way to assess what the patients still want and may induce hope in them. Lazarus (1991) suggested that for every emotion there is an action that occurs. For the emotion of hope, vigilance is the corresponding action (Lazarus, 1991). Therefore, assessing and encouraging patient hopefulness may contribute to the patient being more vigilant and decrease mortality (Saleh & Brockopp, 2001; Stern, Dhanda, & Hazuda, 2001). The fifth statement was retained because nurses with a positive attitude can create hope with their optimism, which is connected to the definition for the hope domain. Nurses perceived that patients, family members, and nurses who had positive emotions and outlooks contributed to patients having better disease and treatment outcomes, therefore contributing to hopefulness (O’Baugh, Wilkes, Luke, & George, 2008). Statement six (my nurses are pulling for me) was kept because it was associated with a patient quote from the Kooken (2008) study.

In the connectedness domain items four (I feel that my nurses understand my situation) and five (My nurses listen to my concerns with respect) were retained despite their suboptimal CVI for theoretical reasons. Statement four was retained because a feeling of connectedness can

be fostered through a mutual understanding. Item five was retained because of the word respect reflecting the definition of the domain. The definition given to the domain states that “this perception [of connectedness] is characterized by positive expressions (e.g., empathy, belonging, caring, respect and trust) that are both received and reciprocated, either by the person or between people, through affective and consistent social interactions” (Phillips-Salimi, Haase, & Kooken, 2011). Including the word respect with the action of listening connects directly to the definition given of connectedness.

In the going beyond the call of duty domain, items six (My nurses give 110%) and seven (My nurses are just here for a paycheck) were retained. Statements six and seven reflected CVIs of 0.72 but were retained because they were patient quotes from the Kooken (2008) study. The language specifically uses the value of “110%” and also made mention of nurses being there for more than “just a paycheck” (Kooken, 2008).

In the shared vigilance, domain item one was eliminated (When I notice a change in my condition, so do my nurses) even though its CVI rating was a 1 because of its redundancy to item 10. Item 10 (My nurses are always on the lookout for things that could threaten my health) had a CVI rating of 0.86 and was associated with recognizing threats to the patient’s health, which presented stronger wording associated with vigilance than item one. In the domain of patient safety and quality care item eight (Any symptoms I had were taken care of promptly) was retained for theoretical relevance because of its connection to vigilance. The item stated that any symptoms the patient had were taken care of promptly. Recognizing and taking care of problems early is a vital component of vigilance.

Discussion

The CVI ratings of each domain improved once the instrument was scaled down to 35 items. This expected result was related to discarding the items with low CVI ratings from the original 70-item instrument. The final CVI of the 35-item instrument was 0.83, which demonstrates acceptable validity for the measurement of nurse vigilance. The final 35-item instrument also contained four negatively worded items. These items were retained to ensure that the patients thoroughly review each item and answer accurately. Although the use of negatively worded items may reduce positive response bias, the use of negatively worded items may also create confusion in how to respond (Devillis, 2003).

The hope domain score remained below the desired 0.8. This domain had the most comments from the experts in terms of not being sure that this domain led to nurse vigilance. Two of the experts had a harder time rationalizing how hope fits into the theory. The ratings they gave the hope statements were reflective of this belief, regardless of how well the hope statement did or did not fit the definition. This domain and its statements have been retained because it was a shared theme category among patients, family members, and nurses in their experiences of vigilance through Kooken's (2008) theoretical model. This domain may prove, however, to be population specific in regards to the original research that this instrument has been created from. Kooken (2008) studied an oncology population, where hope emerged as a strong domain; however, in a more diverse population this domain might not hold as much worth in terms of nurse vigilance. This domain will be tested further for reliability and validity.

Overall, the 35-item instrument performed strongly on statistical analysis for both reliability and validity. For the final version of the retained items, see Appendix E. This instrument will now need to be tested in a pilot study to determine if factor loading supports the

theorized domains and to evaluate its effectiveness at measuring nurse vigilance in diverse population. If further research indicates it is reliable and valid, then this instrument could be used to quantify nurse vigilance and determine what tasks and attitudes make nurses appear more vigilant from patients' perspectives. This instrument will also help to draw correlations between nurse vigilance and patient safety and quality outcomes. The addition of the final domain of patient safety and quality outcomes will allow future researchers to examine vigilance and quality and safety simultaneously. There is still limited research on the connection between vigilance and increased patient safety and this instrument could be used to gain further insight into this connection.

