

Nurse Distractions in the Intensive Care Unit

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**Abstract**

Critical care nurses are often distracted or interrupted in their daily work caring for seriously ill patients in the fast-paced, high-tech Intensive Care Unit (ICU) setting. Distractions can lead to poor patient outcomes if they result in mistakes in practice. Nurses respond to distractions in a number of ways, such as acknowledging the distraction, multitasking, or interrupting the task at hand. Much of the literature focuses on medication errors, but little is known about events and responses leading to the error or other distracted patient care tasks. The purpose of this study was to describe distraction and nurses' response to distractions during bedside care in the ICU. Specifically, we aimed to describe (1) tasks distracted/interrupted, (2) sources of distraction, (3) how distractions were managed, and (4) nurses' perceptions of distractions during bedside care. Four nurses, with 1-27 years' (mean=10.25 years) experience, were observed during bedside care in the ICU. Each nurse was observed for four 15-minute patient interactions. The nurses were then debriefed about what they found to be distracting and what they were thinking/feeling during the observation. The 16 observations (~4 hours total) and debriefing interviews were coded and analyzed using basic qualitative description and constant comparison in Atlas.ti. Forty-four distractions were observed, half (22;50%) were interruptions. Tasks most commonly interrupted were patient assessment (n=24) and medication preparation/administration (n=12). Alarms and monitors were the most frequent sources of distraction (n=14), followed by coworkers (n=12). Nurses reported that distractions by coworkers were often beneficial to their practice and patient care, but identified missing or out-of-reach equipment and alarms and monitors as "true" distractions, which accounted for 4 and 14 distractions, respectively. These findings are consistent with the literature that medication

preparation/administration is commonly disrupted. However, this study goes a step further to address disruptions of other important nursing tasks and nurses' perceptions of those distractions.

## **Chapter I: Statement of the Problem**

Distractions are a part of everyday life. A person begins a task and it is not uncommon for something to pull their attention in another direction. Whether it is another person, the television, or a car alarm out the window, the original task has now been paused, even if just to acknowledge that there is something else happening or to see where the noise is coming from. In today's busy society, many people assume that they have the ability to work on two different tasks at the same time; for example, study for a test while watching television, cooking and scanning social media or texting while driving. All of these actions can have varying degrees of consequences. Interruptions have been heavily studied in aviation, driving, and healthcare (Grundgeiger et al., 2010). The consequences of interruptions in these fields can potentially be catastrophic.

Just as distractions occur throughout our daily lives, they are also a part of the hospital environment. Unfortunately, distractions can result in medical errors (Kohn, 2000). These errors can include anything from a miscommunication or disruption in workflow to more serious events such as hospital-acquired infections and medication administration errors. Nurses are the primary caregivers at the bedside in busy, technologically complex intensive care units (ICUs) where distractions can have a direct impact on patient care. So what are the sources of these distractions? Is the nurse even aware that these distractions are occurring? By obtaining this type of information, the ultimate goal is to diminish the distractions that nurses encounter and create an overall safer environment for patients in the hospital.

This study examines data from direct observations made of bedside patient care in the Intensive Care Unit. Nurse participants were then debriefed after the observations and discussed what they found to be distracting. Debriefing the nurses helped validate what distractions were

actually occurring and, furthermore, interrupting the nurse. According to a survey by Treiber and Jones (2010), nurses (n=20) gave various reasons for why a medication error occurred, but a certain level of distraction played a role in nearly every medication error circumstance. If interruptions and distractions can be identified and eventually minimized, nurses could potentially make significantly fewer errors. This study aims to examine Intensive Care Unit (ICU) nurses' perceptions of distractions encountered at the bedside in comparison to observed interruptions and distractions recorded by trained researchers.

Patients are admitted to the ICU with complicated and life-threatening diseases, illnesses, and disorders. They also frequently undergo aggressive procedures to combat these problems. Attention and focus are critical components for medical personnel, specifically nurses, in these intensive care settings (Egerod et. al, 2015). In addition, the patient's inability to communicate with their nurse or the medical team further complicates patient care in this type of hospital setting. Many patients are mechanically ventilated which inhibits the patient from speaking. The nurse must now devote even more attention to determining what the patient needs without vocal communication by attempting other forms of communication (Happ et.al, 2015).

