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MANAGING THE EFFECTS OF POOR SLEEP QUALITY IN NURSES

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A senior research paper submitted in partial fulfillment of the requirement for the degree of Bachelor of Science in Nursing

Anna Vaughn College of Nursing

Oral Roberts University

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We would like to thank God for His faithfulness, strength, and guidance in writing this paper. To our mentor, Rachael Valentz, RN, MSN, thank you for your support and guidance throughout the research process. Your ideas, emotional strength, engaging intellect, and firm direction in critical thinking helped lead us through the maze. Hyunsoo Park, Cheonyoung Park, Jongsung Lim, and Hongyeol Kim, thank you for your diligent, efficient, and quality work translating the article from Korea. Without this we would not have as broad an understanding of how to care for nurses. Thank you to family and friends for encouragement in times of difficulty.
Abstract

Staffing shortages, high turnover rates, and prolonged work shifts has caused decreased sleep quality in nurses due to fatigue. The fatigued nurse causes concern for safety, coordination and agility, patient avoidance, lack of compassion, impaired cognitive function, risk for chronic diseases, and patient care errors. This systematic research review was designed to identify evidence-based practice nursing interventions currently being used to manage the effects of reduced sleep quality. Methods for performing this systematic research review were to search multiple databases using keywords, scanning article titles and abstracts, and critiquing for relevance and quality. Findings from this systematic review found multiple evidence-based interventions which improved the mental, physical, and spiritual health of the nurse such as dry cupping, knitting, and changes in call schedule. Implications of this review included: education related to management of reduced sleep quality of nurses in undergraduate nursing programs, further research related to napping and duty-free breaks, and the need to create national guidelines for monitoring and managing reduced sleep quality in nurses.

Managing the Effects of Lack of Sleep Quality in Nurses

The profession of nursing is designed to support the broken. In the process of supporting others, the nurse inevitably becomes broken. Turnover rate for newly-licensed nurses after one year of work is 17.5% and after two years the rate increases to 33.5% (Kovner, Brewer, Fatehi, & Jun, 2014). Long work hours and the pressure of preserving life pulls upon the nurse to the point of exhaustion. Fatigue has become prevalent throughout the nursing profession (Scott, Arslanian-Engoren, & Engoren, 2014).

According to a continuing education course by Eanes, many nurses work more than twelve hours a day and succumb to working over forty hours per week (2015). Although the Occupational Safety and Health Act (OSHA) does not define a specific standard regarding shifts that are prolonged or atypical, it does recognize longer shifts with prolonged hours are known to interrupt the body’s circadian rhythms causing increased stress, lack of focus and fatigue (2018). Fatigue affects the cognitive functions of a nurse, decreasing the ability to make decisions, affecting the work environment and ultimately modifying lifestyle and sleep. In turn, lack of sleep results in fatigue, creating a stressful work environment and disturbing quality of sleep for the nurse. It is a cyclical pattern (Scott, Arslanian-Engoren, & Engoren, 2014). The cycle raises curiosity of the effects on a nurse as an individual in this sequence of events.

Background

Nursing is the fifth largest occupation in the United States with over three million registered nurses (Bureau of Labor Statistics, 2016). In 2017, a report by The World Health Organization (WHO) indicates there is a current shortage of nurses which will impact healthcare globally (Mudallal, Othman, & Hassan, 2017). The shortage in the
United States is also impacted by the anticipated demand as the baby boomer generation ages and the need for healthcare increases (American Association of College of Nursing, 2018). The rising demand for nurses resulted in shift changes from eight hours to twelve, which is now the typical work hours of a nurse (Rollins, 2015). The preceding factors influence the health of the nurse, consequently affecting the mind, body, and spirit. According to the Theory of Nursing for the Whole Person, all three of these aspects are intertwined; therefore, one facet impacts the entirety of the person (Jezek, 2017). The following paragraphs will address the consequences of body, mind, and spirit.

Nearly 82% of nurses reported their sleep patterns were impacted by work duties and corresponds with 91.3% reporting that sleep influences their quality of life (Owens, 2017). Kunzweiler et al. found nurses who stated being overworked reported more signs of poor sleep quality than those who did not report being overworked (2016). The current recommendation of sleep hours for adults ages eighteen to sixty-four are seven to nine hours a night (Hirshkowitz et al., 2015; Battie et al., 2017; Gardner & Dubeck, 2016). Nurses working twelve-hour shifts accumulate substantial sleep deficits as well as fatigue and sleepiness (Dean, 2014). The average sleep interval, among healthcare workers, between twelve-hour shifts is five and a half hours (Caruso, 2014).

