Nurses' Perceptions of Dynamic Patient Events And Workflow Changes

Laura Allen

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The Ohio State University College of Nursing

Honors Thesis Committee

Esther Chipps PhD, RN, Advisor

Valerie Moore, MS, RN

Mary Beth Happ, PhD, RN, FAAN, FGSA

Abstract

Despite the large role of nurses in a hospital, there remains much debate about how to quantify their role and how to determine the best methodology to staff each nursing care unit. Nurses make up the single largest employee group and cost center in the hospital and are essential in maintaining patient safety and promoting the most efficacious patient outcomes. In spite of the large expense associated with providing nursing care, there is currently no method that accurately captures their contribution and helps administrators to make evidence-based staffing decisions (Beswick, Hill, & Anderson, 2010). The reality of the nurse's workload is that they are often faced with dynamic patient events, which shift the nurse from being available to all patients to focusing on one patient for an extended period of intense care. The specific aim of this project is to gain a greater understanding of nurses' perceptions about dynamic patient events, workflow disruption, and its' impact on missed nursing care. This is a qualitative analysis of focus groups with nurses that were conducted at a large, urban, Midwestern hospital. Examination of the data revealed five major themes: (1) the types of dynamic patient events that frequently occur; (2) missed or delayed care as a result; (3) the emotional and stress response of the nurse; (4) workflow changes; and (5) the impact on patient satisfaction. These findings indicate that dynamic patient events impact nurses' workload and both nurse and patient satisfaction. Patient status and acuity can fluctuate throughout the day and cause nurse-to-patient ratios to be awkward. This study facilitates our understanding of the demands on the nurse and provides the hospital administration with more information to make informed staffing decisions.

Chapter I: Literature Review

Despite the large role of nurses in a hospital, there remains much debate about how to quantify their role and how to make the best staffing decisions. According to Beswick et al. (2010) nurses make up the single largest employee group and cost center in the hospital. In spite of the large expense of nurses, there is currently no method that accurately captures their contribution and helps administrators to make intelligent staffing decisions. Overstaffing can be costly for the hospital but understaffing can adversely affect patient outcomes. Evidence has shown that a higher nurse-to-patient ratio not only improves patient safety but also patient outcomes (Bray et al., 2010). Pearson et al. (2006) noted that a high nursing workload is related to an increase in patient mortality and failure-to-rescue rates, an increase in the incidence of respiratory infections, and a decline in the quality of care delivered. In addition to improved patient outcomes, a low nurse-to-patient ratio can increase nurses' perception of their ability to cope, their job satisfaction, as well as their ability to collaborate with other members of the treatment team. Overall, nurses working with low nurse-to-patient ratios view their work environments more positively (Pearson et al., 2006). However, without valid and accepted definitions and measures of nursing outcomes, it is difficult to make a compelling case (Flynn & Mckeown, 2009). The lack of an effective workload measurement tool makes achieving ideal nurse-to-patient ratios difficult.

There is a growing body of research that demonstrates the relationship between nursing workload and patient and hospital outcomes. Pearson et al. (2006) reported that a healthy work environment is a "practice setting that maximizes the health and well-being of nurses, quality patient outcomes and organizational performance " (p. 339). Increases in nurse-to-patient ratios were found to be associated with lower levels of hospital functioning and effectiveness. An

increase in the number of available nursing hours is associated with improved patient outcomes in a variety of areas, including falls incidence, hospital-acquired pneumonia, pressure ulcers, urinary tract infections, length of stay, and post-operative infection rates. Nurses who experienced higher nurse-to-patient ratios reported less job satisfaction and a greater desire to quit (Pearson et al., 2006). Kane et al. (2007) reported that the addition of just one nurse per patient day, however, was associated with the reduction of hospital-acquired pneumonia, respiratory failure in intensive-care units, unplanned extubation, and lowered odds of cardiac arrest. Lower nurse-to-patient ratios may help to effectively reduce costs for hospitals by preventing expensive complications, especially those that are increasingly no longer reimbursed by insurers such as pressure ulcers and injuries related to falls.

