Presenteeism in Nursing

By

Jessica G. Rainbow

A dissertation submitted in partial fulfillment of the requirements for the degree of

Doctor of Philosophy

(Nursing)

at the

UNIVERSITY OF WISCONSIN-MADISON

2018

Date of final oral examination: 5/8/2018

Dissertation was approved by the following members of the Final Oral Committee:

Linsey Steege, Assistant Professor, School of Nursing (Chair)

Barbara King, Assistant Professor, School of Nursing

Eileen Kintner, Professor, School of Nursing

Brad Gilbreath, Management Professor, CSU Pueblo Hasan School of Business

Tonya Roberts, Assistant Professor, School of Nursing

Abstract

Presenteeism is an issue across the global workforce; however, nurses have been identified as having the highest rates of presenteeism. Presenteeism is when an employee is physically at work, but is not fully engaged or performing. Health conditions, stressful hospital work environment, work-life imbalance, and nurse role identity as *helpers* have all been linked to presenteeism. Presenteeism in nursing can lead to negative patient consequences, nurse health and well-being consequences, and billions lost in healthcare costs for healthcare organizations. Although presenteeism research in nursing is recent, organizational and occupational health scholars have long studied presenteeism across industries. However, throughout the presenteeism literature, there is inconsistent conceptualization and measurement, which limits evaluation of prevalence across studies and the design and evaluation of interventions. The purpose of this dissertation was to develop a conceptual model and measurement approach for the study of presenteeism in nursing. I conducted a cross-sectional nationwide survey of 447 nurses who worked in hospital settings and provided direct patient care. Analysis included exploratory and confirmatory factor analysis and structural equation modeling. Results of this dissertation are presented as three papers: 1) a concept analysis exploring the use of presenteeism in nursing literature in comparison to business and occupational health literature, 2) psychometric analysis of five reliable and validated measures of presenteeism, and 3) development and evaluation of the Presenteeism in Nursing Model. Findings from this study can serve as basis for future work to improve measurement approaches and develop interventions to address presenteeism in nursing.

Acknowledgements

After four years of hard work, it is difficult to believe that I have made it to this point. Looking back on the last four years, I feel incredibly nostalgic and thankful for the wonderful people and experiences that have shaped me. I would like to thank each of my dissertation committee members – Linsey Steege, Barb King, Eileen Kintner, Tonya Roberts, and Brad Gilbreath – for their feedback and support. I am especially thankful to my chair, Linsey Steege, who has provided me with incredible opportunities to grow as a researcher, leader, and mentor. These experiences, along with Linsey's incredibly insightful questions and ideas, have led me to this moment. I really could not have asked for a better advisor – I aspire to be the mentor and champion for my future students that Linsey has been for me.

I would also like to thank all of the nurses who participated in this study, along with the hospitals and nursing organizations that helped me with recruitment. This study would not have been possible without the generous support of the Jonas Foundation and the National Institute for Occupational Safety and Health.

I would also like to thank the members of the King-Steege Research Group who provided me with thoughtful feedback and support over the last four years. I am deeply indebted to my wonderful PhD student colleagues who provided lots of support, laughs, and advice. Finally, this journey would not have been possible without the incredible support of my family and friends. My parents Jim and Jane and my brother Josh helped me move across the country for this opportunity and have supported me. My husband Dan has kept me grounded and has been incredibly flexible and loving. I would not have made it to this point without everyone's encouragement and support, and for that I will be forever grateful.

Table of Contents

List of Tables

Introduction

Background and Significance

Every year, $150 billion is lost in the U.S. economy due to presenteeism (Hemp, 2004). Presenteeism is an important contemporary construct related to employee attendance with decreased performance at work. Presenteeism has been defined broadly as lost time at work (Brooks, Hagen, Sathyanarayanan, Schultz, & Edington, 2010). It has also been defined more specifically as presence at work when ill or when performance is impacted due to job stress (Aronsson, Gustafsson, & Dallner, 2000; Gilbreath & Karimi, 2012). Both sickness and job-stress, among others, have been identified as antecedents of presenteeism (Rainbow & Steege, 2017). The findings of Rainbow and Steege's (2017) concept analysis led to the definition of presenteeism for use in my program of research as when you are at work, but not fully performing or engaged.

Presenteeism has multiple consequences, especially in nursing. Nurses have the highest rates of presenteeism across 42 work sectors (Aronsson et al., 2000). The consequences of presenteeism in nursing include increased medication errors and patient falls, missed patient care, and transmission of illness to patients and coworkers (Cassie, 2014; Letvak, Ruhm, & Gupta, 2012; Widera, Chang, & Chen, 2010). It is estimated that presenteeism among nurses due to back pain and depression in the United States costs $14,339 per nurse annually (Letvak et al., 2012). In a prospective study, presenteeism was identified as a significant predictor of self-reported employee health and vitality (Bergström et al., 2009). Presenteeism in nursing is linked to increased risk for anxiety and depression (Laranjeira, 2013). When employees attend work but their performance is affected, there also is increased potential for workplace injuries (McCaughey et al., 2016). Due to the safety and health consequences, the National Institute for

Occupational Safety and Health (2017) has identified addressing concepts such as presenteeism as important, especially among healthcare workers. This dissertation focuses on presenteeism among nurses specifically because of the consequences outlined above and the multiple antecedents of presenteeism in nursing.

Presenteeism has been linked to multiple antecedents in nursing. Presenteeism can occur as a result of multiple factors (Brborović, Daka, Dakaj, & Brborović, 2017). The identified antecedents of presenteeism in nurses are somewhat unique and include work context factors (e.g., teamwork, workplace culture, and work stressors); personal context factors (e.g., work-life imbalance, stress, and professional self-identity); and acute, episodic, or chronic sickness (Rainbow & Steege, 2017).

***Work context factors*.** The Occupational Safety and Health Administration (OSHA, 2013) declared hospitals one of the most hazardous places to work due to the unique risks and culture. Nurses working in hospitals care for patients at their most vulnerable time; advocate for and educate patients, families, and communities; and collaborate with other members of the healthcare team to find creative solutions to complex healthcare problems. These responsibilities often act as psychological stressors that are linked to poor health outcomes for nurses, high incidence of workplace injuries, and increased nurse turnover rates (Hayes et al., 2006; McNeely, 2005).

***Personal context factors*.** Nurses often work compressed work week schedules, which have been linked to work-life imbalance (Bambra, Whitehead, Sowden, Akers, & Petticrew, 2008). Nursing is also often identified as a helping profession and is linked to higher rates of presenteeism (Johns, 2010). This professional self-identity as a caregiver has been linked to other negative concepts, like fatigue (Steege & Rainbow, 2017). Professional self-identity is the

process of aligning one's personal identity with perception of your professional identity and has been identified as a salient antecedent of presenteeism in nursing (Cowin, Johnson, Wilson, & Borgese, 2013).

Acute, episodic, or chronic sickness. Over half (54%) of nurses reported suboptimal physical and mental health in a recent nationwide survey (Mazurek Melnyk et al., 2018). Nurses in low-control, high-demand jobs had greater health deterioration in a 4-year period than they would have had if they had smoked or led sedentary lives (Lynch, 2001). Additionally, eight out of 10 nurses stated that they frequently work while in pain (OSHA, 2013).

Identified Gaps in Current Presenteeism Research

Inconsistent conceptualization and measurement. Presenteeism is often defined and studied as due to a specific antecedent. The two most common antecedents studied are sickness and job stress. Sickness presenteeism is generally defined as people attending work despite being sick or feeling like they should have taken sick leave (Aronsson et al., 2000). Job stress presenteeism is defined as when employees are at work, but only a portion of their cognitive energy is devoted to work due to job stress (Gilbreath & Karimi, 2012). These different conceptualizations have led to the development of two areas of presenteeism research that each focus on either sickness or job stress as the antecedent of presenteeism. Each of these research domains have their own measures of presenteeism.

There are a plethora of reliable and validated measures, with over 10 measures of sickness presenteeism alone (Thompson, Ospina, Dennett, Waye, & Jacobs, 2015). However, there is currently not a gold standard for presenteeism measurement in either domain (Garrow, 2016), which makes it difficult to compare presenteeism rates, evaluate the saliency of different antecedents, or assess consequences across populations (Brooks et al., 2010). The separate

domains of the two areas of research make this even more difficult. For example, one study looked at presenteeism as occurring due to back pain and depression only (Letvak et al., 2012). However, sickness and job stress antecedents do not occur in isolation, but are often related. For example, the link between stressful work environment and depression has been well established (Gherardi-Donato, Cardoso, Teixeira, Pereira, & Reisdorfer, 2015). Meaning, that the depression and resulting presenteeism experienced by participants in the study may have been related to stressors in their work environment. More research is needed to understand how the different antecedents in each of these domains relate and lead to overall presenteeism risk. Similarly, the consequences of presenteeism in nursing are related. For example, missed patient care as a proximal outcome or consequence of presenteeism has more distal consequences for outcomes in healthcare organizations, as well as nurse health and wellbeing (Agency for Healthcare Research and Quality, 2017).

In order to address presenteeism in nursing, the relationships between the antecedents, consequences, and presenteeism need to be explored and more clearly defined. Taking a broader view of presenteeism that is inclusive of both domains of research can answer some of these questions. To address this gap, this study takes a holistic view of presenteeism as presence at work when not fully engaged or performing. We measure presenteeism across five measures taken from both sickness and job stress domains of presenteeism.

Lack of a conceptual model. Conceptual models have been identified as essential in guiding health services research and interventions (Fox, Gardner, & Osborne, 2014). Scholars from business and occupational health have studied presenteeism and these antecedents and consequences extensively. They have created multiple models of presenteeism; however, these models focus on either sickness or job stress exclusively and are not specific to nursing

(Aronsson & Gustafsson, 2005; McGregor, Iverson, Caputi, Magee, & Ashbury, 2014; Winona Pit & Hansen, 2016). These models are backed by research findings and literature. The body of research on presenteeism in business and occupational health is two decades older than the body of nursing research (Johns, 2010; Rainbow & Steege, 2017). To capitalize on this strong body of research, I have chosen to adapt one of these models of presenteeism for use in nursing. In adapting this model, I have considered both sickness and job stress antecedents, as identified in my concept analysis (Rainbow & Steege, 2017). I also have taken into account the multiple consequences of presenteeism that are unique to nursing, as identified in my concept analysis.

Specific Aims

In order to address two critical gaps in the literature—(a) inconsistent conceptualization and measurement and (b) and lack of a conceptual model for nursing—the purpose of my dissertation was to assess existing measures of presenteeism for use within the nursing population and to identify a conceptual model of the relationships among presenteeism antecedents, prevalence, and consequences. The aims of this dissertation study are:

Study Aim 1: To evaluate the psychometrics of and utility of combining different existing self-report measures of presenteeism occurrence for use in nursing.

Study Aim 2: To examine the fit of the Presenteeism in Nursing Model, an adapted conceptual model of the relationships between presenteeism, its antecedents, and its consequences for use in nursing.

Proposed Conceptual Model

To guide evaluation of measures of presenteeism, I propose adapting Johns' (2010) Dynamic Model of Presenteeism and Absenteeism for use in nursing. This model was selected for adaption because it is based on a wide breadth of presenteeism literature, includes multiple

work context, sickness, and personal context factors that can lead to presenteeism, and includes consequences of presenteeism. The model proposes that an employee's work performance is impacted by an event. The event can be acute, episodic or chronic, and can be related to employee's health, as described by Johns (2010). The employee's response to that event is mediated by their work context and personal context factors, which if not supportive, can lead to presenteeism and/or absenteeism (Johns, 2010). Presenteeism and absenteeism in this model can lead to multiple negative consequences.

My adapted model, Presenteeism in Nursing, conceptualizes presenteeism broadly as presence at work when not fully engaged or performing. My model focuses on presenteeism only – it does not include absenteeism. It takes into account multiple domains of presenteeism research in the measurement of presenteeism. It also proposes that presenteeism is a mediator between work and personal antecedents of presenteeism and consequences for the nurse, the healthcare organization, and the patient. The Presenteeism in Nursing Model is discussed more in-depth in Manuscript 3. The broader conceptualization of presenteeism in this model will allow researchers and practitioners to better understand the multiple antecedents of presenteeism and their relationships to presenteeism in nursing work environments. However, the model must be tested in order to further explore the proposed relationships in this conceptual model.

Overview of Methods

In pursuit of these aims, I conducted a cross-sectional survey comprised of existing reliable and validated measures of antecedents, consequences, and occurrence of presenteeism across both the sickness and job stress domains of presenteeism among U.S. hospital nurses. The antecedent and consequences variables surveyed were identified as salient by my concept analysis (Rainbow & Steege, 2017). I recruited survey participants from across the United States

through three hospital organizations, nine nursing organization listservs, and social media posts. Inclusion criteria for participation was: (a) be a registered nurse, (b) work on an inpatient hospital unit, and (c) provide direct patient care. A total of 447 nurses took the online survey via Qualtrics (2018). Each survey measure was scored according to published guidelines. Exploratory and confirmatory factor analysis was conducted for each presenteeism measure (Aim 1). Structural equation modeling was utilized to analyze the proposed Presenteeism in Nursing Model (Aim 2).

Introduction to the Three Manuscripts

The three manuscripts that follow represent a cohesive body of work on presenteeism in nursing completed for my dissertation study. The concept analysis paper describes the concept of presenteeism in nursing and identifies gaps in the nursing literature. The two data-based papers describe results related to the two specific aims of my dissertation study, which were developed to address the identified gaps in current research.

Manuscript 1: *Presenteeism in Nursing: An Evolutionary Concept Analysis*. This concept analysis followed Rodgers' (1989) concept analysis approach. It describes presenteeism in nursing in relation to presenteeism within the larger business and occupational health contexts. The findings of this paper highlight the antecedents, facets, and consequences of presenteeism in nursing that are the basis of the proposed model for aim two.

Manuscript 2: *How to Know if You're Really There: An Evaluation of Measures for Presenteeism in Nursing*. This paper reports presenteeism levels across all five presenteeism measures and discusses the findings of Aim 1 of the dissertation study (to evaluate the

psychometrics of different existing self-report measures of presenteeism occurrence for use in nursing). The multiple facets of presenteeism and the measurement issues identified in the concept analysis were the basis for study Aim 1. The focus of this manuscript was to present findings on holistically conceptualization and measure presenteeism. The portion of Aim 1 that assesses the utility of combining measures is discussed in the final chapter of this dissertation.

Manuscript 3: *Risky Business: A Mediated Model of Risk Factors for Presenteeism in Nursing.* The final paper describes findings of Aim 2 of the dissertation study (to examine the fit of the conceptual model adapted from business literature of the relationships between antecedents, presenteeism, and consequences for use in nursing). The proposed Presenteeism in Nursing Model is adapted from Johns' (2010) Dynamic Model of Presenteeism and Absenteeism and includes the salient antecedents and consequences identified in my concept analysis.

Manuscript 1

Presenteeism in Nursing: An Evolutionary Concept Analysis

(Published in Nursing Outlook: Rainbow, J. G., & Steege, L. M. (2017). Presenteeism in nursing: An evolutionary concept analysis. *Nursing Outlook*, *65*(5), 615–623. doi:10.1016/j.outlook.2017.03.005)

Abstract

Background: Presenteeism is an emerging concept in nursing that has been linked to increased healthcare costs, patient medication errors and falls, and negative nurse wellbeing. However, prior work has utilized various definitions and antecedents. Clarity on the significance, development, and consequences of presenteeism in nursing is needed.

Purpose: This concept analysis seeks to understand the application of presenteeism within nursing workforce literature and in the broader workforce context.

Method: Rodgers' evolutionary concept analysis method was used.

Discussion: The proposed definition of presenteeism as the act of being physically present at work with reduced performance can be attributed to multiple antecedents, which include nurse health, professional identity, work-life balance, and work environment. The prevalence of these antecedents with high rates of presenteeism among nurses and consequences point to the need for interventions.

Conclusion: These findings can guide development of future interventions and policies that address the broader context of factors leading to presenteeism.

Introduction

Addressing the Institute for Healthcare Improvement's (IHI, 2016) Triple Aim Initiative of better care for individuals, better health for populations, and lower per capita costs is a priority for much of the healthcare sector, including consumer organizations and government groups worldwide. There are an estimated 400,000 patient deaths in U.S. hospitals resulting from preventable adverse patient events, including medical errors, medication errors, and failure to rescue, that can result in patient consequences such as death (James, 2013). Moreover, the United States spends the most on healthcare worldwide, with spending at 17.5% of the gross domestic product in 2014, and future projections of spending predicting growth to 20.1% by 2025 (U.S. Department of Health and Human Services [USDHHS], 2014). The IHI (2016) recommends optimizing performance within healthcare systems as one necessary step in addressing the Triple Aim Initiative.

One way to optimize performance within healthcare systems is to optimize nurse performance. Nurses are the largest group of healthcare providers in the United States and spend more time directly with patients than other providers. Furthermore, nursing care has been linked to patient outcomes and increased healthcare costs (Aiken, Clarke, Sloane, Sochalski, & Silber, 2002; Blegen, Vaughn, & Goode, 2001). Unlike factors such as nurse staffing ratios and the nursing shortage, which impact care and costs, nurse behaviors are potentially correctable within the short term and within organizations. One specific element of nursing care that has been linked to negative patient outcomes is presenteeism (Letvak, Ruhm, & Gupta, 2012). Broadly, presenteeism can be defined as when employees are physically present at work, but not performing at their full capacity (Johns, 2010).

Research on presenteeism behavior has been conducted for decades in the broader workforce across multiple industries by management, epidemiology and occupational health scholars. These scholars have looked at how chronic illnesses and work context factors (i.e., job demands and economic conditions) impact the prevalence of presenteeism and the short- and long-term consequences for both the employees and their organizations. While many factors in presenteeism are consistent across industries, a multi-sector study of presenteeism found that nursing home aids, teachers, and nurses reported three to four times the rates of presenteeism as individuals in management positions and had the highest rates of the 42 occupational groups surveyed (Aronsson, Gustafsson, & Dallner, 2000). Scholars posit that these differences could be attributable to short-staffing in these fields and the professional self-identity culture of loyalty to attend work to care for patients and students that is present in these helping professionals. Prior work on presenteeism among healthcare professionals has found that providers do not want to become patients, and hospitals often have cultures that encourage provider presenteeism because of loyalty, teamwork, and professional identity, regardless of messaging from management (Johns, 2010).

Nurses, in particular, have been found to espouse lofty and unrealistic expectations for themselves that are often detrimental, a phenomena referred to as *super nurse* (Davidhizar & Shearer, 1999). Prior work has found that this super nurse culture in the midst of the continuous and unique mental, physical, and emotional demands of caring for patients, and working as a team in a rapidly changing and often resource-lacking environment for 8 to 12 hour shifts can lead to nurse fatigue (Steege & Rainbow, 2017). Due to these unique demands, nurse fatigue has been conceptualized as having additional antecedents, attributes, and consequences beyond the diminished capacity often studied in other industries (Ream & Richardson, 1996; West, Abbott,

& Probst, 2014). Because presenteeism is a broader concept that would encompass fatigue, it is likely that presenteeism would also be different in nursing. Among nurses, presenteeism due to back pain and depression has been linked to higher medication error rates, increased patient falls, negative nurse health outcomes, and increased healthcare spending (Letvak et al., 2012). Presenteeism behavior among nurses who experience back pain and depression is estimated to cost the United States $12 billion annually (Letvak et al., 2012). Researchers have provided a glimpse into the consequences of presenteeism behavior in nursing due to specific chronic conditions and work context factors, but the full impact is potentially grimmer, as antecedents beyond back pain and depression have been linked to presenteeism and the associated consequences (Aronsson & Gustafsson, 2005; Johns, 2010; Letvak et al., 2012).

The higher rates of presenteeism behavior among nurses, the unique factors present in nursing and nursing work environments that have led to nursing-specific conceptualizations of related concepts, the negative patient and cost consequences, and the importance of addressing quality and cost serve as a motivation for exploration of presenteeism specifically in the nursing workforce. As presenteeism within the nursing context has factors common to other industries in addition to unique factors, it is important to understand broader workforce research on presenteeism and how it relates to the nursing workforce context. A concept analysis can provide a framework to explore these factors and how they relate to the concept of presenteeism. The purpose of this evolutionary concept analysis is to better understand the application of presenteeism within nursing workforce literature, while taking into account the larger context of presenteeism research in other job sectors.

Methods

Presenteeism has been studied in various fields and the term has evolved over time. Thus, Rodgers' Evolutionary Method was selected for this concept analysis (Rodgers, 1989). Rodgers' (1989) method is an iterative process that provides a basis for future knowledge development of a term. The method values the importance of context and the constantly evolving nature of concepts through inductive identification of the current state of the definition, as well as antecedents, consequences, and related terms (Rodgers, 1989). Furthermore, Rodgers' method seeks to understand the *common use* of a concept by not imposing strict criteria to explore what is the current use of the concept. The iterative steps of Rodgers' method include: 1) identification of a concept, 2) selection of a setting and sample, 3) data collection, 4) data analysis, 5) identification of an exemplar, and 6) identification of implications and future work. Given the origins of the concept and the larger body of research related to presenteeism in the management, epidemiological, and occupational health literature, this article will provide background to first position presenteeism within the management, epidemiological, and occupational health literature before contextualizing the term within the nursing workforce context. The analysis section of this paper will discuss: (a) definitions and related terms of presenteeism in nursing workforce literature, (b) the various identified antecedents of presenteeism, and (c) the consequences of presenteeism. The article concludes with a discussion of implications of this analysis for nursing practice and research and a suggested holistic view of presenteeism.

Search Criteria

Presenteeism has roots in a variety of disciplines; therefore, multiple databases were searched to provide a nursing and broader prospective on presenteeism. These databases included: the Cumulative Index to Nursing and Allied Health Literature (CINAHL), PsychInfo, PubMed, Web of Science, SocINDEX, and Business Source Premier. The search term used for

this multi-database search was *presenteeism*, excluding articles focused on children, teen, adolescent, or geriatric populations. Additionally, sources that were not in English were excluded during the search process. No date parameters or limitations on type of source (i.e. peer-reviewed journal article or editorial) were used, as evolutionary concept analyses seek to provide an evolving perspective on the common use of a concept. After combining all the sources from the multiple databases and removing duplicates, a list of 962 sources was compiled (see Figure 1 for a description of search).

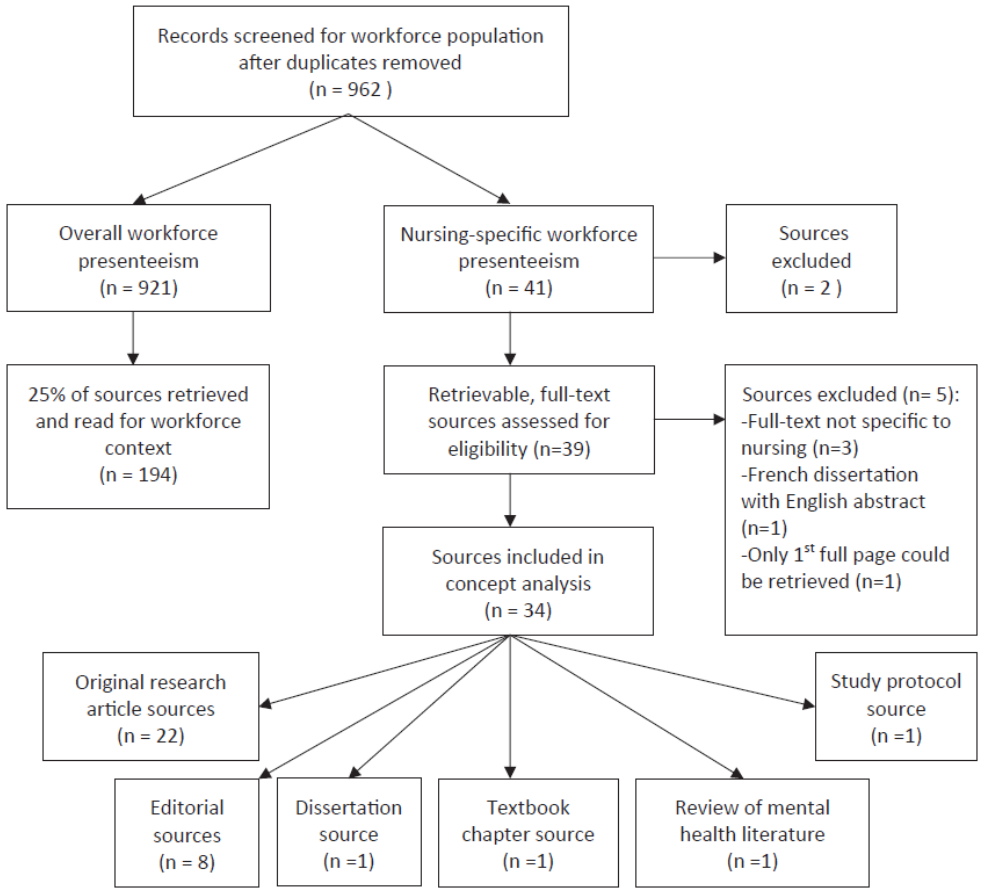

Figure 1. Search strategy diagram.

Data Extraction

In alignment with Rodgers' (1989) method, this search provided a perspective on the use of presenteeism within the nursing workforce context, as well as in other contexts The titles and abstracts of the 962 sources were read to determine if the source discussed presenteeism within the nursing workforce or within the broader workforce context. The sample was then split into a *nursing workforce presenteeism* sample and an *overall workforce presenteeism* sample. After reading the titles and abstracts, the nursing workforce sample contained 41 sources and the overall workforce presenteeism sample consisted of 921 sources.

Rodgers (1989) describes that a minimum of 20% of the available sources should be included in a sample when conducting an evolutionary concept analysis. An online random number generator was used to select 25% of the large overall workforce sample articles; oversampling was done in the event that some articles were not accessible or irrelevant. The 194 selected articles made up the overall workforce sample and were compiled by an academic librarian. In line with Rodgers' method, all articles (including research articles and editorial columns) were included in this analysis to grasp the common use of the concept. The nursing workforce sample contained 39 retrievable nursing sources, and all of the articles in this sample were read. Of those 39 that were read in their entirety: three were found to be non-nursing, one source only had an English abstract and the rest was in French, and one source could not be found in its entirety (only the first page could be found by the research librarian). A total of 34 sources were included in this analysis: 22 original research articles, eight editorials, one dissertation, one textbook chapter, one literature review of mental health, and one study protocol.

As the purpose of the analysis was to better describe presenteeism in the nursing workforce, the nursing workforce sample was analyzed first. In parallel, the academic librarian pulled the overall workforce sample, which was analyzed second to review broader context and

evolution of the concept in line with Rodgers' (1989) method. The first author skim read through the sources in the nursing workforce sample before utilizing a grid to organize the data to ensure the grid captured all relevant information. The grid included columns for the definition of the term, antecedents, consequences, attributes, related-terms, study findings, type of source, and global location of source. When a definition of presenteeism was provided, it was copied word-for-word into the grid in the definition of the term column. Terms were added to the antecedents column that authors looked at as leading to presenteeism in research studies or things that authors said could be addressed by employers to prevent presenteeism in editorials. The list of consequences was created from items that were measured as outcomes secondary to presenteeism or explicated listed consequences. Attributes of presenteeism were identified in the descriptions of presenteeism. Related terms were identified by the different authors as either similar or opposite concepts. The sources were then re-read and the grid was completed. The grid was analyzed for themes in each category. To ensure accuracy of findings, the second author read through more than 20% of the nursing workforce sources and met with the first author to discuss themes that the first author identified in reviewing the compiled grid. The findings from the nursing sources were then presented to a group of nurse researchers to ensure thematic findings were accurate and relevant to the nursing context. The same process was carried out separately for the overall workforce presenteeism sample. After the overall workforce presenteeism sample had been read, added to a grid, and themes discussed, the authors discussed findings on presenteeism in the overall workforce context and the relationship between these overall workforce findings and those within the nursing workforce. This analysis provided a context for the concept of presenteeism within the nursing workforce context, as well as contextualization of presenteeism within the overall workforce.

