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## The possible role of burnout in nursing errors

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# THE POSSIBLE ROLE OF BURNOUT IN NURSING ERRORS

by

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A thesis submitted in partial fulfillment of the requirements  
For the Honors in the Major Program in Nursing  
In the College of Nursing  
and in The Burnett Honors College  
at the University of Central Florida  
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Thesis Chair: Dr. Stephen Heglund

## **ABSTRACT**

Nurse burnout and the commission of errors are two seemingly unrelated phenomena in the health care arena. Burnout was first described by Herbert J. Freudenberger in 1974 and has since been studied in many industries, including nursing. The issue of errors in health care has been a growing concern since the Institute of Medicine published the report, *To Err is Human* in 1999. Little research has been done to link burnout and the commission of errors. A literature review was performed to investigate these two issues. Peer-reviewed research articles were analyzed for contributing factors and effects on patient outcomes. The findings of the literature suggest that burnout and the commission of errors have many similar contributing factors, particularly in regards to work environment conditions. The conclusion from this literature review is that more research should be done to correlate burnout and error commission and that efforts should be made to improve the work environment of nurses.

## **DEDICATION**

This thesis is dedicated to my mother and fellow nurse, Marianne Hoskins. Thank you for your unending support and encouragement as I make my journey into the nursing profession. You taught how to do the most important thing a nurse does: care. I am so excited to be joining you as a nurse!

## **ACKNOWLEDGEMENTS**

I would like to sincerely thank my committee members: Dr. Stephen Heglund, Dr. Diane Andrews, and Dr. Donna Malvey. I sincerely appreciate your time, patience, and feedback. Thank you so much for sharing your knowledge and for making this thesis possible.

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## INTRODUCTION

Burnout is a phenomenon that was first described in the 1970s by Herbert J. Freudenberger (1974). Since then, it has been widely studied in many professions, including nursing. There are many factors that may contribute to the development of burnout and it can have many negative emotional, mental, and physical effects on the nurse experiencing it. But does it also affect the patients the burnt out nurse is caring for?

This literature review considers relevant articles on the topics of nurse burnout, nursing errors, and patient outcomes. Burnout and error commission appear to share several similar contributing factors. Characteristics of the work environment may play a large role in both the commission of nursing errors as well as in the development of burnout.

## **PROBLEM**

Nurses experiencing burnout may be providing less efficient care or may perceive their own working environment to be less safe than nurses who are not experiencing burnout (Halbesleben, Wakefield, Wakefield, and Cooper, 2008). The problem with nurse burnout is that patients may be adversely affected by it as high levels of burnout are associated with lower ratings of quality care (Goetz, Beutel, Mueller, Trierweiler-Hauke, & Mahler, 2011). Nurses who are emotionally and physically exhausted may risk making mistakes that could potentially harm a patient. Furthermore, burnout has been shown to be a predictor of nurse turnover. Higher turnover rates result in additional costs to a hospital. There is very little research specifically linking nurse burnout and errors, creating a further problem.

## **PURPOSE**

This thesis reflects the review of relevant literature related to nurse burnout, errors, patient outcomes and the possible association between the two phenomena of burnout and errors. It is anticipated that the findings of this thesis will inform staff nurses and management of the possible costs of burnout with respect to patient outcomes. It will also inform management of the benefits of creating a more positive work environment to prevent burnout among staff nurses. The primary question this literature review seeks to answer is, is there a correlation between nurse burnout and errors?

## **BACKGROUND**

Many factors contributing to the commission of errors in health care have been theorized. These include distractions, heavy workloads, fatigue, poor communication, and possibly, burnout. The following section will provide background information on both burnout and the commission of errors, and the possible relationship between the two.

### **Burnout**

The phenomenon of burnout was first described by Herbert J. Freudenberger after he observed workers in free clinics (1974). He suggested that after about a year of working in a stressful environment, a person becomes inoperative. Physical signs of burnout include exhaustion, fatigue, headache, GI disturbances, sleeplessness, and shortness of breath. Behavioral signs include irritability, frustration, risk-taking, and resistance to change, cynicism, and depression. Freudenberger suggested that those who are prone to burnout feel internal and external pressures to help and thus work “too much, too long, and too intensely” (1975, p. 74). In his 1975 follow-up to his original article, Freudenberger suggested that professionals who identify closely to those they are helping, such as nurses, are especially at risk for burnout. He suggested that burnout be prevented but treated as soon as signs begin to appear. His suggestions for preventing burnout included preventing rapid turnover, avoiding having the same person do the same job repeatedly, limiting hours worked, and allowing staff to take time off when signs of burnout are noticed. In a 2001 article, Aiken and colleagues found that

43.2% of nurses in the United States scored in the high burnout range on the Maslach Burnout Inventory and 41% were dissatisfied with their jobs.

Work environment may play a large role in the development of burnout. Factors such as nurse-physician relationships, staff and resource adequacy, leadership and support, a nursing foundation for quality of care, and nurse participation in policy making were found to influence the perception of work environment as unfavorable, resulting in nurses experiencing some degree of burnout (O'Mahoney, 2011). Heavy workloads, a characteristic common in the nursing profession, were found to be a contributing factor to burnout in multiple studies (Aiken et al., 2001; Goetz et al., 2011; Kowalski et al., 2009; Leiter & Maslach, 2009).

## **Errors**

Errors may be defined as “decisions and actions that generally fail to achieve their intended outcomes, as well as omissions” (Karga, Kiekkas, Aretha, & Lemonidou, 2011, p. 3246) or, more simply, as a deviation from a physician’s orders (Mayo & Duncan, 2004). In 2000 the Institute of Medicine published a report stating that more people die from errors each year than “traffic accidents, breast cancer, or AIDS” (Clancy, 2009, p. 525). Errors are an issue of patient safety and quality of care. Since the publication of the Institute of Medicine report, efforts have been made to determine why errors occur and what can be done to prevent them.

