

Nursing Fatigue and Impact on Patient Safety

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Abstract

This research paper is an evidence-based group project addressing the topic of nursing fatigue and its effects primarily on patient outcomes. This project explores six research reports conducted between 1998 – 2008, all which implicated various correlations of nurse fatigue and patient safety. The articles varied in research from different hospitals and units, sampling data gleaned from notebooks, questionnaires, recorded data of shift nurses, as well as information obtained from discharge notes, medical records, and incident reports. Patient outcomes reviewed in the research include medication errors, morbidity, and near-errors as well. Fatigue was implicated due to extended work hours and inadequate staffing regarding nurse-to-patient ratios, concerning high acuity of patients. Five nurses in this group share narratives that describe how this evidence has been affected in their own practice. Their experiences and the patients under their care were framed within the context of nursing fatigue in this environment. Comparisons have been made of the evidence and of the experiences. Conclusions and recommendations were summarized with an analysis of the research results, using the best evidence as presented relevant to nursing fatigue in healthcare settings.

Introduction to Problem

Nursing fatigue can lead to many areas of concern, mainly patient safety. Compromised safety in patient care is one of the greatest risks taken by fatigued nurses. Nurses must remain alert and focused in order to provide essential, safe, and high quality care to patients under their supervision.

The primary cause of nursing fatigue is from extended work hours, being double shifts or more than forty hours in a workweek. These extended hours could be from mandatory extended shifts or voluntary extended shifts. High acuity levels of patients or a higher patient load per nurse can also lead to nursing fatigue. Other factors that can lead to fatigue include the fast paced environment of admissions and discharges, few or short breaks, if any break at all, quick turn around time between scheduled shifts and on-call time after a shift has been completed.

Support for Relevance of Concern over Nursing Fatigue and Patient Safety

The effects of fatigue in nursing has been studied, well researched, and documented. “Other evidence reports that 60-80% of nurses who rotate shifts have chronic sleep problems and/or chronic fatigue” (Ross, 2008, p. 58). Fatigue has been known to cause slowed thinking, delayed reaction times, and impaired judgment. Garrett (2008) discussed how fatigue was implicated in disasters such as Chernobyl, Exxon Valdex, Bhopal, and Three Mile Island (p. 1191). Mental alertness is an essential factor in nursing that is required for critical thinking, judgment, and overall good patient care.

Some studies have compared fatigue to the effects that alcohol has on a person. Ross (2008) expresses on how both fatigue and alcohol leave one physically and cognitively impaired. Garrett (2008) states how “Research has shown that after 17 hours without sleep, performance

degrades to the equivalent of having a blood alcohol concentration of 0.05%, and after 24 hours without sleep, the effect of performance is equivalent to a blood alcohol level of 0.10%”

(p. 1192). Ross (2008) also discussed the research review of multiple research articles that studied the relationships between poor staffing patterns and negative effects on patient care, resulting in adverse outcomes and medical errors. Despite these correlations and studies, states have not legislated any restrictions in regards to safety and fatigue. Rogers, Hwang, Scott, Aiken, & Dinges (2004) impress that “There is no state or federal regulation restriction on limiting the number of voluntary hours that a nurse may work in any twenty-four hour or seven-day period”, yet, they add how “The Institute of Medicine (IOM) report, for Keeping Patients Safe, has strongly recommended to limit voluntary overtime” (p. 203). Prevention of errors and providing safe care was highly correlated to nursing fatigue in Garret’s study (2008):

Analysis of the data indicated that work duration, overtime, and number of hours worked per week had significant effects on errors, with the likelihood of making an error increasing with longer work hours. Nurses were three times more likely to make an error when working shift that lasted 12.5 hours or more. (p. 1196)

Aim of the Paper

The purpose of this paper is to emphasize the concerns related to nursing fatigue and patient safety, ultimately preventing unnecessary patient morbidity and mortality. There are ways to avoid some unnecessary nursing fatigue and these suggestions may lead to improved patient safety through decreasing nursing fatigue and medical errors. Policy implementation on ways to avoid fatigue may lead to improved patient care and safety for patients. One example of policy implementations would be to restrict the use of mandatory extra shifts.