Background

Presenteeism within the Overall Workforce

Presenteeism is an emerging concept in nursing research, but has been an interest of scholars in management, epidemiology, and occupational health around the world for decades (Johns, 2010). Johns (2010) discussed the differing foci of research on presenteeism between European and American management, occupational health, and epidemiology scholars. However, these differences have not been explored among scholars who focus on nursing workforce presenteeism. Studies on presenteeism in the nursing workforce context have been conducted in countries in Europe, South America, Australia, and North America. The growing international body of literature on workforce presenteeism highlights the widespread importance of researching and addressing presenteeism in the overall international workforce. However, the global attention also means that the concept of presenteeism has been broadly applied without a consistent definition across various work contexts.

Contextual overview of overall workforce presenteeism. The articles of the overall workforce sample defined presenteeism as employees who are physically present, but exhibit decreased performance or productivity. There were four distinct types of articles in this overall workforce sample: (a) articles that studied a medical condition and used presenteeism as an outcome or consequence; (b) editorials for managers or other business leaders with suggestions on how to address presenteeism; (c) theoretical research or model building articles; and (d) articles targeting effectiveness of employee wellness programs, including reduction of presenteeism. Antecedents of presenteeism in the overall workforce literature could be placed into three categories: work-related, personal circumstances, and personality. The work-related antecedents included job demands, teamwork/supervisor support, job security, organizational

commitment, and burnout. The most common personal circumstance was individual illness or pain, with additional areas being family satisfaction and situation. The consequences in the overall workforce sample related mostly to illness or continued illness for employees and lost productivity for organizations.

Presenteeism within the Nursing Workforce

Research on presenteeism within the nursing workforce started to grow after a multi-sector job study by Aronsson et al. (2000) found that rates of presenteeism due to employee chronic illness were highest among nurses and teachers. The earliest mention of presenteeism specifically in the nursing workforce literature was a public health nursing editorial in 2002. The editorial called for a focus on nursing occupational health in hospital settings that have not consistently promoted employee health (Shamansky, 2002). Subsequent studies on presenteeism within the nursing workforce have highlighted the elevated levels of the different antecedents for presenteeism identified in overall workforce literature (i.e., elevated levels of workplace stress within nursing due to traumatic situations with patients). However, studies within the nursing workforce context utilize definitions of presenteeism that often specify it as the result of a specific antecedent, rather than as a behavior resulting from multiple known associated factors.

The lack of clarity surrounding the conceptual definition of presenteeism within the nursing workforce context is the motive for this concept analysis of presenteeism. The hope is that this analysis will provide insight into presenteeism's unique definition within the nursing workforce context and to gain knowledge for future work within the nursing workforce. The culmination and synthesis of knowledge regarding the antecedents and consequences of presenteeism from these different contexts is needed to lay the groundwork for future descriptive, measurement, and intervention studies.

Results

Definitions, Attributes, and Related Terms in Nursing Workforce

The nursing sample defined presenteeism in a variety of ways with the common denominator being presence at work when the nurse should not be (see Table 1 for sample presenteeism definitions and Figure 2 for a summary of results). Related concepts identified include absenteeism (the antonym of presenteeism) and burnout. Research into absenteeism, the opposite of presenteeism, is vast, but presenteeism has been found to account for 1.5 times more working time lost than absenteeism (Perry, Lamont, Brunero, Gallagher, & Duffield, 2015).

Table 1

A Sample of Presenteeism Definitions Applied in Nursing

Article Title	Author(s) Year	Country of Study	Definition of Presenteeism Used in the Article
Shiftwork, Work-Family Context Among Italian Nurses and Prevention Efficacy	Camerino et al. (2010)	Italy	"going to work when your state of health meant that you should have stayed home"
Psychometric Properties of Nurses Work Functioning Questionnaire	Gartner, Nieuwenhuijsen, van Dijk &Skuiter (2011)	The Netherlands	"impairment in work functioning due to health problems"
The Effects of Emotional Intelligence and Stress-Related Presenteeism on Nurses' Well-Being	Karimi, Cheng, Bartram, Leggat & Sarkesjik (2015)	Australia	"a type of passive withdrawal behaviors that occurs when employees are present at work but their cognitive energy is diverted elsewhere, away from work"
Presenteeism…Or When Being There is Not Being There	Shamasky (2002)	USA	"people are physically present at work but are functionally absent"
Presenteeism: Sick & Tired at Work	Middaugh (2007)	USA	The opposite of absenteeism that can occur when people are at work when sick or employees put in excessive hours

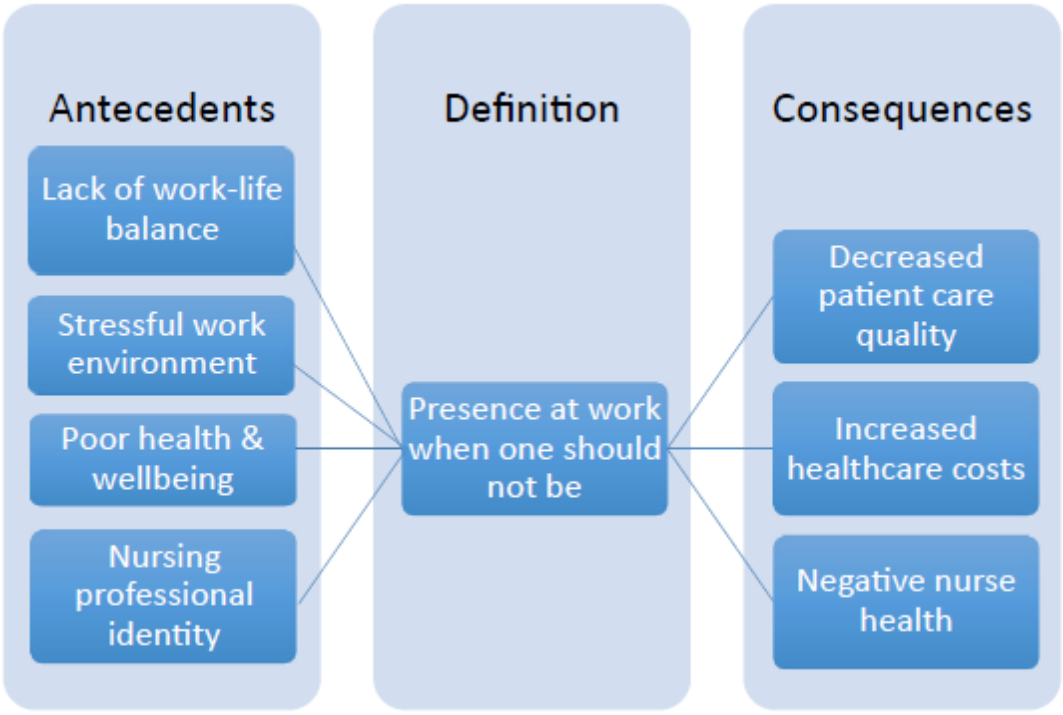

Figure 2. Presenteeism antecedents, definition, and consequences.

A majority of the nursing workforce sample articles specified that presenteeism was resulting from an individual's illness, condition, or disease. However, in these definitions, the illness served as the reason for the nurse's presence at work when he/she should not have been; therefore, we have decided that illness, condition, or disease is an antecedent of presenteeism. There also are differences in terms that authors used to describe the condition of the nurse at work. As seen in Table 1, authors describe presenteeism as presence at work when functionally absent, diverted cognitive energy, impaired, or not feeling well (Hensel, 2011). These terms all are all attributes of the nurses' presence at work that constitute presenteeism behavior.

Antecedents of Presenteeism in Nursing

Understanding the antecedents of presenteeism is important. As the precursors to the behavior, antecedents may form the basis for future interventions and research. Articles pointed

to poor physical and mental health and emotional wellbeing (d'Errico et al., 2014; Gartner, Nieuwenhuijsen, van Dijk, & Sluiter, 2012), stressful work environments (Laranjeira, 2013), nursing professional identity (Cassie, 2014; Hensel, 2011), and lack of work-life balance (Pilette, 2005) as antecedents. Some articles acknowledged that these antecedents were intertwined and led to one another (Pilette, 2005).

However, the most prevalent antecedent of presenteeism in the nursing workforce sample was presenteeism resulting from an illness or disease. This is often referred to as *sickness presenteeism* (Johns, 2010). Different types of sicknesses identified as antecedents of presenteeism in the nursing workforce articles included chronic illness or pain, acute illness, or a mental health or psychological condition. These articles generally identified a specific medical conditions in relation to the behavior and utilized those as co-variates in their analyses. It is interesting to note that the emphasis in many articles within the nursing workforce on mental health as an antecedent in the presenteeism definition (Gartner et al., 2011; Noben et al., 2015) (Gillespie, Gates, & Succop, 2011) is unique, as many articles that focused on sickness presenteeism in the overall business context focused on non-mental health medical diagnoses, like chronic dry eye (Yu, Asche, & Fairchild, 2011). Gartner et al. (2010) identified presenteeism as an outcome of work functioning due to mental illness. Conversely, Laranjeira (2013), who utilized the sickness presenteeism definition, discussed that an unfavorable work environment, including working excessive hours, is a risk factor for anxiety and depression, which lead to presenteeism. However, many authors used instruments for presenteeism and co-variates that measured one specific antecedent of presenteeism. Shamasky (2002) pointed to the difficulty of addressing presenteeism due to nonvisible causes. Overall, the articles reviewed looked at one specific antecedent or a narrow group of antecedents rather than looking at various types of

antecedents. For example, studies often focused on chronic illness or work environment rather than including more than one antecedent.

Consequences of Presenteeism in Nursing

Presenteeism is identified as a workforce issue by multiple editorials because of negative patient outcomes, nurse health, and cost consequences associated with it. Many articles mentioned decreased productivity and decreased quality of care were difficult to measure, as only self-report instruments are available, such as MISSCARE (Cassie, 2014), or having participants self-report patient falls and medication errors (Letvak et al., 2012). Articles that performed cost analyses, projected the annual costs of presenteeism to be $33 trillion in the nursing and pharmacist workforce (Warren et al., 2011) or $14,339 per nurse (Letvak et al., 2012).

Proposed Definition

The simplest definition of presenteeism in nursing may be the act of being physically present at work when one should not be there. However, many definitions used to operationalize presenteeism for studies conducted within the nursing workforce incorporate identified antecedents as conditions for the behavior into the definition. For example, working when not feeling physically or mentally well (Hensel, 2011). The variety of antecedents identified in the literature points to a need for a broader definition and/or operationalization of presenteeism that incorporates multiple antecedents. The operationalization of a holistic definition of presenteeism, which is inclusive of all the identified antecedents, would move research and interventions to address presenteeism forward. Work that leaves identified sources out of the definition limits our ability to learn about the breadth of presenteeism, as well as develop interventions to address the antecedents. A proposed holistic operational definition of presenteeism behavior is as follows:

physical presence at work when one should not be due to one's health and wellbeing, stressful work environment, lack of work-life balance, or sense of professional identity or obligation.

Discussion

While the antecedents of presenteeism varied within the nursing workforce context, all articles explained the prevalence of presenteeism within nursing as a result of the specific antecedents they studied. These included complex workplace environments such as difficult schedules and high demands, prevalence of medical conditions in staff, challenges in attaining work-life balance, and outside economic and organizational forces. The nursing workforce also faces a shortage in upcoming years that is already being felt in some states (Juraschek, Zhang, Ranganathan, & Lin, 2012). This shortage could lead to increased burnout and dissatisfaction at work (Juraschek et al., 2012), therefore, cyclically contributing to negative nurse health and presenteeism (Aiken et al., 2002). Additionally, the professional culture of nursing that promotes self-sacrifice can be a negative in both increasing workplace stress and health consequences for nurses (Eley, Eley, & Rogers-Clark, 2010; Steege & Rainbow, 2017). The specificity of antecedents of presenteeism studied in each article points to the need for more work with a holistic view of presenteeism that encompasses all the antecedents in order to understand the prevalence of presenteeism within the nursing workforce.

In addition to the decreased productivity consequences of presenteeism found in other industries, presenteeism in nursing has unique patient consequences not present in the larger workforce. Negative patient health consequences include medication errors and falls (Letvak et al., 2012), missed care (Cassie, 2014), and transmission of viruses to health-compromised patients (Widera, Chang, & Chen, 2010). These consequences make it more difficult to estimate

the cost of presenteeism in nursing than in other industries. Future work is needed to measure the consequences of presenteeism.

One of the differences between the consequences of presenteeism explored within nursing workforce context in comparison to the larger workforce context articles was the use of economic analysis. Overall workforce articles regularly discussed the costs of presenteeism and evaluated different wellness programs or other recommendations in terms of dollar savings to an organization. Studies in the nursing context that have estimated costs of presenteeism have largely looked at presenteeism resulting from specific medical diagnoses (e.g., back pain and depression (Letvak et al., 2012) or looked at presenteeism in more than one healthcare profession (Warren et al., 2011); however, the financial case was not generally made. As multiple organizations pursue the Triple Aim Initiative (IHI, 2016), addressing presenteeism may be an important strategy. Addressing presenteeism has the potential to decrease healthcare costs and improve the quality of care that patients receive. Additionally, it will also improve the health of the nursing workforce, which is the largest in the healthcare sector at 2.8 million (USDHHS, 2014). An intervention study by Noben et al. (2015) in the Netherlands to address presenteeism among nurses with mental illness led to a return on investment of 5 Euros for every 11 Euros spent. In order to make the business case for importance of addressing presenteeism to a healthcare organization, it will be crucial to provide data like that provided by Noben et al., which include a cost analysis in addition to prevalence.

Studies on presenteeism within the nursing context have been written to an audience of nursing executives, hospital organizations, and researchers. These articles have recommended that organizations invest in nursing staff and address nursing workplace cultural issues, review staff satisfaction and address individual employee concerns, provide workplace wellness

programs and employee assistance programs, review sick leave policies and provide health insurance to manage sickness, and encourage employee work-life balance (Middaugh, 2007; Oliveira et al., 2015; "'Presenteeism' now a major issue," 2015; Shamansky, 2002). Intervention work in the Netherlands aimed at addressing mental health among nursing staff and to decrease absenteeism and presenteeism has been successful (Noben et al., 2015). This intervention's success supports the development of interventions to address the often unseen causes of presenteeism. However, presenteeism can also be a potential unintended consequence of interventions to address absenteeism. For example, in a study done in Canada to decrease absenteeism, nurses became uncomfortable with not coming to work and came even when sick (Gaudine, Saks, Dawe, & Beaton, 2013), thereby increasing rates of presenteeism. This points to the importance of monitoring presenteeism when doing an intervention to address an antecedent or concept related to presenteeism. Studies on presenteeism in nursing spanned countries, including the Netherlands, the United States, Italy, Brazil, and Canada. Although not explicitly identified in any of these studies as an antecedent or moderator to presenteeism, political/ economic/national culture may also impact presenteeism behaviors. Future work should explore and measure how culture and differences in political/economic/workforce systems and norms impact the conceptualization of presenteeism in nursing.

Shamansky (2002) acknowledged that as a nurse, she was unaware of presenteeism and feels that increasing awareness among nurses is crucial because of the organizational and individual consequences. The long-term consequences of presenteeism on the nursing workforce, specifically the health consequences, have been understudied. This follows the trend in the overall workforce literature, which has called for more of such research (Aronsson & Gustafsson, 2005). Lynch (2001) found that nurses in low-control and high-demand jobs had

greater health deterioration in a 4-year period than they would have had if they had smoked or led sedentary lives. The likelihood of health deterioration coupled with the negative health effects of presenteeism, found in studies of specific medical conditions conducted in overall workforce literature, speaks to the need for further study into long-term nurse health consequences of presenteeism. Furthermore, increasing nurse awareness of presenteeism could be an important step in addressing presenteeism within patient populations that are at high-risk.

Limitations

Limitations of this concept analysis include potentially missed articles on presenteeism in the nursing workforce and overall workforce contexts due to the sampling methods. While efforts were made to include multiple databases, it is always possible that key articles were missed. The global landscape of presenteeism research also makes it possible that limiting the search to include only articles published in English may have limited the range of articles on the topic. Global sources read for this analysis did not look at the role of culture in presenteeism among their national nursing workforce; therefore, this analysis was unable to explore the potential role of culture. The analysis performed was also limited by the number of articles that did not provide a definition for presenteeism. Even with these limitations, the strength of the broad search within multiple contexts provides a view of presenteeism not currently found in the nursing workforce literature.

Conclusion

Presenteeism is a complex behavior that can stem from a variety of antecedents and lead to cost, performance, and productivity loss for companies. There also are consequences for individual employee health. Presenteeism among the nursing workforce is unique because of the negative patient consequences and professional self-identity of nursing that promotes self-

sacrifice for patient care. The consequences and antecedents make presenteeism in nursing complex and worthy of additional study. This concept analysis adds to the current literature on presenteeism by exploring both the concept within the nursing workforce and in the larger business contexts. Understanding the similarities and differences between presenteeism in the two contexts has the potential to support instrument selection and intervention development and thus adds to the overall presenteeism literature. Future work is needed to explore the role of culture, measurement of different antecedents, and consequences of presenteeism, and interventions to address presenteeism are needed in addition to work on the prevalence of presenteeism.

Manuscript 1 References

Aiken, L. H., Clarke, S. P., Sloane, D. M., Sochalski, J., & Silber, J. H. (2002). Hospital nurse staffing and patient mortality, nurse burnout, and job dissatisfaction. *JAMA: Journal of the American Medical Association, 288*(16), 1987-1993. doi:10.1001/jama.288.16.1987

Aronsson, G., & Gustafsson, K. (2005). Attendance presenteeism: Prevalence, attendance-pressure factors, and an outline of a model for research. *Journal of Occupational and Environmental Medicine, 47*(9), 958-966. doi:10.1097/01.jom.0000177219.75677.17

Aronsson, G., Gustafsson, K., & Dallner, M. (2000). Sick but yet at work. An empirical study of sickness presenteeism. *Journal of Epidemiology and Community Health, 54*(7), 502-509. doi:10.1136/jech.54.7.502

Blegen, M. A., Vaughn, T. E., & Goode, C. J. (2001). Nurse experience and education: Effect on quality of care. *Journal of Nursing Administration, 31*(1), 33-39. doi:10.1097/00005110-200101000-00007

Camerino, D., Sandri, M., Sartori, S., Conway, P. M., Campanini, P., & Costa, G. (2010). Shiftwork, work-family conflict among Italian nurses, and prevention efficacy. *Chronobiology International, 27*(5), 1105-1123. doi:10.3109/07420528.2010.490072

Cassie, F. (2014). Nursing research finds presenteeism steps up risk of missed care. *Nursing Review (1173-8014), 14*(6), 12-12.

d'Errico, A., Viotti, S., Baratti, A., Mottura, B., Barocelli, A. P., Tagna, M., … Converso, D. (2014). Low back pain and associated presenteeism among hospital nursing staff. *Journal of Occupational Health, 55*(4), 276-283. doi:10.1539/joh.12-0261-oa

Davidhizar, R., & Shearer, R. (1999). The 'super nurse' syndrome. *Seminars for Nurse Managers, 7*(2), 59-62.

Eley, R., Eley, D., & Rogers-Clark, C. (2010). Reasons for entering and leaving nursing: An Australian regional study. *Australian Journal of Advanced Nursing, 28*(1), 6-13.

Gartner, F. R., Nieuwenhuijsen, K., van Dijk, F. J. H., & Sluiter, J. K. (2010). The impact of common mental disorders on the work functioning of nurses and allied health professionals: A systematic review. *International Journal of Nursing Studies, 47*(8), 1047-1061. doi:10.1016/j.ijnurstu.2010.03.013

Gartner, F. R., Nieuwenhuijsen, K., van Dijk, F. J. H., & Sluiter, J. K. (2011). Psychometric properties of the Nurses Work Functioning Questionnaire (NWFQ). *Plos One, 6*(11). doi:10.1371/journal.pone.0026565

Gartner, F. R., Nieuwenhuijsen, K., van Dijk, F. J. H., & Sluiter, J. K. (2012). Impaired work functioning due to common mental disorders in nurses and allied health professionals: The Nurses Work Functioning Questionnaire. *International Archives of Occupational and Environmental Health, 85*(2), 125-138. doi:10.1007/s00420-011-0649-0

Gaudine, A., Saks, A. M., Dawe, D., & Beaton, M. (2013). Effects of absenteeism feedback and goal-setting interventions on nurses' fairness perceptions, discomfort feelings and absenteeism. *Journal of Nursing Management, 21*(3), 591-602. doi:10.1111/j.1365-2834.2011.01337.x

Gillespie, G. L., Gates, D. M., & Succop, P. (2011). Psychometrics of the healthcare productivity survey. *Advanced Emergency Nursing Journal, 33*(3), 258-271.

Hensel, D. (2011). Relationships among nurses' professional self-concept, health, and lifestyles. *Western Journal of Nursing Research, 33*(1), 45-62. doi:10.1177/0193945910373754

Institute for Healthcare Improvement (IHI). (2016). *The IHI triple aim*. Retrieved from http://www.ihi.org/engage/initiatives/tripleaim/pages/default.aspx

James, J. T. (2013). A new, evidence-based estimate of patient harms associated with hospital care. *Journal of Patient Safety, 9*(3), 122-128. doi:10.1097/PTS.0b013e3182948a69

Johns, G. (2010). Presenteeism in the workplace: A review and research agenda. *Journal of Organizational Behavior, 31*(4), 519-542. doi:10.1002/job.630

Juraschek, S. P., Zhang, X., Ranganathan, V., & Lin, V. W. (2012). United States registered nurse workforce report card and shortage forecast. *American Journal of Medical Quality, 27*(3), 241-249. doi:10.1177/1062860611416634

Karimi, L., Cheng, C., Bartram, T., Leggat, S. G., & Sarkeshik, S. (2015). The effects of emotional intelligence and stress-related presenteeism on nurses' well-being. *Asia Pacific Journal of Human Resources, 53*(3), 296-310. doi:10.1111/1744-7941.12049

Laranjeira, C. A. (2013). Validation of the Portuguese version of the Stanford Presenteeism Scale in nurses. *International Journal of Nursing Practice, 19*(6), 644-650. doi:10.1111/ijn.12117

Letvak, S. A., Ruhm, C. J., & Gupta, S. N. (2012). Nurses' presenteeism and its effects on self-reported quality of care and costs. *American Journal of Nursing, 112*(2), 30-38; quiz 48, 39. doi:10.1097/01.NAJ.0000411176.15696.f9

Lynch, W. D. (2001). Health affects work, and work affects health. *Business and Health, 19*(10), 31-37.

Middaugh, D. J. (2007). Presenteeism: Sick and tired at work. *Dermatology Nursing, 19*(2), 172-173, 185.

Noben, C., Evers, S., Nieuwenhuijsen, K., Ketelaar, S., Gartner, F., Sluiter, J., & Smit, F. (2015). Protecting and promoting mental health of nurses in the hospital setting: Is it cost-effective from an employer's perspective? *Int J Occup Med Environ Health, 28*(5), 891-900. doi:10.13075/ijomeh.1896.00465

Oliveira, R. M., Leitao, I., Aguiar, L. L., Oliveira, A., Gazos, D. M., da Silva, L. M. S., … Sampaio, R. L. (2015). Evaluating the intervening factors in patient safety: focusing on hospital nursing staff. *Revista Da Escola De Enfermagem Da Usp, 49*(1), 102-111. doi:10.1590/s0080-623420150000100014

Perry, L., Lamont, S., Brunero, S., Gallagher, R., & Duffield, C. (2015). The mental health of nurses in acute teaching hospital settings: A cross-sectional survey. *BMC Nursing, 14*(1), 1-8. doi:10.1186/s12912-015-0068-8

Pilette, P. C. (2005). Presenteeism in nursing—A clear and present danger to productivity. *Journal of Nursing Administration, 35*(6), 300-303.

"Presenteeism" now a major issue. (2015). *World of Irish Nursing & Midwifery, 23*(5), 31-31.

Ream, E., & Richardson, A. (1996). Fatigue: A concept analysis. *International Journal of Nursing Studies, 33*(5), 519-529.

Rodgers, B. L. (1989). Concepts, analysis and the development of nursing knowledge: The evolutionary cycle. *Journal of Advanced Nursing, 14*(4), 330-335.

Shamansky, S. L. (2002). Presenteeism … or when being there is not being there. *Public Health Nursing, 19*(2), 79-80. doi:10.1046/j.1525-1446.2002.19201.x

Steege, L. M., & Rainbow, J. G. (2017). Fatigue in hospital nurses — 'Supernurse' culture is a barrier to addressing problems: A qualitative interview study. *67*, 20-28.

U.S. Department of Health and Human Services, Health Resources and Services Administration, National Center for Health Workforce Analysis. (2014). *The future of the nursing workforce: National- and state-level projections, 2012-2025.* Rockville, MD: Author.

Warren, C. L., White-Means, S. I., Wicks, M. N., Chang, C. F., Gourley, D., & Rice, M. (2011). Cost burden of the presenteeism health outcome: Diverse workforce of nurses and pharmacists. *Journal of Occupational & Environmental Medicine, 53*(1), 90-99. doi:10.1097/JOM.0b013e3182028d38

West, P., Abbott, P. A., & Probst, P. (2014). Alarm Fatigue. *Online Journal of Nursing Informatics, 18*(2).

Widera, E., Chang, A., & Chen, H. L. (2010). Presenteeism: A public health hazard. *Journal of General Internal Medicine, 25*(11), 1244-1247. doi:10.1007/s11606-010-1422-x

Yu, J. H., Asche, C. V., & Fairchild, C. J. (2011). The economic burden of dry eye disease in the United States: A decision tree analysis. *Cornea, 30*(4), 379-387. doi:10.1097/ICO.0b013e3181f7f363

Manuscript 2

How to Know if You're Really There: An Evaluation of Measures for Presenteeism in Nursing

(To be submitted to Journal of Occupational and Environmental Medicine)

Abstract

Objective. To report presenteeism prevalence across presenteeism measures from the work-stress and sickness domains. To evaluate the psychometric fit of those measures in a nursing population.

Methods. Cross-sectional descriptive survey of 447 U.S. RNs using five reliable and validated measures of presenteeism. The survey was evaluated using descriptive, exploratory factor analysis and confirmatory factor analysis.

Results. Rates of presenteeism of nurses were higher than rates published in other studies and spanned both work-stress and sickness domains of presenteeism. We identified different factors structures than previously published for three of the five presenteeism instruments.

Conclusion. A conceptualization of presenteeism that is inclusive of both the work-stress and sickness domains is crucial to developing future measures of and interventions for presenteeism. The nursing prevalence of presenteeism makes this group an important target for future interventions.

Introduction

Approximately $150 billion is lost in the U.S. economy annually due to presenteeism (Hemp, 2004). Presenteeism is defined as when you are present at work, but you are not fully performing or engaged (Rainbow & Steege, 2017), which can occur as a result of many factors (e.g., chronic illness, workplace stress, and work-life imbalance). Presenteeism is often defined and measured based on one of these specific sources. For example, Cooper and Dewe (2008) defined presenteeism as "lost productivity that occurs when employees come to work ill and perform below par because of that illness" (p. 522). Whereas, Gilbreath and Karimi (2012) defined presenteeism as "when employees are physically present, but mentally absent" (p. 120).