There are several potential factors that may contribute to committing errors. Distractions, heavy workload, communication problems, and lack of supervision of inexperienced staff were identified as factors contributing to errors (Karga et al., 2011).

During a study by Hall and colleagues a total of 13,025 interruptions to nurses were observed, 17.6% of which occurred during medication preparation or administration (2010).

### **Relationship**

Nurse burnout and errors do not have a well-documented relationship. The two phenomenon, however, do have several similar contributing factors. Factors such as heavy workload, lack of communication, and fatigue were found to be contributing factors for both burnout and error commission. These contributing factors and the idea of a possible connection between the two are further discussed in the findings of this literature review.

## METHOD

A systematic review of the literature associated with nurse burnout, errors, and patient outcomes was conducted. Literature for review was obtained from databases such as the Cumulative Index to Nursing & Allied Health Literature (CINAHL), MEDLINE-EBSCOhost, OVID, and Web of Science via the University of Central Florida Library.

Inclusion of an article for review was based on the following criteria. Original research published in English in a peer-reviewed professional journal. Preferred publication dates were after 2002, however exceptions were required due to the limited number of relevant studies published. Articles were primarily sought from countries with similar health care worker environments including the United States, Canada, Germany, Australia, Greece, and the United Kingdom. In addition to similar working environments, these countries were accepted for inclusion due to their cultural likeness to the United States in regards to the sociocultural status of women and their health care similarities with regards to the role of nursing.

Exclusion criteria included articles that were not published in English and those from countries other than countries not noted in the inclusion criteria as previously listed. Literature reviews, metasyntheses and metanalyses were also excluded. However, such resources were explored to investigate ancestor and descendent citations in order to identify other primary sources of relevant information not otherwise captured via keyword searches.

Initial search terms used to explore the databases included burnout, nurs\*, contribut\* factor\*, med\* error\*, and patient outcome\*. Terms with an "\*" indicate a truncated scheme to allow for maximum return of data. These terms were used both singly and in varied combinations to find articles of relevance.

The phenomenon of turnover was found to be associated with burnout. There was a positive association between turnover and burnout (Leiter & Maslach, 2009). Therefore, a secondary search was conducted using the term "turnover" to more thoroughly explore the relevant literature. This yielded a single article relevant to this literature review. A holistic evaluation of each article was conducted to establish its quality and worthiness for inclusion. Each evaluation was conducted using guidance from Polit and Beck's guides to focused critiques for quality of research reports (2010).

## **FINDINGS**

Seventeen research articles related to burnout and/or errors were evaluated for this literature review. The articles were evaluated for factors contributing to burnout or errors, the effect of workplace environment on burnout and patient outcomes, and the effect of burnout on patient outcomes. Thirteen of the articles were published within the last ten years, with nine of them being published within the last five years. Four of the articles chosen were published outside of the ten-year criteria for their relevance (Freudenberger, 1974; Freudenberger, 1975; Dugan et al., 1996; Aiken et al., 2001). The articles were subdivided into three categories: burnout, errors, and burnout and patient outcomes.

### **Burnout**

#### **Maslach Burnout Inventory**

A colleague of Freudenberger, Christina Maslach, further refined the concept of burnout. This concept is based on the idea that burnout consists of three components: emotional exhaustion, cynicism and detachment, and a feeling of ineffectiveness or lack of achievement at work (Leiter & Maslach, 2009). Maslach and her colleagues developed a tool for measuring to what extent each factor of burnout is being experienced by an individual. The Maslach Burnout Inventory (MBI) uses 16 items to measure burnout with the continua exhaustion-energy, cynicism-involvement, and

inefficacy-efficacy. It is a widely used tool and is widely regarded as reliable and valid (Laschinger & Leiter, 2006). The MBI was used in many studies included in this literature review.

### **Article Reviews**

In 2001 Linda H. Aiken and colleagues published their “Nurses’ Reports on Hospital Care in Five Countries”. The quantitative, cross-sectional study included data on staffing, organization, and patient outcomes in 711 hospitals from the United States, Canada, England, Scotland, and Germany. 13,471 nurses from the United States, 17,450 from Canada, 5,006 from England, 4,721 from Scotland, and 2,681 from Germany were surveyed for a total of 43,329 participants (Aiken et al.). The MBI was used to measure burnout in the participants and a separate survey tool was used to assess turnover intentions, work climate (including staffing, competency, and management), workload, support from management, structure of work, quality of care, and adverse events. Other than the MBI, the survey used was developed for this study to cover the topics mentioned above.

The study found that 41% of nurses in the United States were dissatisfied with their jobs, with 43.2% having scores in the high burnout range on the MBI (Aiken et al., 2001). Only 34.4% of the United States nurses felt there were enough registered nurses in their workplace to provide quality care and 43.1% believed there were adequate support services, such as ancillary staff. The authors believed this indicated that nurses perceived their work environment to be understaffed. The survey also indicated that United States nurses did not feel supported by management. Specifically, only 29.1%

felt that administration listened to their concerns while 40.6% felt that they had the opportunity to participate in policy decisions. A minority of 39.3% felt that they were publicly acknowledged for the contributions to patient care. A significant majority of those surveyed, 83.2%, felt that they had experienced an increase in workload in the past year. Only 35.7% rated the quality of care in their hospital as excellent. In regards to patient outcomes, a disturbing 15.7% of the United States nurses felt that wrong medications/doses were given “not infrequently” and 34.7% felt that nosocomial infections were also “not infrequent”. Along those same lines, 20.4% reported that patient falls and injuries were “not infrequent” (Aiken et al., pp. 49-50). The authors believed that problems with workforce design and management may contribute to errors and adverse patient outcomes.