Summary of the Most Relevant and Best Evidence to Answer the Question

Garrett (2008) describes the following incident:

On July 4, 2006, Julie Thao, RN, a veteran obstetrical nurse in Wisconsin, worked two eight-hour shifts back to back. Thao slept on a cot at the hospital overnight and was near the end of her shift on July 5 when she administered the wrong medication to a patient, which resulted in a fatal medication error. She was charged with a felony, “criminal neglect of a patient causing great bodily harm,” the sentence for which is three years on probation and mandatory exclusion from working in a critical care setting. She ultimately pled no contest to two misdemeanors. This was the first time a nurse in Wisconsin had been criminally charged for a medical error. (p. 1191)

This demonstrates the possible detrimental effects caused by fatigue. This is one situation in which fatigue is linked to adverse patient outcomes, which was at least in part caused by inadequate staffing patterns that lead to extended shift overtime and a quick change to come back to work. Garrett (2008) also wrote about the review of work hours, duration, overtime, and how many hours worked in a week had a significant impact on errors. This error rate increased significantly for shifts worked beyond a 12-hour shift at one time. Garrett (2008) also reviewed how mandatory overtime or on call time potentially causes fatigue. Garrett summarized that when working 12.5 hours or more, a nurse was three times more likely to make an error.

Fatigued nurses may also suffer directly from fatigue itself. Although the nurses who are fatigued themselves are may not know just how fatigued they really are. They may even experience a micro-sleep from a large debt of accumulated sleep deprivation (Ross, 2008, p. 57). Garrett (2008) defined micro-sleeps as very short periods of sleep that occur when people are extremely fatigued. Micro-sleeps may occur without the person experiencing one even realizing

that one occurred. Garrett (2008) referred to the Association of periOperative Nursing (AORN) position statement relating to safe work and on-call practices. In this statement, fatigue is defined as “A response to predefined conditions that has physiological and performance consequences. Fatigue is identified as deterioration in human performance arising as a consequence of changes in the physiological condition” (p. 1199). These statements acknowledge the great concern over the risk that nurses and patients have been placed in when nurses were fatigued. Fatigue has caused slowed thinking and slowed response time and has even been the main cause of death of a patient, as in the case of Thao in Wisconsin.

There are no state restrictions for nursing that limits the number of hours that a nurse can work in any 24-hour period or even per week. Unfortunately, many of the times nurses are required to work over or made to feel like working extra hours is mandatory and if refused, their jobs may be in jeopardy. Filling in shortages in staffing by use of mandatory extra shifts or extended hours is a practice that can only lead to fatigue. This type of work schedule does not allow for adequate rest time and may further enhance on any type of sleep deprivation that a nurse may already have. Rogers et al. (2004) referred to the error occurrence rates beginning after working 8.5 hours per day and significantly increasing after 12.5 hours have been worked in any given day.

Evidence also shows a correlation between patients to nurse staffing ratios. Nurses who are responsible to a smaller number of patients and are less fatigued, also have fewer incidences of making medical or near medical errors. Research studies have even shown a decrease in mortality when adequate staffing patterns are utilized.

According to Keller (2009, p. 497), “It is estimated 1.3 million health care errors each year and of those errors 48,000 to 98,000 results in the death of patients” as cited in Barger,

Ayas, Cade, Cronin, Rosner, & Speizer, (2006). Keller (2009) notes that “Errors occur for a variety of reasons; some causes of errors include the effects of extended work hours and shift work” (p. 497).

Critical Appraisal of the Evidence

Critical appraisal is an appraisal based on careful analytical evaluation. The intent of this paper is for the reader to gain an understanding of this important topic of nurse fatigue as it relates to patient safety. When doing a critical appraisal we sought to assess the data in various published research articles, apply the rules of evidence to factors such as internal validity, adherence to reporting standards, and conclusions. Critical appraisal methods form a central part of the systematic review process, and are used in evidence-based healthcare training to assist in clinical decision-making.

In the articles that we reviewed, the research supports the correlation between nursing fatigue and patient safety. Because direct patient care is provided around the clock, nurses have many options in scheduling regular shifts and extra shifts that fit into their lifestyles. Unfortunately, nurses are not always recognizing just how fatigued they actually are and the fatigue can potentially lead to compromised patient care, such as was previously described in the Thao case in Wisconsin.

Some of the most significant insults to patient care have occurred when nurses have either worked rotating shifts, or worked more than 12.5 hours in a day. Ross (2008) writes that individuals lack the ability to judge their own level of fatigue. In addition, he reiterates that working more than 8 hours can cause more errors, a decrease in productivity, and a decrease in vigilance in what nurses are doing. Keller (2009) also indicates this: “Nurses and interns have both reported impairment in critical thinking abilities. The risk of an error almost doubles when

nurses work 12.5 or more consecutive hours” (p. 489). Garret (2008) reviews a study correlating work patterns and medical errors:

A study by Rogers et al. examined the relationship between medical errors and both staff work patterns and hours worked by nurses. The researchers found that mandatory overtime was used frequently to cover hospital nursing staff vacancies. This policy produces fatigue and nurse burnout, which ultimately results in more mandatory overtime to solve staffing issues, a practice that is both controversial and potentially dangerous. (p. 1194)

This study included nurses who were working more than their scheduled shifts, including voluntary and involuntary overtime. Garrett (2008) further indicates how “During the data-gathering period, 199 errors and 213 near errors were reported, with medication errors accounting for more than half of the total errors” (p. 1194).