The impediment of the circadian rhythm negatively affects the attitude and demeanor of the nurse (Middaugh, 2016). An aspect affected is the nurse’s mindfulness and self-compassion. Mindfulness refers to being nonjudgmental and attentive in the current moment. Self-compassion is a conglomeration of kindness to one’s self, mindfulness, and identification of one’s humanity along with others (Kemper, Mo, & Khayat, 2015). Nurse’s emotional intelligence is correlated with self-compassion, and many consider
self-compassion essential to empathetic and compassionate care. Kemper, Mo, and Khayat found sleep disturbance, self-compassion and mindfulness were negatively correlated (2015). Therefore, it is seen that nurse’s mental health is being affected by fatigue, shaping their quality of life and their ability to give empathetic and compassionate care.

Considerable irregularity of sleep patterns and biological functioning are caused by interruption of natural circadian rhythms (Ferri et al., 2016). Due to the impact of interrupted circadian rhythms, there is a correlation between sleeping less than six hours and high body mass index (BMI). The implications from chronic sleep deprivation and increased BMI result in the higher chances of comorbidities such as cardiovascular disease and diabetes (Eanes, 2015).

Nurse fatigue and shift work sleep disorder influence the excellence of work completed, decrease safety and quality of life and aid in creating chronic diseases (Birmingham, Dent, & Ellerbe, 2013; Ferri et al., 2016). According to Gardner and Dubecck, characteristics of fatigue are diminished cognitive and physical ability, weariness, loss of vigor, and extreme burnout (2016). The cognitive functioning of a person after remaining awake for seventeen to nineteen hours is representative of a person who has the blood alcohol level of 0.05% and enduring more than twenty-four hours is equal to the blood alcohol level of 0.1%. As stated by Gardner and Dubecck, this level is above the 0.08% blood alcohol legal limit in the United States (2016). With this information, the cognitive impairment associated with lack of sleep and fatigue is exemplified.
Not only is the nurse’s physical and mental life affected by lack of quality sleep but also the spiritual. Although information related to sleep’s influence on spirituality is limited, according to the Theory of Nursing for the Whole Person and Shelly and Miller, human beings are made of a mental, spiritual, and physical aspects which are intertwined (Jezek, 2017; Shelly & Miller, 2006). According to the Relationship-Based Care theory, health is a balance of the body, mind, and spirit and there are intentional behaviors to help achieve health, one of them being adequate sleep (Johnson, 2016). The spiritual aspect may be manifested in the idea of compassion fatigue as part of compassion fatigue is spiritual depletion. Braunschneider indicates that nurses incur compassion fatigue when continuous stress is experienced from work and reach extreme exhaustion, no longer being able to care for others or themselves (2013). A direct correlation between sleep and spirituality is lacking and requires further research.

**Significance**

A nurse is required to be at peak caliber in order to perform excellence in work; however, fatigue causes inadvertent attention with decreased coordination and agility (Battie et al., 2017; Scott, Arslanian-Engoren, & Engoren, 2014). Nurses are not able to accurately assess their fatigue level (Eanes, 2015; Gardner & Dubeck, 2016). Eanes reports when nurses account feeling mildly sleepy, their practice was at their worst (2015). As inability to process information increased, nurses did not report their sleep and fatigue level rising, revealing nurses are not always aware of when they are cognitively impaired (Eanes, 2015). Johnson, Jung, Brown, Weaver, and Richards found over half of their nurse subjects were lacking essential sleep (2014). The analysis of this study determined sleep-deprived nurses committed a greater average of errors compromising
patient safety. For every hour of sleep lost, medical care errors increased by one and conversely every hour of sleep gained, chance of medical errors decreased by one. The ratio of sleep hours of a nurse to patient care errors is one to one; thus, increasing sleep hours will diminish the chances of errors (Johnson et al., 2014).