Some conflicting information exists about the relationship between nurse staffing and patient outcomes. While a number of studies show an association between nurse staffing and improved patient outcomes, patient and hospital characteristics (such as a hospital's commitment to quality medical care) may more likely be the actual cause of improved outcomes (Kane, Shamliyan, Mueller, Duval, & Wilt, 2007). Additionally, researchers who examine the relationship between the two frequently rely on the Medicare case mix index in order to adjust for patient acuity, despite the fact that it was developed based on medical diagnoses that may not necessarily correlate with the patient's need for nursing care (Mark & Harless, 2011). This raises a lot of questions about the validity of existing research. More solid evidence is necessary to make a more compelling case for improved staffing ratios.

Traditionally, midnight census, or the number of beds filled at midnight, has been used to inform staffing decisions (Baernholdt, Cox, & Scully, 2010). Beswick et al. (2010) contended that relying on this measurement has proved faulty because it misses admissions, discharges, and

transfers that can occur during the day. These activities can be time-consuming for the nurse, with an admission lasting on average 30-60 minutes and a discharge lasting on average 15-30 minutes (Beswick, Hill, & Anderson, 2010). A discrepancy occurs when chief financial officers budget for nurses based on the midnight census and unit managers are forced to staff for each patient that arrives on the unit throughout the day.

Some alternatives to the use of the midnight census for staffing decisions have been explored. Baernholdt et al. (2010) compared midnight census with two other indicators: unit activity index (UAI) and the total number of treated patients in a 24-hour period. UAI is the ratio admissions, discharges and transfers to the total number of treated patients. Both total treated patients and UAI were shown to be better indicators when planning for staffing. While neither indicator can be monitored in real-time, knowing overall trends and combining these with other measures, such as patient acuity, could still prove to be helpful (Baernholdt et al., 2010). Beswick et al. (2010) also found that admissions, discharges and transfers added significantly to the workload compared to that predicted by midnight census and should be considered. Unruh and Fottler (2006) examined what role the rate of patient turnover played in adjusting nurse staffing and found that unadjusted nurse staffing underestimates nursing workload and overestimates nursing staffing levels. Patient turnover, in addition to severity, should be factored into decision making (Unruh & Fottler, 2006). Hoi, Ismail, Ong, and Kang (2010) proposed a prototype nursing workload intensity measurement system (WIMS) that utilized nursing diagnoses as indicators of patient acuity. Nurses would enter information into an electronic system about the number of patients with each of the nursing diagnoses identified; total nursing time required for the shift could then be generated (Hoi, Ismail, Ong, & Kang, 2010).

California was the first state to require minimum nurse-to-patient ratios by law at all times. Donaldson and Shapiro (2010) noted that this method of staffing reduced the number of patients per nurse and increased the number of worked nursing hours per day in hospitals but had no significant impact on nursing quality, patient safety and adverse outcomes. Despite the amount of research that has been done on measuring nursing workload in order to make informed staffing decisions, there is still no clear support for a standardized system.

Dynamic patient events (DPE) are defined as: "rapid and unanticipated changes in patient's clinical status or nursing care needs that result in very sudden shifts in nursing workload and the need to carry out rapid staffing adjustments" (Moore & Chipps, 2012). Examples of DPEs include codes, unanticipated bedside procedures, and the need for the RN to accompany a patient when the patient leaves the unit. These events can cause certain aspects of nursing care to be missed. Missed nursing care, conceptualized within the Missed Nursing Care Model, is defined by Kalisch, Landstrom, and Hinshaw (2012) as "any aspect of required patient care that is omitted (either in part or in whole) or delayed" (p. 1510). Depending on the type of care that is being delayed or omitted, missed nursing care could threaten patient safety. A variety of circumstances can lead to missed care, including the availability of resources (including both the quantity of staff members and supplies), the quality of communication between team members, and patients that have a sudden increase in their demand for care (Kalisch, Landstrom, & Hinshaw, 2009). The types of care that are commonly missed ranges from hygiene care to missed doses of medications. Particular types of missed medications, for instance antibiotics, could delay a patient's discharge and increase costs.