Other analysis showed that work duration, overtime and the number of hours worked in a weeks’ time had significant impact on errors made. Rogers et al. (2004) states: “The likelihood of making an error increased with longer work hours and was three times higher when nurses worked shifts lasting of 12.5 hours or more. Working overtime increased the odds of making at least one error, regardless of how long the shift was originally scheduled” (p. 206).

Fatigue cannot be willed away and recovery from fatigue takes a minimum of two consecutive days of six to eight hours of sleep (Tabone, 2004). The National Sleep Foundation (NSF) expresses that the quality and quantity of sleep has a big impact on how we perform in our daily lives. According to Tabone (2004), “NSF further documents that a deficit of sleep is associated with decreased alertness, problems with task completion, problems with concentration, irritability, unsafe actions, and unsafe decision making” (p. 8).

In summarizing the critical review of the literature, it is apparent that nurses must be held to a standard of working eight hours a day in order to reduce the errors associated with extended shift fatigue. Extended shifts, overtime, rotating shifts, and anything else that interferes with a nurse's ability to recover from fatigue will have a negative impact on patient care.

Integration of the Evidence with the Students' Experiences

Nurse Experiences

The nurses in this research paper have experienced common themes from nursing fatigue. All five have worked in various units and facilities, including medical-surgical, critical care units, a cardiology office, and supervisory positions within the hospital setting. All five nurses have experienced fatigue during 12-hour shifts on both dayshift and nightshift. Each has reported and experienced personally a medical error involving either the wrong time and/or wrong dose, attributed to a compromised cognition related to being tired. Half of the group has reported and experienced micro-sleeps during their shifts. Micro-sleeps or decreased concentration in driving ability related to fatigue has endangered nurses and other motorists during a commute to and from work. Other various health issues experienced by sleep-deprivation include nausea, chronic fatigue, headaches, decreased nutritional intake, and gastrointestinal dysfunction. Some have even witnessed nurses sleeping on the job at the facilities in which they work.

Patient Preferences

Patient preferences include the need and desire for an alert nurse who has the time and energy to meet their various needs in the healthcare setting. All five nurses have heard comments and complaints regarding concerns about fatigued nurses from patients as well as the

overall rushed nature of the care they have received at times due to overworked, stressed and tired nurses.

Compromised patient safety and quality of care is an unfortunate but real event in the experiences of the five nurses. This is related to nursing fatigue from lack of sleep, understaffing, and too many hours or rotating shifts of duty. Patients notice and feel the difference when nurses and other staff who are not overworked, stressed or fatigued have delivered their patient care. Nurses who are not fatigued are more connected with holistic patient care in terms of ancillary services, interdisciplinary team interventions, and the needs of patient families as well.

Utilizing the Evidence in Practice

The above factors have been noted by all five nurses and have examined the information in the context of the research in order to implement a conscious and cognitive change based on the evidence and recommendations. One decision made in order to reduce the negative effects of fatigue was to keep a regular schedule in order to maintain a normal sleep pattern with a healthy and consistent home schedule. Switching too many types of shifts has been recognized to be detrimental to one's personal and work lives. Maintaining consistency is an important factor in avoiding fatigue. All five nurses have made adjustments in their own sleep patterns in order to obtain proper amounts of sleep. The studies revealed how oftentimes nurses do not realize how tired they really are, until an error or adverse event has occurred. Cognitively recognizing one's own fatigue is a first step in implementing a healthy change and remedy. Bright lights and keeping conversation during a long shift is a factor to consider. Respecting one's need for uninterrupted sleep between shifts, especially night shifts or extended shifts, is a decision that involves steps such as turning off phone ringers at home, darkening the room, or notifying family

members of sleep times to avoid unnecessary interruptions. Advocating for adequate staffing to reduce mandated overtime is also a critical part of taking care of nursing staff. Poor working conditions that exhaust the human resources do not lead to good patient care, and ultimately harms everyone involved in the healthcare industry.

Being overly tired and not completely alert has been and currently is a huge nursing concern for both the patients that the nurses care for, as well as for the nurses themselves. Typically, sleep is of better quality and staff is able to perform better with a regular sleep schedule. When not fatigued, these nurses report being able to perform high quality care and use critical thinking about patients and their medical conditions. When not fatigued, there has been improved stamina and cognition to pay attention to the details that can make a huge difference for a patient or family members during difficult times of coping and experiencing a crisis.