Limitations

Timing of recruitment and lack of control over data collection was a limitation of this study. Originally ten experts were contacted; eight agreed to participate and only seven completed the packet in its entirety. This sample was adequate, as anywhere between 5 and 10 raters are desired (Polit & Beck, 2010). The sample was convenient, in the sense that three of the experts were familiar with the original research and also made suggestions for other professionals that could be solicited as an expert for the study.

In this study there was also a lack of a priori decisions about the process of retaining and examining items, as well as statistical cutoff. Many decisions were made based on data due to the inexperience of the research team. The research team did consult with persons with expertise in instrument development and used psychometric standards established by statistical theorists to delete or retain items.

Another limitation exists in the fact that the original research and subsequent items for instrument statements were derived from a homogenous population. The original population

focused on patients with cancer, oncology nurses, and the family members of the cancer patients. Due to this, the instrument's ability to be generalized to a more diverse patient population is yet to be determined. With further research, it will be seen if this instrument and theory is applicable to a patient population outside of those diagnosed with cancer.

Future Research

The next step in this instrument development is to conduct a pilot study administering the instrument to a diverse group of patients with varying diagnoses. This will add to validity and reliability data. Results would be examined statistically with factor analysis to see if items load on the expected domains.

If items performed below expected standards for a new instrument, further research could include cognitive interviews, a qualitative technique that requires patients to say in their own words what they believe the items are asking (Knafl, Deatrick, Gallo, Holcombe, Bakitas, Dixon, & Grey, 2007). Cognitive patient interviews may help to determine if the statements are universal and simple enough for the patients to understand what they are trying to say. Another option would be to perform a focus group of 15-20 persons, who are somewhat knowledgeable about vigilance, who could rank the statements on the relevance scale to further test content validity (Beck & Gable, 2001).

Conclusions

This study produced a reliable and valid instrument that was designed to measure nurse vigilance from a patient's perspective. After careful statistical and theoretical review, a 35-item instrument has been retained with adequate reliability and validity. The patient centered instrument could be used to potentially draw correlations between what patients perceive as nurse vigilance and how this in turn affects patient safety and quality outcomes.