Nurses' perceptions, reactions and understandings of missed care are important to examine. As Kalisch et al. (2009) notes, missed care evokes many emotions for nurses, such as

anger, frustration and worry. Many nurses describe feelings of low self-esteem because they are not providing the level of nursing care that they desire (Kalisch et al., 2009). Winters & Neville (2012) interviewed a group of five nurses to investigate their concepts of missed care. The participants expressed feelings of frustration, dissatisfaction, and worry about their inability to provide their nursing care, labeled by the researchers as "moral distress." As a result of these feelings, nurses may avoid or withdraw from patient care, which puts the patient at increased risk (Winters & Neville, 2012).

Practicing staff nurses are the greatest source of information about issues that affect the delivery of direct care. Crafting and implementing strategies to improve the quality of the work environment—as well as nurse, patient and hospital outcomes—is essential to developing better tools to measure nursing workload. The specific aim of this project is to gain understanding of nurses' perceptions about dynamic patient events, workflow disruption, and its impact on missed nursing care.

Chapter II: Methods

Design

A qualitative study design with focus groups and concept analysis was utilized.

Setting

This project took place at the Ohio State University Wexner Medical Center on three inpatient care units. The first unit, 11 East Rhodes, is a 39 bed medical unit that cares for patients with infectious and pulmonary disease. The second unit, 2 Ross, is an 30 bed medical cardiac unit which uses a universal bed staffing model. Tower 5, a 24-bed unit, cares for patients with cardiac disease.

Sample

A series of five focus groups were conducted on three units. Staff nurses and charge nurses from the selected units were invited to participate. Participants were required to have at least one year of experience on their unit. All shifts (day, evening, nights) were approached. Nurses who were eligible were identified by the nurse manager. The research team then contacted them via email or in person to ask them if they were interested in participating. Following identification of participants, focus groups were then arranged.

Table 1. Focus group participation (n=16)

	Group 1 (number of participants)	Group 2 (number of participants)
11 East Rhodes (total focus groups=2)	4	3
2 Ross (total focus groups=1)	3	n/a
Tower 5 (total focus groups=2)	3	3

Data Collection Procedure

After obtaining Institutional Review Board approval and verbal consent from participants, investigators held 60 minutes focus groups during work hours in a private area. Verbal consent and the elimination of participant names from the transcripts were used to ensure confidentiality. A semi-structured interview format was used to guide discussion (See Appendix A). The interview began by giving the participants a definition of dynamic patient events: "rapid and unanticipated changes in patient's clinical status or nursing care needs that result in very sudden shifts in nursing workload and the need to carry out rapid staffing adjustments." Interview questions were developed based upon the literature review and the investigators' knowledge of nursing workload and staffing. Using the semi-structured interview format, participants were asked about their recent experience with dynamic patient events, and how these events impacted patient outcomes, patient safety, and nursing workload.

Data Analysis

Interviews were audio-recorded and transcribed verbatim. The data were then organized into tables and analyzed; preliminary analysis involved identifying major codes. These codes

were agreed upon by consensus between the student, and 2 investigators. The data was then organized in tables based on the preliminary major codes and themes. Further analysis will be performed by the primary investigators at a later date.