Leiter & Maslach (2009) used an Areas of Worklife Scale and the MBI to assess burnout and the contributing factors among 667 nurses in Canada with the ultimate goal of relating burnout to turnover intentions. Most of the participants were full time, female, point-of-care registered nurses which the researchers considered to be representative of the nursing population. The Areas of Worklife Scale measured workload, reward, control, community, fairness, and values using a five point Likert scale (Leiter & Maslach). It was developed by Leiter and Maslach in 2004 and subsequent reliability testing found it to be an internally consistent model. Cronbach’s alpha scores for the Areas of Worklife Scale were as follows: 0.85 for workload, 0.70 for control, 0.82 for reward, 0.80 for community, 0.77 for fairness, and 0.82 for values. Turnover intentions were measured with three items that participants responded to using a 5-point Likert

scale. The items were, “I plan on leaving my job within the next year”, “I have been actively looking for other jobs”, and “I want to remain in my job” (Leiter & Maslach, p. 334). The internal consistency of this measure in this study was 0.84 which was considered high.

Leiter and Maslach (2009) found that workload, values, control, reward, community, and fairness all correlated with the three components of burnout. Workload had the highest correlation with the exhaustion component (-0.60). In their study, burnout was found to be a predictor of turnover intention. The cynicism component was the biggest predictor of turnover intentions.

In addition to areas of work life, the overall work environment may play a role in burnout as well. A 2011 Literature review performed by O’Mahoney on the subject of burnout in emergency nurses was followed up with a survey of 86 nurses in an emergency department in Ireland. Sixty-four of the nurses responded for a rate of 74%. The survey contained the MBI and thirty items from the Nursing Work Index Practice Environment Scale (O’Mahoney). The author then divided the items of the Nursing Work Index Practice Environment Scale into five subscales inspired by Magnet hospital standards. The five subscales were (1) nurse participation in hospital affairs, (2) nurse foundations for quality of care, (3) nurse manager ability, leadership, and support for nurses, (4) adequacy of staffing and resources and (5) collegial nurse-physician relations (O’Mahoney). In the study, the MBI was found to have an internal consistency of 0.87 for an emotional exhaustion subscale and 0.75 for a depersonalization subscale. The internal consistency of the five subscales of the Nursing Work Index Practice

Environment Scale were as follows: “0.72 for nurse participation in hospital affairs; 0.64 for nursing foundation for quality of care; 0.64 for nurse manager ability, leadership, and support of nurses; 0.53 for staffing and resource adequacy; and 0.80 for collegial nurse-physician relations” (O’Mahoney, p. 34).

Sixty-one percent of the participants reported some level of burnout on the MBI. Fifty-three percent of the nurses surveyed reported their work environment as “unfavorable”; 39% reported it as “mixed” and 8% reported it as “favorable” (O’Mahoney, 2011, p. 34). An analysis of the findings showed that the burnout subscales did correlate with the working environment subscales. The overall impression from these findings was that the high level of burnout could be a result of the unfavorable working environment. The author supported the encouragement of positive working relations and bettering the working environment. The author also supported the Magnet model, suggesting that implementing Magnet standards in Ireland may help reduce burnout (O’Mahoney).

Another study specifically examined the emotional exhaustion aspect of burnout with regards to social capital (Kowalski et al., 2009). Social capital is the degree of shared values and mutual trust within an organization and its employees. The study involved 959 nurses from four German hospitals and used the MBI and a social capital scale. The social capital scale measured common values and “perceived mutual trust” in an organization (Kowalski et al.). It was a six item scale with each response given a point value from one to four. The social capital scale had a Cronbach’s alpha of 0.91. In addition, workload and decision latitude were measured. Decision latitude is a concept

similar to autonomy, where nurses have the ability to make decisions as well as develop professionally and personally at work (Kowalski et al.). Workload was measured using an “intensity of labor scale” that also had six items with point values ranging from one to four. The workload scale had a Cronbach’s alpha of 0.78. Decision latitude was measured using seven items with the same one to four point value response system. This scale had a Cronbach’s alpha of 0.73. The study sample was divided into three groups based on their scores on the MBI: not at risk for emotional exhaustion (0-1.49), at risk for emotional exhaustion (1.5-3.49), and currently experiencing emotional exhaustion (greater than 3.5).

The study sample showed that 34.9% fell into the no risk group; 49.9% fell into the “at risk” group; and 15.1% fell into the group with emotional exhaustion symptoms (Kowalski et. al, 2009). Workload was positively associated with emotional exhaustion; decision latitude and social capital were inversely associated with emotional exhaustion. The authors found that social capital has an inverse relationship with burnout in that when social capital is low, emotional exhaustion is high and vice versa. The authors supported developing a positive workplace environment that supports decision latitude and development of social capital in order to prevent emotional exhaustion (Kowalski et. al.).

Goetz et al. (2011) conducted a cross-sectional survey among eighty-six Intensive Care Unit and Intermediate Care Unit nurses in Germany. The authors hypothesized that the working conditions of nurses (heavy workloads and responsibilities with limited autonomy) put them at risk for burnout and their patients at

risk of receiving a lower quality of care. The study measured professional commitment, resistance to stress, and overall emotional well-being to determine a risk for burnout. These three areas were measured using a short form of the Work-Related Behaviour and Experience Patterns questionnaire. The questionnaire consisted of forty-four items assessing attitudes, experiences, and thoughts of working situations using a five-point Likert scale. The Work-Related Behaviour and Experience Patterns questionnaire had a Cronbach's alpha score ranging from 0.76 to 0.84, leading the authors to regard it as a reliable tool. Results of the questionnaire allowed participants to be placed in one of four work-related behavior and experience patterns: a healthy type, a withdrawal type, an excessively strained (overexertion) type, and a burnout-related risk type (Goetz, et al.).

Results of the Goetz (2011) study showed that the most common pattern was the withdrawal type with 46.8% of the surveyed nurses falling into this pattern. The healthy type pattern was the second most common, with 25.3% of the nurses falling within that pattern. Of the nurses surveyed, 17.7% fell into the risk burnout pattern. The authors recommended structural changes to create more positive working environments with teamwork, leadership, and emotional support to prevent burnout. They believed that work condition changes would especially benefit Intensive Care Unit nurses. They advocated for teamwork, a positive atmosphere, strong leadership, and emotional support in the workplace.