Sleepiness not only affects safety in medical care, it also affects the safety of the general public. A study in 2007 reports during the survey, 66.6% of nurses stated driving while drowsy one or more times, while 3.4% reported driving while drowsy after every shift (Eanes, 2015). A specific example would be the motor vehicle accident that caused the death of Elizabeth Jasper. It is concluded she fell asleep after working a twelve-hour night shift (Gardner & Dubek, 2016). It was stated there is an increased risk for motor vehicle accidents to those who work irregular hours, night shift or more than sixty hours per week (Eanes, 2015).

It is significant to understand interventions to decrease effects of fatigue as the physical health of the U.S. nurse is at risk. The American Nurses Association (ANA) states the majority of nurses are overweight with a BMI of 28 or greater (Yoder, 2017). A positive correlation between high body mass index and less than six hours of sleep exists, placing nurses at greater risk for breast, endometrial, and colon cancer; hypertension, type II diabetes, stroke, heart disease, and obstructive sleep disorders (Eanes, 2017; Centers for Disease Control and Prevention, 2017; Matey, 2016).

Compassion fatigue impacts patient care creating the potential to cause patient avoidance, lack of compassion, and work avoidance by calling in sick (Matey, 2016). A nurse affected by compassion fatigue has higher probability to make errors in medication administration, use improper nursing skill technique, neglect to intervene when a patient
is in pain, have decision regret and generate negative patient outcomes (Braunschneider, 2013; Scott, Arslanian-Engoren, & Engoren, 2014).

Furthermore, compassion fatigue affects the hospital on a larger scale due to its high influence on a nurses’ decision to leave the workplace (Sheree, 2017). A study performed in Korea identifies 29.6% of turnover is affected by compassion fatigue and 42.2% is contributed by a mix of compassion fatigue and nurse burnout (Sung, Seo, & Kim, 2012). The fatigue of a nurse is not limited to the nursing environment but encompasses multiple aspects within a healthcare organization. The information in this research raises concerns of what options are available for reducing the significant effects of impaired sleep quality.

**Problem and Purpose Statement**

The increased need for nurses has resulted in consequences for the nurse on an individual level. Nurses have poor sleep quality creating fatigue, compassion fatigue, impaired cognitive function, decreased coordination and agility, ultimately fostering decreased quality of life and increased risk for chronic diseases, patient care errors and safety (Eanes, 2015; Matey, 2016). The purpose of this systematic research review was to answer the question, “in nurses with poor sleep quality, what are evidence-based practice nursing interventions to manage the effects of reduced sleep quality?”.

**Definition of Variables**

The purpose of this study was to look at interventions that benefit nurses with poor sleep quality. Sleep quality was defined by length of falling asleep time, duration of sleep, amount and quantity of time aroused, and effects of disruptive sleep disorders
(Ohayon et al., 2017; Kunzweiler et al., 2016). Quality of sleep can also be interpreted through the lens of subjective feeling of the individual when awoken (Dewald, 2010).

The independent variable in this study was evidence-based practice nursing interventions, defined as the care provided by a nurse which is founded upon best evidence-based practice, clinical experience and results in patient health benefits (Butcher, Bulechek, Dochterman, & Wagner, 2018). It includes the merging of clinical experience, patient predilection, and current proven research (Sackett, Straus, Richardson, Rosenberg, & Haynes, 2000; Kitson, Harvey, & McCormack, 1998; Houser, 2018). The dependent variable in this study was the effects of reduced sleep quality. The effects of reduced sleep quality were defined as compassion fatigue, impaired cognitive function, fatigue, decreased coordination and agility, risk for patient care errors, safety deterioration, and risk for chronic diseases, increase time to fall asleep, quantity of times aroused, and individuals sensation of sleep (Eanes, 2015; Matey, 2016).

**Methodology**

The searches for this systematic research review were conducted between February 2018 and August 2018. Databases utilized included Cinahl Complete, Google Scholar, Medline, Ovid Journals, PsycARTICLES, Sage Journals, Science Direct, and WorldCat Databases. Keywords included “best practice”, “case study”, “compassion fatigue”, “educational intervention”, “effects”, “fatigue”, “fatigue—prevention and control”, “health promotion”, “intervention”, “interventions for nursing fatigue”, “interventions or strategies or best practice”, “nurse fatigue”, “nurses”, “nurses without sleep”, “nurse turnover”, “nursing”, “nursing fatigue intervention”, “occupational interventions”, “shift work”, “sleep deprivation”, “sleep problem, strategies, and training”. The various
databases used and the keywords used singly and in combination provided the most comprehensive number of hits. Limiters and inclusion criteria were that articles had to be published within the last 10 years due to lack of research in the last 5 years, from a peer reviewed journal, available in full text, research article, major subject heading: nurses, and in English or available for translation, no country limiters were placed. The combination of criteria allowed for the most credible information on the topic. The total number of hits from all searches were 574.