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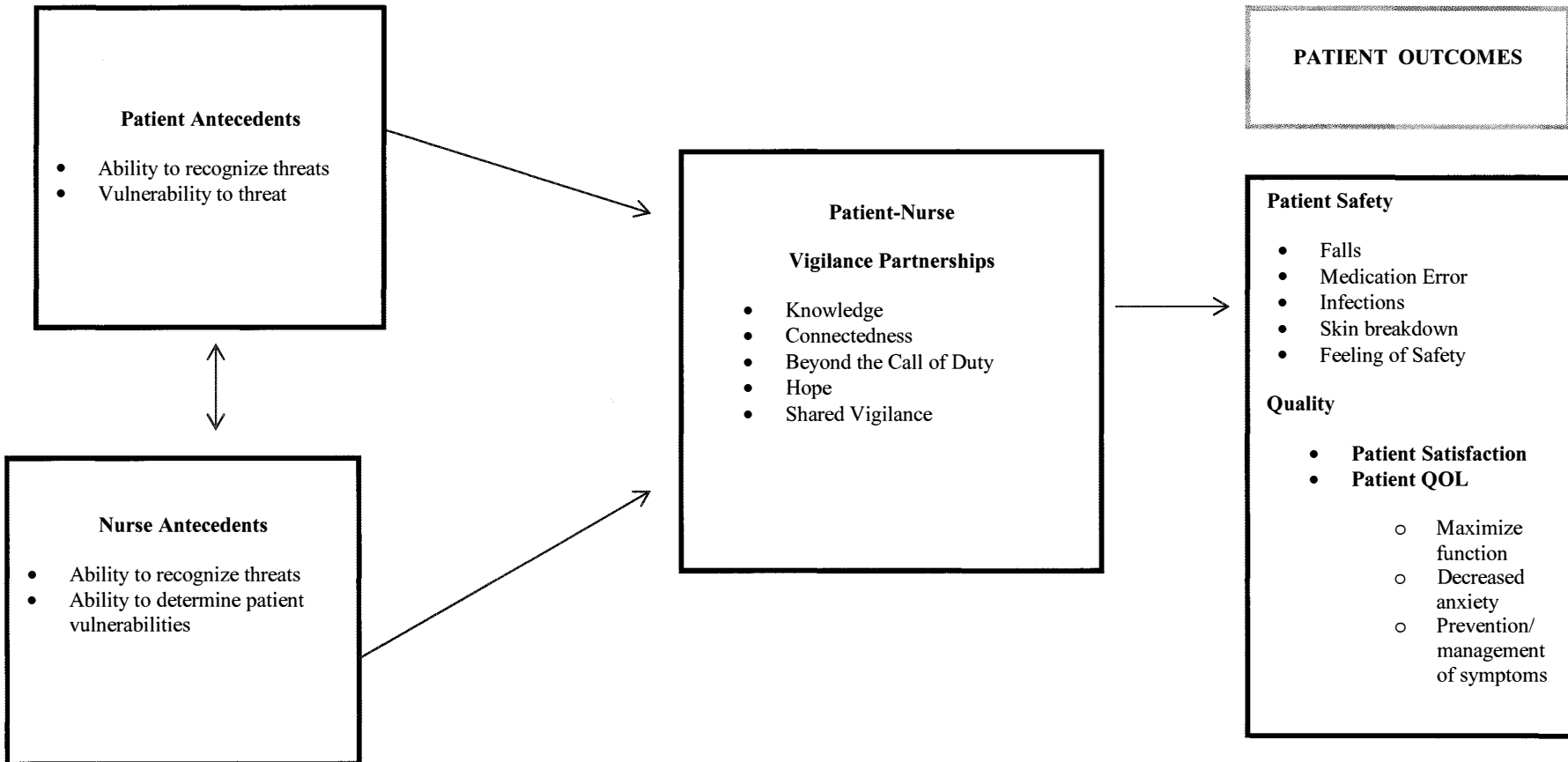
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Appendix A

Model of Patient-Nurse Vigilance Partnerships (Kooken, 2008)



Appendix B
Expert Panel Packet

Dear Expert Panel Member,

Thank you for agreeing to participate as an expert to evaluate items for possible inclusion in a tool being developed as part of an honors research project at Illinois Wesleyan University. The tool is designed to measure patients' perception of nurse vigilance. It is hoped that the use of the tool will give insight into what makes a nurse vigilant and what behaviors signify vigilance to patients. Moreover, our goal is to identify how vigilance relates to patient outcomes, such as safety, quality, and satisfaction.

The enclosed instruction sheet gives an outline of the IRB-approved research project, the expert rating process and the definitions of the domains of vigilance. Please return the completed rating of the statements in one week to jboll@iwu.edu. Feel free to email or call 630-337-0990 with any questions.

Thank you again for your help with this research.

Sincerely,

Jennifer Boll
Undergraduate Nursing Student
Illinois Wesleyan University

Wendy Kooken, PhD, RN
Assistant Professor
Illinois Wesleyan University

A Measurement of Nurse Vigilance from the Patient's Perspective

Jennifer Boll and Dr. Wendy Kookan,

School of Nursing, Illinois Wesleyan University

Research is limited on vigilance as a topic of primary interest; rather vigilance emerges as a theme in many research studies. Further, thousands of abstracts reviewed suggest vigilance is essential to protect patients, yet deeper analysis of the manuscripts reveal little about how vigilance can be operationalized. The development of this instrument is based on a qualitative study in which patients with cancer, one of their family members, and a nurse (who the patient or family member identified as being most vigilant) were interviewed about their experiences of being vigilant for themselves or others. Additionally, an extensive literature review including a concept analysis enhanced what is known about vigilance in healthcare at this time.

In the qualitative study, patient, family, and nurse data were analyzed individually and vigilance themes were derived. Each of these themes was compared across groups and commonalities were identified. Five commonalities among patient, family, and nurse experiences are being used as dimensions of vigilance. Each of these dimensions has been defined and statements were developed in relation to each dimension. The five dimensions of vigilance used for this instrument are knowledge, hope, connectedness, going beyond the call of duty, and shared vigilance.