## **Errors**

Karga and colleagues (2011) defined errors as "decisions and actions that generally fail to achieve their intended outcomes, as well as omissions" (p. 3246). Errors

can occur in areas of patient surveillance, drug preparation and administration, equipment use, and documentation. The authors of this article recognized that distractions, heavy workloads, ineffective communication, and lack of supervision of inexperienced staff have been identified as contributing factors to errors. The study's aim was to examine the emotional responses of nurses who committed errors and whether the specific responses and coping mechanisms led to constructive or defensive changes. Five hundred thirty-two nurses from five hospitals in Greece were surveyed.

The authors adapted a questionnaire that assessed emotional responses to errors, coping, senior staff responses to errors, and changes in nursing practice as a result of errors (Karga, et al., 2011). The study then proceeded in five stages. The first stage consisted of ensuring the validity of the language used in the questionnaire. This was done by translating it from English to Greek and then back to English by two individuals. The second stage of the study consisted of a literature review to review possible responses to errors from staff nurses as well as management. The authors also looked for changes in nursing practice that occurred in response to errors. The third stage involved interviewing 16 nurses in a pilot study to formulate new, relevant options to add to the questionnaire. These nurses were not included in the final study. At the fourth stage, the authors performed a content validity index. The items of the questionnaire were assessed for "clarity, relevance, and completeness" (Karga, et al., p. 3248). All items received a content validity index ranging from 0.88 to 0.96, so all items were included in the final questionnaire, but some were reworded. During the fifth stage, a pilot study with forty nurses was performed. These nurses were included in the final

study. The nurses completed the questionnaire and then assessed the questionnaire itself. Some items on the questionnaire were then reworded and it was then distributed to the actual survey sample.

According to Karga et al. (2011), 67% of the participants felt depressed after an error, 54.2% felt anger towards themselves, 44% felt guilty, 21.5% felt professionally inadequate and 34.3% felt embarrassed. Additionally 14.9% were angry at others, 36% were fearful of the patient's clinical course, 13.8% were fearful of repercussions, and 21.6% feared losing the trust of their colleagues. The perceived causes of errors were also assessed. The top two perceived causes of errors were high workload (78.2%) and inexperience (65.9%). Half of the respondents (50.6%) indicated that they felt supported by senior staff when they made an error; 23.4% believed that the senior staff focused on the true cause of the error; 54.1% reported that was a discussion about prevention of future errors; 35.1% of the nurses took measures to prevent future errors. These were considered positive senior staff responses. Negative senior staff responses included the following: 17.1% reported feeling a loss of professional respect; 21.4% felt they were treated unfairly; 6.0% felt that they were used as a scapegoat; 9.1% felt that measures taken were disproportionate to perceived error severity.

Karga and colleagues found that constructive changes in nursing practice were positively correlated with positive senior staff response, accepting responsibility, seeking social support, emotional self-control, and internal emotional responses (2011). Constructive changes included paying more attention to detail, keeping better patient records, reading patient notes more carefully, seeking advice, asking what colleagues

would have done, devoting more time to patient observation, and reading literature to make up for knowledge deficits. Defensive changes in nursing practice in response to errors were positively correlated with internal and external emotional responses, negative perceived senior staff response, escape-avoidance, and distancing. Defensive changes included nurses becoming more worried, feeling less confident, being more likely to not talk about errors, trusting others less, and considering leaving the nursing profession. Karga, et al. concluded that positive responses to errors from management allowed nurses to change constructively after they made an error. They advocate for proper support and positive responses to allow nurses to learn from errors and improve patient safety.

Clancy (2009) published a ten-year follow-up editorial report to the Institute of Medicine's (IOM) "To Err is Human". The author summarized the IOM's initial recommendations for reducing errors and further cited a secondary IOM report published in 2008, "Resident Duty Hours: Enhancing Sleep, Supervision, and Safety", concerning excessive work hours among medical residents and associated errors. The recommendations included setting patient safety goals, creating evidence-based knowledge to understand errors, voluntary and mandatory reporting of errors, developing systems for reporting errors that allowed for prevention rather than punishment, and a goal to reduce them by 50% within 5 years (Clancy). The author goes on to note that progress in reducing errors had been slow due to the overall environment of health care. Each hospital or provider had been left on its own to make changes to address patient safety, something that was not working. The author's

recommendations for furthering the process of reducing errors include changing the culture of health care to promote safety, improving teamwork and communication, and promoting evidence-based knowledge. Also notable from this article was the IOM's 2008 finding that medical resident fatigue is a "key patient safety workforce issue" (Clancy, p. 527). A recommendation for the reduction of medical residents' hours is thought to be associated with a reduction of errors (Institute of Medicine, 2008).

Another definition of medication errors is any deviation from physicians' orders (Mayo & Duncan, 2009). Mayo and Duncan suggest that errors have a psychological effect, causing guilt, terror, loss of confidence, and anger. This study looked at nurses' perceptions of medication errors and reporting. The study included 983 nurses in California that demographically represented intended nurse population. The Modified Gladstone, a previously designed tool, was used in this study. This tool measured "nurse perceived causes of medication errors", "percentage of drug errors reported to nurse managers", "types of incidents that would be classified as medication errors, reportable to physicians, or reportable using an incident report", and "nurse views about reporting medication errors" (Mayo & Duncan, p. 211). The tool had a reliability of 0.78.

The survey also asked how many errors the nurse had made over the course of their career. The mean was 4.9 per nurse with 68.3% reported a range of 2-5 errors throughout their career (Mayo & Duncan, 2009). Participants ranked the perceived cause of errors, from greatest to least, as the following: illegible physician handwriting, distracted nurses, tired/exhausted nurses, confusion between similar sounding names, miscalculation of dose, failure to check patient's name band against the Medication

Administration Record, incorrectly set up infusion device, poor quality of medication labels, and nurse confusion over different infusion devices (Mayo & Duncan). The survey found that only 45.6% of nurses believed that all errors are reported. Reasons for not reporting an error included fear of manager reactions (76.9%), fear of coworker reactions (61.4%), and thinking the error wasn't serious enough (52.9%). No relationships were made between nurse characteristics (such as years of experience or type of unit) and the responses. To the authors, this meant that medication errors and reporting of them was a system-wide problem. They recommended education on proper reporting. They emphasized the importance of reporting all errors, including near misses, so that system-wide improvement may occur (Mayo & Duncan).