While medication errors are the most commonly identified and studied medical-nursing error, any misstep or unintentional mistake made in the healthcare setting can be hazardous to patient safety (Treiber & Jones, 2010). One way to make patient care safer within the hospital setting is to identify what distracts nurses and in turn what nurses find distracting within their practice. If these distractions and the resulting task interruptions can be diminished, then the hope is that patient safety will improve within the healthcare setting.

### **Significance of the Study**

According to Kohn (2000), while medication errors are usually not extreme, i.e., resulting in major trauma or death, the number of medication errors are increasing. For this reason, there is a greater potential risk for more serious consequences to occur. The proposed study represents two different ICUs with patient-to-nurse ratios (2:1) common in the USA. The findings will contribute to the science of patient safety in critical care by providing a more complete understanding of distraction and interruption in bedside care including the ICU nurses' perceptions of distractions and their strategies for managing nurse disruption and interruption in the ICU.

### **Theoretical Framework**

This study is guided by the Distributed Model of Interruption and Task Resumption Processes which delineates six phases of the task interruption-resumption process beginning with distraction management in which the nurse allows the primary task to be interrupted or not (e.g., by acknowledging or multitasking) (Gruneiger, et al., 2010). When a nurse stops a task due to a distraction, a cognitive shift occurs and the nurse runs the risk of not finishing the primary task. Nurses use visual cueing and scanning the environment as adaptive behaviors to help remember a task.

### **Definition of Terms**

The **primary task of the RN** is defined as work or responsibility that is the chief principal or aim of the nurse action. Some examples include, but are not limited to: information, sharing, patient teaching, assessment, medication administration, or repositioning. A **distraction** is defined as a physical/physiological, visual, or auditory event that observably captures the attention of the nurse and delivers some information or delivers a competing need or demand

(Grundgeiger et al. 2013). Some examples include, but are not limited to: alarms, coworkers who approach the nurse, turning away to cough or sneeze. The distractions were categorized in one of three ways; acknowledging, multitasking, or interrupting. **Acknowledging** is defined as short oral or visual acceptance of the distraction without primary task discontinuity (Grundgeiger et al. 2013). For example, acknowledging a distraction is when a nurse briefly looks at the monitor that is alarming and then returns to the primary task. **Multitasking** is defined as continuous work on both the primary and distracting tasks (Grundgeiger et al. 2013). An example of multitasking is answering a physician or patient question while continuing to program the infusion pump. Finally, the task can be managed by **interrupting** which will be defined as “hands off” cessation of the primary task that leads to discontinuity in the primary task (Grundgeiger et al. 2013). This is the only response to a distraction that causes a break in the primary task. An example of interruption is when the nurse stops programming the infusion pump in order to walk over to the monitor to stop an alarm.

### **Limitations**

This study is limited to the medical and cardiothoracic ICUs of a single academic medical center in Pennsylvania. The nurses were purposefully selected for maximum variation in age, gender, race/ethnicity, educational preparation, and experience. This research was initially conducted to collect data for a larger study conducted by Dr. Mary Beth Happ, the *Study of Nurse Distraction and Interruption During Bedside Care in the ICU*, which included analysis of a data bank of video recorded observations of nurse caregiving interactions with mechanically ventilated ICU patients as well as observations and nurse debriefing interviews.

## **Chapter II: Literature Review**

This literature review was conducted using Google Scholar as well as CINAHL and PubMed from The Health Sciences Library's Database at The Ohio State University. The following key phrases and words searched were 'nurses,' 'distractions,' 'ICU or intensive care unit,' 'interruptions,' and 'errors.' Articles were then sorted by year and relevancy to this particular topic. All articles were from 2003 or later. Approximately sixty abstracts were examined, while nineteen were selected for this literature review. Articles that focused on medication errors that occurred due to distractions and interruptions were also included in this literature review in order to identify gaps in the literature on this topic.