Chapter III: Results

Table 2. Nurses' perceptions of dynamic patient events: Themes, descriptions, and examples

Theme	Description	Examples
Types of Dynamic Patient Events	A rapid and unanticipated event that requires the nurse to shift their focus from their entire treatment team to a single patient.	traveling off the unit with a patient, codes, early recognition team (ERT), patients who require a sitter
Impact on Nurses	Dynamic patient events place an emotional burden on nurses and negatively impact their job satisfaction and perception of their job performance.	stress, feeling overwhelmed, burnout, dissatisfied with job performance, decreased job satisfaction
Impact on Patients	Dynamic patient events and inadequate staffing as a result may pose a significant risk to patient satisfaction and patient safety.	decreased patient satisfaction, unmet needs, patients feel devalued, lack of identification of potential problems, decreased time for patient teaching
Impact on Nursing Workload	When a dynamic patient event occurs nurses lose time and focus and the remainder of their patients must be shifted to other nurses on the unit.	reassigning patients, reprioritizing the day, gaps in patient care with high nurse-to-patient ratios
Delayed or Missed Care	When nurses must spend time exclusively with one patient care for others may be delayed or missed altogether.	medications, IV restarts, dressing changes, hourly rounding, discharges

Types of Dynamic Patient Events

The interviews revealed a group of dynamic patient events that nurses frequently encounter. These include traveling off the unit with a patient, codes and ERTs, and patients who require a one-on-one sitter. The commonality among the types of events is that they require the nurse to change their focus and accessibility from their entire assignment to a single patient.

Traveling off the unit with a patient was the most frequently mentioned dynamic patient event during the focus groups. Depending on the day and time of day, as well as the patient's

condition, the time it took to travel with a patient could vary. On day shift there are transportation staff available to assist, but on nights and weekends the nurse is solely responsible. When a nurse is off the floor with a patient who is at a test or procedure, his or her assignment must be covered by the remaining nurses on the unit. One participant described how traveling can become further complicated: "I think another piece to that, though, too is that it's not necessarily just one nurse off the floor traveling at a time. There can be multiple of us off the floor. We keep two RNs on the floor at all times, but there are times like today—if 2 of us are off the floor, that only leaves 2 nurses on the floor. And one is sitting. [one-to-one observation of a patient who is at risk for harm]" Traveling creates high nurse-to-patient ratios. One participant described how traveling does not just affect the nurse who is traveling: "Yeah, I mean, there have been days when we've had an extraordinary amount of traveling. And the mood of the unit is—the stress level's high because everybody's trying to be all things to all people."

Codes and ERTs are similar in the impact that they have on nurses. Both affect not only the patient's primary nurse but others who must assist. One participant described this: "I had actually a specific patient last Tuesday that had an acute MI up here. So it actually required 3 of us to start 3 different drips and the vital signs and monitor and Lasix and calling of physicians and cardiologists." The other patients for whom the nurses are responsible must now be shifted to other nurses not involved with the code or ERT. When multiple nurses are involved, this has the potential to create very high nurse-to-patient ratios.

Patients who require a sitter for reasons such as suicidal ideations or confusion make the nurse temporarily unavailable to their assigned patients. The situation becomes increasingly complex when there are multiple patients on the unit who need a sitter: "So we assign one nurse

to one sitter. And she was the sitter and the nurse. And then we rotated the other 2. So all those hours out, and you're not seeing your patients. I like to look at my patients hourly. I like to get in there and see if anything's going on."

Impact on Nurses

DPEs affect nurses emotionally and impact their job satisfaction and their perception of their job performance. The participants described a variety of emotions, including stress and frustration. They also felt dissatisfied with their jobs and performance because events such as traveling or codes cause them to give an inadequate amount of time to their remaining patients.

The nurses felt that there was an emotional burden related to DPEs. Participants described feelings of stress and fatigue. They also felt that at times the stressful and overwhelming nature of DPEs left them feeling burned out: "You take to heart their care. It's important that you feel –if that were your dad, would you want that done? And if you can't leave that day knowing you took care of your "dad" the way you wanted to, then you just feel like crap on the drive home, which causes burn out and all that." DPEs were also overwhelming to the nurses because of the decreased amount of time they had to devote to the details of their patients' care: "I guess it can be overwhelming at times, especially if there's things going on with their patients. And the hard part about that is when you're traveling, you don't really have time to give a full report on these patients, so there's a lack of knowledge and if something does happen, you're scrambling to pick up the pieces." In addition to the stress and feelings of burn out, nurses also described feeling fearful that they would be blamed if something were to happen to another patient while they were busy with a DPE: "Because you always have the fear in your

head too: "Well, what if something did happen to my patients?" I'm going to get docked to the wall with neglect because they don't care whether I had to go and travel, you know."