Hall and colleagues conducted a study that was published in 2010 in an attempt to find specific sources of interruptions to nurses. They cited "interruptions to nurses" as the "key reason for medication administration errors" (p. 1041). The study consisted of data collectors observing nurses on 36 units at nine different hospitals in Canada. For a period of two weeks the data collectors observed one nurse at a time on each unit. The data collectors were trained for two weeks prior to the study on proper observation and collection of data. Nine data collectors observed a total of 360 nurses, yielding 2880 hours of data throughout the study. This sample was considered accurate with 95% confidence. Following the observation all observed nurses were invited to participate in focus groups to further validate the data. Of the studied nurses, 113 participated in focus groups that included nurses from all nine of the hospitals. Focus group data was

analyzed by using descriptive statistics from transcriptions and then integrated with the observational data.

During the study, 13,052 interruptions were observed (Hall et al., 2010). Exactly half of the interruptions occurred on medical units and the other half occurred on surgical units. The interruptions came from other health care providers (26.2%), nursing colleagues (22.3%), the nurse himself or herself (22%), the environment (17%), patients (7.9%), and patients' family members (4.6%). The most common types of interruptions were distractions (52.2%), intrusion (35.5%), and discrepancies, such as missing supplies (9.4%). Incidents that occurred during medication preparation or administration time accounted for 17.6% of the interruptions. Other activities that were being performed during the time of interruption were documentation (27.4%), patient care (24.8), in transit (15.3%), communication (11.3%), and housekeeping or clerical duties (3.6%). The authors suggested creating an environment that helps to prevent interruptions, such as establishing an interruption-free zone. The authors also suggest that system wide improvements are needed.

A study from Australia examined medication errors (considered unintentional events) as well as violations (considered intentional events) and how they correlated with organizational climate, morale, quality of working life, and individual distress (Fogarty & McKeon, 2006). One hundred seventy six nurses were surveyed using the Queensland Public Agency Staff Survey (QPASS), a violations scale, and an error index. The QPASS measured quality of work life, individual morale, individual distress, workplace morale, workplace distress, and organizational climate. The violations scale

contained 13 items that used a 5-point scale (from 'never' to 'most of the time') to assess of how often in the past 12 months participants had to "bend the rules" when giving medications. The scale had a Cronbach's alpha of 0.80. The error index used a four point Likert scale ('never', 'once or twice', 'three or four times', or 'more often') to assess how often a nurse had made an error within the past 12 months. After the survey was conducted, a path analysis was performed.

The study found that organizational and individual factors affect the occurrence of errors but was unable to conclude if the link between organizational climate and errors was direct or indirect (Fogarty & McKeon, 2009). Individual variables (stress and morale) did have a direct relationship to errors. When nurses are stressed or suffering from low morale and there is an overall poor organizational climate, errors are more likely to occur. Individual factors that correlated with errors included stress and morale. The authors supported the belief that a positive work environment may lead to nurses being less stressed and therefore less likely to "violate procedures" and make errors.

### **Burnout & Patient Outcomes**

The search terms "turnover" and "burnout" yielded a 1996 article by Dugan and colleagues. The article documented an attempt to investigate a relationship between nurse stress and burnout with nurse injuries, patient incidents, personal incidents (absences), and staff turnover. Patient incidents were defined as medication errors, intravenous medication errors, and falls. Data for these events were retrospectively obtained from hospital records. Stress was measured using a self-test tool created by Blinder and colleagues that measured the nurse's perceptions of long-term work-related

stress (Dugan et al.) in conjunction with the Stress Continuum Scale (SCS) which was a 0 to 10 analog scale that allowed the nurse to quantify a perception of immediate stress.

Dugan et al. reported that more than half (56%) of the nurses surveyed indicated their stress as a 6.0 or higher, and 27% rated their stress as a 7.5 or higher (1996). SCS scores and patient incidents had a mean correlation of 0.43. There was a correlation of 0.16 between SCS scores and personal incidents. Nurse injuries had a correlation of 0.14 with SCS scores. Staff turnover had a negative correlation of -0.13 with SCS scores. Due to the results, the authors recommended that management make efforts to support staff in stress reduction. They also suggested that staff stress reduction may result in fewer patient incidents, higher quality of care, and decreased costs to the hospital. Unfortunately, this study was found to be lacking in quality and was therefore determined to be too unreliable for inclusion in this literature review. The lack of quality was related to the qualifications of the authors, no indication of reliability testing of the tools, and the shallow concept development of stress and burnout. None of the authors had a degree beyond the Masters level and none were in an academic position. The two tools were used to validate each other, despite the fact that each tool measured different factors (immediate stress versus long-term stress). Stress and burnout are two separate phenomena which were not measured appropriately in this study. Despite these limitations, the findings were consistent with Laschinger and Leiter's 2006 Nursing Worklife Model.

Another study from Australia examined staff skill mix, workload, patient outcomes, and nursing work environments (Duffield et al., 2011). Workload was

measured using patient acuity, length of stay, patient turnover, and case mix. The study was a five year longitudinal study that also used cross-sectional methods. The researchers asked if nursing workload and skill mix had increased over time, and what the relationships between patient outcomes, nursing skill mix, nursing workload, and nursing work environment were. Five years of administrative data were collected from 2001 to 2006 and one year (2004-2005) of data was collected from 80 nursing units from 19 different hospitals.