The current literature focuses primarily on medication errors, but not the events leading up to the error. There is very little research on general distractions and the variety of mistakes that can occur when a nurse is distracted or interrupted during routine care tasks other than medication preparation and administration. While medication errors may be the most common and potentially most life-threatening error, there are other mistakes that can occur with detrimental consequences to a patient. After identifying this gap, a thorough examination and review of the existing literature was conducted. According to a systematic review conducted by Li et al. (2012), interruptions are not unilateral. Their effects can range from a loss in focus to serious adverse medical events. While some interruptions result in mistakes that eventually lead to errors, other interruptions are necessary because it involved the task at hand. In a simulation study conducted by Grundgeiger et al. (2013), prospective memory was investigated to determine how it affected nurses remembering tasks in an ICU setting. Prospective memory is the ability to perform future actions (Grundgeiger et al., 2013). The study showed that the use of visual cues improved the nurses' prospective memory. For example, once the nurse completed

all of the tasks in a patient room, she scanned the room and saw the suction canister, which reminded her to suction the patient's tracheostomy. The researchers manipulated in a simulated setting whether a visual cue was present or not. The researchers concluded that these visual cues can actually assist in dealing with the potentially inevitable interruptions that nurses encounter and enable them to remember something they may have otherwise forgotten (Grundgeiger et al., 2013). Similarly, in an ethnographic mixed methods study conducted by Potter et al. (2005), the cognitive workload of a nurse was studied via observations along with observations of the complex environments in which nurses' worked. A unique job requirement of nursing is critical thinking and reasoning to make the best possible clinical decisions for every patient. This can be difficult when distractions and interruptions are also a part of the nursing work environment. This is how errors can occur. Due to the complexity of the environment along with the cognitive load that nurses endure, the common theme found in this study was that the nurses' made use of multitasking, conducting two tasks at once, but still experienced a cognitive shift. While this was a small study that focused on only seven RNs, this study can be the framework for larger studies and addresses that the cognitive workload of a nurse needs to be further evaluated and studied in accordance with distractions, interruptions, and consequently, errors (Potter et al., 2005).

Medication errors have consistently been identified as a major hazard to patient safety. Nurses are the final link of the medication administration chain. In a survey study conducted by Treiber and Jones (2010), nurses were asked to identify medication errors that had occurred, why the nurse believed the error occurred, and the nurse's feelings after the error had occurred. While severity of the errors ranged widely, the nurses' feelings after the event were fairly consistent across the board: guilt, remorse, fear, and, generally, a significant amount of distress. Several studies were conducted to determine medication error incidence and prevalence, why errors

occur, and what can be done to stop them. In a literature review conducted by Frith (2013), ICUs were targeted as an environment where a high volume of medication errors occur and interventions are needed to decrease distractions to prevent errors. In several studies, the practice of a “distraction-free medication zone” was utilized so that patients and other healthcare personnel were warned by a symbol or other visual cue that the nurse was not to be disturbed or interrupted when he/she was obtaining the medication, preparing the medication, and performing the five “rights” of medication administration (Connor et al., 2016; Kieffer et al., 2015).

Similarly, a pilot study in the ICU conducted by Anthony et al. (2010) addressed these five “rights” of medication administration and the importance of limiting distraction and interruption at this critical time demonstrating that use of a “no interruption zone,” decreased interruptions by 40.9%. Another literature review conducted by Bower et al. (2015) stressed the importance of studying interruptions and errors in the intensive care unit because these patients are not only on a large number of medications, but also medications that are considered to be of high risk (Bower et al., 2015). ICU patients are more heavily monitored resulting in more alarms than the average medical-surgical unit. Because ICU patients have complex medical problems, the healthcare team is composed of a greater number of people. With more medications, more healthcare workers, and more frequent alarms, nurses in the ICU are seemingly more likely to encounter distractions and interruptions that can have the greatest repercussions (Bower et al., 2015).

A study conducted by Grundgeiger et al. (2010) comprehensively examined aspects of the interruption including what caused it, how long it took to return to task, and how long the interruption lasted. This observational study, conducted in an Australian ICU, followed nurses by using glasses that had a video camera attached so that the researchers could see and record what

the nurse was actually seeing and doing. A lens was also focused on the nurses' eye movement to record when gaze was diverted from a task. The study focused on what distracted the individual nurse and how they responded to the distraction by acknowledging the distraction, multitasking, or completely interrupting the task. This study is one of the first to objectively quantify distractions and interruptions rather than just relying on nurse self-report and to explain how nurses manage distractions and interruptions. Some distractions were crucial to the task at hand, while others caused a break in focus (Grüngeiger et al., 2010).