Evidence Based Practice (EBP)-Recommendations

Several recommendations based on EBP have been documented in the readings. These include those from both state legislatures and professional organizations. Both of these bodies support institutions and private individuals in the use of these recommendations. There are no federal or state regulations in the number of voluntary overtime hours for nurses, but four states-- California, Maine, New Jersey and Oregon--have passed legislation, which bans mandatory overtime for nurses (Rogers et al., 2004). At least nineteen other states have considered bans on mandatory overtime for nurses and health care professionals. Ironically, error results were less pronounced when the extra work required of nurses was voluntary rather than mandatory (Tabone, 2004).

The Institute of Medicine (IOM) recommends voluntary overtime be limited. In the IOM report on medical errors “safer medical care is more likely to result from changes in the

environment in which health care is provided rather from blaming health care professionals, who may be providing the best care possible under poor conditions” (Rogers et al., 2004, p. 210).

This same report also recommends “blanket regulatory mandates that nurses in direct patient care be allowed to work no more than 12 hours per day and no more than 60 hours per week” (Tabone, 2004, p. 6).

The Association of Perioperative Registered Nurses (AORN) has published strategies concerning safe work and on call practices. This includes that the perioperative nurse be required to work no more than 12 consecutive hours in a 24-hour period and not more than 60 hours in a seven-day period. Off duty periods should include an uninterrupted eight-hour sleep cycle and a break from continuous duties. It also states that health care organizations support these strategies so that fatigue is recognized as a risk to patient and worker safety (Garrett, 2008).

Health care institutions are finding that “inadequately staffing and unrealistic workloads place a burden on nursing staff members, reduce the quality of care that nurses provide, lead to fatigue and unachievable expectations, and result in uncompleted tasks” (Garrett, 2004, p. 1202). During the legislative process in California, hospital stakeholders supported 10 patients per nurse, but the governing body mandated that five to six patients per nurse and that might be reduced to one to five when fully implemented.

There are also legal implications to be considered. Precedents in the United States hold both the driver and employer responsible for injuries resulting from motor vehicle crashes caused by fatigued drivers (Keller, 2009). Shift workers on their way home from work involved in an accident are held liable; the hospital may be responsible also if long hours may be a potential cause.

Employers can insure good lighting and an area for recreation for their workers. Scheduling should include not more than two consecutive night shifts, or two or three consecutive 12-hour day shifts. Staff should have at least two weekends off per month with equal distribution of workdays and days off. Keeping regular schedules helps maintain home activities and more consistent work/sleep time.

“Individuals are not good judges of their own fatigue levels” (Ross, 2008, p. 58). Individuals should develop a good sleep routine: go to bed when sleepy, use relaxation techniques, no exercise two hours prior to retiring, and only a light snack at bedtime. Encourage a nap before coming to work. Use alcohol and sleeping pills with caution as they interrupt the normal sleep cycle. Use caffeine when needed for acute awareness.

Workers should also consider darkening the rooms, the need for quiet white noise, turning off the telephone ringer and getting proper nutrition. Also very important is notifying family and friends of sleep times so they do not call or stop in.

Not all of these recommendations will be heeded or implemented, but the information about fatigue, job satisfaction and patient errors is prevalent. It is hoped that outside forces help take care of nurses and nurses learn to care for themselves and their patients.

References

- Garrett, C. (2008). The effect of nurse staffing patterns on medical errors and nurse burnout. *AORN Journal*, 87(6), 1191-1198. Retrieved from CINAHL database.
- Keller, S. (2009). Effects of extended work shifts and shift work on patient safety, productivity, and employee health. *AAOHN Journal*, 57(12), 497-502. doi:10.3928/08910162-20091116-01.
- Rogers, A., Hwang, W., Scott, L., Akin, L., & Dinges, D. (2004). The working hours of hospital staff nurses and patient safety: both errors and near errors are more likely to occur when hospital staff nurses work twelve or more hours at a stretch. *Health Affairs*, 23(4), 202-212. Retrieved from CINAHL database.
- Ross, J. (2008). Fatigue: do you understand the risks to safety? *Journal of PeriAnesthesia Nursing*, 23(1), 57-59. Retrieved from CINAHL database.
- Tabone, S. (2004). Data suggest nurse fatigue threatens patient safety: is prescribing the nurse's work hours the only answer? *Texas Nursing*, 78(2), 4-7. Retrieved from CINAHL database.
- Tabone, S. (2004). Nurse fatigue: the human factor. *Texas Nursing*, 78(5), 8-10. Retrieved from CINAHL database.