The participants described feeling dissatisfied with both their job and their performance of their job because of DPEs. Decreased job satisfaction stemmed from their inability to care for patients as they would like: "You feel a lot of weight on your shoulders, like—Did I really do a good job today? No, because I didn't take good care of my patients because I wasn't able to get in there like I should've been." One participant described her care as "drive-by nursing" because of DPEs.

Impact on Patients

Focus group participants expressed that the staffing adjustments DPEs cause may lead to a negative impact on patients. The examples they cited can be grouped into two broad categories: patient satisfaction and patient safety.

The nurses felt that patients had unmet needs because of DPEs and as a result patient satisfaction was decreased. When a DPE occurs and the nurse is unable to attend to her patients as she would, certain cares may get delayed or missed. One participant felt that patients may take the nurse's poor response time personally: "You think about it, if you're in excruciating pain and your pain medicine got missed, you feel devalued as a patient." During a DPE the nurse's remaining patients may get divided up among other staff causing higher nurse-to-patient ratios, or they may get lost in the chaos. Participants felt that because patients do not understand that the nurse is not ignoring them, but rather is attending to a DPE, that patients felt like the staff had a lack of care or concern for them. One nurse summed up this thought: "I think sometimes the patients feel like they haven't seen you. ' Where have you been?' Or 'I called out for you, and

someone else—you must be busy.' I think they then—because if someone else comes in to do something for them because you were off the floor, I think sometimes the patient either feels like you didn't want to do it or--they feel like 'Well, you must be really busy.'"

The focus group participants felt that not only was there a potential impact on patient satisfaction but also perhaps patient safety. When staff members are not able to respond in a timely fashion because of DPEs or because of the resulting high nurse-to-patient ratios, then adverse events such as falls may occur more. When the nurse is not able to get in the room with the patient as often as they would like, they may not pick up potential issues the patient is experiencing. When asked if DPEs may lead to an increase in falls and patient safety issues, a participant responded: "It's inevitable. I'm not saying it happens. But the risk increases." Another gave a more specific example of how this situation would occur: "They're on diuretics. They're hooked to IVs. They're going to be in a hurry. They can only wait so long. If they [the nurse] can't get there, if someone doesn't respond to that need, then they're going to go on their own. That's an increase to falls."

Impact on Nursing Workload

When a DPE occurs there is both an immediate and long-lasting impact on nursing workload. In the immediate period while the DPE is occurring the nurse's patients must be covered. Sometimes there is a structured way of doing this, such as dividing the patients up among other staff or by having the charge nurse take the entire remaining assignment. Additionally, some DPEs like codes and ERTs will tie up more than one nurse: "So for almost 3 hours' worth, it had all three of us in there for the majority of the time. And my patient load actually had to be distributed to the other 3 RNs that were on the floor so that I could stay with

that particular patient." When these remaining patients are not divided up in an official manner, they may have their needs met on an "as-needed" basis by other nurses on the unit. The focus group participants, however, felt that this method led to gaps in care. Patients did not always get their needs met in a timely fashion. Additionally, the unpredictable and fast-paced nature of traveling in particular led to holes in coverage: "And the hard part about that is when you're traveling, you don't really have time to give a full report on these patients, so there's a lack of knowledge and if something does happen, you're scrambling to pick up the pieces."

In addition to these immediate changes, DPEs may impact the workload of the nurse involved for the remainder of her shift. For example, upon returning from traveling the nurse must re-prioritize her day. Some participants felt that a DPE could cause them to lose focus and regaining that focus could be time-consuming: "But yeah, probably, there's a little bit of down time for my brain to catch back up again."