Throughout the literature, presenteeism is associated with consequences beyond decrements in worker performance, such as consequences to employee health and wellbeing (Skagen & Collins, 2016). As a result, addressing presenteeism has been a focus of research by occupational health and business scholars since the 1970s (Brborović, Daka, Dakaj, & Brborović, 2017; Johns, 2010). However, variation in conceptualization and definition of presenteeism has created siloed scopes of presenteeism research. There are researchers who focus on sickness presenteeism, while others focus on job-stress-related presenteeism. Scholars in each of these areas have developed measures, conceptual models, and interventions to address their scope of presenteeism.

The parallel development of these scopes of research has led to increased understanding of different causes of presenteeism, but a lack of understanding of the whole picture of presenteeism. A broader and more holistic conceptualization and measurement of presenteeism is necessary to address the inherent relationships between these two scopes. For example, individuals can develop illnesses as a result of working in stressful work environments

(Laranjeira, 2013). In these presenteeism cases, is it the illness and/or the stressful work environment that is leading to the individual's presenteeism? Without considering the relationships between different scopes of presenteeism research, we may fail to account for the root cause and fail to design interventions that will address the multiple related factors that may lead to presenteeism for an individual. The first step toward joining these scopes of presenteeism research is conceptualizing and measuring presenteeism in a way that is inclusive of both scopes. We have chosen to take this step in a study of presenteeism in the nursing population. Nursing was chosen due to the prevalence of presenteeism, the consequences of presenteeism in nursing, and the differences in conceptualization and measurement of presenteeism within research on this population of workers.

When compared to 41 other work sectors, nurses have been identified as having the highest rates of presenteeism (Aronsson, Gustafsson, & Dallner, 2000). There are multiple risk factors inherent in nursing work that may contribute to these high rates, including the healthcare work environment, suboptimal health, and professional identity as a caregiver (Brborović et al., 2017; Johns, 2010; Rainbow & Steege, 2017). Sixty-one percent of nurses in the United States work in hospital settings (U.S. Department of Labor, 2018). The Occupational Safety and Health Administration (OSHA, 2013) has declared hospitals as one of the most hazardous places to work due to the unique risks and culture. The physical, mental, and emotional demands of hospital nursing are linked to poor health outcomes for nurses, high incidence of workplace injuries, and increased nurse turnover rates (Hayes et al., 2006; McNeely, 2005). These hospital work demands are often coupled with suboptimal health. Over half of nurses report suboptimal physical and mental health (Mazurek Melnyk et al., 2018). However, nurses attend work when ill more frequently than other professionals. Nurses had a lower median number of days away from

work as a result of musculoskeletal disorders (9 in comparison to 12, U.S. Department of Labor, 2016a), and eight out of 10 nurses state that they frequently work while in pain (Hayes et al., 2006). This is often attributed to the dedication nurses feel toward their patients and coworkers. Nurses often put the needs of patients and coworkers above their own health and wellbeing. This dedication has been described as a nurse's desire to be a *super nurse* with heroic abilities to care for others regardless of impact on themselves (Davidhizar & Shearer, 1999; Steege & Rainbow, 2017). The hospital work environment, suboptimal health, and this heroic professional identity are all prevalent risk factors for presenteeism in nursing that need to be considered in the conceptualization and measurement of presenteeism (Rainbow & Steege, 2017).

Consequences of presenteeism among nurses include negative consequences for patients (e.g., medication errors), healthcare organizations (e.g., increased costs), and nurse health and wellbeing (e.g., depression) (Laranjeira, 2013; Letvak, Ruhm, & Gupta, 2012; Warren et al., 2011). Presenteeism has been linked to omission of nursing care tasks and missed care (Cassie, 2014), as well as patient falls and medication error (Letvak et al., 2012). Nurse health consequences have also been identified, including increased risk for anxiety and depression (Laranjeira, 2013). These negative consequences can affect health care costs for society and healthcare organizations. One study looked at presenteeism resulting from back pain and depression and estimated the cost of presenteeism to be $14,339 per nurse annually in the United States (Letvak et al., 2012). These studies all measured presenteeism through different self-report measures. Conceptualization and measurement of presenteeism that is inclusive of more than one risk factor will provide a fuller picture of the true consequences of presenteeism in the nursing workforce.

There are multiple measures of worker performance that have been used to measure presenteeism (Garrow, 2016; Johns, 2010; Thomas, Ospina, Dennett, Waye, & Jacobs, 2015). Existing measures are all retrospective self-report. There are three current measurement issues with presenteeism measurement: (a) industry-specific items, (b) focus on either sickness or job-stress presenteeism, and (c) different approaches to measuring presenteeism. Many of these measures have been developed and tested for use in other industries, which means some items are particular to industry-specific tasks (e.g., performance in lifting items greater than 10 pounds) (Lerner et al., 2001). Some of these tasks are not transferrable to a nursing context, and items should be considered prior to use in this population.

Another existing measurement issue is the focus of existing measures on one specific scope of presenteeism research. The majority of measures assess presenteeism only related to one specific risk factor, for example sickness or stress (Gilbreath & Karimi, 2012; Koopman et al., 2002). Researchers who study presenteeism resulting from sickness have often utilized scales that ask respondents to describe how their specific medical condition impacted their work performance (Aronsson & Gustafsson, 2005; Gustafsson, Lovseth, Schenck-Gustafsson, & Fridner, 2013; Sanchez Bustillos, Vargas, & Gomero-Cuardra, 2015). These instruments have been shown to be reliable and valid, but do not take into account other known risk factors for presenteeism beyond sickness. The same measurement issues apply to the measures developed in the job-stress-related presenteeism research scope. Therefore, measures from both areas only measure a subset of presenteeism occurrence.

A third measurement issue is that presenteeism is a latent concept, so measurement is difficult. Scholars often approach measuring presenteeism through assessing other related concepts to triangulate the occurrence of presenteeism. Two approaches used are assessing the

prevalence of both signs (e.g., I am unable to concentrate on my job due to work stress.) and consequences of presenteeism (e.g., How often did you almost cause an incident at work?). These different approaches mean that instruments to measure presenteeism vary greatly in approach, subscales, and items. The different conceptualizations and measures only further limit the ability to compare prevalence across studies and populations. To fit a broader conceptualization of presenteeism, measurement must straddle different industries, domains, and approaches. Specific and non-specific worker population instruments that study both sickness and job-stress presenteeism and utilize different approaches should be used.

To address the variations in conceptualization and measurement, we propose a holistic conceptualization of presenteeism that is inclusive of the multiple factors that have been linked to presenteeism within the nursing population. We define presenteeism as physical presence at work when not fully engaged or functioning. To measure this conceptualization, we utilized a survey of hospital registered nurses (RNs) with five different reliable and validated presenteeism measures. The selected instruments measure presenteeism across industries and domains of presenteeism and utilize different measurement approaches. The aims of this study were to (a) measure presenteeism prevalence across five measures in the nursing population and (b) evaluate the psychometric fit and utility of those five measures of presenteeism for use in nursing.

Methods

Data and Sample

This study used a cross-sectional survey design to measure and conduct psychometric testing on measures of presenteeism sourced from available literature. All of these measures have been utilized previously to study presenteeism in nursing and/or other populations. In order to test the psychometrics of each instrument in its entirety, participants completed all of each

measure. The survey was conducted online via Qualtrics (2018). The survey included five measures of presenteeism (111 items), eight measures of presenteeism risk factors and consequences (124 items), and demographic questions (18 items). The median response time to complete the survey was 32 minutes. This study was deemed exempt by the University of Wisconsin-Madison Health Sciences IRB. Data were collected from August of 2017 through February of 2018.

We targeted a sample size of greater than 300, as recommended by Myers, Ahn and Jin (2011), for confirmatory factor analysis. Participants were recruited through listservs of nursing organizations, nursing school alumni groups and hospital organizations, advertisements in nursing organization newsletters, and on social media posts. Potential participants completed three screening questions for inclusion criteria: (1) Are you a registered nurse? (2) Do you work on an inpatient hospital unit? and (3) In that role, do you provide direct patient care? If a participant responded *yes* to all three questions, a description of the study and consent screen appeared. Participants who did not answer *yes* to all three questions were thanked for their interest in participating, but excluded from participating. Participants had to select *consent* to participate before beginning the survey. Participants had the option of providing an email address to enter a raffle for Amazon gift cards, with additional gift cards raffled off to those who completed the survey in its entirety. Participant email addresses were stored separately from the rest of survey responses. All other survey questions were anonymous.

Study Measures

We selected five validated and reliable measures of presenteeism identified through a literature search completed as a part of a concept analysis of presenteeism in nursing (Rainbow & Steege, 2017). All of these measures have been used to measure presenteeism in prior studies,

even though some of the measures were originally developed to assess related concepts (Garrow, 2016; Ospina, Dennett, Waye, Jacobs, & Thompson, 2015). Four out of the five measures have been used in a nursing population, but only one of the measures, the Healthcare Productivity Scale (Gates, Gillespie, & Succup, 2011), has been used in the nursing population in the United States. The fifth measure, the Health and Work Questionnaire (Shikiar, Halpern, Rentz, & Kahn, 2004), was identified as having strong evidence to support its use in multiple presenteeism measurement reviews and in studies comparing it to objective measures of productivity (Prasad, Wahlqvist, Shikiar, & Shih, 2004). These measures encompass the sickness and job-stress-related presenteeism domains. These measures also utilize different approaches to measure presenteesim. These diverse measures were chosen to match our broader conceptualization of presenteeism.

Stanford Presenteeism Scale (SPS-6). The SPS-6 (Koopman et al., 2002) is a widely used reliable and validated scale for assessing the impact of health problems on work performance and productivity among nurses and other employee groups (Laranjeira, 2013; Paschoalin, Griep, Lisboa, & de Mello, 2013). The published Cronbach's alpha of this scale is 0.80 (Koopman et al., 2002). This scale is six items long, with a response scale ranging from *strongly disagree* to *strongly agree*. Three items are reverse scored. There is a two-factor structure, with one factor on completing work (items 2, 5, and 6) and the second factor on avoiding distraction (items 1, 3, and 4). A higher total score indicates less presenteeism despite a health condition. Studies using the SPS-6 in nursing populations in other countries have found: Croatia had a mean score of 21.3 (sd= 4.58) (Brborović, Brborović, Brumen, & Pavlekovic, 2014); Italy had a mean score of 20.9 (sd=3.5) (Cicolini, Della Pelle, Cerratti, Franza, & Flacco, 2016); and Portugal had a mean score of 24.0 (sd=7.1) (Lanjeira, 2013).

Health and Work Questionnaire (HWQ). The HWQ (Shikiar et al., 2004) is a recommended reliable and validated scale for measuring workplace productivity and workplace health that has been used to measure presenteeism in prior studies (Ospina et al., 2015; Prasad et al., 2004). The questionnaire is made up of six subscales: productivity (items 12–16); concentration/focus (items 20–24); supervisor relations (items 8 and 10); non-work satisfaction (items 4, 5, and 11); work satisfaction (items 2, 3, 6, and 7); and impatience/irritability (items 17–19). This questionnaire is composed of 24 items with six different 1 to 10 response scales (*very dissatisfied* to *very satisfied, not rewarding at all* to *very rewarding, no control at all* to *total control, not at all easy* to *very easy, my worst ever* to *my best possible, never* to *almost always*). Eight items are reverse scored. Means are calculated for each subscale and total score. A higher score indicates less presenteeism. The HWQ has not been used in a nursing population, but in a population of airline agents, the mean score was 7.66 (total score standard deviation not reported) (Shikiar et al., 2004).

Nurses Work Functioning Questionnaire (NWFQ). The NWFQ (Gartner, Nieuwenhuijsen, van Dijk, & Sluiter, 2011) is a reliable and validated measure developed to assess presenteeism due to health conditions among nurses and allied health professionals. The questionnaire is composed of seven subscales: cognitive aspects of task execution and general incidents (items 1-7, 9, 15, and 16); impaired decision making (items 48-50); causing incidents at work (items 14 and 26-32); avoidance behavior (items 36-43); conflicts and irritations with colleagues (items 33-35 and 44-47); impaired contact with patients and their family (items 10-13 and 22-25); and lack of energy and motivation (items 17-21). The scale is composed of 50 items, with four 1- to 7-point (*no difficulty* to *great difficulty, totally disagree* to *totally agree, almost never* to *almost always, not once* to *on average more than 1x per day*) and two 5-point response

scales (*almost never* to *almost always, disagree* to *agree*). The three items (48-50) on the impaired decision-making subscale are reverse scored and not appropriate for use in allied health professional populations due to the subject matter of the items in this scale. Standardized sum scores are calculated for the subscales and total questionnaire, with higher scores indicating greater presenteeism due to health conditions. Scores range from 0 to 100. Nurses and allied health professionals in the Netherlands had a median score of 11 across six domains (without the impaired decision-making subscale) (Gartner, Nieuwenjuijsen, van Dijk, & Sluiter, 2012).

Health Productivity Scale (HPS). The HPS (Gillespie, Gates, & Succop, 2011) is a reliable and validated scale developed to measure the extent to which workplace violence and trauma impacts a provider's performance at work. The scale has 29 items, with a response scale ranging from -2 to +2 (decreased productivity to increased productivity). The published Cronbach's alpha for the scale is 0.97 (Gillespie et al., 2011). This scale has a four-factor structure: (1) cognitive demands (items 1-4 and 11), (2) handle/manage workload (items 5-10), (3) support and communication with patients and visitors (items 12-17), and (4) safety and competency (items 18-27). Items 28 and 29 are not part of a factor. A summative total score is calculated, with scores less than 0 meaning performance is impacted and there is presenteeism. Scores can range from -58 to 58. A prior study using this scale among emergency room nurses in the United States found a mean of -0.05 (sd= 14.26) (Gates et al., 2011).

Job-Stress-Related Presenteeism Scale. The Job-Stress-Related Presenteeism Scale (Gilbreath & Karimi, 2012) is a reliable and validated measure of presenteeism. Gilbreath and Karimi (2012) defined presenteeism as cognitive energy diverted due to job stress. The published Cronbach's alpha of this scale is 0.91 (Gilbreath & Karimi, 2012). The scale is composed of six items, with a 5-point Likert response scale that ranges from 1 to 5 (*never* to *all the time*). This

scale has a one-factor structure. A total mean score is calculated, with higher scores indicating greater presenteeism. Karimi et al. (2017), in a study using the Job-Stress-Related Presenteeism Scale in community nurses in Australia using a 0-4 scale, found a mean of 1.4 (sd=0.7).

Statistical Analysis

Survey responses were transferred from Qualtrics (2018) to R (Team RC, 2016) for scoring. All scales were scored according to published instructions. All missing data were excluded from analysis. Descriptive statistical analysis was conducted in SPSS (2016). Reliability and correlational scores were analyzed. As all of these instruments had not previously been used in a U.S. nursing population, we conducted an exploratory factor analysis (EFA) on each measure for our sample. In parallel, we conducted confirmatory factor analysis (CFA) for each presenteeism measure according to each measure's published guidelines (Stata/SE 15.0, 2017). The EFA is data-driven and identifies the factor structure of an instrument within a particular dataset. Meanwhile, CFA is theory-driven, and findings provide information about how items in our dataset load on the factors created by the scale authors. Both types of analysis provide information about the fit of an instrument for our population. As our aim was to examine the fit of each of these measures and not to alter the measures, we did not conduct CFA based on the findings of our EFAs. We also ran a Harmon's single-factor method to test for common-method bias. Common-method bias is artificial inflation or deflation in the relationships between variables that can lead to misleading results, which has been identified as an issue in prior discussions of measurement (Garrow, 2016).

Results

There were 447 total participants in the survey. Participants came from 40 states. Ninety-four percent of participants were female. The mean age of the sample was 38.5 years (standard

deviation of 11.6). The mean years of experience as a nurse was 11.3 (10.1). The mean weekly hours worked was 34.0 (8.7). The Harmon's single-factor test revealed there was more than one factor present (variance = 25.5%). The descriptive statistics of each measure of presenteeism are reported in Table 1. The EFA and CFA results for each measure can be found in Table 2.

Table 1

Total and Subscale Descriptives

	n	Mean (SD)	Range
SPS-6	413	19.5 (2.4)	14 to 26
JSP	447	2.1 (0.6)	1 to 4.3
HPS	429	-15.1 (15.0)	-56 to 53
NWFQ			
(47 item)	398	17.0 (12.0)	0 to 62
(50 item)	398	17.0 (11.8)	0 to 63
Cognitive aspects of task execution and general incidents	438	19.1 (15.9)	0 to 89
Impaired decision making	419	17.4 (25.1)	0 to 100
Causing incidents at work	408	7.6 (9.1)	0 to 63
Avoidance behavior	419	18.6 (16.8)	0 to 88
Conflicts and irritations with colleagues	419	22.1 (19.1)	0 to 93
Impaired contact with patients and their family	431	16.9 (14.8)	0 to 79
Lack of energy and motivation	430	23.3 (20.8)	0 to 100
HWQ Total	400	6.7 (2.0)	0 to 10
Productivity	405	7.6 (1.1)	2 to 9
Concentration/focus	403	7.5 (2.0)	1 to 10
Supervisor relations	414	7.1 (2.5)	1 to 10
Impatience/irritability	402	7.7 (1.8)	1 to 10
Work satisfaction	413	6.8 (1.9)	1 to 10
Non-work satisfaction	414	7.4 (2.1)	1 to 10

Table 2

Factor Analysis Results for Each Measure

Measure	Cronbach Alpha	EFA with Varimax Rotation	Confirmatory Factor Analysis
SPS-6	0.66	2 factors	CFI=0.95
Factor 1	0.83		TLI=0.90
Factor 2	0.81		AIC=7284.76
			BIC=7361.21
			RMSEA=0.13
			X2 63.116 (model vs saturated with 8 df)
			X2 1035.20 (baseline vs saturated with 15 df)
			p =0.000 in both cases
HWQ	0.95	4 factors	Did not converge
Subscale 1	0.95		
Subscale 2	0.87		
Subscale 3	0.91		
Subscale 4	0.90		
Subscale 5	0.87		
NWFQ	0.79	7 factors	CFI=0.78
Subscale 1	0.93		TLI=0.77
Subscale 2	0.93		AIC=47402.74
Subscale 3	0.90		BIC=48072.46
Subscale 4	0.82		RMSEA=0.081
Subscale 5	0.82		X2 3971.51 (model vs saturated with 1106 df)
Subscale 6	0.85		
Subscale 7	0.89		X2 14295.39 (baseline vs saturated with 1176 df)
	0.91		
			p =0.000 in both cases
HPS	0.97	4 factors	CFI=0.87
Factor 1	0.88		TLI=0.85
Factor 2	0.90		AIC=17428.47
Factor 3	0.92		BIC=17781.81
Factor 4	0.95		RMSEA=0.099
			X2 1654.35 (model vs saturated with 318 df)
			X2 10306.13(baseline vs saturated with 351 df)
			p =0.000 in both cases

Job-stress-related presenteeism scale	0.86	1 factor	CFI=0.88 TLI=.87 AIC=5521.46 BIC=5574.79 RMSEA=0.15 X2 161.02 (model vs saturated with 14 df) X2 1264.01 (baseline vs saturated with 15 df) p =0.000 in both cases

The SPS-6 mean score was 19.5. The total scale had a Cronbach's alpha of 0.66. We found the same two-factor structure as the scale's authors. The Cronbach's alpha of the two factors was 0.83 and 0.81. The total variance explained by the two factors was 75.2%. The CFA revealed: $X^2 = 63.12$ (df = 8), CFI =0.95, and RMSEA = 0.13.

The HWQ had a mean total score of 6.7. The scale had a Cronbach's alpha of 0.95. Our initial EFA identified four factors rather than six factors, as published by the original authors. In our analysis, items 17–24 loaded together instead of onto two separate concentration and impatience factors. Items 1, 2 and 9 did not load on any factors. All three parts of question 14 loaded on both the productivity subscale factor, but loaded higher as their own separate factor. A CFA following their original factor guidelines did not converge.

The mean score on the NWFQ in this sample was 17.0. The Cronbach's alpha for this scale was 0.79 for the total scale. We identified seven factors; however, our EFA revealed a factor structure different than the published structure. Items 34 loaded on both factors 2 and 3 (0.51 on factor 2 and 0.52 on factor 3). Our seven factors were: (1) items 1–10 and 12–14; (2) items 33–35, 37–39, and 45; (3) items 17–21 and 34; (4) items 22–25; (5) items 28–32; (6) items 48–50; and (7) items 41–43. Our CFA, following the published guidelines, had this fit: $X^2 = 3{,}971$ (df = 1,106), CFI = 0.78, RMSEA = 0.081.

The HPS had four factors, but the items in each factor differed from the published factor breakdown. The four factors we identified were (1) items 1–5, (2) items 6–9, (3) items 12–15, and (4) items 16–29. Items 10 and 11 did not load on any factor, while items 28 and 29 did load. Item 16 was loaded on both factors 3 and 4 (0.53 on factor 3 and 0.52 on factor 4). These four factors accounted for 96% of the variance. The Cronbach's alpha for this scale was 0.97. The mean score was -15.1. Our CFA, following the published guidelines, had this fit: X^2 = 1,654.4 (df = 318), CFI = 0.87, RMSEA = 0.099.

The Job-Stress-Related Presenteeism Scale had a one-factor structure with six items. This aligned with previously published information on this scale. The Cronbach's alpha for the scale was 0.86. The mean score on this scale was 2.1. The one-factor model explained 60.3% of the variance. A CFA identified: X^2 = 161.0 (df = 14), CFI = .882, RMSEA = 0.15.

Discussion

Prior studies have explored presenteeism as either the byproduct of sickness or work environment issues. However, these different scopes of presenteeism research are related. This study conceptualized presenteeism holistically as presence at work with decreased engagement and performance, but is inclusive of both the sickness and work environment causes of presenteeism. Key findings of this study included higher rates of presenteeism among nurses and differences in factor structure and psychometrics of measures than previously reported. These findings can guide the development of interventions to address presenteeism in nursing and improvement of presenteeism measurement.

Nurses in our study had higher levels of presenteeism than those found in prior studies utilizing the different scales. Prior work using the SPS-6 scale among nurses working on a medical unit in Croatia identified a mean score of 21.3 (Brborović et al., 2014). The mean score

in our population was 19.5. On the SPS-6, a higher score means greater ability to perform at work with one's health condition. Our population's lower score means that nurses in our sample could have worse performance at work. The differences in level of presenteeism may be attributable to cultural differences between the United States and Croatia.

The HWQ has identified 7.7 mean total scores in a population of airline reservation agents (Shikiar et al., 2004). The mean total score in our population was 6.7. On this scale, lower scores mean less satisfaction with performance (Shikiar et al., 2004). The score in our sample is lower than this previous published score, meaning that nurses have a higher level of presenteeism than airline agents. The HWQ has not been previously used in the nursing population. Nurses could have higher levels of presenteeism than other groups surveyed, as they have in other studies (Aronsson et al., 2000). This could be due to the unique mental, physical, and emotional demands of nursing. It is also posited that higher levels among nurses are due their identity as a *helper* (Aronsson et al., 2000; Brborović et al., 2017).

The NWFQ was developed to assess presenteeism resulting from mental illness in nursing and allied health professionals in the Netherlands. The median score across 47 items (across six domains without the impaired decision-making subscale), as reported from a population of nurses and allied health professionals in the Netherlands, was 11 (Gartner et al., 2012). The median score in our sample was 14 and the mean score in our sample was 17.0. Presenteeism was higher in our sample. It is possible that the higher score in our population is due to differences between nursing populations in the United States and the Netherlands. The Netherlands has universal healthcare coverage that focuses on prevention and has better healthcare outcomes than the United States in many areas (World Bank, 2018). These differences impact the role of the nurse in each country's healthcare system. There also is one additional

nurse per 1,000 members of the population in the Netherlands than in the United States (World Health Organization, 2017).

The HPS sets a score of 0 or lower as when individuals should take time away from work (Gillespie et al., 2011). The mean score in our survey was -15.1. In another study of emergency room nurses using this scale, the mean score was -0.05 (Gates et al., 2011). Our sample had reduced productivity beyond what was found in the sample of emergency room nurses. Our sample was broader than just emergency room nurses and included any nurse who worked on an inpatient hospital unit providing direct patient care. It is possible nurses on other units experience more workplace trauma that results in presenteeism than nurses in the emergency room.

On the Job-Stress-Related Presenteeism Scale, the mean in our sample was 2.1. This was higher than the published mean of 1.44 in hospital employees in Australia (Gilbreath & Karimi, 2012). When compared to a population of nurses in Australia, in a study that used a 0-4 scale, our sample had lower presenteeism (mean of 1.1 versus 1.4) (Karimi et al., 2017). Differences between hospital employees and nurses, as well as differences between the United States and Australia, could account for these differences. Studies using the Job-Stress-Related Presenteeism measure should be conducted in the United States to further explore if levels of presenteeism differ by nation and/or by profession.

This is the first study of presenteeism in nursing that looks at presenteeism rates across multiple measures and both scopes of presenteeism research. The elevated levels of presenteeism identified in this sample echo similar findings of the high rates of presenteeism in nursing (Aronsson et al., 2000). We found high rates of presenteeism across both the stressful work environment and sickness domains of presenteeism. These high rates across both domains of presenteeism, coupled with the nurse health and wellbeing, healthcare system, and patient

consequences of presenteeism, make interventions to address presenteeism in nursing crucial and complex. Interventions to address presenteeism need to be multifaceted and target both work system and sickness causes of presenteeism.

This is the first study to compare multiple measures of presenteeism for use in a nursing population. The psychometric analysis revealed that the Cronbach's alpha of the scales in this study ranged from 0.66 to 0.97. The SPS-6 had a Cronbach's alpha of 0.66 for the total scale, which is lower than the recommendation of 0.70 (Nunnally, 1978). This scale should be further examined for use in the U.S. nursing population. All other Cronbach's alphas were higher than 0.79. The factor analysis of three of the five instruments revealed different underlying structures in these scales than what has been previously published. These differences varied from differences in the fit of particular items to subscale factors to differences in the number of subscale factors. The factor structures that we identified should be examined with CFA in another sample of U.S. nurses. These findings have implications for the use of these currently existing measures, as well as the development of new measurement approaches.

It was interesting that both the HPS and the NWFQ, which were both developed for use specifically in the nursing population, had factor structures that did not align with published guidelines. These measures were created to fill specific gaps in presenteeism measurement in the nursing population. They each had questions about nursing-specific work demands. This raises the question of whether we should be developing nursing-specific measures or just utilizing and potentially adapting published measures from other fields.

Because presenteeism research has utilized multiple measures, it is difficult to compare prevalence levels across studies. The length of some of these measures has also led previous researchers to choose to use specific subscales rather than using the measure in its entirety. The

findings of this study reveal that the subscales and measures may not have the same psychometrics in one's own study population. Therefore, using a published subscale may not be appropriate if the subscale psychometrics do not align. For example, we utilized the entire NWFQ scale and identified a factor structure that differed from the published structure. Prior work has used three of the subscales rather than the scale in its entirety (Smith, 2016). However, our findings that the scale may not entirely align with published results should be considered when choosing to only use some portion of the entire scale.