The results showed an average skill mix of 68.4% registered nurses, 7.4% clinical nurse specialists, 20.4% enrolled nurses (similar to licensed practical nurses), and 3.8% nursing assistants or trainees (Duffield et al., 2011). Length of stay over the five year period decreased from 3.26 to 3.23 days. Acuity was measured using the PRN-80, which measured the hours of care a patient required. The average number of hours of care was 6.2 hours. Workload was measured by dividing the required hours of care from the PRN-80 by the actual number of hours of care provided. A score of 100 would indicate balanced workload and staff. The average was 124, indicating an imbalance with too high of a workload.. Nurse-to-patient ratios ranged from 6.13 to 9.9 patients per nurse. Of the participants surveyed, 14.3% reported experiencing physical abuse from patients or families, 20.8% received threats of assault, and 38.7% reported emotional abuse. According to the cross sectional data, an average of 18.4% of patients experienced a medication error or fall but there was a range across all units from 0% to 71.4% (Duffield et al.).

The study found that quality of care was diminished when workload was increased and when nurses faced abuse. An unstable unit—that is, one with a lack of staff, high patient turnover, and unpredictable acuity—was found to lead to more adverse patient outcomes. The authors suggest that creating a higher quality work environment and managing workload may help to improve patient outcomes (Duffield et al., 2011).

Michael P. Leiter and Heather K. Spence Laschinger created and tested a causal model relating work and practice environment to professional burnout called the Nursing Worklife Model (2006). The model identified five worklife factors: effective nurse leadership, staff participation in organizational affairs, adequate staffing to provide quality care, support for a nursing model (as opposed to a medical model), and effective nurse-physician relationships. These factors were hypothesized to interact with each other and ultimately affect nurse and patient outcomes with regards to the burnout-engagement continuum. To test the model 8,597 nurses in Canada were surveyed using the MBI and the Nursing Work Index (NWI). The results supported the Nursing Worklife Model. The testing was then replicated using a second data set, which the model still supported. Nursing leadership was found to be the factor that most strongly influenced the other environmental factors. This was found to influence burnout and engagement.

Laschinger and Leiter then used the Nursing Worklife Model in a study designed to link work conditions to burnout and then to patient outcomes (2006). Data came from the same sample that was used to test the model. The instruments used, again, were

the NWI and the MBI. Adverse events were measured by nurses reporting the frequency of the events over the last year. Responses were rated from 1 (never) to 4 (frequently). Measured adverse events included falls, nosocomial infections, medication errors, and patient complaints. The data from these measures were then applied to the Nursing Worklife Model.

Laschinger & Leiter (2006) also found correlations between adverse events and staffing (-0.30), emotional exhaustion (0.30), and depersonalization (0.34). Two of three factors of burnout, emotional exhaustion and depersonalization, were highly correlated with each other, ( $r = 0.71$ ). The most common adverse event reported was patient complaints, with a mean of 2.36 (on the scale of one to four). Nosocomial infections had a mean of 2.06, patient falls had a mean of 1.96, and medication errors had a mean of 1.89. The Nursing Worklife Model showed a direct path from staffing adequacy to adverse events and a path from nursing model to adverse events (Laschinger & Leiter).

Laschinger and Leiter reported that the results show patient safety outcomes are correlated with the quality of work environment, and that the burnout-engagement continuum process plays a role in that relationship (2006). The authors believe that work environments that allow nurses to practice within their professional standards would increase work satisfaction, prevent burnout, and allow patients to receive safe and high-quality care.

Halbesleben and colleagues used the MBI and the Agency for Healthcare Research & Quality (AHRQ) Patient Safety Culture measures to examine a possible link between nurse burnout and patient safety outcomes such as nurses' safety perception

and perceived reporting behaviors (2008). Nurses (148) from a Veteran's Administration hospital in the Midwest participated. In this study the exhaustion component of the MBI had a Cronbach's alpha of 0.94 while the depersonalization component had a Cronbach's alpha of 0.87. On the AHRQ Patient Safety Culture survey, safety perceptions had a Cronbach's alpha of 0.81 and near-miss reporting frequency had a Cronbach's alpha of 0.87. These indicate internal consistency.

This study explored the hypotheses of (1) burnout would be associated with nurses perceiving the environment to be less safe for their patients and (2) that burnout would be associated with a decreased likelihood of reporting errors and near misses (Halbesleben, et al., 2008). The survey showed that high burnout scores were associated with lower patient safety grades. Exhaustion and depersonalization were both negatively correlated with a lower patient safety grade. High burnout scores were also associated with nurses' perceptions of a less safe environment (Halbesleben et al.). Results indicated that there was no association between burnout and number of events reported, but that higher burnout scores were associated with decreased reporting of near misses. The authors suggest that increased burnout prevents nurses' ability to consider the flaws in a process, potentially increasing the threat of errors occurring. Nurses experiencing burnout perceive the environment to be less safe and are less likely to participate in preventative reporting.

Table 1: Summary of Findings

<b>Authors &amp; Date</b>	<b>Title &amp; Journal</b>	<b>Method</b>	<b>Synopsis</b>
Dugan et al. (1996)	Stressful nurses: The effect on patient outcomes <i>Journal of Nursing Care Quality</i>	Quantitative Survey of 293 nurses using a self-test tool measuring work-related stress and burnout	56% of nurses reported their stress as a 6.0 or greater. SCS scores and patient incidents had a mean correlation of 0.43. Staff turnover had a negative correlation of -0.13 with SCS scores.
Aiken, Clarke, Sloane, Sochalski, Busse, Clarke...& Shamian (2001)	Nurses' reports on hospital care in five countries <i>Health Affairs</i>	Quantitative Survey of 43,000 nurses from 5 countries and review of patient outcomes measures	43.2% of US nurses received high burnout scores. Only 35.7% rated the quality of care in their hospital as excellent. Findings showed that nurses feel their units are understaffed and that they do not feel supported by management.
Mayo & Duncan (2004)	Nurse perceptions of medication errors: What we need to know for patient safety <i>Journal of Nursing Care Quality</i>	Quantitative Survey of 983 nurses using the Modified Gladstone	Top 3 perceived causes of errors (from greatest to least): illegible physician handwriting, distracted nurses, and tired/exhausted nurses. Only 45.6% of nurses believed that all errors are reported.
Fogarty & McKeon (2006)	Patient safety during medication administration: The influence of organizational and	Quantitative Survey of 176 nurses using the Queensland Public Agency Staff	Organizational and individual factors affect the occurrence of errors but the study was unable to