In order to narrow the results, titles were scanned. Those that did not appear to directly relate to answering the research question were excluded. If articles could not be excluded based on title, abstracts were read. Those that appeared promising to answer the research question were saved and the full text articles were reviewed. An ancestry search was also carried out with all studies. From all of the searches, 56 studies were saved for possible inclusion in the sample. Saved studies were critiqued for quality and ability to answer the research question. Once critiqued the sample size was 22.

**Findings**

Twenty-two articles are included in this systematic research review. The dates for the included studies were 2008-2018. Thirteen studies were quantitative in nature (Hevezi, 2016; Aycock & Boyle, 2009; Bazarko, Cate, Azocar, & Kreitzer, 2013; Duarte & Pinto-Gouveia, 2016; Leedo, Beck, Astrup, & Lassen, 2017; Movahedi, Ghafari, Nazari, & Valiani, 2017; Poulsen, Sharpley, Baumann, Henderson, & Poulsen, 2015; Sohn, Yoon, & Jung, 2011; Aycock & Boyle, 2009; Neville, Velmer, Brown, & Robol, 2017; Scott, Hofmeister, Rogness, & Rogers, 2010a; Dehghan, Azmoon, Souri, & Akbari, 2014; Wendsche, Ghadiri, Bengsch, & Wegge, 2017), three were qualitative (Scott, Hofmeister,
Rogness, & Rogers, 2010b; Smith-Miller, Harden, Seaman, Li, & Blouin, 2016; Haglund & Schmidt, 2017; Adimando, 2017), three were a systematic review of the literature (Ruggerio & Redeker, 2013; Smith-Miller, Shaw-Kokot, Curro, & Jones, 2014), and four were a mixed methods study (Anderson & Gustavson, 2016; Dos Santos, Kozasa, Carmagnani, Tanaka, Lacerda, & Nogueira-Martins, 2016; Seaman, 2015).

Table 1 gives the basic demographic information for each study including authors, year published, type of study/level of evidence, and primary findings.