Two different studies address distractions and interruptions in the handover process in an ICU, either from nurse to nurse at shift change or physician to nurse. Although handover is often considered a short process, there were generally at least one to two interruptions per handover (Kowitlawakul et al., 2015; Spooner et al., 2015). Both articles identified that the most common interruptions during the handover process involved other nurses, doctors, alarming intravenous pumps or call lights and family members. Similarly, a concurrent incident study conducted by Donchin et al. (2003) in the ICU identified that errors occurred frequently in this fast-paced setting due to poor communication between healthcare workers and multiple human factors.

Cole et al. (2015) conducted an observational study focusing on interruptions in an emergency department (ED). While different from an ICU, both environments are fast-paced and care for acute and critically ill patients. This study found that interrupted tasks took longer to complete and the most common source of interruption in the ED was the patient's family members (Cole et al., 2015). Another observational study conducted by Sasangohar et al. (2014) categorized interruptions by characteristics, the context in which they occurred, and the content that the interruption contained. In 48 hours, 1007 interruptions were observed in an ICU and other staff nurses were the most common cause of interruption. The researchers suggested that to

deal with these interruptions in the future, studies need to be conducted to determine which interruptions are positive and which are negative and when they occur, how the nurse can best manage the interruption (Sasangohar et al., 2014). Hayes et al. (2015) found that distractions and interruptions frequently led to medication errors but, like Sasangohar, recommended that nurses need to be educated on ways to manage these distractions and interruptions while performing these tasks. Hall et al. (2010) measured approximately eight interruptions per shift in an acute-care hospital and found that the majority of the interruptions came from other healthcare professionals, followed by other RNs. Similar to Sasangohar et al. (2014), this study encourages future studies to increase awareness of distractions and interruptions and determine how they can be minimized (Hall et al., 2010). Finally, Kalisch & Aebersold (2010) identified that a gap exists in the literature because most of the research that examines distraction and interruption focuses on physicians instead of nurses. Nurses frequently multitask as they work in a fast-paced environment and are left with no other option than to tolerate some degree of distraction and interruption in the workflow. This study found that nurses encountered about 10 interruptions per hour. ICU and acute care nurses were most frequently interrupted by their patients while documenting, passing medications, and performing interventions (Kalisch & Aebersold, 2010).

In summary, current literature focuses almost solely on medication errors. While medication errors are likely the most common error and often the most dangerous, there are gaps in the literature that fail to identify what other kinds of mistakes can result from distractions such as missing an important order in the computer or breaking sterile technique while inserting a catheter. Much of the existing literature develops and tests interventions or practice changes to curb medication errors, rather than what can be done to decrease the actual distractions or interruptions that are creating an environment prone to errors. Another gap in the research is that

the majority of the research consists of self-reported studies rather than observational and quantitative studies. Nurses' perceptions of distractions and interruptions may not be accurate because nurses may under or over report distractions and interruptions. This project attempts to bridge that gap and identify distracting factors that can hopefully be reduced or eliminated while also bringing awareness to an even broader problem that is clearly overlooked by researchers.

### **Chapter III: Methodology**

#### **Research Design**

The purpose of this qualitative descriptive study is to identify and describe the source of distractions/interruptions that ICU nurses encounter at the bedside, the nature or purpose of these distractions/interruptions, the nurses' response to distractions/interruptions, and the advantages and disadvantages of distractions/interruptions.. The design was qualitative observational.

#### **Sample and Setting**

A sample of five nurses were selected to participate in observations based on recommendation by the critical care clinical nurse specialist and from prior participation in the SPEACS 2 study. We used data from the first four nurses for this honors research project. The nurses' years of experience varied from 1-27years (mean=10.25 years). The study was conducted in a Medical ICU (MICU) and Cardiothoracic Surgical ICU (CTICU) in a large, academic quaternary care hospital in the Mid-Atlantic region of the United States.