<b>Authors &amp; Date</b>	<b>Title &amp; Journal</b>	<b>Method</b>	<b>Synopsis</b>
	individual variables on unsafe work practices and medication errors <i>Ergonomics</i>	Survey, a violations scale, and an error index	conclude if the link between organizational climate and errors was direct or indirect. Individual stress and morale did have a direct relationship to errors.
Leiter & Laschinger (2006)	Relationships of work and practice environment to professional burnout: Testing a causal model <i>Nursing Research</i>	Quantitative Survey of 8,597 nurses using the MBI and Nursing Worklife Index followed by analysis to test a nursing worklife model	Test supported the development of the Nursing Worklife Model that related work/practice environment to burnout.
Laschinger & Leiter (2006)	The impact of nursing work environments on patient safety outcomes: The mediating role of burnout/engagement <i>The Journal of Nursing Administration</i>	Quantitative Survey of 8,597 nurses using the MBI and Nursing Worklife Index and then applying the data to the Nursing Worklife Model	Correlations between adverse events and staffing (-0.30), emotional exhaustion (0.30), and depersonalization (0.34) were shown. The Nursing Worklife Model showed a direct path from staffing adequacy to adverse events and a path from nursing model to adverse events.
Halbesleben, Wakefield, Wakefield, & Cooper (2008)	Nurse burnout and patient safety outcomes: Nurse safety perception versus reporting behavior <i>Western Journal of Nursing Research</i>	Quantitative Cross-sectional survey of 148 nurses using the MBI and AHRQ Patient Safety Culture Survey	Higher burnout scores were associated with perceptions of a less safe environment. Burnout was not associated with the number of errors reported. Higher burnout scores were associated with decreased reporting

Authors & Date	Title & Journal	Method	Synopsis
Institute of Medicine (2008)	Resident Duty Hours: Enhancing Sleep, Supervision, and Safety <i>Consensus Report</i>	IOM Consensus Report	of near-misses. Reduction of medical resident work hours is thought to reduce errors. However, the increased number of handoffs may offset the error reduction.
Clancy (2009)	Ten years after to err is human <i>American Journal of Medical Quality</i>	Editorial	Cited resident fatigue as a patient safety issue. Promoted changing the culture of health care to promote safety, improving teamwork and communication, and promoting evidence-based knowledge.
Kowalski, Ommen, Driller, Ernstmann, Wirtz, Kohler, & Pfaff (2009)	Burnout in nurses- The relationship between social capital in hospitals and emotional exhaustion <i>Journal of Clinical Nursing</i>	Quantitative Cross-sectional, retrospective Survey of 959 nurses	Workload was positively associated with emotional exhaustion; decision latitude and social capital were inversely associated with emotional exhaustion. When social capital is low, emotional exhaustion is high.
Leiter & Maslach (2009)	Nurse turnover: The mediating role of burnout <i>Journal of Nursing Management</i>	Quantitative Survey of 667 nurses using the MBI, Areas of Worklife Scale, and Turnover intentions measure	Workload, values, control, reward, community, and fairness all correlated with the three components of burnout. Workload had the highest correlation with the exhaustion component (-0.60). Burnout was found to

Authors & Date	Title & Journal	Method	Synopsis
			be a predictor of turnover intention. The cynicism component was the biggest predictor of turnover intentions.
Hall, Ferguson-Pare, Peter, White, Besner, Chisholm, Ferris,... & Hemingway (2010)	Going blank: Factors contributing to interruptions to nurses' work and related outcomes <i>Journal of Nursing Management</i>	Mixed Observation of 360 nurses followed by focus groups with 113 of those nurses	13,052 interruptions to nurses were observed; 17.6% of the interruptions occurring during medication preparation or administration.
Duffield, Diers, O'Brien-Pallas, Aisbett, Roche, King, & Aisbett (2011)	Nursing staffing, nursing workload, the work environment, and patient outcomes <i>Applied Nursing Research</i>	Mixed Longitudinal (5 years) and cross-sectional analysis of patient outcome data from 80 hospital units	Quality of care diminished when workload was increased and when nurses faced abuse.
Karga, Kiekkas, Aretha, & Lemonidou (2011)	Changes in nursing practice: Associations with responses to and coping with errors <i>Journal of Clinical Nursing</i>	Quantitative Prospective, correlational study surveying 536 nurses using a questionnaire on response to errors	The top two perceived causes of errors were high workload (78.2%) and inexperience (65.9%). 67% of nurses felt depressed after making an error. Negative management responses to errors led to defensive (rather than constructive) changes in nursing practice.
O'Mahoney (2011)	Nurse burnout and the working environment <i>Emergency Nurse</i>	Quantitative Survey of 64 nurses using the MBI and Nursing Work Index Practice Environment Scale	61% of the participants reported some level of burnout on the Maslach Burnout Inventory. 53% nurses reported

Authors & Date	Title & Journal	Method	Synopsis
			their work environment as “unfavorable”. Working environment did correlate with burnout.
Goetz, Beutel, Mueller, Trierweiler-Hauke, & Mahler (2012)	Work related behaviour and experience patterns of nurses <i>International Nursing Review</i>	Quantitative Cross-sectional survey of 378 nurses using a Work-Related Behavior and Experience Patterns questionnaire	46.8% of the surveyed nurses fell into a withdrawal pattern. 17.7% of those surveyed fell into the “risk burnout pattern”

## **DISCUSSION AND IMPLICATIONS**

The purpose of this literature review was to synthesize the extant literature regarding the possible correlation between burnout and errors in nursing care. More specifically, the purpose was to answer the research question: is there a correlation between burnout and the incidence of errors? The findings of this literature review suggest that burnout and errors have similar causative factors. The work environment seems to play a large role in both the occurrence of burnout and the occurrence of errors (Aiken et al., 2001; O'Mahoney, 2011; Kowalski et al., 2009; Goetz et al., 2011; Hall et al., 2010; Fogarty & McKeon, 2006). Despite the similar causative factors, there was no literature found to confirm a relationship between these two phenomena.