Table 1

*Summarized Findings for the Effects of Reduced Sleep Quality*

<table>
<thead>
<tr>
<th>Authors</th>
<th>Type of Study/ Level of Evidence</th>
<th>Sample Size</th>
<th>Findings</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>● reduced compassion fatigue, increase patient safety,</td>
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<td></td>
<td>job satisfaction, &amp; retention rates</td>
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<td>● reduced burnout post intervention</td>
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<td></td>
<td></td>
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<td>● significant trend of compassion satisfaction scores.</td>
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<tr>
<td>Aycock &amp; Boyle, (2009)</td>
<td>Mixed methods causal-comparative (II)</td>
<td>62 Onc. RNs</td>
<td>Emotional expression, pastoral care, retreats, program planning, training, &amp; peer support</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>● improved compassion fatigue</td>
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<tr>
<td>Bazarko et al., (2013)</td>
<td>Time series analysis (II)</td>
<td>36 RNs</td>
<td>Mindfulness-Based Stress reduction program</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>● decreased perceived stress &amp; burnout.</td>
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<td>● decreased overall general health</td>
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<td>● improved mental health &amp; social functioning</td>
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<td></td>
<td>● increased serenity, empathy, &amp; self-compassion</td>
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<td>Dehghan et al., (2014)</td>
<td>Correlation analysis (II)</td>
<td>80 RNs</td>
<td>Thermal Regulation</td>
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<td></td>
<td></td>
<td></td>
<td>● improved sleep quality &amp; eye fatigue</td>
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<td></td>
<td>● improved atmosphere affects mental &amp; physical health</td>
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<tr>
<td>Study Authors</td>
<td>Methodological Design</td>
<td>Sample Size</td>
<td>Intervention</td>
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</table>
| Dos Santos et al., (2016)  | Mixed methods time series analysis (I) | 13 RNs, techs, or NAs | Stress reduction program  
  • reduced depression, perceived stress, burnout, anxiety  
  • increased physical & psychological domains of quality of life style |
| Duarte & Pinto-Gouveia, (2016) | Non-randomized experimental (II) | 48 RNs | Mindfulness-Based Stress reduction program  
  • decreased compassion fatigue & experiential avoidance  
  • increased mindfulness & non-judging |
| Hevezi, (2016)             | Quasi-experimental (III)     | 14 RNs | Meditation  
  • increased compassion satisfaction, feelings of relaxation, self-compassion, & positive changes in physical, emotional, & mental reaction to stress  
  • decreased burnout and secondary trauma |
| Haglund & Schmidt, (2017)  | Case study (IV)              | 1 RN      | Debriefing  
  • supports staff members, prevents secondary stress, and can improve leadership |
| Leedo et al., (2017)       | Randomized cross-over design (II) | 60 RNs,  Dr.s NAs | Providing water, snacks, and healthy meals  
  • improves mood and fatigue |
| Movahedi et al., (2017)    | Experimental (I)             | 50 RNs | Acupressure  
  • decrease physical fatigue  
  • sample mean stress score decreased |
| Neville et al., (2017)     | Comparative descriptive (III) | 65 RNs | Napping  
  • experienced greater fatigue p=0.2 |
| Poulsen et al., (2015)     | Randomized experimental (II) | 70 RNs | Interventional workshop on job stress recovery  
  • increased relaxation, control, mastery, & psychological detachment  
  • prevents decline in self-care & sleep-quality |
| Ruggerio & Redeker, (2013) | Systematic Review (I)        | 13 articles | Napping during night shifts  
  • reduced night-time sleepiness, improve performance  
  • seldom affect daytime sleep |
| Scott et al., (2010a)      | Quasi-experimental (III)     | 54 RNs | Fatigue countermeasure program for nurses (FCMPN) improves fatigue:  
  • awareness of impact on patient & individual health  
  • rest & taking breaks allows a sense of revival  
  • lifestyle control & balancing home & occupation  
  • ease of program implementation |
All of the studies analyzed contained information related to coping with fatigue in the nursing population such as knitting, napping, meditation, acupressure, dry cupping, reduced call schedule, reduced work hours, countermeasure programs, debriefing, guidance, resources available to staff, training, acknowledgement, intervention delineation, pastoral care, emotional expression, program planning, peer support,

<table>
<thead>
<tr>
<th>Study</th>
<th>Methodology</th>
<th>Sample Size</th>
<th>Findings</th>
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<tbody>
<tr>
<td>Scott et al., (2010b)</td>
<td>Time series analysis (III)</td>
<td>47 RNs</td>
<td>Fatigue countermeasures program</td>
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<td></td>
<td></td>
<td></td>
<td>- employee/employer partnership</td>
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<td>- support for research engagement</td>
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<td></td>
<td></td>
<td></td>
<td>- mitigate fatigue, improve sleep, reduce drowsy driving, and reduce errors among hospital staff</td>
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<tr>
<td>Seaman, (2015)</td>
<td>Mixed methods time series analysis (III)</td>
<td>62 RNs</td>
<td>No significant decrease in fatigue related to duty-free breaks, limiting consecutive hours worked, and consecutive shifts</td>
</tr>
<tr>
<td>Smith-Miller et al., (2016)</td>
<td>Time series analysis (III)</td>
<td>4 RN units</td>
<td>Decreased work hours and requiring 48 hours recuperation time between night &amp; day shift reduces fatigue</td>
</tr>
<tr>
<td>Smith-Miller et al., (2014)</td>
<td>Systematic Review (I)</td>
<td>22 articles</td>
<td>Duty-free breaks, strategic napping &amp; limiting frequency of day-night rotations improve fatigue management</td>
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<td></td>
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<td>- Magnet A hospitals provide protective mechanism for fatigue</td>
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<tr>
<td>Sohn et al., (2011)</td>
<td>Time series analysis (III)</td>
<td>27 RNs</td>
<td>Dry cupping</td>
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<td>- reduces musculoskeletal pain &amp; fatigue</td>
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<td>- pain frequency, fatigue, &amp; pain level decreased</td>
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<td></td>
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<td></td>
<td>- balance of central nervous system raising functional recovery level</td>
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<tr>
<td>Warren &amp; Tart, (2008)</td>
<td>Causal comparative (III)</td>
<td>24 RNs</td>
<td>Reduced call schedule for OR RNs &amp; work hours decreased physical fatigue &amp; care errors</td>
</tr>
<tr>
<td>Wendsche et al., (2017)</td>
<td>Systematic Review (I)</td>
<td>36 articles</td>
<td>Rest breaks</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- high quality break areas aid in coping</td>
</tr>
<tr>
<td></td>
<td></td>
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<td>- positively affects well-being &amp; behavior</td>
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</table>
strategic education, rest breaks, healthy diet, thermoregulation, educational workshops, interventional workshops on job stress, mindfulness-based interventions, and set recuperation time between day and night shift. There was no consistent definition of sleep quality or fatigue found in the literature. More descriptive information and other results are included in the discussion section.