Nurse vigilance appears related to patient satisfaction and safe outcomes for patients. A model developed from the concept analysis demonstrates the relationship of nurse vigilance to patient outcomes. In addition to further evaluating the five theoretical dimensions of vigilance, this instrument is being developed to measure patient perceptions of nurse vigilance and its relationship to patient outcomes of safety and quality. The instrument is designed to be administered for any healthcare condition or healthcare setting.

Content Validity Indices

DIRECTIONS: For each dimension of vigilance, a definition is provided. The items should reflect the definition of the dimension. Please rate the **relevance of each item to its respective dimension of vigilance** (1 = not relevant to 4 = very relevant). Please place an “x” under the number you believe best reflects the relevance of the statement. Please add any additional comments or suggestions about the item, including wording, below the boxes. We appreciate any comments/suggestions about the items.

Not Relevant 1	Somewhat Relevant 2	Relevant 3	Very Relevant 4
---------------------------------	--------------------------------------	-----------------------------	----------------------------------

Dimension 1: Knowledge

For the knowledge dimension of vigilance, knowledge is defined as, “Familiarity, awareness, or understanding gained through experience or study” (Allee, 2003).

1. My nurses are knowledgeable about my care.

1	2	3	4

Comments/Suggestions:

2. My nurses seem confident in their skills and abilities.

1	2	3	4

Comments/Suggestions:

3. My nurses seem to know what’s going on.

1	2	3	4

Comments/Suggestions:

4. My nurses have a lot of experience in their field.

1	2	3	4

Comments/Suggestions:

5. I feel confident in the responses my nurses give me to my questions.

1	2	3	4

Comments/Suggestions:

6. My nurses give me valuable information about things that may be threats to my health.

1	2	3	4

Comments/Suggestions:

7. My nurses teach me things about my condition that are important to know.

1	2	3	4

Comments/Suggestions:

8. I am confident in my nurses' skills.

1	2	3	4

Comments/Suggestions:

9. My nurses teach my family important things about my condition.

1	2	3	4

Comments/Suggestions:

10. My nurses explain things in a clear and concise manner.

1	2	3	4

Comments/Suggestions:

Dimension 2: Hope

Not Relevant 1	Somewhat Relevant 2	Relevant 3	Very Relevant 4
---------------------------------	--------------------------------------	-----------------------------	----------------------------------

For the hope dimension of vigilance, hope is defined as 'a desire accompanied by expectation' (Frank, 1968). In the case of patients, that desire is often to heal or be in a state of health acceptable to them.

1. My nurses inspire me to continue on my journey.

1	2	3	4

Comments/Suggestions:

2. My nurses instill hope in me.

1	2	3	4

Comments/Suggestions:

3. My nurses are hopeful and it helps me feel positive about my health.

1	2	3	4

Comments/Suggestions:

4. My nurses ask me about my hopes and dreams.

1	2	3	4

Comments/Suggestions:

5. My nurses have a positive attitude about my health.

1	2	3	4

Comments/Suggestions:

6. My nurses are pulling for me.

1	2	3	4

Comments/Suggestions:

7. My nurses care that I have hope.

1	2	3	4

Comments/Suggestions:

8. My nurses notice if I am feeling down.

1	2	3	4

Comments/Suggestions:

9. My nurses help me believe I can get better.

1	2	3	4

Comments/Suggestions:

10. My nurses believe that I will get better.

1	2	3	4

Comments/Suggestions:

Dimension 3: Connectedness

Not Relevant 1	Somewhat Relevant 2	Relevant 3	Very Relevant 4
---------------------------------	--------------------------------------	-----------------------------	----------------------------------

For the connectedness dimension of vigilance, connectedness can be defined as, “the degree to which a person perceives that he/she has a close, intimate, meaningful and significant relationship with another person or group of people. This perception is characterized by positive expressions (e.g., empathy, belonging, caring, respect and trust) that are both received and reciprocated, either by the person or between people, through affective and consistent social interactions,” (Phillips-Salimi, Haase, & Kookan, 2011).