#### **Data Collection Procedures and Instruments**

Data collection consisted of semi-structured, qualitative observations and nurse debriefing interviews. Four 15-minute patient care encounters were observed for each nurse during day shift (total = 16). Dr. Happ, an expert in non-participant observation in the critical care setting, led the observation team and trained a graduate assistant. The observations were conducted by Dr. Happ and the trained PhD student researcher. Observations began when the nurse entered the room and the 15 minutes was counted with a stopwatch controlled by the observer. The observers used a semi-structured observational tool to guide detailed written field notes during the observations. Following observations, Dr. Happ conducted audio recorded debriefing interviews of nurse responses to open-ended questions. Debriefing started by asking

the nurse to describe the demands of the situation and followed by probe questions to the nurses based on their responses. The nurse was asked what he or she found distracting, what he or she was thinking while this distraction/interruption occurred, and how he or she felt they managed the situation.

The field notes from each observer were transcribed, reviewed, and combined to produce a complete account of the nurse-patient encounter. Transcripts were then transferred into the ATLAS.ti (Scientific Software) qualitative database for data management and analysis. The text data were examined and distractions were identified, then the primary task was described and categorized based on classifications developed in the parent study. Each primary task that was distracted was assigned to one of three categories of managing distractions: *acknowledging*, *multitasking*, and *interrupting*, based on the nurse's observed response. This same procedure was followed to code and analyze the nurse debriefing sessions that took place after the observations. Additional codes were added to debriefing interviews to adequately capture the nurses' perspectives. The two different perspectives (observers and nurses) of the nurse's distraction were then compared and combined to understand what occurred during the situation and what the nurse was thinking about when the observed distractions took place. Each line of text and coding was reviewed by the faculty mentor (Dr. Happ) with discrepancies discussed and resolved by consensus in team analysis meetings. Operational definitions for primary tasks were refined and clarified during this analysis process.

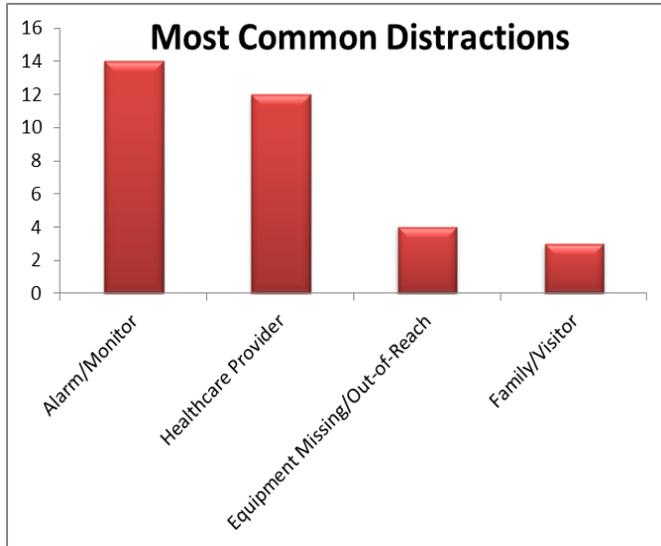
This project is designed to combine and compare nurse perceptions about what they found to be distracting in the ICU during bedside care with observer descriptions of distractions and interruptions that occurred during the encounter. This research project will help to identify common distractions/interruptions that nurses experience during bedside care in the ICU and

how nurses handle these distractions/interruptions. It also compares what the observer found with the nurse's perception of distractions. The hope is that this research will help further research in determining what errors not only occur due to these distractions/interruptions, but how we can address and eliminate the unnecessary distractions/interruptions to create an environment of safer patient care in the future.

**Chapter IV: Results**

Observations

In this study, 44 distractions were identified across the four different nurse case studies (240 minutes observation). The most common distraction that nurses encountered was an alarm or monitor that was responsible for 14 of the 44 distractions (32%) (See Figure 1). The second