**Discussion**

This systematic review validated the need for interventions related to managing the effects of reduced sleep quality among nurses. To increase both patient and nurse safety, it is critical for the nurse and health organizations to employ interventions to lessen the consequences of reduced sleep quality. Despite current findings of patient care errors and decreased nurse wellbeing related to sleep quality, there is a lack of literature to directly manage sleep quality of the nurse. However, the studies found enhancement to aid the mental, physical, and spiritual health of the nurse, ultimately leading to improved patient care outcomes. A wide array of evidence-based practice nursing interventions were found that target these various components of reduced sleep quality.

**Mental Interventions**

The general mental health of nurses can be improved through mindfulness, meditation, stress reduction programs, thermoregulation, nutrition, and rest break interventions. A specific intervention related to mental health was a mindfulness-based stress reduction program. Beneficial outcomes of such programs included increased mental health and social functioning (Bazarko et al., 2013). Meditation can also be effective in improving general mental health and nurses’ reaction to stress (Hevezi, 2016). Programs focusing on stress reduction also decreased depression, perceived stress,
and anxiety while improving self-concept (Dos Santos et al., 2016). Alleviating uncomfortable working conditions related to thermoregulation, which is affected by environmental and physical factors, resulted in reduced anxiety, ultimately improving mental health (Dehghan et al., 2014). Nutritional intervention among health care workers involving simplified access to hydration, snacks, and healthy meals, improved mood related fatigue (Leedo et al., 2017). Furthermore, rest breaks, including rest break areas and activities, were positively correlated with mental health and coping (Wendsche et al., 2017).

Some interventions were found to improve specific areas of mental health such as general mindfulness-based interventions, self-compassion, and cognitive functioning. Innovative interventions for increasing mindfulness included implementation of a reduced call schedule and education and implementation of exercises (Warren & Tart, 2008; Dos Santos et al., 2016; Duarte & Pinto-Gouveia, 2016). The implementation of a reduced call schedule reduced mental distraction and decreased charting errors (Warren & Tart, 2008). Through a mindfulness-based stress reduction program by Duarte and Pinto-Gouveia, improvement in the specific mental health area of mindfulness, and a non-judgmental attitude were noted (2016).

A mindfulness-based stress reduction program performed by Bazarko et al., meditation interventions as well as an educational workshop on job stress were found to affect self-compassion (2013). The mindfulness-based program noted increases in self-compassion, serenity, and empathy while the intervention of meditation increased feelings of self-compassion and relaxation (Bazarko et al., 2013; Hevezi, 2016).
Implementing a workshop on job stress recovery was found to prevent a decline in self-care (Poulsen et al., 2015).

Due to the positive correlation between patient safety and compassion fatigue, educational workshops on the topic of compassion fatigue increased patient safety (Adimando, 2017). Fatigue countermeasure programs reduce care errors by providing educational sessions and implementing the use of sleep log books (Scott et al., 2010b). Interventional workshops on job stress can improve patient safety as well as reduce psychological detachment making the nurse more cognizant and decrease patient care errors (Poulsen et al., 2015). Implementation of 20 minute naps between the hours of 02:00 and 03:00 for night-shift nurses was found to reduce night-time sleepiness and decrease deficits in reaction time, lapses, driving performance, task load, and psychomotor vigilance. It is important to note this intervention was not found useful in day-shift nurses and this intervention cannot make up for sleep debt. Nurses still need to ensure adequate sleep is attained after shift, but napping can be used as an on shift tool (Ruggerio & Redeker, 2013).