1. My nurses make an effort to get to know my family and me.

1	2	3	4

Comments/Suggestions:

2. My nurses and I have meaningful relationships.

1	2	3	4

Comments/Suggestions:

3. My nurses take the time to talk with me and get to know me.

1	2	3	4

Comments/Suggestions:

4. I feel that my nurses understand my situation.

1	2	3	4

Comments/Suggestions:

5. My nurses listen to my concerns with respect.

1	2	3	4

Comments/Suggestions:

6. My nurses treat me like they would their own family.

1	2	3	4

Comments/Suggestions:

7. I can joke with my nurses.

1	2	3	4

Comments/Suggestions:

8. I know my nurses as individuals.

1	2	3	4

Comments/Suggestions:

9. I am not just a number to my nurses.

1	2	3	4

Comments/Suggestions:

10. My nurses notice even small changes in my mood.

1	2	3	4

Comments/Suggestions:

Dimension 4: Going beyond the call of duty

Not Relevant 1	Somewhat Relevant 2	Relevant 3	Very Relevant 4
---------------------------------	--------------------------------------	-----------------------------	----------------------------------

The ‘going beyond the call of duty’ dimension of vigilance, is defined as, “nurses who perform beyond patient and family expectations, through extra and unexpected actions, beyond routine care. Going beyond the call of duty requires a wholehearted investment, beyond just a desire for a paycheck,” (Kooken, 2008).

1. My nurses always ask me if I need anything.

1	2	3	4

Comments/Suggestions:

2. My nurses bring me comfort items without me having to ask.

1	2	3	4

Comments/Suggestions:

3. My nurses check on me more often than they are required to.

1	2	3	4

Comments/Suggestions:

4. My nurses spend extra time in my room that I know they do not have.

1	2	3	4

Comments/Suggestions:

5. My nurses cater to my family's and my needs.

1	2	3	4

Comments/Suggestions:

6. My nurses give 110%.

1	2	3	4

Comments/Suggestions:

7. My nurses are just here for a paycheck.

1	2	3	4

Comments/Suggestions:

8. My nurses became nurses because it is a calling, not just a job.

1	2	3	4

Comments/Suggestions:

9. My nurses go the extra mile when giving my care.

1	2	3	4

Comments/Suggestions:

10. My nurses do special things for me I would never expect them to do.

1	2	3	4

Comments/Suggestions:

Dimension 5: Shared Vigilance

Not Relevant 1	Somewhat Relevant 2	Relevant 3	Very Relevant 4
---------------------------------	--------------------------------------	-----------------------------	----------------------------------

Vigilance in healthcare “is the degree to which an interactive process of knowledgeable watchfulness occurs between persons in response to threats” (Kooken, 2008).

1. When I notice a change in my condition, so do my nurses.

1	2	3	4

Comments/Suggestions:

2. The nurses and entire healthcare team seem to be on the same page about my health.

1	2	3	4

Comments/Suggestions:

3. The nurses on the unit watch out for me, even when I’m not their patient.

1	2	3	4

Comments/Suggestions:

4. My nurses ask my family for their input on my care.

1	2	3	4

Comments/Suggestions:

5. The nurses let my family members know what they can do to help with my care.

1	2	3	4

Comments/Suggestions:

6. My nurses expect me to know things about my own health.

1	2	3	4

Comments/Suggestions:

7. My nurses take any concerns my family or I have very seriously.

1	2	3	4

Comments/Suggestions:

8. My nurses seem to get along with each other.

1	2	3	4

Comments/Suggestions:

9. My family feels safe leaving me with my nurses.

1	2	3	4

Comments/Suggestions:

10. My nurses are always on the lookout for things that could threaten my health.

1	2	3	4

Comments/Suggestions:

Dimension 5: Patient Safety and Quality Care

Not Relevant 1	Somewhat Relevant 2	Relevant 3	Very Relevant 4
---------------------------------	--------------------------------------	-----------------------------	----------------------------------

The IOM (Institute of Medicine) defines quality of care as "the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge" (Lohr, 1990, p. 375).

Patient safety was defined by the IOM as "the prevention of harm to patients". Emphasis is placed on the system of care delivery that (1) prevents errors; (2) learns from the errors that do occur; and (3) is built on a culture of safety that involves health care professionals, organizations, and patients. The glossary at the AHRQ Patient Safety Network Web site expands upon the definition of prevention of harm: "freedom from accidental or preventable injuries produced by medical care" (Mitchell, 2008).