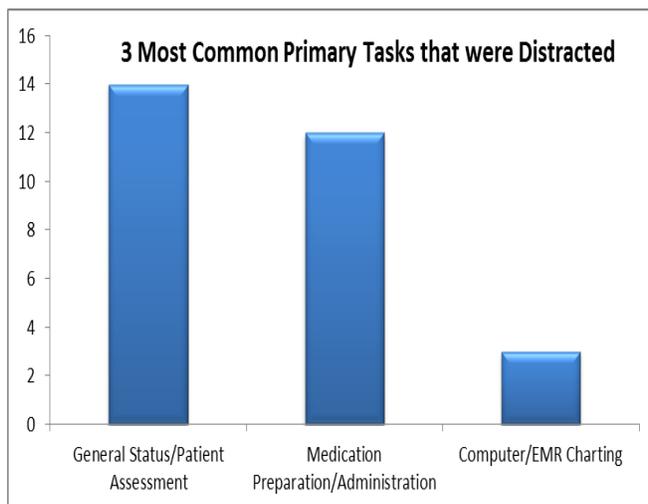
most common source of distraction was another healthcare provider other than the bedside nurse, 12 times (27%). Other distractions included missing or out-of-reach equipment (n=4), a family member or visitor (n=3), self-interruption (n=3), equipment failure (n=2), an off-screen

**Figure 1. Sources of Distraction**

object (n=1), a patient movement or behavior (n=1), and a

television or telephone (n=1).

The most common tasks that were distracted were general patient status or assessment

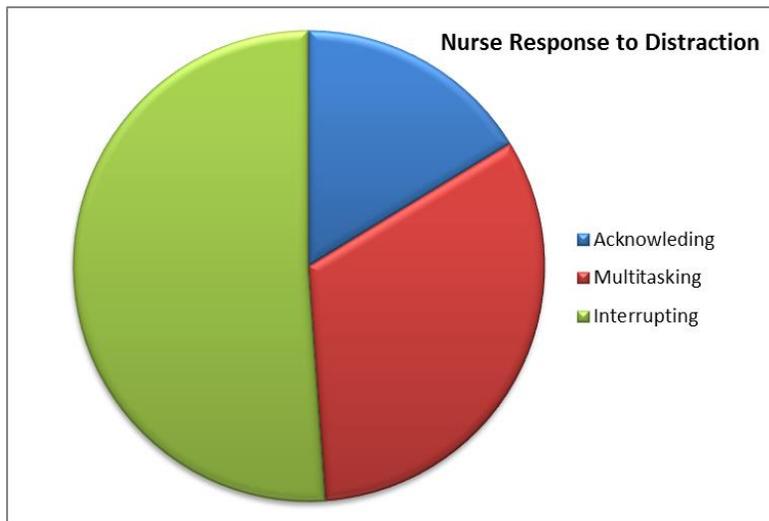


(n=14) and medication preparation or administration (n=12), which are both very critical tasks in nursing care. Other primary tasks that were distracted included computer charting (n=3), a bedside test or procedure (n=2), patient hygiene task (n=2), patient repositioning (n=2), wound care or a dressing

**Figure 2. Primary Tasks Distracted**

change (n=2), patient education (n=1), an urgent patient care activity (n=1), and replacing equipment (n=1).

The most common response to the distractions was interruption of the primary task which occurred in 22 of the 44 distractions (50%). Of the 44 distractions, only 7 (15.9%) were



**Figure 3. Nurses Response to Distraction**

acknowledged, which is the response least disruptive to the primary task. Fifteen (15) of the 44 distractions (34.1%) were handled by multitasking. Multitasking was further described as (a) monitoring and task, (b) response and task, or (d) physical response and task.

### Debriefing Interviews

When the nurses were debriefed, they often identified alarms or monitors as a distraction or interruption in their workflow. One nurse even said that it was rather frustrating because sometimes the monitor would alarm because it was faulty or not picking up a signal and may have required no intervention by the nurse at all. Unfortunately, it still caused a break in workflow and a brief interruption in the nurse's focus on the primary task. Similarly, when we observed the distraction as an alarm/monitor, we often found that it led to a complete interruption because the nurse left what she was doing (the primary task), to determine what the problem was and often it did require the nurse's attention at least to make an adjustment to the technology. Nurses also addressed the second most common distraction, another healthcare provider, during

the debriefing interviews. However, when we examined the scenario surrounding the event, the distraction was often another nurse checking in to see if the observed nurse needed help with anything or a request for help. One nurse identified this as a beneficial aspect of the unit because nurses make sure that their colleagues are doing alright and that they do not need any help with anything. Regardless, if a healthcare provider was the source of the distraction, the nurse still needed to determine which was more important, responding to the healthcare provider or finishing their own primary task.