Delayed or Missed Care

The last major theme discussed by focus group members was delayed or missed care as a result of dynamic patient events. The participants felt that not only did these delays or omissions harm their relationship with the patient but they also felt that they could delay the patient's discharge. There were a variety of examples of delayed or missed cares cited by participants but those discussed most frequently included medications, patient teaching, dressing changes, "TLC" cares, and hourly rounding.

Participants said that DPEs commonly caused them to give medications beyond the scheduled time. One participant identified that missing certain medications was more harmful than others when it comes to discharges delays: "If it's a med they receive once a day, usually

you still give it late. If it's something that's only so many hours apart, you may be too close to that next dose, so they miss that dose. Potentially, could it delay discharges or progress toward discharge? Sure, it absolutely could. Especially with antibiotics and things, if you miss a dose, you have to reset the whole timeframe. That can cause delay in care." Missing medications could also be a source of frustration for patients, especially when they are in need of pain medication.

A major source of frustration for focus group participants was the inability to provide the type of care they wanted. These "TLC" cares often get delayed or missed altogether. As one participant identified, there simply was no time for these types of cares: "I think it falls to the wayside almost because you have other things on other patients that need to be done besides "Let me give you a backrub to get your off your back more to make sure we don't have any further skin breakdown." Like the personalized care that I feel like is why so many of us go into nursing—like that gets pushed over because you don't have the time to do it." One participant felt like there was a lack of time to develop a therapeutic relationship with patients: "You can't sit and stand and talk to them and get to know them and certain things about them. It's like "drive-by" nursing. You're in, you do what you need to do, and you get out because you've got 4 other people. I don't want to call it an assembly line, but me sometimes feeling like I'm just going from room to room." In the end the inability of the nurse to provide these comfort cares was not only dissatisfying for the patient but for the nurse as well.

Another care that several participants felt became a low-priority item because of DPEs was patient teaching, which has the potential to impact both discharges and readmission rates. Participants felt that when teaching did occur, it was rushed: "I would say—and this is the frustrating part of this because we never feel like we have enough time to adequately teach our

patients. So like when you're discharging and admitting, you're teaching on the fly. I think they always want you to be here "now" with these patients to be able to teach them correctly and make sure they're hearing us. Sometimes I think we fly through it so fast that the patient catches half of that, we're busy thinking about the next thing we have to do and 'Oh, my admission's coming. See you later. I'll get you transportation.'"

Participants cited dressing changes as another care that was often delayed or missed altogether. When the dressing was to be changed once a day then day shift would pass it on to night shift. When it was a dressing that needed to be changed twice a day, however, one dressing change could be missed altogether.

One last major care that participants felt was delayed or missed was hourly rounding, or checking on their patients on an hourly basis. This was cited as a risk to patient safety and patient satisfaction. One nurse described how not checking on the patient for an extended period of time can lead to unmet needs. In this particular situation the nurse had been busy with an ERT: "I don't know that it was so much missed or her last hourly rounding was probably not done on her patients because she was in that room. So her last go around before she has report to the next nurse, she probably didn't get to go and say, 'Do you need pain medicine? Do you need anything?' Make sure that they're tucked in."

Chapter IV: Discussion and Nursing Implications

There is a lack of published studies regarding dynamic patient events, or those in which there is a rapid and unanticipated change in a patient's status which results in the need for rapid staffing adjustments and shifts in nursing workload. Much of what has been studied about nursing workload involves static measures of nursing care and outcomes. This study demonstrated the vast influence of dynamic patient events. There is a need for greater understanding of the impact of unplanned circumstances that occur during a nurse's shift. Greater understanding will enable nurse administrators to make more informed staffing decisions.