Of the instruments we used, the one with the most potentially serious issues is the HWQ. Its factor structure is problematic, because we could not get the confirmatory factor analysis, as published, to converge. This instrument is newer and has not been tested in as many populations as the other instruments that we used (Ospina et al., 2015). This measure is unique in that it asks respondents to answer questions about not only their perception of their work performance, but also how they perceive their supervisors and coworkers view their work. This instrument is also one of the few presenteeism instruments that was examined against objective measures of total hours lost and performance in its development (Shikiar et al., 2004). Both of these approaches are novel ways to triangulate presenteeism not seen in other measures used to assess presenteeism. Because of these different measurement approaches, we thought the HWQ may provide new insight into presenteeism. However, the factor structure of this measure did not align with the published structure, and we could not run a CFA. The psychometrics of this measure should be further studied in additional populations.

In this study, we focused on retrospective self-report measures of presenteeism. Retrospective measurement of presenteeism can provide valuable information about what is already occurring, but does not provide actionable information to address presenteeism before

consequences occur. Real-time measurement of presenteeism could serve as a basis for interventions that can target nurses at the right time to prevent consequences of presenteeism. Self-report measurement of presenteeism faces the same challenges as other self-report measurement (Podsakoff & Organ, 1986). Ideally, measurement of presenteeism would include real-time objective measurement in addition to subjective measurement. Objective productivity measurement has been used to assess presenteeism in other industries (Dababneh, Swanson, & Shell, 2001). However, this measurement differs across fields due to job tasks. In some fields, productivity can be measured objectively (e.g., by the number of phone calls placed) (Prasad et al., 2004). Measurement of productivity in nursing is difficult due to the multiple and unique demands nurses address during their shifts. This difficulty with measurement of productivity of nurses and quantifying the value of the work of a nurse to a healthcare organization has been raised by other scholars (Urden & Roode, 1997; Williamson & Johnson, 1988). Future work to improve measurement of presenteeism should seek to develop objective prospective measures of presenteeism.

Potential limitations of this study are similar to limitations of other online survey studies and studies that utilize convenience and snowball recruitment approaches. Electronic surveys have traditionally had lower response rates. In a meta-analysis of electronic and paper surveys, Shih and Fan (2009) found email surveys had a 33% response rate. The response rate of paper surveys was 20% higher at 53%. We selected convenience and snowball recruitment in order to reach as many nurses nationwide as possible. We tried to counteract electronic survey barriers through utilizing leverage-saliency theory (Groves, Singer, & Corning, 2000) to increase the activation of potential participants to participate. We did this through video advertisements and posts appealing to nurses' altruism and raffling gift cards for participation and survey

completion. It is also possible that there was selection bias. Nurses who are experiencing presenteeism and/or are particularly interested in the topic may have been more likely to participate in the survey. It also is possible that the timing of this survey may have impacted the findings. This survey was given during a particularly difficult flu season in the United States, which impacted staffing and sickness levels among clinicians. In the design of the study, we selected five measures of presenteeism. There are many more measures available. While we chose measures that were salient for our population, it is possible that there are other existing measures that would be more appropriate for use in nursing. Future studies should further examine measures of presenteeism for use within specific populations.

Conclusion and Relevance

In this study, we looked specifically at nursing. However, our broader conceptualization of presenteeism as encompassing both the sickness and work environment domains has relevance for research on presenteeism across professions. The two domains of research are intertwined and can both lead to negative consequences for employees and employers. The measurement of presenteeism needs to include both domains and seek to be prospective rather than retrospective. These advances in measurement are a crucial foundation to the development of future interventions. These interventions need to be multifaceted and address the multiple causes of presenteeism. Our understanding of the true cost of presenteeism will continue to grow as measurement improves through broader conceptualization. Similarly, the success of interventions will improve as multiple causes of presenteeism are addressed cohesively.

Manuscript 2 References

Aronsson, G., & Gustafsson, K. (2005). Sickness presenteeism: Prevalence, attendance-pressure factors, and an outline of a model for research. *Journal of Occupational and Environmental Medicine, 47*(9), 958-966. doi:10.1097/01.jom.0000177219.75677.17

Aronsson, G., Gustafsson, K., & Dallner, M. (2000). Sick but yet at work. An empirical study of sickness presenteeism. *Journal of Epidemiology and Community Health, 54*(7), 502-509. doi:10.1136/jech.54.7.502

Brborović, H., Brborović, O., Brumen, V., Pavleković, G., & Mustajbegović, J. (2014). Are nurse presenteeism and patient safety culture associated: A cross-sectional study. *Archives of Industrial Hygiene and Toxicology,* 65(2), 149-156. doi:10.2478/10004-1254-65-2014-2462

Brborović, H., Daka, Q., Dakaj, K., & Brborović, O. (2017). Antecedents and associations of sickness presenteeism and sickness absenteeism in nurses: A systematic review. *International Journal of Nursing Practice*, *23*(6), e12598. doi:10.1111/ijn.12598

Cassie, F. (2014). Nursing research finds presenteeism steps up risk of missed care. *Nursing Review, 14*(6), 12.

Cicolini, G., Della Pelle, C., Cerratti, F., Franza, M., & Flacco, M. E. (2016). Validation of the Italian version of the Stanford presenteeism scale in nurses. *Journal of Nursing Management, 24*(5), 598-604. doi:10.1111/jonm.12362

Cooper, C., & Dewe P. (2008). Well-being-absenteeism, presenteeism, costs and challenges. *Occupational Medicine, 58*(8), 522-524. doi:10.1093/occmed/kqn124

Dababneh, A. J., Swanson, N., & Shell, R. L. (2011). Impact of added rest breaks on the productivity and well being of workers. *Ergonomics, 44*(2), 164-174. doi:10.1080/00140130121538

Davidhizar, R., & Shearer, R. (1999). The "super nurse" syndrome. *Seminars for Nurse Managers, 7*(2), 59-62.

Garrow, V. (2016). *Presenteeism: A review of current thinking*. Retrieved from https://www.employment-studies.co.uk/system/files/resources/files/507_0.pdf

Gartner, F. R., Nieuwenhuijsen, K., van Dijk, F. J. H., Sluiter, J. K. (2011). Psychometric properties of the nurses work functioning questionnaire (NWFQ). *PLoS One, 6*(11). doi:10.1371/journal.pone.0026565

Gartner, F. R., Nieuwenhuijsen, K., van Dijk, F. J. H., & Sluiter, J. K. (2012). Interpretability of change in the nurses work functioning questionnaire: Minimal important change and smallest detectable change. *Journal of Clinical Epidemiology, 65*(12),1337-1347. doi:10.1016/j.jclinepi.2012.06.013

Gates, D. M., Gillespie, G. L., & Succop, P. (2011). Violence against nurses and its impact on stress and productivity. *Nursing Economics, 29*(2), 59-67.

Gilbreath, B., & Karimi, L. (2012). Supervisor behavior and employee presenteeism. *International Journal of Leadership Studies, 7*(1), 114–131. Retrieved from http://www.regent.edu/acad/global/publications/ijls

Gillespie, G. L., Gates, D. M., & Succop, P. (2011). Psychometrics of the healthcare productivity survey. *Advanced Emergency Nursing Journal, 33*(3), 258-271. doi:10.1097/tme.0b013e3181e97510

Groves, R. M., Singer, E., & Corning, A. (2000). Leverage-saliency theory of survey participation: Description and an illustration. *Public Opinion Quarterly*, *64*(3), 299-308. doi:10.1086/317990

Gustafsson, S., Lovseth, L., Schenck-Gustafsson, K., & Fridner, A. (2013). What makes physicians go to work while sick: A comparative study of sickness presenteeism in four European countries (HOUPE). *Swiss Medical Weekly*. doi:10.4414/smw.2013.13840

Hayes, L. J., O'Brien-Pallas, L., Duffield, C., Shamian, J., Buchan, J., Hughes, F., … Stone, P. W. (2006). Nurse turnover: A literature review. *International Journal of Nursing Studies, 43*(2), 237-263. doi:10.1016/j.ijnurstu.2011.10.001

Hemp, P. (2004). Presenteeism: At work - but out of it. *Harvard Business Review, 82*(10), 49-58. Retrieved from https://www.researchgate.net/publication/816689

Johns, G. (2010). Presenteeism in the workplace: A review and research agenda. *Journal of Organizational Behavior, 31*(4), 519-542. doi:10.1002/job.630

Karimi, L., Leggat, S. G., Cheng, C., Donohue, L., Bartram, T., & Oakman, J. (2017). Are organisational factors affecting the emotional withdrawal of community nurses? *Australian Health Review, 41*(4), 359-364. doi:10.1071/AH16027

Koopman, C., Pelletier, K. R., Murray, J, F,, Sharda, C., Berger, M., Turpin, R., … Bendel, T. (2002). Stanford presenteeism scale: Health status and employee productivity. *Journal of Occupational and Enviornomental Medicine, 44*(1), 14-20. doi:10.1097/00043764-200201000-00004

Laranjeira, C. A. (2013). Validation of the Portuguese version of the Stanford presenteeism scale in nurses. *International Journal of Nursing Practice*, *19*(6), 644-650. doi:10.1111/ijn.12117

Lerner, D., Amick, B. C. III, Rogers, W. H., Malspeis, S., Bungay, K., & Cynn, D. (2001). The work limitations questionnaire. *Medical Care 39*(1), 72-85. Retrieved from http://journals.lww.com/lww-medicalcare/Fulltext/2001/01000/The_Work_Limitations_Questionnaire.9.aspx

Letvak, S. A., Ruhm, C. J., & Gupta, S. N. (2012). Nurses' presenteeism and its effects on self-reported quality of care and costs. *American Journal of Nursing, 112*(2), 30-38, 39. doi:10.1097/01.NAJ.0000411176.15696.f9

Mazurek Melnyk, B., Orsolini, L., Tan, A., Arslanian-Engoren, C., D'Eramo Melkus, G., Dunbar-Jacob, J., … Lewis, L. M. (2018). A national study links nurses' physical and mental health to medical errors and perceived worksite wellness. *Journal of Occupational and Environmental Medicine, 60*(2), 126-131. doi:10.1097/JOM.0000000000001198

McNeely, E. (2005). The consequences of job stress for nurses' health: Time for a check-up. *Nursing Outlook, 53*(6), 291-299. doi:10.1016/j.outlook.2005.10.001

Myers, N. D., Ahn, S., & Jin, Y. (2011). Sample size and power estimates for a confirmatory factor analytic model in exercise and sport: A Monte Carlo approach. *Research Quarterly for Exercise and Sport, 82*(3), 412-423. doi:10.1080/02701367.2011.10599773

Nunnally, J. C. (1978). *Psychometric theory* (2nd ed.). New York, NY: McGraw-Hill.

Occupational Safety and Health Administration. (2013). *Worker safety in your hospital: Know the facts.* Retrieved from https://www.osha.gov/dsg/hospitals/documents/1.1_Data_highlights_508.pdf

Ospina, M. B., Dennett, L., Waye, A., Jacobs, P., & Thompson, A. H. (2015). A systematic review of measurement properties of instruments assessing presenteeism. *American Journal of Managed Care, 21*(2), e171-e185.

Paschoalin, H. C., Griep, R. H., Lisboa, M. T. L., & de Mello, D. C. B. (2013). Transcultural adaptation and validation of the Stanford presenteeism scale for the evaluation of presenteeism for Brazilian Portuguese. *Rev Lat Am Enfermagem, 21*(1), 388-395.

Podsakoff, P. M, & Organ, D. W. (1986). Self-reports in organizational research: Problems and prospects. *Journal of Management, 12*(4), 531-544. doi:10.1177/014920638601200408

Prasad, M., Wahlqvist, P. Shikiar, R., & Shih, Y-C T. (2004). A review of self-report instruments measuring health-related work productivity: A patient-reported outcomes perspective. *Pharmacoeconomics, 22*(4), 225-244. doi:10.2165/00019053-200422040-00002

Qualtrics. (2018). Provo, UT: Author. Retrieved from http://www.qualtrics.com.

Rainbow, J. G., & Steege, L. M. (2017). Presenteeism in nursing: An evolutionary concept analysis. *Nursing Outlook, 65*(5), 615-623. doi:10.1016/j.outlook.2017.03.005

Sanchez Bustillos, A., Vargasm, K. G., 3rd, & Gomero-Cuadra, R. (2015). Work productivity among adults with varied body mass index: Results from a Canadian population-based survey. *Journal of Epidemiology and Global Health, 5*(2), 191-199. doi:10.1016/j.jegh.2014.08.001

Shih, T. H., & Fan, X. (2009). Comparing response rates in e-mail and paper surveys: A meta-analysis. *Educational Research Review, 4*(1), 26-40. doi:10.1016/j.edurev.2008.01.003

Shikiar, R., Halpern, M. T., Rentz, A. M., & Khan, Z. M. (2004). Development of the health and work questionnaire (HWQ): An instrument for assessing workplace productivity in relation to worker health. *Work, 22*(3), 219-229.

Skagen, K., & Collins, A. M. (2016). The consequences of sickness presenteeism on health and wellbeing over time: A systematic review. *Social Science Medicine, 161,* 169-177. doi:10.1016/j.socscimed.2016.06.005.

Smith, C. A. (2016). *Presenteeism in nursing: A mixed methods study of its relationship with nurse fatigue and patient safety* (Doctoral dissertation). Available from ProQuest Dissertations and Theses database. (UMI No. 10103952)

SPSS Statistics. (2016).

Stata/SE 15.0 for Mac. (2017).

Steege, L. M., & Rainbow, J. G. (2017). Fatigue in hospital nurses — "Supernurse" culture is a barrier to addressing problems: A qualitative interview study. *International Journal of Nursing Studies*, *67*, 20–28. doi:10.1016/j.ijnurstu.2016.11.01

Team RC. (2016). R: A language and environment for statistical computing.

Thompson, A., Ospina, M., Dennett, L., Waye, A., & Jacobs, P. (2015, December). *IHE report: A systematic review of the measurement properties of self-report instruments that assess presenteeism*. Alberta, Canada: Institute of Health Economics.

Urden, L. D., & Roode, J. L. (1997). Work sampling: A decision-making tool for determining resources and work redesign. *Journal of Nursing Administration, 27*(9), 34-41.

U.S. Department of Labor, Bureau of Labor Statistics. (2016a). *Nonfatal occupational injuries and illness requiring days away from work, 2015*. Retrieved from https://www.bls.gov/news.release/pdf/osh2.pdf

U.S. Department of Labor, Buruea of Labor Statistics (2018b). *Occupational outlook handbook: Registered nurses*. Retrieved from https://www.bls.gov/ooh/healthcare/registered-nurses.htm.

Warren, C. L., White-Means, S. I., Wicks, M. N., Chang, C. F., Gourley, D., & Rice, M. (2011). Cost burden of the presenteeism health outcome: Diverse workforce of nurses and pharmacists. *Journal of Occupational and Environmental Medicine, 53*(1), 90-99. doi:10.1097/JOM.0b013e3182028d38

Williamson ,W. J. J., & Johnston, J. (1988). Understanding, evaluating and improving nursing productivity. *Nursing Management, 19*(5), 49-55. doi:10.1097/00006247-198805000-00010

World Health Organization. (2017). *Density of nursing and midwifery personnel (total number per 1000 population, latest available year).* Retrieved from http://www.who.int/gho/health_workforce/nursing_midwifery_density/en/

World Bank. (2018). *World Bank open data*. https://data.worldbank.org/

Manuscript 3

Risky Business:
A Mediated Model of Antecedents and Consequences of Presenteeism in Nursing

(To be submitted to International Journal of Nursing Studies)

Abstract

Aim. The aim of this study was to examine the fit of the Presenteeism in Nursing Model, a conceptual model of the relationships between presenteeism, its antecedents, and its consequences, among hospital RNs who provide direct patient care.

Background. Nurses have been identified as a high risk group for presenteeism, when one is present at work but not fully engaged. Presenteeism can occur due to multiple work, personal, and event factors and has been linked to negative patient, nurse, and organizational outcomes. A model that accounts for the multiple antecedents that lead to presenteeism, as well as the consequences of presenteeism, is needed.

Design. A cross-sectional survey of RNs was conducted in the United States on antecedents, consequences, and presenteeism.

Methods. A sample of 447 RNs who work on inpatient hospital units and provide direct patient care were recruited through hospitals, nursing organization listservs, and social media. Data were collected via an online survey comprised of reliable and validated measures and demographic questions. All data were collected between August 2017 and February 2018. Structural equation modeling was used to estimate the relationships in the proposed model.

Results. The overall model fit was good based on multiple fit indices. There were significant relationships between work environment, nurses' professional value, perceived stress and work-life balance, and presenteeism. There were also significant relationships between presenteeism and secondary trauma, compassion satisfaction, missed care, burnout, and turnover intention. These significant relationships align with prior literature and identify significant antecedents and consequences of presenteeism. Presenteeism was a mediator between multiple antecedents and turnover intention, missed care, burnout, secondary trauma, and compassion satisfaction.

Conclusions. The Presenteeism in Nursing Model holistically accounts for multiple significant presenteeism antecedents and consequences. This model can be used by practitioners and researchers in developing interventions to address presenteeism and improve health system, nurse, and patient outcomes.

Keywords: presenteeism, patient safety, nurse health, nurses, retaining nurses, work environment, intention to stay

Introduction

Improving patient outcomes has been established as a priority for healthcare practitioners, organizations, and governments worldwide (World Health Organization, 2005). This goal is captured in the Triple Aim of Healthcare, which seeks to improve patient experience and population health and reduce costs (Berwick, Nolan, & Whittington, 2008). Nurses are well-positioned to improve patient and cost outcomes (Aiken, Clarke, Sloane, Sochalski, & Silber, 2002). However, nurses—like other healthcare providers—report widespread fatigue, burnout, and dissatisfaction, which can negatively impact the patient care quality a nurse provides (Aiken et al., 2002; Barker & Nussbaum, 2011). As such, a fourth aim has been proposed, which seeks to improve the work life of healthcare providers to positively impact their ability to affect patient outcomes and healthcare costs (Bodenheimer & Sinsky, 2014). For example, high levels of fatigue or burnout are a by-product of poorly designed work systems. Increased levels of fatigue or burnout result in decreased performance of health professionals, in turn, negatively impacting patient outcomes and healthcare quality. Changes in the performance of health professionals can be more broadly defined as contributing to a state of presenteeism.

Presenteeism is defined as when a person is physically at work, but not fully engaged or functioning (Rainbow & Steege, 2017). A state of presenteeism can be due to acute or chronic illness, work environment antecedents (e.g., stressful work environment), or personal antecedents outside of work (e.g., work-life imbalance) (Garrow, 2016; Johns, 2010; Rainbow & Steege, 2017). The prevalence of presenteeism in nursing is higher than other work sectors (Aronsson, Gustafsson, & Dallner, 2000). Moreover, presenteeism in nurses is associated with multiple negative consequences for patient care, such as missed care, patient falls, and medication errors (Cassie, 2014; Letvak, Ruhm, & Gupta, 2012). One way to improve the work

lives of nurses and improve patient care quality is to address presenteeism. However, efforts to address presenteeism are limited due to focus on one antecedent when multiple interacting antecedents are occurring. Further, these interactions may result in or lead to presenteeism, which has multiple consequences. The importance of frameworks in guiding nursing research, specifically in health service research, has previously been established (Fox, Gardner, & Osborne, 2014). In order to understand and address presenteeism, a framework of the risk factors for and consequences of presenteeism is needed. Therefore, the purpose of this study was to test the proposed Presenteeism in Nursing Model (PNM).

Background

Theoretical Framework

Organizational theory and occupational health scholars have studied presenteeism prevalence, risk factors and consequences, and designed models and interventions (Aronsson & Gustafsson, 2005; McGregor, Iverson, Caputi, Magee, & Ashbury, 2014; Winona Pit & Hansen, 2016). However, none of these were developed specifically for presenteeism in nurses. Pragmatic adaptation of one of these models for use in nursing can capitalize on this body of existing research, while adding what is known about presenteeism specifically in the nursing context. The Dynamic Model of Presenteeism and Absenteeism (DMPA), created by Johns (2010), takes into account health events, work context factors, and personal context factors and their relation to presenteeism and absenteeism. This makes the model well-suited for adaptation for use in nursing, as examples of all these factors were identified as antecedents of presenteeism in a concept analysis of presenteeism in nursing (Rainbow & Steege, 2017).

Rainbow and Steege's (2017) concept analysis identified unique multidimensional antecedents in nursing that interact and can lead to presenteeism. Antecedents of presenteeism in

nursing include work-life imbalance, stressful work environment, poor health, and nursing professional identity. Consequences identified included decreased patient care quality, increased healthcare costs, and negative nurse health and wellbeing. These identified antecedents and consequences of presenteeism fit into the framework of the factors leading to presenteeism and consequences in the DMPA. The PNM is based on the DMPA, but designed specifically for the nursing context. The PNM adds the potential for interaction between antecedents because of the multifaceted demands in the nurse work environment highlighted in the concept analysis. A nurse may have more than one antecedent affecting his/her presenteeism. For example, nurses may feel the need to attend work even when sick, if the work environment is not properly staffed. In making the decision to attend work, nurses may consider their health, the work environment on the unit, and their commitment to their patients and coworkers. The PNM also posits presenteeism is a mediator between the antecedents and the consequences. Another difference between the PNM and the DMPA is that the DMPA considers both absenteeism and presenteeism. The PNM focuses only on presenteeism, because presenteeism is identified as three times as costly as absenteeism in overall workforce studies (Hemp, 2004). Additionally, nurses have lower rates of absenteeism due to health conditions than other professions (U.S. Department of Labor, 2016a). The PNM is illustrated in Figure 1.

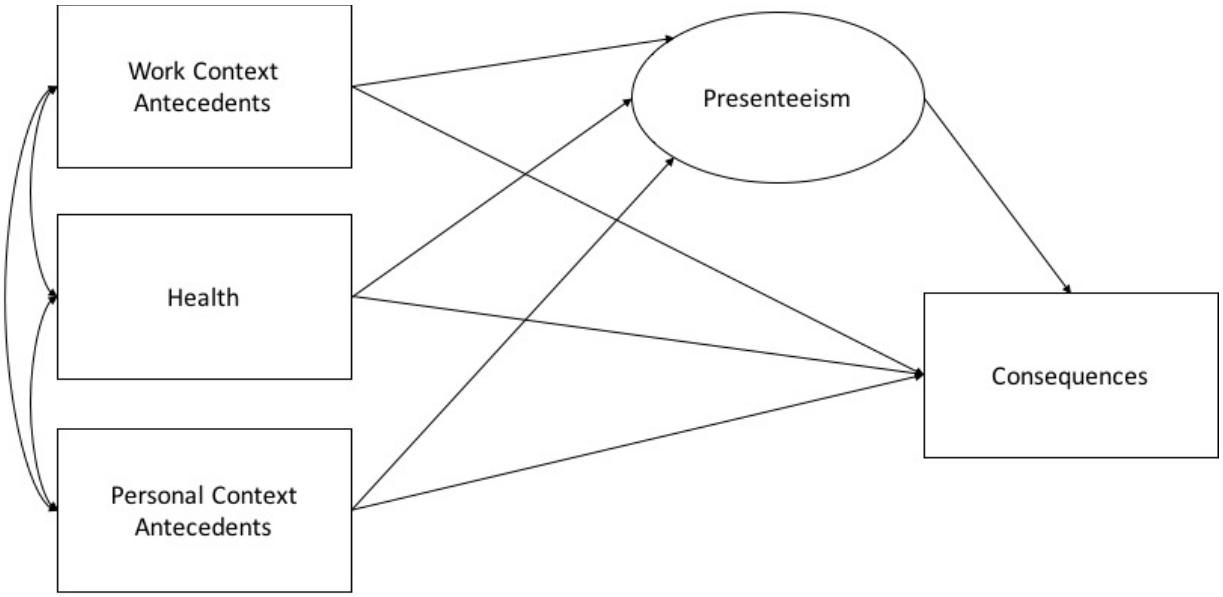

Figure 1. Proposed PMN.

Presenteeism Measurement

Presenteeism research has two foci, job stress and sickness. Each of these research foci have their own measures (Garrow, 2016). Presenteeism is a latent variable, and therefore, historically has been measured using retrospective self-report measures. Garrow (2016) highlights the multiple difficulties with current presenteeism measurement, including the debate about a threshold for presenteeism, the variety of measurement instruments and differences in approaches of the two foci. Measures often ask respondents to identify the prevalence of both signs (e.g., "I am unable to concentrate on my job due to work stress") and consequences of presenteeism (e.g., "How often did you almost cause an incident at work?") to assess presenteeism. Presenteeism is studied as both an outcome variable and an independent variable. The definition for presenteeism that we have chosen for this study is broader and encompasses both foci of presenteeism research. This broader conceptualization is necessary, because both types of presenteeism have been identified as prevalent in nursing (Rainbow, 2018). Therefore,

we have chosen to use presenteeism measures that employ different measurement approaches and come from both research foci in assessing presenteeism in this study.

Antecedents of presenteeism in nursing. The identified antecedents for presenteeism in nursing can be broken into three groups: health, work factors, and personal factors. All three types of antecedents are prevalent in hospitals, where 1.6 million registered nurses (RNs) work in the United States (U.S. Department of Labor, Bureau of Labor Statistics, 2016b). Hospitals have been declared one of the most hazardous places to work due to the unique risks and culture (Occupational Safety and Health Administration [OSHA], 2013). The negative relationship between stressful hospital work environments and presenteeism has been previously established (Gillespie, Gates, & Succop, 2011; Karimi, Cheng, Bartram, Leggat, & Sarkeshik, 2015; Umann, Guido, & Grazziano, 2012). For hospital nurses, the stressful work environment can include tension between coworkers, teamwork, and work conditions (e.g., shift length).

Personal factor antecedents include nursing professional identity, work-life imbalance, and perceived stress. Nurses prioritize their role as a caregiver or helper above their own health and wellbeing as a part of their professional identity. The helper identity has been linked to work-life imbalance and presenteeism (Aronsson et al., 2000; Hensel, 2011). Stress has been linked to increased presenteeism among nurses (Martinez & Ferreira, 2012).

Presenteeism due to poor health is often called sickness presenteeism. Poor health among nurses has been identified as an antecedent of presenteeism as well (Letvak et al., 2012; Noben et al., 2015). In a recent study of nurses across the United States, over 50% reported suboptimal health (Mazurek Melnyk et al., 2018).

While multiple antecedents have been identified as contributing to nurse presenteeism, they have generally been measured and described in isolation from one another. Nurses work in

complex work environments and have exposure to multiple risk factors that may cause them to be a presentee. For example, nurses can place their patients' needs above themselves and not go to the bathroom during a shift, which may lead to a urinary tract infection (UTI). The symptoms of a UTI may impact nurse engagement and performance at work, which can lead to negative consequences for the nurse (e.g., a bladder infection), for the patient (e.g., delayed or missed nursing care), and for the healthcare system (e.g., increased employee healthcare costs). In this example, multiple presenteeism antecedents compounded to lead to presenteeism. The potential compounding relationships of multiple antecedents are discussed, but not studied in the nursing literature. To address this gap, the PNM includes multiple antecedents and their potential interactions, in addition to their relationship to presenteeism. This addresses the gap in prior studies of presenteeism in nursing.