1. During my stay, my nurses explained things to me in a way I understood.

1	2	3	4

Comments/Suggestions:

2. I am better off now than when I entered the hospital.

1	2	3	4

Comments/Suggestions:

3. I felt like I could place my life in the nurses' hands.

1	2	3	4

Comments/Suggestions:

4. My nurses prepared me for what was coming.

1	2	3	4

Comments/Suggestions:

5. My nurses came back to my room when they said they would.

1	2	3	4

Comments/Suggestions:

6. I often felt worried about my care in the hospital.

1	2	3	4

Comments/Suggestions:

7. I felt like no one really knew what they were doing.

1	2	3	4

Comments/Suggestions:

8. Any symptoms I had were taken care of promptly.

1	2	3	4

Comments/Suggestions:

9. I felt like my nurses protected me during my hospital stay.

1	2	3	4

Comments/Suggestions:

10. There were times when I felt like my nurses were giving unsafe care to me.

1	2	3	4

Comments/Suggestions:

11. I caught my nurses before they made a mistake.

1	2	3	4

Comments/Suggestions:

12. When I used my call button my nurses responded promptly.

1	2	3	4

Comments/Suggestions:

13. I feel ready to take care of myself when I am discharged from the hospital.

1	2	3	4

Comments/Suggestions:

14. I always felt that my nurses were close by in case something happened.

1	2	3	4

Comments/Suggestions:

15. I am extremely satisfied with the care I received from my nurses.

1	2	3	4

Comments/Suggestions:

16. I always felt safe during my hospital stay.

1	2	3	4

Comments/Suggestions:

17. I had no adverse events during my hospitalization.

1	2	3	4

Comments/Suggestions:

18. My pain was always controlled during my hospitalization.

1	2	3	4

Comments/Suggestions:

19. I would recommend this hospital to my friends and family.

1	2	3	4

Comments/Suggestions:

20. I would never come back to this hospital for care if I had a choice.

1	2	3	4

Comments/Suggestions:

Appendix C

Table 2. 70-item Content Validity Index

	Expert 1	Expert 2	Expert 3	Expert 4	Expert 5	Expert 6	Expert 7	CVI
1K	4	3	4	4	4	4	3	1
2K	2	2	4	4	4	3	3	0.72
3K	3	4	4	4	3	4	4	1
4K	2	3	4	4	4	4	2	0.72
5K	3	2	3	4	4	3	2	0.72
6K	3	3	4	4	4	4	3	1
7K	3	2	4	4	4	3	2	0.72
8K	2	3	4	4	4	3	2	0.72
9K	3	2	4	4	4	4	2	0.72
10K	2	2	4	4	4	4	2	0.57
1H	3	1	4	4	3	4	2	0.57
2H	4	2	4	4	4	4	2	0.72
3H	3	1	4	4	4	2	2	0.57
4H	3	1	4	4	4	3	1	0.72
5H	3	2	4	4	4	4	1	0.72
6H	3	1	4	4	3	4	1	0.72
7H	3	2	4	4	4	3	1	0.72
8H	2	3	4	4	4	4	4	0.72
9H	3	1	4	4	4	4	1	0.86
10H	3	1	4	4	4	4	1	0.72
1C	3	2	4	4	4	4	2	0.72
2C	4	2	4	4	4	2	3	0.72

3C	3	2	4	4	4	4	3	0.86
4C	3	2	4	4	4	4	3	0.72
5C	4	1	4	4	4	4	3	0.72
6C	4	1	4	4	4	4	1	0.72
7C	2	1	2	4	4	3	1	0.43
8C	3	1	4	4	4	4	1	0.72
9C	4	2	4	4	4	4	3	0.86
10C	4	3	4	4	3	2	4	0.86
1G	2	2	4	4	4	2	3	0.57
2G	3	2	4	4	3	2	2	0.57
3G	4	2	4	4	4	4	4	0.86
4G	4	1	4	4	4	3	4	0.86
5G	3	1	4	4	4	2	3	0.72
6G	4	1	4	4	3	4	1	0.72
7G	4	1	3	4	3	3	1	0.72
8G	2	1	4	4	4	3	3	0.72
9G	4	1	4	4	4	3	3	0.86
10G	4	1	4	4	4	2	1	0.57
1V	3	3	4	4	4	4	4	1
2V	3	2	4	4	4	4	4	0.86
3V	3	4	4	4	4	4	4	1
4V	2	1	4	4	4	4	3	0.72
5V	2	2	4	4	4	2	2	0.43
6V	2	1	3	4	4	2	2	0.43
7V	4	1	4	4	4	4	4	0.86
8V	1	2	4	3	2	4	1	0.43
9V	3	2	4	4	4	4	3	0.86
10V	4	3	4	4	4	4	4	1