Heavy workload was found to be one of the most significant factors of the work environment that contributed to burnout and errors. Workload was found to specifically correlate very highly with the emotional exhaustion component of burnout (Leiter & Maslach, 2009; Kowalski et al., 2009). Limited autonomy, poor relationships with other health care professionals, frequent interruptions, and poor communication were other factors that were found to affect the work environment and contribute to burnout as well as errors.

While no study was found to specifically correlate burnout with errors, the Nursing Worklife Model (Laschinger & Leiter, 2006) came close. This model found that emotional exhaustion and depersonalization, two out of the three components of

burnout measured by the MBI, correlated with adverse patient outcomes. Further research using this model may be beneficial in further examining errors or adverse patient outcomes with regards to burnout.

Laschinger and Leiter (2006) associated three factors: adverse events, including medication errors and falls, burnout, and work environment. Work environment and burnout-engagement both exist on a continuum. Adverse events occur as a combination of the other two factors. For example, if an individual is on the burnout end of the burnout-engagement continuum and works in an environment that falls on the negative end of that continuum, adverse events such as errors are more likely to occur. The opposite is also true. Adverse events are less likely to occur when an individual is on the positive ends of those both spectrums. However, if an individual is on the negative side of either continuum (experiencing some level of burnout or working in an unfavorable environment), adverse events are more likely to occur.

An unfavorable work environment that allows the development of burnout to occur and fosters conditions for errors may be dangerous to patients and costly to an organization. Patient safety is the core of nursing and health care. If a work environment is poor or unstable and errors are likely to occur, patient safety is compromised. Errors can be very financially costly to an organization. Harm that occurs as a result of an error and the care necessary to rectify the situation is often not reimbursed. This results in losses to the health care organization. If the unfavorable working environment causes burnout and therefore causes nurses to turnover, as Leiter and Maslach (2009) suggest, this is also costly. Replacing nurses can add costs for an organization.

In Clancy's 2009 editorial regarding the status of health care ten years after the Institute of Medicine published their report on errors, she noted that resident fatigue had been found to be a factor in errors. Research in this area led to resident hours being more strictly monitored and reduced (Institute of Medicine, 2008). Are fatigued nurses also more likely to make errors? Does this have any implications for nursing practice? The literature reviewed for this thesis suggests that this may be possible. Mayo and Duncan (2004) found that tired or exhausted nurses were one of the top three perceived causes of errors. Fatigue may be a result of the heavy workloads that were cited as reasons for both burnout and errors in many studies. Despite the finding that fatigue was found to increase the amount of errors, reducing medical resident hours was actually found to increase the risk of errors due to the increased number of handoff reports (Institute of Medicine, 2008). This suggests that the problem may not lie within the number of hours worked, but within the workload.

One interesting finding from this literature review was the study that found that nurses that scored high on the MBI were less likely to report "near misses" (Halbesleben et al., 2008). The failure to participate in preventative reporting is problematic because it is something that can help prevent future errors from occurring. This is hugely problematic because it impedes process improvement that may help to prevent future errors from occurring. A nurse experiencing burnout most likely still intends to "do no harm", but that nurse is unlikely to go above and beyond what is minimally required by him or her because he or she lacks the energy to do so. They are

too emotionally exhausted and do not have the additional resources that are required to file an incident report for an event that did not cause harm.

Additional research is needed to establish a relationship between work environment, burnout, and errors. If additional research could support this relationship, it may inspire health care leaders to take proactive steps in improving the nursing work environment as an effort to prevent errors as well as burnout. The inspiration should come from what is best for the patient as well as what is best for the nurse. While the ultimate goal should be patient safety, one cannot deny the monetary benefit of having a more efficient work environment.

Limitations of the literature review lie in the limited amount of research studying burnout as a mediator for errors. Many articles were found to study factors that contributed to burnout or factors that contributed to errors, but none were found that specifically attempted to correlate burnout with errors.

Future research in this area may also be limited. While the MBI is a reliable, valid, and consistent way to measure burnout, it would be difficult to gather data on errors. Self-report of errors may not be reliable due to the guilt or shame many nurses may feel after an error occurs (Karga et al., 2011). Additionally, researchers may not be able to gain access to hospital incident reporting systems.

## CONCLUSION

Nurse burnout and nursing errors have many similar causative factors, but the possible link between these two phenomena is inconclusive. The overall nursing work environment appears to play a role in both the development of burnout and the occurrence of errors but no literature was found to show a definite correlation between burnout and errors. More research is needed in the areas of burnout and errors in order to make a conclusion with regards to burnout as a mediator of nursing errors. Most of the literature reviewed for this thesis suggested making improvements in the work environment as a means of burnout prevention or to decrease the likelihood of errors.

O'Mahoney (2011) advocated for the implementation of Magnet standards in Ireland as an effort to improve the work environment and therefore prevent burnout. Magnet organizations are shown to have lower rates of nurse burnout. The lower rates are attributed to the positive work environments for which Magnet organizations are recognized (Shirey, 2012). Hospitals should strongly consider implementing changes that reflect Magnet standards. This would serve the dual purpose of decreasing burnout as well as improving the care of patients. In addition to improving patient outcomes, work environments that prevented burnout have been shown to decrease turnover intentions. Decreased nurse turnover is another Magnet quality (Shirey). Decreasing nurse turnover is more cost-effective for a health care organization and is indicative of better unit culture. A work environment designed to support nurses professionally and

emotionally would be favorable to staff, patients, and health care organizations as a whole.

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