Consequences of presenteeism in nursing. There are multiple consequences of presenteeism for patients, nurse health and wellbeing, and healthcare organizations. A unique consequence of presenteeism in nursing and other healthcare workers, as compared to other professions such as factory workers, is negative patient outcomes. Presenteeism has been linked to omission of nursing care tasks and missed care (Cassie, 2014; Dhaini et al., 2017), as well as patient falls and medication errors (Letvak et al., 2012). Nurse health consequences have also been identified, including increased risk for anxiety and depression (Laranjeira, 2013). In addition, presenteeism is associated with negative organizational outcomes, including increased costs and staff turnover. One study examined presenteeism resulting from back pain and depression and estimated the cost of presenteeism to be $14,339 per nurse annually in the United States (Letvak et al., 2012). A study of presenteeism costs among the nursing and pharmacy workforce estimated the cost to be $33 trillion annually (Warren et al., 2011). However, these

studies only considered or estimated the cost consequences of presenteeism associated with a singular presenteeism antecedent. Therefore, it is likely that the true cost consequences of presenteeism are greater than currently understood.

Design

A cross-sectional design was used to examine the relationships in the PNM (see Figure 1).

Participants and Sample

A nationwide sample comprised of RNs who work on inpatient hospital units and provide direct patient care was recruited to take part in the online survey. Participants were recruited through listservs of nine nursing association and three hospital organizations, advertisements in *American Nurse Today*, and postings to social media (e.g., Facebook and Twitter). Based on the 26 measured variables, a sample size calculator recommended a minimum of sample size of 288 (Soper, 2018). The sample size requirements for structural equation modeling vary from a minimum of 30 to a maximum of 460 participants (Wolf, Harrington, Clark, & Miller, 2013). Based on these two calculations, we targeted a sample size between 288 and 460.

Data Collection

The survey included 13 reliable and validated instruments and demographic items and was conducted online via Qualtrics (2018). Participants were recruited between August 2017 and February of 2018. Raffles for gift cards were used as incentives for participant recruitment. A total of 447 RNs participated.

Measures

Figure 2 shows the relationships between the measures described below in the PNM.

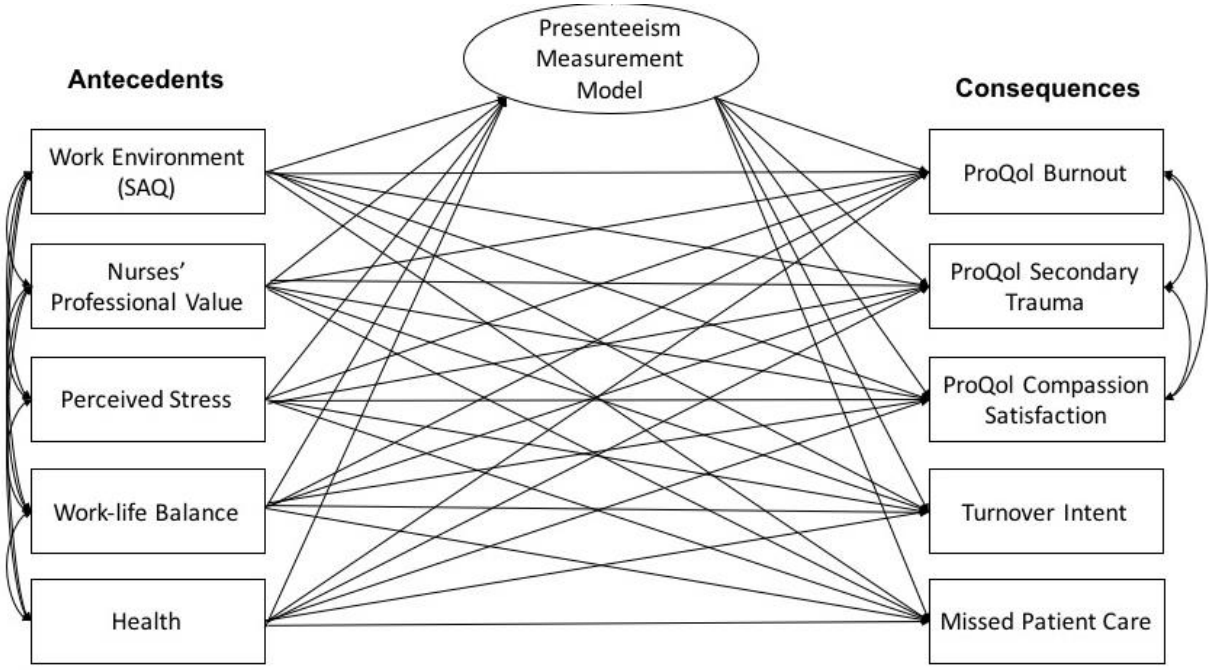

Figure 2. Presenteeism in nursing model with measures.

Nurse characteristics. Participants were asked demographic questions, including age, education, and gender. Participants were also asked about hours worked per week and years of experience as a RN.

Presenteeism measures. Presenteeism was measured using five reliable and validated presenteeism measures: The Healthcare Productivity Survey (HPS), the Job-Stress-Related Presenteeism Scale, the Nurses Work Functioning Questionnaire (NWFQ), the Stanford Presenteeism Scale (SPS-6), and the Health and Work Questionnaire (HWQ). These measures span the two presenteeism research foci and utilize different measurement approaches.

The HPS measures the extent to which workplace violence and trauma impact a healthcare provider's ability to do their job (Gillespie et al., 2011). The HPS has 29 items, utilizes a 5-point Likert scale ranging from -2 (decreased productivity) to +2 (increased

productivity). A total score is tallied; a score less than 0 indicates that an employee needs to take time away because their work may be affected.

The Job-Stress-Related Presenteeism Scale measures cognitive energy that is diverted from work due to job stress (Gilbreath & Karimi, 2012). The scale is 6-items and uses a 5-point Likert scale, with responses ranging from 1 (never) to 5 (all the time). A mean total score is calculated, with a higher score meaning more presenteeism.

The NWFQ was developed to assess impaired work functioning in the Netherlands for nurses and allied health professionals due to health conditions (Gartner, Nieuwenhuijsen, van Dijk, & Sluiter, 2011). The NWFQ is made-up of 50 items with seven subscales: cognitive aspects of task execution and general incidents, impaired decision making, causing incidents at work, avoidance behavior, conflicts and irritations with colleagues, impaired contact with patients and their family, and lack of energy and motivation. Standardized sum scores are calculated for each subscale ranging from 0 to100. Higher scores indicate impaired work functioning, which the authors equate to presenteeism conditions (Gartner et al., 2011).

The SPS-6 measures the ability to focus on one's job despite health issues (Koopman et al., 2002). The SPS-6 has six items and uses a 5-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). Total scores range from 6 to 30, with higher total scores indicating decreased presenteeism.

The HWQ measures the impact of health on work quality, quantity, and efficiency (Shikiar, Halpern, Rentz, & Khan, 2004). The HWQ is comprised of 24 items and has a 10-point response scale. Lower scores signify decreased performance. Additional details on the occurrence of presenteeism and the psychometrics of these measures can be found elsewhere (Rainbow, 2018).

Presenteeism antecedent measures. Work environment was assessed using The Safety Attitudes Questionnaire (SAQ), which was designed to measure the perceptions of teamwork, job satisfaction, management, safety climate, working conditions, and recognition of stress effects on clinical team (Sexton et al., 2006). The scale has 36 items and utilizes a 5-point Likert response scale, ranging from 1 (disagree strongly) to 5 (agree strongly). There are six subscales: teamwork climate, safety climate, job satisfaction, stress recognition, perceptions of management, and working conditions. The SAQ has been used in over 500 healthcare institutions and in a benchmarking study promoted by the Agency for Healthcare Research and Quality with over 10,843 responses (Sexton et al., 2006). The percent of positive responses for each subscale is calculated and converted to a 100-point scale. A higher score indicates that the respondent perceives a safer work climate.

The work-life balance measure was used to measure perceptions of balance between work and personal lives (Brough et al., 2014). The measure is comprised of four items and response options range from 1 (strongly disagree) to 5 (strongly agree). A mean score is calculated, with higher mean scores signifying better work-life balance.

The Perceived Stress Scale (PSS) was used to measure perceived stress (Cohen, Kamarck, & Mermelstein, 1983). The 10-item version of the PSS was used as it has been shown to have superior psychometrics (Lee, 2012). Response options range from 0 (never) to 4 (very often), and a total score is calculated. Total scores range from 0 to 40, with a higher score indicating higher perceived stress.

The Nurses Professional Values Scale Revised (NPVS-R) was used to measure professional self-identity (Weis & Schank, 2009). The NPVS-R has 26 items and response

options range from 1 (not important) to 5 (most important). Total possible scores range from 26 to 130, with higher scores indicating stronger nurse professional value orientation.

A self-rated health question was used to measure health (Lorig et al., 1996). This is one question that asks, "In general, would you say your health is…" and gives respondents a 5-point Likert scale, ranging from 1 (excellent) to 5 (poor). Self-rated health questions have been shown to be reliable and valid in multiple studies without placing increased burden on participants (Idler & Angel, 1990; Schoenfeld, Malmrose, Blazer, Gold, & Seeman, 1994).

Presenteeism consequences factor measures. *Turnover intent* was measured using a single item (Hinshaw & Atwood, 1983). The item stated, "Do you plan to leave this facility within the next year?" The item was scored on a 1 (not at all) to 7 (I surely do) Likert scale. This turnover intent item has been used in prior studies to assess turnover intent among nurses (Beecroft, Dorey, & Wenten, 2008).

The Professional Quality of Life Scale (ProQol) was used to assess quality of life (Stamm, 2005). There are 30 items and three subscales: compassion satisfaction, burnout, and secondary traumatic stress. The response scale ranges from 1 (never) to 5 (very often). Subscale scores range from 5 to 50. Lower scores on the compassion satisfaction subscale indicate decreased satisfaction. Higher scores on the burnout and secondary traumatic stress scales indicate higher risk for burnout and traumatic stress.

The MissCare Survey Part A was used to assess the frequency of missed nursing care (Kalisch & Williams, 2009). The 22-item scale asks how frequently nursing care tasks are missed on a 1 (never missed) to 5 (always missed) response scale. A total mean score is then calculated, with higher scores indicating more missed tasks.

Ethical Considerations

This study was approved by the University of Wisconsin-Madison Health Sciences Review Board. Survey responses were anonymous.

Data Analysis

All scales were scored according to published guidelines. Descriptive statistics of the scale scores and nurse characteristics were examined. Missing data were addressed through mean substitution (Kang, 2013). Structural equation modeling (SEM) to test the proposed model was performed using STATA (2017) software. The SEM was selected for this mediation analysis because it can test the multiple proposed relationships in one model, provides model fit information, and provides a framework for looking at latent variables, like presenteeism (Gunzler, Chen, Wu, & Zhang, 2013).

We first created a measurement model for the latent variable, presenteeism, using confirmatory factor analysis across the multiple presenteeism measures. A congeneric measurement model was selected because they are the least restrictive and allow for the use of different scales, degrees of precision and error across items (Graham, 2009). The second step was to estimate and evaluate the PNM. Due to the complexities in presenteeism measurement, we tested the PNM with presenteeism as one latent variable and an alternative model with the measurement model factor structure as separate variables. Model fit was evaluated based on the Chi-squared ($p > 0.05$), standardized root mean square residual (SRMR) (should be around 0.90 or lower), and confirmatory fit index (CFI) (0.95 or higher) (Iacobucci, 2010).

Results

Participant Characteristics

Participants surveyed came from 40 states. Sixty-six percent of our sample reported having a bachelor's degree. Those who provided race and gender identity were mostly Caucasian (92%) and female (94%). Participants worked on various hospital units, with 28.6% of respondents reporting working on more than one unit type. The three most common single unit types were emergency room (19%), long-term acute care/skilled nursing (10%), and labor and delivery/postpartum (9%). The most common patient populations served by nurses in this sample were adults and older adults (37%), only adults (23%), and pediatrics (10%). The majority of participants worked in large (400+ beds) hospitals (40%). The majority of participants worked day shift (44%) and 39% reported worked overtime in the last month. Additional participant characteristics are summarized in Table 1.

Table 1

Participant Characteristics

Characteristic	Mean	SD	Range
Hours worked weekly	34.0	8.7	0 – 72
Age	37.7	12.7	20 – 70
Years of experience as nurse	11.3	10.1	1 – 48

Presenteeism Measurement Model Analysis

As these measures have not all been previously used in the U.S. nursing population, we elected to separately conduct both exploratory and confirmatory factor analysis (EFA and CFA) for each of the presenteeism measures and subscales (described separately in Rainbow, 2018). We utilized the published factor/subscale structures for our CFA. We were able to conduct CFA following the published guidelines for the HPS, NQFA, SPS-6 and Job-Stress-Related

Presenteeism Scale. However, the HWQ scale would not converge to published subscale breakdowns in our CFA. This led to difficulties in creating a congeneric model that utilized the published subscales. Therefore, we elected to utilize the HWQ subscale breakdown that we identified in our EFA. Our subscale breakdown also identified five factors. Factor A included items 12–16, which is the same as the published HWQ *productivity items* subscale. Factor B contained items 17–24, which includes both the published *concentration/focus* and *impatience/irritability* subscales. Factor C contained items 8 and 10, which are the same as the *supervisor relations* subscale. Factor D contained items 4, 5, and 11, which are the same as the *non-work satisfaction* subscale. Factor E contained items 3 and 6, which were half of the *work satisfaction* subscale; however, items 6 and 7 did not load on this subscale as published. We were able to run a CFA on this version of the adapted version of the HWQ. We utilized this model of HWQ, along with the other published presenteeism subscales, to build our congeneric model of presenteeism. Our congeneric model identified three factors of presenteeism (see Table 2).

Table 2

Congeneric Factor Structure of Presenteeism

	Factor 1	Factor 2	Factor 3
SPS-6 Completing work			
SPS-6 Avoiding distraction			
Job-stress-related presenteeism	-0.53		
HWQ A Productivity			-0.54
HWQ B Concentration/focus & impatience/irritability	0.69		
HWQ C Supervisor relations	0.62		
HWQ D Non-work satisfaction	0.77		
HWQ E Work satisfaction	0.68		
NWFQ Cognitive aspects of task execution and general incidents			0.73
NWFQ Impaired decision making			
NWFQ Causing incidents at work			0.68
NWFQ Avoidance behavior	-0.69		
NWFQ Conflicts and irritations with colleagues	-0.80		
NWFQ Impaired contact with patients and their family			0.66

NWFQ Lack of energy and motivation	-0.70	
HPS Cognitive demands		0.74
HPS Time demands		0.81
HPS Support & communications with patients and visitors		0.80
HPS Safety and competency		0.79

Presenteeism factor 1 (behavior and relationships at work) included items that assessed the mood and behavior that individuals reported internally (e.g., distraction) and toward coworkers (e.g., avoidance or irritation). This factor included the Job-Stress-Related Presenteeism Scale, NWFQ avoidance behavior, NWFQ conflicts and irritations with colleagues, NWFQ lack of motivation, modified HWQ B including both the concentration/focus and impatience/irritability subscales, HWQ C supervisor relations, and HWQ E adapted work satisfaction scales. Our second factor, role of workplace violence, included the four subscales of the HPS, which assess presenteeism due to workplace violence. All of the subscales included in this factor ask participants to think back on a workplace violence incident and respond about how that affected performance at work (Gillespie et al., 2011). Our third factor, consequences at work, assesses presenteeism by asking about consequences in performance at work that could be signs of presenteeism. This factor included the HWQ productivity, NWFQ cognitive aspects of task execution and general incidents subscale, NWFQ causing incidents at work subscale, and the NWFQ impaired contact with patients and their families subscale. The SPS-6 presenteeism measure did not load on any of the three factors. These subscales each capture different approaches to presenteeism measurement by assessing signs of presenteeism and consequences of presenteeism. Presenteeism factor 2, role to workplace violence, captures presenteeism not traditionally measured in either the sickness or job-stress presenteeism measures. All three presenteeism factors had high internal consistency: (a) behavior and relationships at work (Cronbach's alpha = .90); (b) role of workplace violence (Cronbach's alpha = .88); and (c)

consequences at work (Cronbach's alpha = .83). This three-factor model cumulatively accounted for 96% of the variance in presenteeism.

Structural Model Findings

For each variable (e.g., missed care), a mean across all items was calculated for use in the model. Each mean score variable was then scaled for use in the model. The SEM was utilized to examine the fit of the initial proposed model (see Figure 2). The initial proposed PNM had good fit (X2 = 15.95, df =7, p=0.026; RMSEA= 0.061, CFI =0.993, SRMR = 0.017, TLI = .956, AIC: 8,688.93). The alternative PNM fit was also good (X2 = 13.69, df =7, p=0.057; RMSEA= 0.054, CFI =0.996, SRMR = 0.012, TLI = .959, AIC: 9,998.93). Figure 3 and Table 3 highlight the significant relationships (p<0.05 level) in the initial PNM. There were multiple significant paths in the alternative model seen in Figure 4 and Table 4.

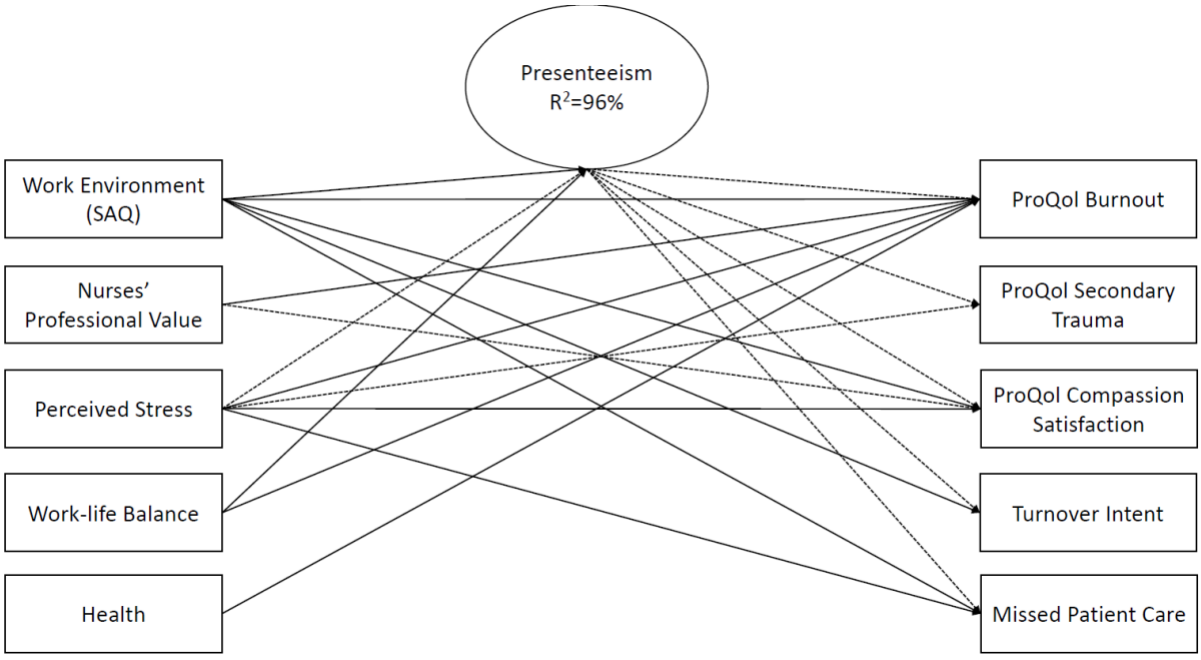

Figure 3. Significant pathways in the proposed PNM. Note: Significant pathways are significant at the p<0.05 level, a dashed line indications a positive or negative coefficient of 0.20 or greater.

Table 3

Initial PNM Path Estimates

Relationships	Coefficient	Std. Error	Z	P value	95% Confidence Interval
Presenteeism -> Proqol STS	-0.32	0.07	-4.46	0.000*	-0.46 to -0.18
Perceived Stress -> Proqol STS	0.24	0.06	4.19	0.000*	0.13 to 0.35
Nurses' professional value -> Proqol STS	-0.03	0.05	-0.62	0.537	-0.13 to 0.07
Work-life balance -> Proqol STS	-0.01	0.03	-0.21	0.831	-0.07 to 0.05
SAQ -> Proqol STS	0.00	0.00	0.40	0.689	-0.003 to 0.004
Health -> Proqol STS	0.05	0.04	1.47	0.143	-0.02 to 0.12
Presenteeism -> Missed Care	-0.31	0.05	-6.52	0.000*	-0.41 to -0.22
Perceived Stress -> Missed Care	-0.09	0.04	-2.49	0.013*	-0.17 to -0.02
Nurses' professional value -> Missed Care	-0.00	0.04	-0.05	0.959	-0.07 to 0.07
Work-life balance -> Missed Care	-0.00	0.02	-0.07	0.943	-0.04 to 0.04
SAQ -> Missed Care	-0.01	0.00	-4.60	0.000*	-0.01 to -0.00
Health -> Missed Care	-0.01	0.02	-0.42	0.673	-0.06 to 0.04
Presenteeism -> Turnover Intent	-0.76	0.28	-2.69	0.007*	-1.31 to -0.20
Perceived Stress -> Turnover Intent	-0.20	0.22	-0.90	0.369	-0.63 to 0.24
Nurses' professional value -> Turnover Intent	-0.08	0.21	-0.37	0.713	-0.48 to 0.33
Work-life balance -> Turnover Intent	-0.01	0.12	-0.05	0.961	-0.24 to 0.23
SAQ -> Turnover Intent	-0.05	0.01	-6.12	0.000*	-0.06 to -0.03
Health -> Turnover Intent	0.12	0.14	0.85	0.397	-0.16 to 0.40
Presenteeism -> PROQOL Burnout	-0.44	0.05	-8.36	0.000*	-0.54 to -0.33
Perceived Stress -> PROQOL Burnout	0.19	0.04	4.63	0.000*	0.11 to 0.27
Nurses' professional value -> PROQOL Burnout	-0.13	0.04	-3.33	0.001*	-0.20 to -0.05
Work-life balance -> PROQOL Burnout	-0.05	0.02	-2.07	0.038*	-0.10 to -0.00
SAQ -> PROQOL Burnout	-0.00	0.00	-3.34	0.001*	-0.01 to -0.00
Health -> PROQOL Burnout	0.06	0.03	2.13	0.034*	0.00 to 0.11
Presenteeism -> PROQOL CS	0.37	0.07	5.45	0.000*	0.24 to 0.51
Perceived Stress -> PROQOL CS	-0.11	0.05	-2.00	-0.045*	-0.21 to 0.00
Nurses' professional value -> PROQOL CS	0.26	0.05	5.06	0.000*	0.16 to 0.35
Work-life balance -> PROQOL CS	-0.00	0.03	-0.11	0.915	-0.06 to 0.05
SAQ -> PROQOL CS	0.00	0.00	2.04	0.041*	0.00 to 0.01
Health -> PROQOL CS	-0.06	0.03	-1.87	0.061	-0.13 to 0.00
Perceived Stress -> Presenteeism	-0.39	0.04	-10.66	0.000*	-0.47 to 0.32
Nurses' professional value -> Presenteeism	0.07	0.04	1.78	0.075	0.03 to 0.11
Work-life balance -> Presenteeism	0.07	0.02	3.20	0.001*	0.03 to 0.12
SAQ -> Presenteeism	0.01	0.00	7.97	0.000*	0.01 to 0.01
Health -> Presenteeism	-0.05	0.03	-1.81	0.070	-0.10 to 0.00

*Indicates significance P<0.05

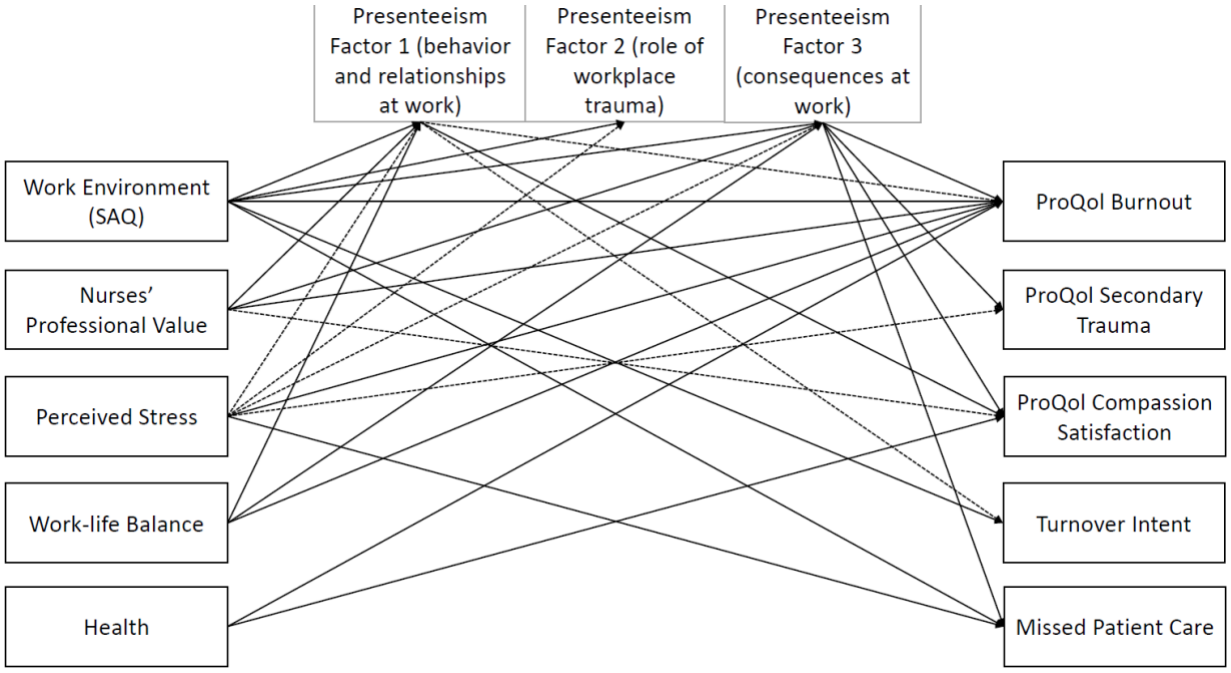

Figure 4. Significant pathways in the alternative PNM. Note: Significant pathways are significant at the p<0.05 level, a dashed line indicates a positive or negative coefficient of 0.20 or greater.