1P	3	1	4	4	4	4	2	0.86
2P	2	1	4	2	4	4	2	0.43
3P	3	1	4	4	4	4	3	0.86
4P	3	1	4	4	4	1	3	0.72
5P	2	2	4	4	3	1	4	0.57
6P	3	2	4	4	4	4	4	0.86
7P	4	1	4	4	4	4	3	0.86
8P	4	2	4	4	4	4	2	0.72
9P	3	2	4	4	4	4	4	0.86
10P	4	2	4	4	4	4	3	0.86
11P	3	3	4	4	4	4	2	0.86
12P	4	3	4	4	3	2	2	0.72
13P	3	1	4	4	4	2	2	0.57
14P	4	2	4	4	4	4	4	0.86
15P	4	1	4	4	4	2	1	0.57
16P	4	2	4	4	4	4	4	0.86
17P	4	1	4	4	4	1	3	0.57
18P	3	2	4	4	4	2	2	0.57
19P	3	1	4	4	4	2	1	0.57
20P	4	1	4	4	4	2	1	0.57

Appendix D

Inter-rater Reliability

Item	Inter-rater Reliability
1K	1
3K	1
6K	1
7K	0.71
9K	0.71
4H	0.71
5H	0.71
6H	0.71
8H	0.71
9H	0.85
3C	0.85
4C	0.85
5C	0.71
9C	0.71
10C	0.85
3G	0.85
4G	0.85
6G	0.71
7G	0.71

9G	0.85
2V	0.85
3V	1
7V	0.85
9V	0.85
10V	1
1P	0.85
3P	0.85
6P	0.85
7P	0.85
8P	0.71
9P	0.85
10P	0.85
11P	0.85
14P	0.85
16P	0.85
Total 30-item Instrument	0.83

Appendix E

Retained Statements

Dimension 1: Knowledge

1. My nurses are knowledgeable about my care.
3. My nurses seem to know what's going on.
6. My nurses give me valuable information about things that may be threats to my health.
7. My nurses teach me things about my condition that are important to know.
9. My nurses teach my family important things about my condition.

Dimension 2: Hope

4. My nurses ask me about my hopes and dreams.
5. My nurses have a positive attitude about my health.
6. My nurses are pulling for me.
8. My nurses notice if I am feeling down.
9. My nurses help me believe I can get better.

Dimension 3: Connectedness

3. My nurses take the time to talk with me and get to know me.
4. I feel that my nurses understand my situation.
5. My nurses listen to my concerns with respect.
9. I am not just a number to my nurses.
10. My nurses notice even small changes in my mood.

Dimension 4: Going beyond the call of duty

3. My nurses check on me more often than they are required to.
4. My nurses spend extra time in my room that I know they do not have.
6. My nurses give 110%.
7. My nurses are just here for a paycheck.
9. My nurses go the extra mile when giving my care.

Dimension 5: Shared Vigilance

2. The nurses and entire healthcare team seem to be on the same page about my health.
3. The nurses on the unit watch out for me, even when I'm not their patient.
7. My nurses take any concerns my family or I have very seriously.
9. My family feels safe leaving me with my nurses.
10. My nurses are always on the lookout for things that could threaten my health.

Dimension 6: Patient Safety and Quality Care

1. During my stay, my nurses explained things to me in a way I understood.
3. I felt like I could place my life in the nurses' hands.
6. I often felt worried about my care in the hospital.
7. I felt like no one really knew what he or she was doing.
8. Any symptoms I had were taken care of promptly.
9. I felt like my nurses protected me during my hospital stay.
10. There were times when I felt like my nurses were giving unsafe care to me.
11. I caught my nurses before they made a mistake.
14. I always felt that my nurses were close by in case something happened.
16. I always felt safe during my hospital stay.