**Physical Interventions**

There were numerous interventions for physical fatigue. Implementation of a reduced call schedule decreased physical fatigue in OR nurses by assigning weekday call to salaried call nurses and assigning surgical technologists to take call for emergency cases during night hours to provide the nurses with uninterrupted rest and sleep during off hours. Physical fatigue was reduced by restricting hours worked to 12 hours (Warren & Tart, 2008). It was found limiting day to night rotations improved fatigue (Smith-Miller et al., 2014) and the requirement of 48 hours between a night shift and a day shift.
decreased physical fatigue by allowing recuperation and adjustment time to the dynamic shift of wake/sleep cycle (Smith-Miller et al., 2016). Acupressure is another effective intervention in decreasing physical fatigue in nurses. (Movahedi et al., 2017). Dry cupping was an effective intervention in reducing physical fatigue related to musculoskeletal pain (Sohn et al., 2011).

Studies were contradictory in regard to the intervention of duty-free breaks, breaks in which nurses have no assigned work tasks. Some studies found no significant decrease in physical fatigue (Seaman, 2015); whereas, other studies found a decrease in physical fatigue (Scott et al., 2010a; Wendsche et al., 2017; Smith-Miller et al., 2014; Smith-Miller et al., 2016) and an increased sense of revival resulting in greater cognizance of effects of sleep on patient care (Scott et al., 2010a). The use of napping is also contradictory. A study found it decreases physical fatigue (Smith-Miller et al., 2014) while another states it does not reduce physical fatigue in younger nurses and night nurses (Neville et al., 2017). Further studies are needed before napping and duty-free breaks can conclusively be considered positive interventions in improving physical fatigue.

Also, several interventions affect the mental problems of reduced sleep quality improved physical fatigue. Meditation improved nurses physical reaction to stress (Hevezi, 2016) and the workshop on job stress created an increase in relaxation and improvement in control and mastery of skills (Poulsen et al., 2015). Additionally, improving thermal comfort in the workplace was proven to reduce eye fatigue in nurses, therefore increasing sleep quality (Dehghan et al., 2014). Magnet A hospitals were found to be a protective mechanism to help prevent fatigue through staff council’s involvement,
engagement, and empowerment (Smith-Miller et al., 2014). Interrupted circadian rhythms is a specific cause of physical fatigue. The countermeasure program implemented assisted in attaining regular circadian rhythms (Scott et al., 2010a; Scott et al., 2010b). Workshops on recovery from job stress also prevented a decline in perceived sleep quality (Poulsen et al., 2015.)

No interventions were found to improve the pathology of chronic disease affected by lack of sleep quality; however, implementing mindfulness-based stress reduction programs and countermeasure programs improved overall general health (Bazarko et al., 2013) and aided in creating balance between home and work life (Scott et al., 2010a). Considering the negative effects of stress on the development of chronic diseases, management of stress is an important factor in physical well-being.

**Spiritual Interventions**

Compassion fatigue interventions combat spiritual depletion. Several interventions were found to improve compassion fatigue, of which the majority of the studies were oncology nurses. An improvement in compassion fatigue can result by the implementation of pastoral care for nursing staff (Aycock & Boyle, 2009). Acknowledging they are at risk of compassion fatigue within the nursing profession helped newly hired nurses reduce the shock and surprise of compassion fatigue. Peer support was shown to decrease a sense of isolation with active dialogue and emotional expression. Steps of guidance, leading a nurse through the grieving process of losing a patient, also decreases compassion fatigue. Debriefing decreases compassion fatigue through support groups, encouragement, individual education, use of coping mechanisms, personal reflection activities, and relational bonding (Haglund & Schmidt, 2017).
Knitting was a particular tool used to provide debriefing time among nurses and reduce burnout and improved compassion fatigue (Anderson & Gustavson, 2016). Through educational workshops, informing nurses how to self-monitor for compassion fatigue can reduce the effects and prevalence of compassion fatigue (Adimando, 2017). Mindfulness interventions were found to decrease compassion fatigue (Duarte & Pinto-Gouveia, 2016) and meditation increased compassion satisfaction (Hevezi, 2016).

Reduced fatigues in nurses can result in both patient and work avoidance. Mindfulness interventions not only decrease compassion fatigue but also experiential avoidance (Duarte & Pinto-Gouveia, 2016). The countermeasure program reduced patient and work avoidance by requiring restful breaks (Scott et al., 2010a). Debriefing can decrease patient avoidance by decreasing compassion fatigue because avoidance is a symptom of compassion fatigue (Haglund & Schmidt, 2017).