Table 4

Alternative PNM Path Estimates

Relationships	Coefficient	Std. Error	Z	P value	95% Confidence Interval
Presenteeism Factor 1 -> Proqol STS	0.10	0.06	1.59	0.112	-0.02 to 0.23
Presenteeism Factor 2 -> Proqol STS	-0.03	0.04	-0.79	0.430	-0.10 to 0.04
Presenteeism Factor 3 -> Proqol STS	0.15	0.05	3.18	0.001*	0.06 to 0.25
Perceived Stress -> Proqol STS	0.24	0.06	4.34	0.000*	0.13 to 0.36
Nurses' professional value -> Proqol STS	-0.02	0.05	-0.46	0.658	-0.13 to 0.08
Work-life balance -> Proqol STS	0.00	0.03	0.13	0.896	-0.06 to 0.06
SAQ -> Proqol STS	0.00	0.00	0.04	0.971	-0.00 to 0.00
Health -> Proqol STS	0.06	0.04	1.69	0.091	-0.01 to 0.13
Presenteeism Factor 1 -> Missed Care	0.07	0.04	1.58	0.115	-0.02 to 0.15
Presenteeism Factor 2 -> Missed Care	-0.02	0.02	-0.65	0.515	-0.06 to 0.03
Presenteeism Factor 3 -> Missed Care	0.19	0.03	6.04	0.000*	0.13 to 0.25
Perceived Stress -> Missed Care	-0.08	0.04	-2.11	0.035*	-0.15 to -0.01
Nurses' professional value -> Missed Care	0.02	0.03	0.49	0.624	-0.05 to 0.09
Work-life balance -> Missed Care	0.01	0.02	0.45	0.656	-0.03 to 0.05
SAQ -> Missed Care	-0.01	0.00	-5.06	0.000*	-0.01 to 0.00
Health -> Missed Care	-0.00	0.02	-0.07	0.940	-0.05 to 0.04
Presenteeism Factor 1 -> Turnover Intent	0.73	0.25	2.89	0.004*	0.24 to 1.22
Presenteeism Factor 2 -> Turnover Intent	0.14	0.14	0.98	0.327	-0.14 to 0.41
Presenteeism Factor 3 -> Turnover Intent	0.15	0.19	0.82	0.415	-0.22 to 0.53
Perceived Stress -> Turnover Intent	-0.29	0.22	-1.30	0.193	-0.73 to 0.15

Nurses' professional value -> Turnover Intent	-0.00	0.21	-0.01	0.995	-0.41 to 0.41
Work-life balance -> Turnover Intent	0.00	0.12	0.02	0.985	-0.24 to 0.24
SAQ -> Turnover Intent	-0.04	0.01	-5.17	0.000*	-0.06 to -0.03
Health -> Turnover Intent	0.13	0.14	0.92	0.356	-0.14 to 0.40
Presenteeism Factor 1 -> PROQOL Burnout	0.24	0.05	5.18	0.000*	-0.15 to 0.33
Presenteeism Factor 2 -> PROQOL Burnout	-0.02	0.03	-0.84	0.401	-0.07 to 0.03
Presenteeism Factor 3 -> PROQOL Burnout	0.13	0.03	3.85	0.000*	0.07 to 0.20
Perceived Stress -> PROQOL Burnout	0.19	0.04	4.56	0.000*	0.11 to 0.27
Nurses' professional value -> PROQOL Burnout	-0.11	0.04	-2.95	0.003*	-0.19 to -0.04
Work-life balance -> PROQOL Burnout	-0.04	0.02	-1.98	0.048*	-0.09 to 0.00
SAQ -> PROQOL Burnout	0.00	0.00	-2.71	0.007*	-0.01 to 0.00
Health -> PROQOL Burnout	0.07	0.03	2.54	0.011*	0.01 to 0.12
Presenteeism Factor 1 -> PROQOL CS	-0.02	0.06	-3.80	0.000*	-0.36 to 0.11
Presenteeism Factor 2 -> PROQOL CS	0.03	0.03	0.80	0.429	-0.04 to 0.09
Presenteeism Factor 3 -> PROQOL CS	-0.10	0.05	-2.08	0.038*	-0.19 to 0.00
Perceived Stress -> PROQOL CS	-0.10	0.05	-1.91	0.056	-0.21 to 0.01
Nurses' professional value -> PROQOL CS	0.24	0.05	4.65	0.000*	-0.19 to 0.01
Work-life balance -> PROQOL CS	-0.00	0.03	-0.02	0.987	-0.06 to 0.06
SAQ -> PROQOL CS	0.03	0.00	1.42	0.157	-0.00 to 0.01
Health -> PROQOL CS	-0.07	0.03	-2.10	0.035*	-0.14 to 0.00
Perceived Stress -> Presenteeism Factor 1	0.48	0.05	10.23	0.000*	0.39 to 0.57
Nurses' professional value -> Presenteeism Factor 1	-0.12	0.05	-2.31	0.032*	-0.21 to 0.02
Work-life balance -> Presenteeism Factor 1	-0.07	0.03	-2.25	0.024*	-0.12 to 0.01
SAQ -> Presenteeism Factor 1	-0.02	0.00	-10.08	0.000*	-0.02 to 0.01
Health -> Presenteeism Factor 1	0.044	0.03	1.31	0.189	-0.02 to 0.11
Perceived Stress -> Presenteeism Factor 2	-0.24	0.08	-3.11	0.002*	-0.40 to 0.09
Nurses' professional value -> Presenteeism Factor 2	-0.14	0.08	-1.71	0.088	-0.30 to 0.02
Work-life balance -> Presenteeism Factor 2	0.03	0.05	0.61	0.540	-0.07 to 0.012
SAQ -> Presenteeism Factor 2	0.01	0.00	3.50	0.000*	0.00 to 0.02
Health -> Presenteeism Factor 2	-0.01	0.06	-0.18	0.859	-0.12 to 0.10
Perceived Stress -> Presenteeism Factor 3	0.37	0.06	5.74	0.000*	0.24 to 0.49
Nurses' professional value -> Presenteeism Factor 3	-0.17	0.07	-2.43	0.015*	-0.30 to 0.03
Work-life balance -> Presenteeism Factor 3	-0.15	0.04	-3.87	0.000*	-0.23 to 0.08
SAQ -> Presenteeism Factor 3	-0.01	0.00	-2.54	0.011*	-0.01 to 0.00
Health -> Presenteeism Factor 3	0.03	0.05	0.59	0.558	-0.06 to 0.11

*Indicates significance P<0.05

The alternative model had four additional significant pathways when compared to the structural PNM. There was a significant negative relationship between nurses' professional value and presenteeism in the alternative model. This relationship means that nurses with lower professional value have higher presenteeism. There was also a significant positive relationship between perceived stress and burnout. There was also a significant negative relationship between work environment and burnout. These two relationships mean that more stress and lower

perceptions of the work environment are linked to more burnout. Lastly, there was a significant relationship between presenteeism factor 3 (consequences at work) and burnout. This relationship means that higher presenteeism is related to higher burnout. The alternative model provided additional information about presenteeism measurement domains and their relationships to the antecedent and consequences variables.

In comparing the two models, the proposed model had a lower AIC than the alternative model (8,688.93 in comparison to 9,998.93), which suggests it has an improved fit (Schreiber et al., 2006). However, the CFI, RMSEA, SRMR, and TLI were all improved in the alternative model (Schreiber et al., 2006). The complexities of the differences in the measurement approaches in the measurement model made the path estimates in the alternative model more interpretable. Presenteeism factors 1 (behavior and relationships at work) and 3 (consequences at work) both reveal higher presenteeism with a higher score. Presenteeism factor 2 (role of workplace violence) reveals more presenteeism at a lower score. Presenteeism was a significant mediator between multiple antecedents and turnover intention, secondary trauma, missed care, and compassion satisfaction in both models.

Discussion

This study examined the fit of the PNM for use in nursing. In this study, we conceptualized presenteeism as presence at work when not fully engaged and/or performing. This conceptualization was broader than previous studies that often conceptualize presenteeism as due specifically to work stress or sickness (Aronsson et al., 2000; Gilbreath & Karimi, 2012). We identified a three-factor measurement model of presenteeism for this conceptualization. The overall model fit was good based on multiple fit indices.

Although we elected to use the alternative PNM, we believe that the measurement model we identified was an important finding of this study. The differences in presenteeism measurement come from the different approaches to measurement of the latent concept and the different areas of presenteeism research (Brooks, Hagen, Sathyanarayanan, Schultz, & Edington, 2010; Garrow, 2016; Ospina, Dennett, Waye, Jacobs, & Thompson, 2015). Some scholars focus on asking participants about impacted work performance to ascertain if presenteeism occurred, while others ask about perceptions of work (e.g., satisfaction and engagement) (Gartner et al., 2011; Shikiar et al., 2004). Because of these differences, combining measures is difficult. Our measurement model provides insight into three approaches to measure the concept of presenteeism. Further exploration of the utility of combining approaches is needed. This work can explore other existing measures of presenteeism for measurement model fit, as well as if certain factors in the model are more salient for different populations. For example, factor 2 focuses on the role of workplace violence, which may not be a salient precursor to presenteeism for employees who do not experience workplace violence.

There were significant relationships between presenteeism and work environment, perceived stress, and work-life balance. Positive work environment was related to decreased presenteeism. This relationship between work environment in presenteeism has been previously established (Merrill et al., 2012; Musich, Hook, Baaner, Spooner, & Edington, 2006). Unfortunately, the hospital work environment has been declared hazardous by OSHA (2013) due to culture and multiple demands. One element of the work environment that is particularly salient in healthcare is teamwork. Teamwork is an important part of providing safe care in the hospital work environment (Manser, 2009). However, not all healthcare teams are high performing (Baker, Day, & Salas, 2006). These can arise due to hierarchies, issues in

communication, and differences in values and goals (Xyrichis & Ream, 2008). Teamwork can lead to consequences for patients and healthcare providers (Manser, 2009; Xyrichis & Ream, 2008). Teamwork is one area of the hospital work environment that could be improved to facilitate improved staff, patient, and healthcare outcomes. However, hospital systems are complex systems, and improved teamwork alone will not solve the many work environment issues. Further exploration into the relationship of the work environment and presenteeism can provide insight into the role of different work environment factors (including teamwork) in presenteeism and its related consequences. In our model, presenteeism is a mediator between the work environment and secondary trauma, so secondary trauma could be improved, as well, if work environment issues are addressed.

Consistent with prior literature, stress and presenteeism were positively related in this study (Elstad & Vabø, 2008). One cause of stress that is unfortunately common in nursing is workplace violence. The OSHA (2015) defines workplace violence as violent and verbal acts directed at an employee while at work. Missed work due to workplace violence is four times as common in healthcare as in other industries in the United States (OSHA, 2015). Workplace violence has been linked to negative physiological, emotional, and social reactions among nurses (Yildirim & Yildirim, 2007). The link between workplace violence and presenteeism among nurses has also been identified previously (Gates, Gillespie, & Succop, 2011). Studying presenteeism as resulting from workplace violence was the basis for the development of the Healthcare Productivity Scale (Gillespie et al., 2011). There have been calls to institute zero tolerance policies for workplace violence from the American Nurses Association (2015) and Society of Trauma Nurses (Doyle & Thurman, 2015). Implementing ways to reduce workplace violence may improve the presenteeism that occurs because of it. Perceived stress and

presenteeism appear to have a complex relationship, and workplace violence is only one possible stressor involved. Further exploration of the relationship between stress and presenteeism in nursing is needed.

We found a negative relationship between nurses' professional value and presenteeism, which is the opposite of the relationship suggested by occupational health and business scholars (Aronsson et al., 2000). However, prior nursing research has identified high professional identity as crucial to the nursing profession (Moyo, Goodyear-Smith, Weller, Robb, & Shulruf, 2016; Weis & Schank, 2009). It is possible that there is a threshold of professional value that counteracts presenteeism behaviors, but that other high levels may be lead to presenteeism. For example, nurses who have very high professional value may also be aware of their own limits and respond accordingly, while other nurses who view their primary identity as a helper may be at risk for being presentee. It is also possible that a different measure of nurse professional value may provide better insight into how and if nurses view their role as helpers. The NPVS-R was developed specifically for use in nursing and has been used multiple times in this population (Fowler, 2013; Yarbrough, Martin, Alfred, & McNeill, 2017). However, a study of measures of nurse professional identity for use in nursing students found poor psychometrics for the NPVS-R (Cowin, Johnson, Wilson, & Borgese, 2013). Future work should explore other measures of professional value for use in this population.

Our finding that work-life balance was negatively related to presenteeism aligns with prior work that identified a relationship between work-life imbalance and presenteeism in the hospitality industry (Cullen & McLaughlin, 2006; Deery, 2008). We posit that individuals who have good work-life balance are able to be fully present in both their work and lives outsides of work leading to less presenteeism. These findings highlight the potential of addressing work-life

imbalance to improve presenteeism. Management scholars have found improving work-life balance improves employee performance and engagement at work (Khatri & Behl, 2013).

Like prior studies, we found a positive connection between presenteeism and turnover intention (Haque, 2015). Turnover intention has been linked to turnover among nurses (Takase, 2010). Nurse turnover is estimated to cost a healthcare organization between $10,098 and $88,000 per nurse (Li & Jones, 2013). By definition, individuals who are presentee are less engaged in their jobs. Our findings indicate that efforts to address presenteeism can potentially decrease turnover intention among nurses. Healthcare organizations with high turnover may want to look into presenteeism rates among their nursing population. Future interventions to address presenteeism may improve turnover intention among nurses.

We found that higher presenteeism and worse health are linked to less compassion satisfaction at work, while nurses' professional value was significantly positively related to compassion satisfaction. Compassion satisfaction is believed to mitigate the potential consequences of burnout and compassion fatigue (Conrad & Kellar-Guenther, 2006). These have both been linked to negative consequences for patients in prior studies (Aiken et al., 2002; Mchugh, Kutney-lee, Cimiotti, Sloane, & Aiken, 2011). Our findings indicate that three ways to increase compassion satisfaction is to improve nurse health and professional value and to address presenteeism.

Missed patient care was significantly related to perceived stress, presenteeism factor 1 (behavior and relationships at work), and work environment. Presenteeism has been identified as a mediator of missed patient care in prior work (Cassie, 2014; Dhaini et al., 2017). Nurses who are presentee may focus on tasks that are evaluated regularly, like medication administration times and charting. This may hide their presenteeism and prevent disciplinary action from their

employer. However, this can leave other important nursing care undone, such as bathing and/or ambulation. Missed patient care is an indicator of overall quality and safety (Ball, Murrells, Rafferty, Morrow, & Griffiths, 2014).

We did not identify significant relationship between health and presenteeism. However, this relationship has also been found by multiple researchers as well in and outside of nursing (Letvak et al., 2012; Stacy, Bloudek, Schwartz, Brin, & Papapetropoulos, 2012). It is possible that a more extensive health scale would have been superior to the one-item predictor that we used. Other researchers often consider a specific illness and its impact on presenteeism (e.g., back pain or depression) (Letvak et al., 2012). In this study, we wanted to assess overall health rather than one specific health condition. Future work should look at more advanced measures of health in relation to a broad conceptualization of presenteeism.

The PNM had very good fit overall. Presenteeism was a mediator between work-life balance, nurses' professional value, work environment and turnover intent, secondary trauma, and compassion satisfaction. The role of presenteeism as a mediator means that addressing presenteeism could improve turnover intent, burnout, missed care, secondary trauma, and compassion satisfaction. The significant antecedents of presenteeism are areas that can be addressed in future interventions. These antecedents of presenteeism span the work and personal lives of nurses. Work and personal lives do not occur completely in silos from each other, but instead are intertwined (Edwards & Rothbard, 2000). In nursing, where the work is physical, emotional, and mental, the separation is often difficult to define and measure (Kim & Windsor, 2015). This means that interventions to address presenteeism will need to span both work and personal antecedents. Work interventions will need to overcome multiple factors in the nurse work system. Human factors interventions that focus on the whole healthcare system are well-

suited to address these multiple factors in the healthcare work system (Carayon et al., 2014). Personal interventions will need to be developed to address the salient presenteeism antecedents for individuals. These personalized interventions can be tailored to be effective. For example, a nurse who has poor work-life balance may need a different intervention than a nurse who has a negative work environment.

Limitations of the Study

One of the limitations of this study was the use of retrospective self-report measures for all variables. The issues with retrospective self-report measurement tools have been previously reported (Banaji & Hardin, 1994). As a latent variable, presenteeism is more difficult to measure and is often measured through various measures and approaches. Because of this, it is important to look at potentially measuring the different variables in the model, including presenteeism, through a combination of objective and subjective data. For example, the consequences of presenteeism could be measured through patient outcomes data, as well as actual turnover, in a future study. This study focused on antecedents and consequences of presenteeism in nursing identified in a concept analysis (Rainbow & Steege, 2017). It is possible that there are antecedents and consequences beyond those measured in this survey that should be considered. This survey was the first study to look at presenteeism across multiple presenteeism measures and to focus on antecedents and consequences that spanned the personal and work realms. Additional studies are needed to validate this model in other samples and to consider the potential impact of measurement error.

Conclusion

Presenteeism in nursing is related to multiple antecedents. These antecedents span the work environment and the individual nurse. This is the first study to look at presenteeism as

occurring due to multiple antecedents and across multiple measures within the nursing population. We examined this more holistic view of presenteeism through a model of presenteeism antecedents and consequences adapted from the business literature. The PNM takes into account personal, health, and work factor antecedents that can lead to presenteeism and tests the role of presenteeism as a mediator between these antecedents and multiple consequences. We identified a three-factor measurement model of presenteeism and found that the PNM was well fitted. Presenteeism is a growing body of research, especially in the nursing population. However, the prevalence of presenteeism, its antecedents, and its consequences found in this study revealed the importance of addressing presenteeism for nurses, patients, and healthcare organizations. Future work to address presenteeism can target the multiple antecedents of presenteeism studied in this model. These interventions to address presenteeism may improve other nurse work issues, such as turnover and quality of life.

Manuscript 3 References

Aiken, L. H., Clarke, S. P., Sloane, D. M., Sochalski, J., & Silber, J. H. (2002). Hospital nurse staffing and patient mortality, nurse burnout, and job dissatisfaction. *JAMA: Journal of the American Medical Association*, *288*(16), 1987–1993. doi:10.1001/jama.288.16.1987

American Nurses Association. (2015, July 22). *Incivility, bullying, and workplace violence position statement.* Retrieved from https://www.nursingworld.org/practice-policy/work-environment/violence-incivility-bullying/

Aronsson, G., & Gustafsson, K. (2005). Attendance presenteeism: Prevalence, attendance-pressure factors, and an outline of a model for research. *Journal of Occupational and Environmental Medicine*, *47*(9), 958–966. doi:10.1097/01.jom.0000177219.75677.17

Aronsson, G., Gustafsson, K., & Dallner, M. (2000). Sick but yet at work. An empirical study of sickness presenteeism. *Journal of Epidemiology and Community Health*, *54*(7), 502–509. doi:10.1136/jech.54.7.502

Baker, D. P., Day, R., & Salas, E. (2006). Teamwork as an essential component of high-reliability organizations. *Health Services Research*, *41*(4 II), 1576–1598. doi:10.1111/j.1475-6773.2006.00566.x

Ball, J. E., Murrells, T., Rafferty, A. M., Morrow, E., & Griffiths, P. (2014). Care left undone during nursing shifts: Associations with workload and perceived quality of care. *BMJ Quality and Safety*, *23*(2), 116–125. doi:10.1136/bmjqs-2012-001767

Banaji, M., & Hardin, C. (1994). Affect and memory in retrospective reports. In N. Schwarz & S. Sudman (Eds.), *Autobiographical memory and the validity of retrospective reports* (pp. 71–86). New York: Springer-Verlag.

Barker, L. M., & Nussbaum, M. A. (2011). Fatigue, performance and the work environment: A survey of registered nurses. *Journal of Advanced Nursing*, *67*(6), 1370–1382. doi:10.1111/j.1365-2648.2010.05597.x

Beecroft, P. C., Dorey, F., & Wenten, M. (2008). Turnover intention in new graduate nurses: a multivariate analysis. *Journal of Advanced Nursing*, *62*(1), 41–52. doi:10.1111/j.1365-2648.2007.04570.x

Berwick, D. M., Nolan, T. W., & Whittington, J. (2008). The triple aim: Care, health, and cost. *Health Affairs (Project Hope)*, *27*(3), 759–769. doi:10.1377/hlthaff.27.3.759

Bodenheimer, T., & Sinsky, C. (2014). From triple to quadruple aim: Care of the patient requires care of the provider. *Annals of Family Medicine*, *12*(6), 573–576. doi:10.1370/afm.1713

Brooks, A., Hagen, S. E., Sathyanarayanan, S., Schultz, A. B., & Edington, D. W. (2010). Presenteeism: Critical issues. *Journal of Occupational and Environmental Medicine*, *52*(11), 1055–1067. doi:10.1097/JOM.0b013e3181f475cc

Brough, P., Timms, C., O'Driscoll, M. P., Kalliath, T., Siu, O., Sit, C., & Lo, D. (2014). Work-life balance: A longitudinal evaluation of a new measure across Australia and New Zealand workers. *International Journal of Human Resource Management, 25*(19), 2724–2744. doi:10.1080/09585192.2014.899262

Carayon, P., Wetterneck, T. B., Rivera-Rodriguez, A. J., Hundt, A. S., Hoonakker, P., Holden, R., & Gurses, A. P. (2014). Human factors systems approach to healthcare quality and patient safety. *Applied Ergonomics*, *45*(1), 14–25. doi:10.1016/j.apergo.2013.04.023

Cassie, F. (2014). Nursing research finds presenteeism steps up risk of missed care. *Nursing Review (1173-8014)*, *14*(6), 12.

Cohen, S., Kamarck, T., & Mermelstein, R. (1983). A global measure of perceived stress. *Journal of Health and Social Behavior*, *24*(4), 385–396. doi:10.2307/2136404

Conrad, D., & Kellar-Guenther, Y. (2006). Compassion fatigue, burnout, and compassion satisfaction among Colorado child protection workers. *Child Abuse and Neglect*, *30*(10), 1071–1080. doi:10.1016/j.chiabu.2006.03.009

Cowin, L. S., Johnson, M., Wilson, I., & Borgese, K. (2013). The psychometric properties of five professional identity measures in a sample of nursing students. *Nurse Education Today*, *33*(6), 608-613. doi:10.1016/j.nedt.2012.07.008

Cullen, J., & McLaughlin, A. (2006). What drives the persistence of presenteeism as a managerial value in hotels? Observations noted during an Irish work-life balance research project. *International Journal of Hospitality Management*, *25*(3), 510–516. doi:10.1016/j.ijhm.2004.09.006

Deery, M. (2008). Talent management, work-life balance and retention strategies. *International Journal of Contemporary Hospitality Management*, *20*(7), 792–806. doi:10.1108/09596110810897619

Dhaini, S. R., Zúñiga, F., Ausserhofer, D., Simon, M., Kunz, R., De Geest, S., & Schwendimann, R. (2017). Are nursing home care workers' health and presenteeism associated with implicit rationing of care? A cross-sectional multi-site study. *Geriatric Nursing*, *38*(1), 33–38. doi:10.1016/j.gerinurse.2016.07.003

Doyle, K. E., & Thurman, P. (2015). *Society of trauma nurses position statement: Workplace violence*. Retrieved from http://www.traumanurses.org/workplace-violence

Edwards, J. R., & Rothbard, N. P. (2000). Mechanisms linking work and family: Clarifying the relationship between work and family constructs. *Academy of Management Review*, *25*(1), 178–199. doi:10.2307/259269

Elstad, J. I., & Vabø, M. (2008). Job stress, sickness absence and sickness presenteeism in Nordic elderly care. *Scandinavian Journal of Public Health*, *36*(5), 467–474. doi:10.1177/1403494808089557

Fowler, D. L. (2013). Service-learning and nursing professional values development: An experimental research study. *Nursing Education Perspectives*, *34*(1), 50. doi:10.1097/00024776-201301000-00011

Fox, A., Gardner, G., & Osborne, S. (2014). A theoretical frameworks to support research of health service innovation. *Australian Health Review*, *39*(1), 70–75. doi:10.1071/ah14031

Garrow, V. (2016, February). *Presenteeism: A review of current thinking* (Institute for Employee Studies Report 507). Retrieved from https://www.employment-studies.co.uk/system/files/resources/files/507_0.pdf

Gartner, F. R., Nieuwenhuijsen, K., van Dijk, F. J. H., & Sluiter, J. K. (2011). Psychometric properties of the nurses work functioning questionnaire (NWFQ). *Plos One*, *6*(11). doi:10.1371/journal.pone.0026565

Gates, D. M., Gillespie, G. L., & Succop, P. (2011). Violence against nurses and its impact on stress and productivity. *Nursing Economic$*, *29*(2), 59–67.

Gilbreath, B., & Karimi, L. (2012). Supervisor behavior and employee presenteeism. *International Journal of Leadership Studies*, *7*(1), 114–131. Retrieved from https://www.regent.edu/acad/global/publications/ijls/new/vol7iss1/IJLS_Vol7Iss1_Gilbreath_pp114-131.pdf

Gillespie, G. L., Gates, D. M., & Succop, P. (2011). Psychometrics of the healthcare productivity survey. *Advanced Emergency Nursing Journal*, *33*(3), 258–271. doi:10.1097/tme.0b013e3181e97510

Graham, J. M. (2009). Congeneric and (essentially) tau-equivalet estimates of score reliability: What are they and how to use them. *Educational and Psychological Measurement*, *66*(6), 930–944. doi:10.1177/0013164406288165

Gunzler, D., Chen, T., Wu, P., & Zhang, H. (2013). Introduction to mediation analysis with structural equation modeling. *Shanghai Archives of Psychiatry*, *25*(6), 390–394. doi:10.3969/j.issn.1002-0829.2013.06.009

Haque, A. (2015). *The influence of presenteeism on job satisfaction and employee turnover intentions : Evidence from Bangladeshi employees*. Retrieved from http://ro.uow.edu.au/cgi/viewcontent.cgi?article=1861&context=buspapers

Hemp, P. (2004). Presenteeism: At work - but out of it. *Harvard Business Review*, *82*(10), 49–58.

Hensel, D. (2011). Relationships among nurses' professional self-concept, health, and lifestyles. *Western Journal of Nursing Research*, *33*(1), 45–62. doi:10.1177/0193945910373754

Hinshaw, A. S., & Atwood, J. R. (1983). Nursing staff turnover, stress, and satisfaction: Models, measures, and management. *Annual Review Nursing Research*, *1*, 133–153. doi:10.1007/978-3-662-40453-9_6

Iacobucci, D. (2010). Structural equations modeling: Fit indices, sample size, and advanced topics. *Journal of Consumer Psychology*, *20*(1), 90–98. doi:10.1016/j.jcps.2009.09.003

Idler, E. L., & Angel, R. J. (1990). Self-rated health and mortality in the NHANES-I epidemiologic follow-up study. *American Journal of Public Health*, *80*(4), 446–452. doi:10.2105/ajph.80.4.446

Johns, G. (2010). Presenteeism in the workplace: A review and research agenda. *Journal of Organizational Behavior*, *31*(4), 519–542. doi:10.1002/job.630

Kalisch, B. J., & Williams, R. A. (2009). Development and psychometric testing of a tool to measure missed nursing care. *Journal of Nursing Administration*, *39*(5), 211–219. doi:10.1097/NNA.0b013e3181a23cf5

Kang, H. (2013). The prevention and handling of the missing data. *Korean Journal of Anesthesiology*, *64*(5), 402–406. doi:10.4097/kjae.2013.64.5.402

Karimi, L., Cheng, C., Bartram, T., Leggat, S. G., & Sarkeshik, S. (2015). The effects of emotional intelligence and stress-related presenteeism on nurses' well-being. *Asia Pacific Journal of Human Resources*, *53*(3), 296–310. doi:10.1111/1744-7941.12049

Khatri, P. V., & Behl, J. (2013). Impact of work-life balance on performance of employees in the organisations. *Global Journal of Business Management*, *7*(1), 39–47. Retrieved from http://globalvisionpub.com/globaljournalmanager/pdf/1387009321.pdf

Kim, M., & Windsor, C. (2015). Resilience and work-life balance in first-line nurse manager. *Asian Nursing Research*, *9*(1), 21–27. doi:10.1016/j.anr.2014.09.003

Koopman, C., Pelletier, K. R., Murray, J. F., Sharda, C. E., Berger, M. L., Turpin, R. S., … Bendel, T. (2002). Stanford presenteeism scale: Health status and employee productivity. *Journal of Occupational and Environmental Medicine*, *44*(1), 14–20. doi:10.1097/00043764-200201000-00004

Laranjeira, C. A. (2013). Validation of the Portuguese version of the Stanford presenteeism scale in nurses. *International Journal of Nursing Practice*, *19*(6), 644–650. doi:10.1111/ijn.12117

Lee, E.-H. (2012). Review of the psychometric evidence of the perceived stress scale. *Asian Nursing Research*, *6*(4), 121–127. doi:10.1016/j.anr.2012.08.004

Letvak, S. A., Ruhm, C. J., & Gupta, S. N. (2012). Nurses' presenteeism and its effects on self-reported quality of care and costs. *American Journal of Nursing*, *112*(2), 30–8, 39. doi:10.1097/01.NAJ.0000411176.15696.f9

Li, Y., & Jones, C. B. (2013). A literature review of nursing turnover costs. *Journal of Nursing Management*, *21*(3), 405–418. doi:10.1111/j.1365-2834.2012.01411.x

Lorig, K., Stewart, A., Ritter, P., Gonzalez, V., Laurent, D., & Lynch, J. (1996). *Outcome measures for health education and other health care interventions*. Thousand Oaks, CA: Sage Publications.