In the debriefing interviews, nurses reported that equipment not being in the patient's room or out of reach was also a common reason for interrupting their primary task. This often occurred in isolation rooms where nurses have to repeatedly don gown and gloves upon entering the room. Forgetting one item starts this process all over again, which can add up over the course of a 12-hour shift.

Multitasking was commonly identified when the nurse performed a technical care task while teaching the patient and/or family. Sometimes the family or patient would ask a question while the nurse was working, but oftentimes, s/he would not identify that as an interruption, just a common part of the job that nurses learned to accommodate over time. When asked if the family asking questions was a source of distraction, one of the nurses stated, "It depends on the source and (the) kind of question." Another nurse wanted the family at the bedside because the patient was intubated and having the family there was perceived to be beneficial for the patient and nurse. She wanted them to want to stay longer at the bedside since no one else was there and her patient was critical. Overall, the nurses recognized the distractions that the researchers observed, but believed that learning to handle distractions and interruptions is part of the job and becomes easier with experience.

## **Chapter V: Conclusions and Recommendations**

### **Summary of Findings**

In 16 observations (240 minutes) of nurse bedside caregiving events in the ICU, a total of 44 distractions occurred. That is a rate of one distraction every 5 ½ minutes. Of those 44 distractions, the nurse responded by acknowledging the distraction 7 times, multitasking 11 times, and by completely interrupting the primary task 22 times. There were similarities and differences between the objectively observed distractions and interruptions and what the nurse participants identified as distracting. Some distractions (i.e., other health care team members) were perceived by nurses as a part of the task or an important part of their workflow and facilitated good patient care. The nurses' perceptions of alarms and monitors as a source of distraction were consistent with observational findings that alarms and monitors were the most common source of distraction.

### **Conclusions**

According to Grundgeiger et al., there were benefits to interruptions, however some interruptions were longer than others and this could be more difficult for the nurse to get back on track (2010). This study also went on to say that the primary task was critical in determining whether or not the nurse proceeded with a full interruption as well as timing how long it took the nurse to get back to the primary task. In this study, we focused more on the type of task that was distracted and how the nurse responded. We found that even in a short amount of time, the nurse will be distracted many times and it is at her discretion to determine if they continue with the primary task or tend to the distraction. This study supports the literature that nurses are frequently distracted or interrupted while preparing or administering medication. This study also suggests that nurses are commonly distracted during their other daily tasks. This study also

begins to fill the gap in the literature by showing that there is more to distractions and interruptions than just risk for medication error. Many critical tasks that nurses perform during bedside care, such as patient assessment and documentation, are distracted or interrupted. More research needs to be conducted (1) to determine whether distractions like those identified in this study lead to errors and (2) to identify how to maintain safe patient care throughout the nursing shift, not just while administering medications.

### **Implications of this Study**

This study finds that distractions and interruptions are multidimensional and there is a lot more to scenario than what was observed. Talking with the nurses after the observation actually provided insight into what they were thinking about when performing bedside care tasks and why they were doing what they were doing. It became very evident that distractions were a common part of nursing tasks, but managing them was based on the nurse's response and whether or not they felt it was more important than what they were currently doing or potentially related to what they were doing. This study identifies the complex environment that nurses encounter daily. The average rate of approximately 1 distraction every 5 ½ minutes found in this study shows that distractions during bedside care in the ICU are ubiquitous and likely, inevitable. While some distractions pose a potential threat to patient safety, distractions may also serve a beneficial purpose in certain settings. The goal is that this study will provide evidence for larger intervention studies that aim to minimize the distractions that nurses' encounter, especially when safe patient care is the primary objective.

**Recommendations**

All of these distractions and interruptions that nurses encounter have further implications to patient care whether they are positive or negative. This study identified and described the distractions that ICU nurses' encounter routinely. Further studies should focus on identifying and implementing protocols that will limit these distractions and interruptions which will then lead to overall safer patient care. Another hope is that this study will bring attention to potentially dangerous distractions during patient care other than medication administration.

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