Burnout was also identified as an effect of reduced sleep quality of a nurse. Burnout can be considered an illness of both the mind and spirit (Shelly & Miller, 2006). Interventions to alleviate the effects of burnout are mindfulness, meditation, countermeasure programs, self-monitoring, debriefing, stress-reduction programs, guidance, resources available to staff, training, acknowledgement, intervention delineation, pastoral care, emotional expression, program planning, peer support, and strategic education (Aycock & Boyle, 2009). Stress reduction programs related to mindfulness were found to decrease perceived stress and burnout (Bazarko et al., 2013; Dos Santos et al., 2016) while meditation was found to decrease burnout and secondary trauma (Hevezi, 2016). Educating nurses on self-monitoring, self-management, and self-care related to compassion fatigue can increase job satisfaction and increase retention
rates of nurses, ultimately decreasing burnout (Adimando, 2017). To alleviate burnout, debriefing facilitated by leadership supports hospital staff and prevents secondary stress (Haglund & Schmidt, 2017).

**Implications**

**Education**

Implications for education include specific interventions in undergraduate nursing programs related to stress, fatigue, and sleep quality. Nursing school is designed to teach students how to care for patients effectively, but due to current evidence related to fatigue in nurses there needs to be more emphasis on this topic in undergraduate programs. If more emphasized in nursing school, proactive measures could be taken to prevent and manage the effects of reduced sleep quality.

**Practice**

When researching for protocols related to the management of the effects of reduced sleep quality, no national protocol could be found or currently enacted from Centers for Disease Control or National Council of State Boards of Nursing (CDC, 2018; NCSBN, 2018). If education was made a part of hospital policy, management of the effects of reduced sleep quality would improve among nurses. Potential barriers to the implementation of management and intervention of the effects of reduced sleep quality include the national nursing shortage, increased costs for hospitals related to staff education, and the nurses’ lack of receptiveness to further education.

**Future research**

Future research should focus on the interventions of napping and duty-free breaks since current studies are contradictory. The intervention of compassion fatigue was
mostly studied in oncology nurses and future research should encompass all nursing
departments. Also, studies relating to sleeps’ spiritual effects for nurses was lacking.
There was a sufficient sample size for this systematic research review; however, further
research is needed. While this systematic research review was related to managing the
effects of reduced sleep quality, further research should address interventions to improve
sleep quality.

**Strengths and Limitations**

Strengths of this systematic research review include consultation with a credentialed
mentor and librarian; limited biases; genuine interest, optimal size, functionality, and
cohesiveness among the researchers; strong sample size; variation of study types and
demographics among research articles; and 60% of the sample had I and II level of
evidence. Among data researched, saturation was reached. Limitations of this systematic
research review include time constraints, inexperience of the researchers, limited
availability to databases, some researched studies had limited sample sizes and lacked
reporting data, not all studies were randomized, studies performed on specific
populations, translations provided by non-medical professionals, and inability to translate
article from foreign language to English. Research reviewed was conducted over the last
10 years due to lack of literature in the last 5 years.

**Recommendations**

Recommendations for study replications include more time dedicated to research,
fewer outside responsibilities, and greater use of extensive databases. Currently, there are
no clinical guidelines for nurses related to general health management and promotion;
therefore, recommendations for further addressing lack of clinical guidelines are to
perform research directly related to sleep quality of the nurse and create guidelines through the NCSBN, including monitoring and management.

**Conclusion**

The purpose of this research study was to analyze interventions that benefit nurses with poor sleep quality. The fatigue of a nurse is not limited to the nursing environment but encompasses multiple aspects within a healthcare organization and personal life of the nurse. No standardized care is recommended among hospitals for the management of the nurses’ sleep quality. The implications of this research raises concerns of what options are available for reducing the significant effects of impaired sleep quality; therefore, emphasizing the necessity of standardized management of nurse sleep quality. Results of this study indicate the positive effects of applied evidenced based practice interventions among nurses to reduce poor sleep quality such as decreased burnout, physical fatigue, and compassion fatigue. Interventions vary, affecting mental, physical, and spiritual health of the nurse such as mindfulness, acupressure, and knitting. Implications of this research review include further research, proactive measures, and guideline development. Thus, combating the effects of poor sleep quality through evidenced-based practice intervention will greatly improve the health of the nurse, allowing the nurse and patients to prosper.
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