Manser, T. (2009). Teamwork and patient safety in dynamic domains of healthcare: A review of the literature. *Acta Anaesthesiologica Scandinavica*, *53*(2), 143–151. doi:10.1111/j.1399-6576.2008.01717.x

Martinez, L. F., & Ferreira, A. I. (2012). Sick at work: Presenteeism among nurses in a Portuguese public hospital. *Stress and Health*, *28*(4), 297–304. doi:10.1002/smi.1432

Mazurek Melnyk, B., Orsolini, L., Tan, A., Arslanian-Engoren, C., D'Eramo Melkus, G., Dunbar-Jacob, J., … Lewis, L. M. (2018). A national study links nurses' physical and mental health to medical errors and perceived worksite wellness. *Journal of Occupational and Environmental Medicine*. doi:10.1097/JOM.0000000000001198

McGregor, A., Iverson, D., Caputi, P., Magee, C., & Ashbury, F. (2014). Relationships between work environment factors and presenteeism mediated by employees' health: A preliminary study. *Journal of Occupational Environmental Medicine*, *56*(12), 1319–1324. doi:10.1097/jom.0000000000000263

Mchugh, B. M. D., Kutney-lee, A., Cimiotti, J. P., Sloane, D. M., & Aiken, L. H. (2011). Nurses' widespread job dissatisfaction, burnout, and frustration with health benefits signal problems for patient care. *Health Affairs*, *2*(2), 202–210. doi:10.1377/hlthaff.2010.0100

Merrill, R. M., Aldana, S. G., Pope, J. E., Anderson, D. R., Coberley, C. R., Whitmer, R. W., & the Hero Research Study Subcommittee. (2012). Presenteeism according to healthy behaviors, physical health, and work environment. *Population Health Management*, *15*(5), 293–301. doi:10.1089/pop.2012.0003

Moyo, M., Goodyear-Smith, F. A., Weller, J., Robb, G., & Shulruf, B. (2016). Healthcare practitioners' personal and professional values. *Advances in Health Sciences Education*, *21*(2), 257–286. doi:10.1007/s10459-015-9626-9

Musich, S., Hook, D., Baaner, S., Spooner, M., & Edington, D. W. (2006). The Association of Corporate Work Environment factors, health risks, and medical conditions with presenteeism among Australian employees. *American Journal of Health Promotion, 21*(2), 127–136. doi:10.4278/0890-1171-21.2.127

Noben, C., Evers, S., Nieuwenhuijsen, K., Ketelaar, S., Gartner, F., Sluiter, J., & Smit, F. (2015). Protecting and promoting mental health of nurses in the hospital setting: Is it cost-effective from an employer's perspective? *International Journal of Occupational Medicine and Environmental Health, 28*(5), 891–900. doi:10.13075/ijomeh.1896.00465

Occupational Safety and Health Administration. (2013). *Worker safety in your hospital: Know the facts.* Retrieved from https://www.osha.gov/dsg/hospitals/documents/1.1_Data_highlights_508.pdf

Occupational Safety and Health Administration (2015). *Workplace violence in healthcare: Understanding the challenge.* Retrieved from https://www.osha.gov/Publications/OSHA3826.pdf

Ospina, M. B., Dennett, L., Waye, A., Jacobs, P., & Thompson, A. H. (2015). A systematic review of measurement properties of instruments assessing presenteeism. *American Journal of Managed Care, 21*(2), e171-185.

Qualtrics. (2018). Provo, UT: Qualtrics. Retrieved from http://www.qualtrics.com

Rainbow, J. G. (2018). *How to know if you're really there: An evaluation of measures for presenteeism in nursing*. Unpublished manuscript.

Rainbow, J. G., & Steege, L. M. (2017). Presenteeism in nursing: An evolutionary concept analysis. *Nursing Outlook, 65*(5), 615–623. doi:10.1016/j.outlook.2017.03.005

Schoenfeld, D. E., Malmrose, L. C., Blazer, D. G., Gold, D. T., & Seeman, T. E. (1994). Self-rated health and mortality in the high-functioning elderly—A closer look at healthy individuals: MacArthur field study of successful aging. *Journal of Gerontology, 49*(3), M109-115. doi:10.1093/geronj/49.3.m109

Schreiber, J. B., Nora, A., Stage, F. K., Barlow, E. A., King, J., Nora, A., & Barlow, E. A. (2006). Reporting structural equation modeling and confirmatory factor analysis results: A review. *Journal of Educational Research, 99*(6), 232–338. doi:10.3200/JOER.99.6.323-338

Sexton, J. B., Helmreich, R. L., Neilands, T. B., Rowan, K., Vella, K., Boyden, J., … Thomas, E. J. (2006). The safety attitudes questionnaire: Psychometric properties, benchmarking data, and emerging research. *BMC Health Services Research, 6*, 44. doi:10.1186/1472-6963-6-44

Shikiar, R., Halpern, M. T., Rentz, A. M., & Khan, Z. M. (2004). Development of the health and work questionnaire (HWQ): An instrument for assessing workplace productivity in relation to worker health. *Work, 22*(3), 219–229. Retrieved from https://www.rti.org/publication/development-health-and-work-questionnaire-hwq-instrument-assessing-workplace

Soper, D. S. (2018). *A-priori sample size calculator for structural equation models*. Retrieved from http://www.danielsoper.com/statcalc

Stacy, M., Bloudek, L., Schwartz, M., Brin, M., & Papapetropoulos, S. (2012). Cervical dystonia substantially impacts employment status, absenteeism, and presenteeism: Baseline results from cervical dystonia patient registry for the observation of onabotulinumtoxinA efficacy (CD PROBE). *Movement Disorders*, *27*, s365–s365. Retrieved from https://onlinelibrary.wiley.com/toc/15318257/27/S1

Stamm, B. H. (2005). *The ProQOL manual*. Brooklandville, MD: Sidran Press.

Stata/SE 15.0 for Mac [Computer software]. (2017). College Station, TX: StataCorp.

Takase, M. (2010). A concept analysis of turnover intention: Implications for nursing management. *Collegian*, *17*(1), 3–12. https://doi.org/10.1016/j.colegn.2009.05.001

Umann, J., Guido, L. de A., & Grazziano, E. da S. (2012). Presenteeism in hospital nurses. *Presenteísmo En Enfermeros Hospitalarios.*, *20*(1), 159–166. doi:10.1590/s0104-11692012000100021

U.S. Department of Labor, Bureau of Labor Statistics. (2016a, November 10). *Nonfatal occupational injuries and illness requiring days away from work, 2015* (Press Release USDL-16-2130). Retrieved from https://www.bls.gov/news.release/pdf/osh2.pdf

U.S. Department of Labor, Bureau of Labor Statistics. (2016b). *Occupational employment and wages, May 2016*: *29-1141 registered nurses*. Retrieved from https://www.bls.gov/oes/current/oes291141.htm

Warren, C. L., White-Means, S. I., Wicks, M. N., Chang, C. F., Gourley, D., & Rice, M. (2011). Cost burden of the presenteeism health outcome: Diverse workforce of nurses and pharmacists. *Journal of Occupational & Environmental Medicine*, *53*(1), 90–99. doi:10.1097/JOM.0b013e3182028d38

Weis, D., & Schank, M. J. (2009). Development and psychometric evaluation of the nurses professional values scale—revised. *Journal of Nursing Measurement, 17*(3), 221–231. doi:10.1891/1061-3749.17.3.221

Winona Pit, S., & Hansen, V. (2016). The relationship between lifestyle, occupational health, and work-related factors with presenteeism amongst general practitioners. *Archives of Environmental and Occupational Health*, *71*(1), 49–56. doi:10.1080/19338244.2014.998329

Wolf, E. J., Harrington, K. M., Clark, S. L., & Miller, M. W. (2013). Sample size requirements for structural equation models: An evaluation of power, bias, and solution propriety. *Educational and Psychological Measurement*, *73*(6), 913–934. doi:10.1177/0013164413495237

World Health Organization. (2005). *World alliance for patient safety: WHO draft guidlines for adverse event reporting and learning systems from information to action*. Geneva, Switzerland: Author.

Xyrichis, A., & Ream, E. (2008). Teamwork: A concept analysis. *Journal of Advanced Nursing*, *61*(2), 232–241. doi:10.1111/j.1365-2648.2007.04496.x

Yarbrough, S., Martin, P., Alfred, D., & McNeill, C. (2017). Professional values, job satisfaction, career development, and intent to stay. *Nursing Ethics*, *24*(6), 675–685. doi:10.1177/0969733015623098

Yildirim, A., & Yildirim, D. (2007). Mobbing in the workplace by peers and managers: Mobbing experienced by nurses working in healthcare facilities in Turkey and its effect on nurses. *Journal of Clinical Nursing*, *16*(8), 1444–1453. doi:10.1111/j.1365-2702.2006.01814.x

Discussion

Presenteeism in nursing is a complex issue due to the multiple antecedents in the nursing work environment and nursing population. The consequences of presenteeism in nursing include impact on patient outcomes in addition to nurses' health and wellbeing and healthcare system costs. In this dissertation, the topic of presenteeism in nursing was explored through a concept analysis and a cross-sectional survey study. The concept analysis identified antecedents and consequences that were then queried in the survey study. Conducting a concept analysis on presenteeism in nursing also identified two gaps in research: (a) inconsistent conceptualization and measurement and (b) lack of a conceptual framework. The two aims of the cross-sectional survey were developed to address these gaps. There are three key overall study findings that will guide the development of my future program of research: (a) prevalence of presenteeism in nursing across presenteeism foci and measures, (b) need for improved measurement of presenteeism, and (c) goodness of fit of the Presenteeism in Nursing Model. This study also has provided insight into methodological strategies for contemporary nursing survey research.

Prevalence of Presenteeism across Presenteeism Foci and Measures

This study conceptualized presenteeism as presence at work when one is not fully engaged or performing. This conceptualization encompasses both the sickness and job stress foci of presenteeism frequently studied by other scholars. No other study of presenteeism in nursing has examined presenteeism across multiple foci and measures. Nurses in this study have higher levels of presenteeism than in previously published studies for each measure (see Manuscript 2). Presenteeism levels were high across measures from both the sickness and work stress foci of presenteeism. These high levels across foci point to a broader conceptualization as more appropriate for this population because both foci are prevalent. This broader conceptualization is

posited in prior work in both job stress and sickness presenteeism research. For example, Laranjeira (2013) recognized that anxiety and depression could be related to presenteeism and stressful work environment. The significant relationships between multiple antecedents and presenteeism imply that more than one antecedent can lead to presenteeism. This means that conceptualization that includes multiple antecedents is more appropriate than studying one antecedent alone. Future work should consider the potential interactions between antecedents as a part of a broader conceptualization of presenteeism.

I plan to carry this broader conceptualization into my future work. For example, in developing future measurement approaches for presenteeism, I will seek to include measures that do not look at presenteeism as the result of a specific cause, but rather as a work system issue resulting from multiple work and personal context antecedents. There are parallels between this broader conceptualization of presenteeism and conceptualizations of related constructs, such as fatigue. Fatigue was previously defined as having distinct dimensions (Åhsberg, 2000; Ream & Richardson, 1996). However, now fatigue is being conceptualized and measured holistically as resulting from the entire work system rather than specific risk factors (Frone & Tidwell, 2015; Steege & Dykstra, 2016). This approach will also be important in developing future interventions to address presenteeism. These interventions will need to target the diverse antecedents of presenteeism identified in this study.

Need for Improved Presenteeism Measurement

In this study, I examined presenteeism occurrence and psychometrics of five reliable and validated measures. These measures were selected from both foci of presenteeism research and utilized different measurement approaches. All of the measures were retrospective self-report. Manuscript 2 describes the psychometrics of all five measures for use in this population. In

Manuscript 3, I identified a measurement model for use in hospital nursing. The three factors of presenteeism identified in the measurement model were (1) behavior and relationships at work, (2) role of workplace trauma, and (3) consequences at work. The subscales used in these factors come from both research foci and take different approaches to measuring presenteeism. The findings of Manuscripts 2 and 3 related to this measurement model will guide my use of retrospective self-report measures in future work.

One of the goals of this dissertation was to explore the utility of combining five existing measures to create a concise retrospective self-report tool for use in future work. In future work, I plan to assess all three factors of the measurement model; however, I will use less measures, subscales, and items overall (see Manuscript 3, Figure 1). Given my findings about the psychometric properties of the HWQ in my sample (see Manuscript 2), I will not utilize this scale in future work. Similarly, as the SPS-6 did not load on any of the factors in the presenteeism measurement model, I will not utilize it in future work (see Manuscript 3). To measure Factor 1 (behavior and relationships at work), I will use the NWFQ *avoidance behavior*, *conflicts and irritations with colleagues*, and *lack of energy and motivation*, and the Job-Stress-Related Presenteeism scale. Removing the HWQ subscales from Factor 1 will decrease the Cronbach's alpha from 0.85 to 0.81. This is still above the Cronbach's alpha recommendation of 0.70 by Nunnally (1978) that was supported by Peterson (1994).

I plan to assess for the role of workplace trauma, Factor 2, with the HPS in future work, as I did in this study. I will utilize the NWFQ *cognitive aspects of task execution and general incidents*, *causing incidents at work*, and *impaired contact with patients and their families* to measure presenteeism Factor 3 (consequences at work). The Cronbach's alpha for presenteeism Factor 3 went up from 0.80 with the HWQ subscale included to 0.81, with only the three NWFQ

(cognitive aspects of task execution and general incidents, causing incidents at work, and impaired contact with patients and their families) subscales. See Table 1 for a comparison of the Cronbach's alphas used in my dissertation study versus my future proposed survey.

Table 1

Cronbach's Alpha of Measurement Model Comparison

	Presenteeism Factor 1 (behavior and relationships at work)	Presenteeism Factor 2 (role of workplace violence)	Presenteeism Factor 3 (consequences at work)	Entire measurement model
Cronbach's alpha in dissertation study	0.85	0.89	0.80	0.87
Cronbach's alpha of future measurement	0.81	0.89	0.81	0.85

This future survey will shorten the length of my questionnaire from 111 items to 78. I may also use screening questions in the future to limit the number of items. For example, I may employ skip logic and have nurses who report they do not experience workplace violence skip through the HPS items. I can also do further work on the factor structures of the NWFQ and HPS. My exploratory factor analyses (EFA) of these instruments differed than the published factor structures. In the future, I can explore my EFA findings to see if the overall measures can be improved through different factor structures and/or removing items. This is still a long survey, but I think these strategies may further shorten the length.

This study also provides valuable information about presenteeism prevalence and measurement and identifies issues with some of the currently available measures. All of the measures for use in nursing are retrospective self-report measures. There are issues with both retrospective and self-report measurement (Banaji & Hardin, 1994). The two biggest

measurement issues in presenteeism that I see in developing my program of research going forward are lack of prospective measurement and lack of objective measurement.

The current retrospective measures can provide valuable information about past presenteeism. Past presenteeism behavior has been shown to be a predictor of future health and work absence (Bergstrom, Bodin, Hagberg, Aronsson, & Josephson, 2009; Taloyan et al., 2012). However, to prevent the negative consequences of presenteeism from occurring, we must be able to identify when someone is presentee and when they are at risk for presenteeism. Identifying these thresholds will be key to proactively addressing presenteeism. We also need to understand if nurses are aware of their own presenteeism and if there is a conscious decision made to be presentee. This can be explored through a qualitative study of nurse experiences and awareness of presenteeism. Learning more about a nurse's level of awareness can provide valuable information about how to develop future monitoring strategies. I hypothesize that future approaches to monitor presenteeism will include subjective information and objective information.

However, we currently are unable to measure presenteeism objectively in nursing. Objective measurement of presenteeism overall is difficult (Brooks et al., 2010). Very few of the available subjective presenteeism measures have been tested against objective data (Ospina, Dennett, Waye, Jacobs, & Thompson, 2015). One exception is the HWQ, which has been compared to both performance and productivity hours lost (Shikiar, Halpern, Rentz, & Khan, 2004). This was one of the reasons that this measure was utilized in this study. However, this measure did not achieve the same psychometric values in the current sample as in previous studies (see Manuscript 2), which may limit its utility.

Objective measurement of presenteeism in nursing may be even more difficult than other worker populations due to the multiple demands that each nurse faces during a shift. Quantifying nurse performance and its value has been an ongoing area of research (Dick, Patrician, & Loan, 2017). This research has focused specifically on the value of nurses (Vanhook, 2007). New research in this area is utilizing technology, new modeling methods, and big data to track the value of a nurse to a patient and to the healthcare organization (Welton & Harper, 2016). Applying some of these same approaches to measuring presenteeism may improve measurement overall and allow for real-time measurement. I am particularly interested in the use of wearable sensing technology as a component in future real-time measurement. Wearable sensing technologies are relatively new, but technological advancements show promise for the future as a low-cost approach to health monitoring (Pantelopoulos & Bourbakis, 2010). Wearable technologies could collect proxy data presenteeism antecedents that could be used to predict presenteeism. For example, variance in speech, heart rate, and galvanic skin response have been found to signify stress (Bach et al., 2013; Taelman, Vandeput, Spaepen, & Van Huffel, 2009; Villarejo, Zapirain, & Zorrilla, 2012). Geneticists have used data from wearables to predict flare-ups of Lyme disease and believe they will be able to predict when one will get sick (Li et al., 2017). Both sickness and stress are antecedents of presenteeism (Rainbow & Steege, 2017). Measurement of these, along with other subjective data, may potentially predict future presenteeism. In continuing to build my program of research, I seek to build improved measures of presenteeism that are real-time and prospective and include objective data.

Goodness of Fit of the Presenteeism in Nursing Model

In Manuscript 3, I examined the fit of my proposed adapted model of presenteeism from business literature, the Presenteeism in Nursing Model. In the Presenteeism in Nursing Model,

presenteeism is a significant mediator between multiple antecedents and consequences. There were significant relationships between work environment, nurses' professional value, perceived stress and work-life balance, and presenteeism. These antecedents span both work and personal factors. I plan to utilize both systems and personalized approaches in developing interventions.

Systems approaches consider the micro and macro ergonomic factors in the work system (Carayon, 2006; Wilson, 2014). Systems-based interventions are recommended to improve patient care quality within healthcare systems (Institute of Medicine, 2001). Personalized interventions can target the presenteeism antecedents most salient to a particular individual (Alyass, Turcotte, & Meyre, 2015; Richards et al., 2007). For example, an individual who has a chronic health condition that leads them to be presentee would receive a different intervention than an individual who is presentee due to the stressful work environment. Developing systems-based and personalized interventions in tandem will be important, as factors in both the individual and the system are antecedents to presenteeism and these different factors may be linked.

Presenteeism is a significant mediator between these multiple antecedents and consequences in this model. This suggests that interventions to address presenteeism may improve secondary trauma, compassion satisfaction, missed patient care, and turnover intention. One of the challenges, though, is that this model is based on literature and one cross-sectional study. While it shows promising relationships, it does not offer complete understanding of the causal mechanisms between antecedents, the three presenteeism factors, and consequences. This model needs to be validated in another sample. Future work may need to collect longitudinal data to evaluate these relationships over time and to explore the why or how of these relationships,

particularly around what may contribute to one person being presentee while another is not with similar antecedents of presenteeism.

Lessons Learned about Recruitment of Registered Nurses

Outside of the contributions to the body of research on presenteeism in nursing, this study also contributes new knowledge about recruitment of registered nurses to participate in online survey research. Recruitment was one of the anticipated challenges of this study due to the large required sample size, length of the survey, and the online format for the survey. Nurses have also been identified as a difficult population to recruit (Kalisch, 2003).

In an attempt to combat the barrier of survey length, a survey center and five nurses acting as pilot participants were asked to provide feedback on the survey design and layout. To address potential recruitment issues, convenience and snowball sampling approaches were utilized. I also utilized social exchange and leverage-saliency theory in my recruitment strategies, which increase participation (Fan & Yan, 2010). Social exchange theory proposes that participants are more likely to participate when they perceive that the expected rewards of responding will outweigh any anticipated costs (Dillman, Smyth, & Christian, 2014). Leverage-saliency theory posits that individuals are more likely to participate in surveys they view as salient to them (Groves, Singer, & Corning, 2000). In order to increase the perceived rewards for participants, I created a video that introduced me, the study purpose and potential for future benefits, and the time cost of participating of this research. The video also explained to potential participants the prevalence and consequences of presenteeism identified in prior studies to persuade potential respondents that presenteeism is relevant to their nursing practice, their patients, and themselves. I did this to encourage beneficence and mutual trust, which have been shown to increase nurse survey response rates in previous studies (Im et al., 2006). We also

offered incentives for participation to increase the perceived reward. Nurses were recruited through nursing association listservs, hospital organization listservs, posts on social media, in-person at a nursing leadership conference, and advertisements. Additionally, participants had the option of sharing the survey link on their own social media at the end of the survey.

In order to track the recruiting success of the approaches, different links were utilized. Through tracking the links, it was clear that directly emailing the links to nurses through a healthcare organization and social media postings led to the most participants (see Table 2). The eight links given to nursing association listservs produced less than 10 participants per link, with some links only producing one respondent. However, these links led to 50% completed surveys, which was higher than the other two approaches; social media yielded 38% completed surveys and hospital links yielded 48% completed surveys.

Table 2

Participants from Various Links

Location	Started Surveys	Consenting Participants		Participants Completing Survey	
		N	%	N	%
Hospital Links	60	41	71	30	48
Nursing Organization Links	269	190	68	128	50
Social Media Link	500	359	72	192	38
Total	829	590	71	350	42

The difference between the number who started the survey and the number who consented highlights the importance of having screening questions. This is especially important in situations where there is limited space to discuss the survey and the researcher does not have complete control over the spreading of the survey link. It is very possible that many people who clicked on the link did not know the inclusion criteria until they attempted to start the survey. In comparison, hospital organizations were able to target potential participants who met the

inclusion criteria within their organizations, so the number of participants attempting the survey who did not meet the criteria was much smaller.

Another lesson learned about survey recruitment was about structure of social media postings. On one social media page, in particular, I made three separate postings over four months. The initial post was very informational, while the second post was asking for advice about how to recruit nurses. The post asking for advice did not include the link for the survey, but there was an overwhelming positive response, with others suggesting that they would like to participate in the survey if I would give the link. The effectiveness of this strategy cannot be formally tested, because the survey link was also available through other sites during the same time period. However, there were 250 surveys started in the week following this particular post. This aligns with the idea that nurses are beneficent and wanted to help a graduate student get survey respondents, and this desire may be stronger than just informing nurses there is a survey with participation incentives.

I also learned about the feasibility of recruiting nurses from nursing practice conferences. There were three different nursing practice conferences that we contacted to discuss onsite recruitment. All three conferences stated that it was against their policy to allow access for onsite recruitment of participants. I know that other researchers have had success with onsite conference recruitment in the past, but my experiences revealed that this is not always easily feasible. Instead, I focused onsite recruitment on networking with individuals who may have access to a population of nurses who could be recruited rather than recruiting nurses onsite. In future work, I plan to focus recruitment efforts of nurses through hospital organizations and social media.

Limitations

The limitations of this study related to each aim can be found in each of the three manuscripts. Overall, the limitations of this study are that it was a self-report survey, utilized convenience and snowball sampling techniques, and the length of the survey. Currently, all existing measures of presenteeism are self-report. The issues with self-report measures have been previously described. Future work should focus on creating more objective presenteeism measures. Future work should also focus on surveying nurses through other sampling techniques that may yield less bias in participation. However, for the purposes of this study, resources available, and the sample size needed, convenience and snowball sampling were appropriate. As previously described, this survey was long, which may have led to survey fatigue and a high number of participants dropping off partway through the survey. There were 100 participants who completed all the presenteeism measures, but did not complete the demographics questions at the end of the survey. Future work should test an abbreviated survey to compare findings. Although there were some limitations of this study, the overall aims of the study were accomplished and findings can serve as a basis for future research.

Conclusion

Through this dissertation study, I was able to explore conceptualization and measurement and evaluate a framework for researching presenteeism in nursing. The unique antecedents and consequences of presenteeism, in nursing along with the high prevalence, highlight the importance of this area of research. This dissertation study is the first step in my program of research to improve measurement and to develop interventions to address presenteeism. Through this dissertation study, I identified additional issues with current measurement of presenteeism. I also identified a three-factor structure spanning multiple presenteeism measures from different

research foci to guide more comprehensive measurement of this construct in future work. The Presenteeism in Nursing Model will continue to be refined, as I explore more antecedents, consequences, and measurement techniques to capture antecedents, consequences, and presenteeism itself. Future work can continue a broader conceptualization of presenteeism, explore new and improved measurement of presenteeism, and validate and expand the Presenteeism in Nursing Model.

Comprehensive Reference List

Agency for Healthcare Research and Quality. (2017). *Missed nursing care*. Retrieved from https://psnet.ahrq.gov/primers/primer/29/missed-nursing-care

Åhsberg, E. (2000). Dimensions of fatigue in different working populations. *Scandinavian Journal of Psychology*, *41*(3), 231–241. doi:10.1111/1467-9450.00192

Aiken, L. H., Clarke, S. P., Sloane, D. M., Sochalski, J., & Silber, J. H. (2002). Hospital nurse staffing and patient mortality, nurse burnout, and job dissatisfaction. *JAMA: Journal of the American Medical Association*, *288*(16), 1987–1993. doi:10.1001/jama.288.16.1987

Alyass, A., Turcotte, M., & Meyre, D. (2015). From big data analysis to personalized medicine for all: Challenges and opportunities. *BMC Medical Genomics*, *8*(1), 1–12. doi:10.1186/s12920-015-0108-y

American Nurses Association. (2015, July 22). *Incivility, bullying, and workplace violence position statement.* Retrieved from https://www.nursingworld.org/practice-policy/work-environment/violence-incivility-bullying/

Aronsson, G., & Gustafsson, K. (2005). Sickness presenteeism: Prevalence, attendance-pressure factors, and an outline of a model for research. *Journal of Occupational and Environmental Medicine*, *47*(9), 958–966. doi:10.1097/01.jom.0000177219.75677.17

Aronsson, G., Gustafsson, K., & Dallner, M. (2000). Sick but yet at work. An empirical study of sickness presenteeism. *Journal of Epidemiology and Community Health*, *54*(7), 502–509. doi:10.1136/jech.54.7.502

Bach, D. R., Flandin, G., Friston, K. J., Dolan, R. J., Sahoo, R., Sethi, S., … Peuscher, J. (2013). Stress detection from speech and galvanic skin response signals. *Journal of Neuroscience Methods*, *3820*(November), 209–214. doi:10.1109/CBMS.2013.6627790

Baker, D. P., Day, R., & Salas, E. (2006). Teamwork as an essential component of high-reliability organizations. *Health Services Research*, *41*(4 II), 1576–1598. doi:10.1111/j.1475-6773.2006.00566.x

Ball, J. E., Murrells, T., Rafferty, A. M., Morrow, E., & Griffiths, P. (2014). Care left undone during nursing shifts: Associations with workload and perceived quality of care. *BMJ Quality and Safety*, *23*(2), 116–125. doi:10.1136/bmjqs-2012-001767

Bambra, C., Whitehead, M., Sowden, A., Akers, J., & Petticrew, M. (2008). "A hard day's night?" The effects of compressed working week interventions on the health and work-life balance of shift workers: A systematic review. *Journal of Epidemiology and Community Health*, *62*(9), 764–777. doi:10.1136/jech.2007.067249

Banaji, M., & Hardin, C. (1994). Affect and memory in retrospective reports. In N. Schwarz & S. Sudman (Eds.), *Autobiographical memory and the validity of retrospective reports* (pp. 71–86). New York, NY: Springer-Verlag.