This study used the firsthand experience of nurses to examine the impact of dynamic patient events. During focus groups nurses identified the types of DPEs that they frequently encounter and how these events influence them and the manner in which they provide care to their patients. Traveling, codes and ERTs, and patients who required a sitter were the most common types of DPEs that the nurses' discussed. Not only did the nurses feel that these events impacted patient satisfaction and safety, but the nurses themselves also felt impacted. There was a notable negative impact on the nurses' perception of their job performance and their job satisfaction. When DPEs occur patient assignments must be shifted to other nurses on the unit; high nurse-to-patient ratios occurred. Care is often delayed or missed altogether as a result of these shifts in workload and high ratios.

The findings of this study raise questions about nursing staffing. Despite the large role that nurses play within the hospital, there remains much debate about how to quantify their role and make informed staffing decisions. Current measures, as discussed in the literature review, are static. The unpredictable nature of nursing is not adequately captured by current staffing

methods. As noted by Beswick et al. (2010), midnight census fails to capture fluctuations in unit census that occur throughout the day with admissions, discharges, and transfers. This study demonstrates the impact of dynamic patient events on a variety of outcomes, including nurse satisfaction, patient satisfaction and patient safety.

The current literature demonstrates a relationship between nursing workload and patient outcomes. Consistent with findings reported by Pearson et al. (2006) associating higher nurse-to-patient ratios with lower hospital functioning and effectiveness, nurses in our study reported that because DPEs increased nurse-to-patient ratios patients did not always receive an appropriate level of care. The high ratios that occurred as a result of DPEs led to delayed or missed nursing care and the nurses felt that they could pose a risk to patient safety.

Nurses expressed feelings of dissatisfaction with their job performance and feelings of burn out. Our findings were similar to research examining the impact of missed care and high nurse-to-patient ratios on nurses. Kalisch et al. (2009) stated that nurses describe feelings of low self-esteem when they are not providing the level of nursing care that they desire. Winters & Neville (2012) labeled these feelings of frustration and dissatisfaction as "moral distress." Nurses in this study expressed a similar conflicted and distressed feeling about the care they were giving patients.

There are several limitations to this study. First, a small focus group size makes it hard to transfer findings of this study. Second, the study was conducted at one hospital. Additionally, because this study only sought out the perceptions of nurses on medical-surgical units the findings cannot be applied to nurses working in other specialty areas and in other hospitals. It is

likely that nurses in other care settings, such as intensive care and obstetrics, experience DPEs. The types and their impact, however, may be different.

Chapter V: Conclusion and Suggestions for Further Research

The findings of this study underscore the complexities of nursing staffing and suggest that dynamic patient events may significantly impact nursing workflow and lead to missed nursing care. Future studies should focus on quantifying the impact of dynamic patient events and the workflow disruptions and link this to patient outcomes. Nursing is a profession which places high value on the quality of care provided to our patients. Understanding the complexity of managing dynamic patient events and nursing workload through nursing research will aid in our efforts to develop evidence-based solutions to managing workload in an increasingly demanding healthcare environment.

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Appendix A

Semi-Structured Interview Questions

For the purposes of this study, we have used the term dynamic patient event to describe as any event in which there is a rapid and unanticipated change in a patient's clinical status or nursing care needs that result in a very sudden shift in nursing workload and the need to carry out rapid staffing adjustments.

1. Please take a few moments to think about a typical workday on your unit. What type of patient events occur that require that you shift your attention to one patient for a designated period of time? Can you provide some examples of these events?

2. When the event requires you to travel off unit with the patient how does that differ from other type of events in care delivery or work load?

3. Can you anticipate any dynamic events occurring with any of your patients at the start of your shift based on your patient assignment? Shift report/nursing judgment.

4. Can you describe how an event alters your work flow/ plan of care.

5. When these events occur, is there a time of day (shift) that they are more likely to occur?

6. When you need to spend an unanticipated amount of time with one patient, can you describe how this impacts your daily work? How does the work get done? Are there times when you need to reschedule patient care and/or ask the oncoming shift to complete a nursing care task?

7. In the perfect world, how would you staff for those times when patient required additional care? What suggestions do you have?