Barker, L. M., & Nussbaum, M. A. (2011). Fatigue, performance and the work environment: A survey of registered nurses. *Journal of Advanced Nursing, 67*(6), 1370–1382. doi:10.1111/j.1365-2648.2010.05597.x

Beecroft, P. C., Dorey, F., & Wenten, M. (2008). Turnover intention in new graduate nurses: A multivariate analysis. *Journal of Advanced Nursing, 62*(1), 41–52. doi:10.1111/j.1365-2648.2007.04570.x

Bergstrom, G., Bodin, L., Hagberg, J., Aronsson, G., & Josephson, M. (2009). Sickness presenteeism today, sickness absenteeism tomorrow? A prospective study on sickness presenteeism and future sickness absenteeism. *Journal of Occupational Enviromental Medicine, 51*(6), 629–638. doi:10.1097/JOM.0b013e3181a8281b

Bergström, G., Bodin, L., Hagberg, J., Lindh, T., Aronsson, G., & Josephson, M. (2009). Does sickness presenteeism have an impact on future general health? *International Archives of Occupational and Environmental Health, 82*(10), 1179–1190. doi:10.1007/s00420-009-0433-6

Berwick, D. M., Nolan, T. W., & Whittington, J. (2008). The triple aim: Care, health, and cost. *Health Affairs (Project Hope), 27*(3), 759–769. doi:10.1377/hlthaff.27.3.759

Blegen, M. A., Vaughn, T. E., & Goode, C. J. (2001). Nurse experience and education: Effect on quality of care. *Journal of Nursing Administration, 31*(1), 33-39. doi:10.1097/00005110-200101000-00007

Bodenheimer, T., & Sinsky, C. (2014). From triple to quadruple aim: Care of the patient requires care of the provider. *Annals of Family Medicine, 12*(6), 573–576. doi:10.1370/afm.1713

Brborović, H., Brborović, O., Brumen, V., Pavleković, G., & Mustajbegović, J. (2014). Are nurse presenteeism and patient safety culture associated: A cross-sectional study. *Archives of Industrial Hygiene and Toxicology,* 65(2), 149–156. doi:10.2478/10004-1254-65-2014-2462

Brborović, H., Daka, Q., Dakaj, K., & Brborović, O. (2017). Antecedents and associations of sickness presenteeism and sickness absenteeism in nurses: A systematic review. *International Journal of Nursing Practice*, *23*(6), e12598. doi:10.1111/ijn.12598

Brooks, A., Hagen, S. E., Sathyanarayanan, S., Schultz, A. B., & Edington, D. W. (2010). Presenteeism: Critical issues. *Journal of Occupational and Environmental Medicine, 52*(11), 1055–1067. doi:10.1097/JOM.0b013e3181f475cc

Brough, P., Timms, C., O'Driscoll, M. P., Kalliath, T., Siu, O., Sit, C., & Lo, D. (2014). Work-life balance: A longitudinal evaluation of a new measure across Australia and New Zealand workers. *International Journal of Human Resource Management, 25*(19), 2724–2744. doi:10.1080/09585192.2014.899262

Camerino, D., Sandri, M., Sartori, S., Conway, P. M., Campanini, P., & Costa, G. (2010). Shiftwork, work-family conflict among Italian nurses, and prevention efficacy. *Chronobiology International, 27*(5), 1105-1123. doi:10.3109/07420528.2010.490072

Carayon, P. (2006). Human factors of complex sociotechnical systems. *Applied Ergonomics, 37*(4), 525–535. doi:10.1016/j.apergo.2006.04.011

Cassie, F. (2014). Nursing research finds presenteeism steps up risk of missed care. *Nursing Review, 14*(6), 12.

Cicolini, G., Della Pelle, C., Cerratti, F., Franza, M., & Flacco, M. E. (2016). Validation of the Italian version of the Stanford presenteeism scale in nurses. *Journal of Nursing Management, 24*(5), 598–604. doi:10.1111/jonm.12362

Cohen, S., Kamarck, T., & Mermelstein, R. (1983). A global measure of perceived stress. *Journal of Health and Social Behavior*, *24*(4), 385–396. doi:10.2307/2136404

Conrad, D., & Kellar-Guenther, Y. (2006). Compassion fatigue, burnout, and compassion satisfaction among Colorado child protection workers. *Child Abuse and Neglect, 30*(10), 1071–1080. doi:10.1016/j.chiabu.2006.03.009

Cooper, C., & Dewe P. (2008). Well-being-absenteeism, presenteeism, costs and challenges. *Occupational Medicine, 58*(8), 522–524. doi:10.1093/occmed/kqn124

Cowin, L. S., Johnson, M., Wilson, I., & Borgese, K. (2013). The psychometric properties of five professional identity measures in a sample of nursing students. *Nurse Education Today, 33*(6), 608–613. doi:10.1016/j.nedt.2012.07.008

Cullen, J., & McLaughlin, A. (2006). What drives the persistence of presenteeism as a managerial value in hotels? Observations noted during an Irish work-life balance research project. *International Journal of Hospitality Management, 25*(3), 510–516. doi:10.1016/j.ijhm.2004.09.006

Dababneh, A. J., Swanson, N., & Shell, R. L. (2011). Impact of added rest breaks on the productivity and well being of workers. *Ergonomics, 44*(2), 164–174. doi:10.1080/00140130121538

Davidhizar, R. & Shearer, R. (1999). The "super nurse" syndrome. *Seminars for Nurse Managers, 7*(2), 59–62.

Deery, M. (2008). Talent management, work-life balance and retention strategies. *International Journal of Contemporary Hospitality Management, 20*(7), 792–806. doi:10.1108/09596110810897619

d'Errico, A., Viotti, S., Baratti, A., Mottura, B., Barocelli, A. P., Tagna, M., … Converso, D. (2014). Low back pain and associated presenteeism among hospital nursing staff. *Journal of Occupational Health, 55*(4), 276-283. doi:10.1539/joh.12-0261-oa

Dhaini, S. R., Zúñiga, F., Ausserhofer, D., Simon, M., Kunz, R., De Geest, S., & Schwendimann, R. (2017). Are nursing home care workers' health and presenteeism associated with implicit rationing of care? A cross-sectional multi-site study. *Geriatric Nursing, 38*(1), 33–38. doi:10.1016/j.gerinurse.2016.07.003

Dick, T. K., Patrician, P. A., & Loan, L. A. (2017). The value of nursing care: A concept analysis. *Nursing Forum, 52*(4), 357–365. doi:10.1111/nuf.12204

Dillman, D. A., Smyth, J. D., & Christian, L. M. (2014). *Internet, phone, mail, and mixed-mode surveys: The tailored design method* (4th ed.). Hoboken, NJ: Wiley.

Doyle, K. E., & Thurman, P. (2015). *Society of trauma nurses position statement: Workplace violence*. Retrieved from http://www.traumanurses.org/workplace-violence

Edwards, J. R., & Rothbard, N. P. (2000). Mechanisms linking work and family: Clarifying the relationship between work and family constructs. *Academy of Management Review, 25*(1), 178–199. doi:10.2307/259269

Eley, R., Eley, D., & Rogers-Clark, C. (2010). Reasons for entering and leaving nursing: An Australian regional study. *Australian Journal of Advanced Nursing, 28*(1), 6-13.

Elstad, J. I., & Vabø, M. (2008). Job stress, sickness absence and sickness presenteeism in Nordic elderly care. *Scandinavian Journal of Public Health, 36*(5), 467–474. doi:10.1177/1403494808089557

Fan, W., & Yan, Z. (2010). Factors affecting response rates of the web survey: A systematic review. *Computers in Human Behavior, 26*(2), 132–139. doi:10.1016/j.chb.2009.10.015

Fowler, D. L. (2013). Service-learning and nursing professional values development: An experimental research study. *Nursing Education Perspectives, 34*(1), 50. doi:10.1097/00024776-201301000-00011

Fox, A., Gardner, G., & Osborne, S. (2014). A theoretical framework to support research of health service innovation. *Australian Health Review, 39*(1), 70–75. doi:10.1071/ah14031

Frone, M. R., & Tidwell, M.-C. O. (2015). The meaning and measurement of work fatigue: Development and evaluation of the three-dimensional work fatigue inventory (3D-WFI). *Journal Occupational Health Psychology, 20*(3), 273–288. doi:10.1037/a0038700

Garrow, V. (2016). *Presenteeism: A review of current thinking*. Retrieved from https://www.employment-studies.co.uk/system/files/resources/files/507_0.pdf

Gartner, F. R., Nieuwenhuijsen, K., van Dijk, F. J. H., & Sluiter, J. K. (2010). The impact of common mental disorders on the work functioning of nurses and allied health professionals: A systematic review. *International Journal of Nursing Studies*, *47*(8), 1047-1061. doi:10.1016/j.ijnurstu.2010.03.013

Gartner, F. R., Nieuwenhuijsen, K., van Dijk, F. J. H., Sluiter, J. K. (2011). Psychometric properties of the nurses work functioning questionnaire (NWFQ). *PLoS One, 6*(11). doi:10.1371/journal.pone.0026565

Gartner, F. R., Nieuwenhuijsen, K., van Dijk, F. J. H., Sluiter, J. K. (2012). Interpretability of change in the nurses work functioning questionnaire: Minimal important change and smallest detectable change. *Journal of Clinical Epidemiology, 65*(12),1337–1347. doi:10.1016/j.jclinepi.2012.06.013

Gates, D. M., Gillespie, G. L., & Succop, P. (2011). Violence against nurses and its impact on stress and productivity. *Nursing Economics, 29*(2), 59–67.

Gaudine, A., Saks, A. M., Dawe, D., & Beaton, M. (2013). Effects of absenteeism feedback and goal-setting interventions on nurses' fairness perceptions, discomfort feelings and absenteeism. *Journal of Nursing Management, 21*(3), 591-602. doi:10.1111/j.1365-2834.2011.01337.x

Gherardi-Donato, E. C. da S., Cardoso, L., Teixeira, C. A. B., Pereira, S. de S., & Reisdorfer, E. (2015). Association between depression and work stress in nursing professionals with technical education level. *Revista Latino-Americana de Enfermagem*, *23*(4), 733–740. doi:10.1590/0104-1169.0069.2610

Gilbreath, B., & Karimi, L. (2012). Supervisor behavior and employee presenteeism. *International Journal of Leadership Studies*, *7*(1), 114–131. Retrieved from http://www.regent.edu/acad/global/publications/ijls

Gillespie, G. L., Gates, D. M., & Succop, P. (2011). Psychometrics of the healthcare productivity survey. *Advanced Emergency Nursing Journal, 33*(3), 258–271. doi:10.1097/tme.0b013e3181e97510

Groves, R. M., Singer, E., & Corning, A. (2000). Leverage-saliency theory of survey participation: Description and an illustration. *Public Opinion Quarterly*, *64*(3), 299–308. Retrieved from http://www.jstor.org/stable/3078721

Gunzler, D., Chen, T., Wu, P., & Zhang, H. (2013). Introduction to mediation analysis with structural equation modeling. *Shanghai Archives of Psychiatry*, *25*(6), 390–394. doi:10.3969/j.issn.1002-0829.2013.06.009

Gustafsson, S., Lovseth, L., Schenck-Gustafsson, K., & Fridner, A. (2013). What makes physicians go to work while sick: A comparative study of sickness presenteeism in four European countries (HOUPE). *Swiss Medical Weekly*. doi:10.4414/smw.2013.13840

Haque, A. (2015). *The influence of presenteeism on job satisfaction and employee turnover intentions: Evidence from Bangladeshi employees*. Retrieved from http://ro.uow.edu.au/cgi/viewcontent.cgi?article=1861&context=buspapers

Hayes, L. J., O'Brien-Pallas, L., Duffield, C., Shamian, J., Buchan, J., Hughes, F., … Stone, P. W. (2006). Nurse turnover: A literature review. *International Journal of Nursing Studies*, *43*(2), 237–263. doi:10.1016/j.ijnurstu.2011.10.001

Hemp, P. (2004). Presenteeism: At work - but out of it. *Harvard Business Review*, *82*(10), 49–58. Retrieved from https://www.researchgate.net/publication/8166899

Hensel, D. (2011). Relationships among nurses' professional self-concept, health, and lifestyles. *Western Journal of Nursing Research*, *33*(1), 45–62. doi:10.1177/0193945910373754

Hinshaw, A. S., & Atwood, J. R. (1983). Nursing staff turnover, stress, and satisfaction: Models, measures, and management. *Annual Review Nursing Research*, *1*, 133–153. doi:10.1007/978-3-662-40453-9_6

Iacobucci, D. (2010). Structural equations modeling: Fit indices, sample size, and advanced topics. *Journal of Consumer Psychology*, *20*(1), 90–98. doi:10.1016/j.jcps.2009.09.003

Idler, E. L., & Angel, R. J. (1990). Self-rated health and mortality in the NHANES-I epidemiologic follow-up study. *American Journal of Public Health*, *80*(4), 446–452. doi:10.2105/ajph.80.4.446

Im, E. O., Chee, W., Lim, H. J., Bender, M., Tsai, H. M., Yang, S. O., & Lee, H. (2006). Recruitment of oncology nurses for internet research: Issues and future directions. *Oncology Nursing Forum*, *33*(2), 249–254. doi:10.1188/06.onf.249-254

Institute for Healthcare Improvement (IHI). (2016). *The IHI triple aim*. Retrieved from http://www.ihi.org/engage/initiatives/tripleaim/pages/default.aspx

Institute of Medicine. (2001). *Crossing the quality chasm: A new health system for the 21th century*. Washington, DC: National Academies Press. doi:10.17226/10027

James, J. T. (2013). A new, evidence-based estimate of patient harms associated with hospital care. *Journal of Patient Safety, 9*(3), 122-128. doi:10.1097/PTS.0b013e3182948a69

Johns, G. (2010). Presenteeism in the workplace: A review and research agenda. *Journal of Organizational Behavior, 31*(4), 519–542. doi:10.1002/job.630

Juraschek, S. P., Zhang, X., Ranganathan, V., & Lin, V. W. (2012). United States registered nurse workforce report card and shortage forecast. *American Journal of Medical Quality, 27*(3), 241-249. doi:10.1177/1062860611416634

Kalisch, B. J. (2003). Recruiting nurses: The problem is the process. *Journal of Nursing Administration, 33*(9), 468–477.

Kang, H. (2013). The prevention and handling of the missing data. *Korean Journal of Anesthesiology, 64*(5), 402–406. doi:10.4097/kjae.2013.64.5.402

Karimi, L., Leggat, S. G., Cheng, C., Donohue, L., Bartram, T., & Oakman, J. (2017). Are organisational factors affecting the emotional withdrawal of community nurses? *Australian Health Review, 41*(4), 359–364. doi:10.1071/AH16027

Khatri, P. V., & Behl, J. (2013). Impact of work-life balance on performance of employees in the organisations. *Global Journal of Business Management, 7*(1), 39–47. Retrieved from http://globalvisionpub.com/globaljournalmanager/pdf/1387009321.pdf

Kim, M., & Windsor, C. (2015). Resilience and work-life balance in first-line nurse manager. *Asian Nursing Research, 9*(1), 21–27. doi:10.1016/j.anr.2014.09.003

Koopman, C., Pelletier, K. R., Murray, J, F,, Sharda, C., Berger, M., Turpin, R., … Bendel, T. (2002). Stanford presenteeism scale: Health status and employee productivity. *Journal of Occupational and Enviornomental Medicine, 44*(1), 14–20. doi:10.1097/00043764-200201000-00004

Laranjeira, C. A. (2013). Validation of the Portuguese version of the Stanford presenteeism scale in nurses. *International Journal of Nursing Practice, 19*(6), 644–650. doi:10.1111/ijn.12117

Lee, E.-H. (2012). Review of the psychometric evidence of the perceived stress scale. *Asian Nursing Research, 6*(4), 121–127. doi:10.1016/j.anr.2012.08.004

Lerner, D., Amick, B. C. III, Rogers, W. H., Malspeis, S., Bungay, K., & Cynn, D. (2001). The work limitations questionnaire. *Medical Care 39*(1), 72–85. Retrieved from http://journals.lww.com/lww-medicalcare/Fulltext/2001/01000/The_Work_Limitations_Questionnaire.9.aspx

Letvak, S. A., Ruhm, C. J., & Gupta, S. N. (2012). Nurses' presenteeism and its effects on self-reported quality of care and costs. *American Journal of Nursing, 112*(2), 30–39. doi:10.1097/01.NAJ.0000411176.15696.f9

Li, X., Dunn, J., Salins, D., Zhou, G., Zhou, W., Schüssler-Fiorenza Rose, S. M., … Snyder, M. P. (2017). Digital health: Tracking physiomes and activity using wearable biosensors reveals useful health-related information. *PLoS Biology, 15*(1), 1–30. doi:10.1371/journal.pbio.2001402

Li, Y., & Jones, C. B. (2013). A literature review of nursing turnover costs. *Journal of Nursing Management, 21*(3), 405–418. doi:10.1111/j.1365-2834.2012.01411.x

Lorig, K., Stewart, A., Ritter, P., Gonzalez, V., Laurent, D., & Lynch, J. (1996). *Outcome measures for health education and other health care interventions*. Thousand Oaks, CA: Sage Publications.

Lynch. (2001). Health affects work, and work affects health. *Business and Health, 19*(10), 31–37.

Manser, T. (2009). Teamwork and patient safety in dynamic domains of healthcare: A review of the literature. *Acta Anaesthesiologica Scandinavica, 53*(2), 143–151. doi:10.1111/j.1399-6576.2008.01717.x

Martinez, L. F., & Ferreira, A. I. (2012). Sick at work: Presenteeism among nurses in a Portuguese public hospital. *Stress and Health, 28*(4), 297–304. doi:10.1002/smi.1432

Mazurek Melnyk, B., Orsolini, L., Tan, A., Arslanian-Engoren, C., D'Eramo Melkus, G., Dunbar-Jacob, J., … Lewis, L. M. (2018). A national study links nurses' physical and mental health to medical errors and perceived worksite wellness. *Journal of Occupational and Environmental Medicine, 60*(2), 126–131. doi:10.1097/JOM.0000000000001198

McCaughey, D., Kimmel, A., Savage, G., Lukas, T., Walsh, E., & Halbesleben, J. (2016). Antecedents to workplace injury in the health care industry: A synthesis of the literature. *Health Care Manage Rev, 41*(1), 42–55. doi:10.1097/hmr.0000000000000043

McGregor, A., Iverson, D., Caputi, P., Magee, C., & Ashbury, F. (2014). Relationships between work environment factors and presenteeism mediated by employees. *Journal of Occupational and Environmental Medicine, 56*(12), 1319–1324. doi:10.1097/JOM.0000000000000263

Mchugh, B. M. D., Kutney-lee, A., Cimiotti, J. P., Sloane, D. M., & Aiken, L. H. (2011). Nurses' widespread job dissatisfaction, burnout, and frustration with health benefits signal problems for patient care. *Health Affairs, 2*(2), 202–210. doi:10.1377/hlthaff.2010.0100

McNeely, E. (2005). The consequences of job stress for nurses' health: Time for a check-up. *Nursing Outlook, 53*(6), 291–299. doi:10.1016/j.outlook.2005.10.001

Merrill, R. M., Aldana, S. G., Pope, J. E., Anderson, D. R., Coberley, C. R., Whitmer, R. W., & the Hero Research Study Subcommittee. (2012). Presenteeism according to healthy behaviors, physical health, and work environment. *Population Health Management, 15*(5), 293–301. doi:10.1089/pop.2012.0003

Middaugh, D. J. (2007). Presenteeism: Sick and tired at work. *Dermatology Nursing, 19*(2), 172-173, 185.

Moyo, M., Goodyear-Smith, F. A., Weller, J., Robb, G., & Shulruf, B. (2016). Healthcare practitioners' personal and professional values. *Advances in Health Sciences Education, 21*(2), 257–286. doi:10.1007/s10459-015-9626-9

Musich, S., Hook, D., Baaner, S., Spooner, M., & Edington, D. W. (2006). The Association of Corporate Work Environment factors, health risks, and medical conditions with presenteeism among Australian employees. *American Journal of Health Promotion, 21*(2), 127–136. doi:10.4278/0890-1171-21.2.127

Myers, N. D., Ahn, S., & Jin, Y. (2011). Sample size and power estimates for a confirmatory factor analytic model in exercise and sport: A Monte Carlo approach. *Research Quarterly for Exercise and Sport, 82*(3), 412–423. doi:10.1080/02701367.2011.10599773

National Institute for Occupational Safety and Health. (2017). *Fundamentals of total work health approaches: Essential elements for advancing worker safety, health, and well-being.* Retrieved from https://www.cdc.gov/niosh/docs/2017-112/pdfs/2017_112.pdf

Noben, C., Evers, S., Nieuwenhuijsen, K., Ketelaar, S., Gartner, F., Sluiter, J., & Smit, F. (2015). Protecting and promoting mental health of nurses in the hospital setting: Is it cost-effective from an employer's perspective? *International Journal of Occupational Medicine and Environmental Health, 28*(5), 891–900. doi:10.13075/ijomeh.1896.00465

Nunnally, J. C. (1978). *Psychometric theory* (2nd ed.). New York, NY: McGraw-Hill.

Occupational Safety and Health Administration. (2013). *Workplace violence in healthcare: Understanding the challenge.* Retrieved from https://www.osha.gov/Publications/OSHA3826.pdf

Oliveira, R. M., Leitao, I., Aguiar, L. L., Oliveira, A., Gazos, D. M., da Silva, L. M. S., … Sampaio, R. L. (2015). Evaluating the intervening factors in patient safety: Focusing on hospital nursing staff. *Revista Da Escola De Enfermagem Da Usp, 49*(1), 102-111. doi:10.1590/s0080-623420150000100014

Ospina, M. B., Dennett, L., Waye, A., Jacobs, P., & Thompson, A. H. (2015). A systematic review of measurement properties of instruments assessing presenteeism. *American Journal of Managed Care, 21*(2), e171–e185.

Pantelopoulos, A., & Bourbakis, N. G. (2010). A survey onwearable sensor-based systems for health monitoring and prognosis. *IEEE Transactions on Systems Man, and Cybernetics, Applications and Reviews, 40*(1), 1–12. doi:10.1109/TSMCC.2009.2032660

Paschoalin, H. C., Griep, R. H., Lisboa, M. T. L., & de Mello, D. C. B. (2013). Transcultural adaptation and validation of the Stanford presenteeism scale for the evaluation of presenteeism for Brazilian Portuguese. *Rev Lat Am Enfermagem, 21*(1), 388–395.

Perry, L., Lamont, S., Brunero, S., Gallagher, R., & Duffield, C. (2015). The mental health of nurses in acute teaching hospital settings: A cross-sectional survey. *BMC Nursing, 14*(1), 1-8. doi:10.1186/s12912-015-0068-8

Peterson, R. A. (1994). A meta-analysis of Cronbach's coefficient alpha. *Journal of Consumer Research, 21*(2), 381–391. doi:10.1086/209405

Pilette, P. C. (2005). Presenteeism in nursing—A clear and present danger to productivity. *Journal of Nursing Administration, 35*(6), 300-303.

Podsakoff, P. M, & Organ, D. W. (1986). Self-reports in organizational research: Problems and prospects. *Journal of Management, 12*(4), 531–544. doi:10.1177/014920638601200408

Prasad, M., Wahlqvist, P. Shikiar, R., & Shih, Y-C T. (2004). A review of self-report instruments measuring health-related work productivity: A patient-reported outcomes perspective. *Pharmacoeconomics, 22*(4), 225–244. doi:10.2165/00019053-200422040-00002

"Presenteeism" now a major issue. (2015). *World of Irish Nursing & Midwifery, 23*(5), 31-31.

Qualtrics. (2018). Provo, UT: Author. Retrieved from http://www.qualtrics.com

Rainbow, J. G. (2018). *How to know if you're really there: An evaluation of measures for presenteeism in nursing*. Unpublished manuscript.

Rainbow, J. G., & Steege, L. M. (2017). Presenteeism in nursing: An evolutionary concept analysis. *Nursing Outlook, 65*(5), 615–623. doi:10.1016/j.outlook.2017.03.005

Ream, E., & Richardson, A. (1996). Fatigue: A concept analysis. *International Journal of Nursing Studies, 33*(5), 519–529.

Richards, K. C., Enderlin, C. A., Beck, C., McSweeney, J. C., Jones, T. C., & Roberson, P. (2007). Tailored biobehavioral interventions: A literature review and synthesis. *Research & Theory for Nursing Practice, 21*(4), 271–285. doi:10.1891/088971807782428029

Rodgers, B. L. (1989). Concepts, analysis and the development of nursing knowledge: the evolutionary cycle. *Journal of Advanced Nursing, 14*(4), 330–335. doi:10.1111/j.1365-2648.1989.tb03420.x

Sanchez Bustillos, A., Vargasm, K. G., 3rd, & Gomero-Cuadra, R. (2015). Work productivity among adults with varied body mass index: Results from a Canadian population-based survey. *Journal of Epidemiology and Global Health, 5*(2), 191–199. doi:10.1016/j.jegh.2014.08.001

Schoenfeld, D. E., Malmrose, L. C., Blazer, D. G., Gold, D. T., & Seeman, T. E. (1994). Self-rated health and mortality in the high-functioning elderly—A closer look at healthy individuals: MacArthur field study of successful aging. *Journal of Gerontology, 49*(3), m109–m115. doi:10.1093/geronj/49.3.m109

Schreiber, J. B., Nora, A., Stage, F. K., Barlow, E. A., King, J., Nora, A., & Barlow, E. A. (2006). Reporting structural equation modeling and confirmatory factor analysis results: A review. *Journal of Educational Research, 99*(6), 232–338. doi:10.3200/JOER.99.6.323-338

Sexton, J. B., Helmreich, R. L., Neilands, T. B., Rowan, K., Vella, K., Boyden, J., … Thomas, E. J. (2006). The safety attitudes questionnaire: Psychometric properties, benchmarking data, and emerging research. *BMC Health Services Research, 6*, 44. doi:10.1186/1472-6963-6-44

Shamansky, S. L. (2002). Presenteeism … or when being there is not being there. *Public Health Nursing, 19*(2), 79-80. doi:10.1046/j.1525-1446.2002.19201.x

Shih, T. H., & Fan, X. (2009). Comparing response rates in e-mail and paper surveys: A meta-analysis. *Educational Research Review, 4*(1), 26–40. doi:10.1016/j.edurev.2008.01.003

Shikiar, R., Halpern, M. T., Rentz, A. M., & Khan, Z. M. (2004). Development of the health and work questionnaire (HWQ): An instrument for assessing workplace productivity in relation to worker health. *Work, 22*(3), 219–229.

Skagen, K., & Collins, A. M. (2016). The consequences of sickness presenteeism on health and wellbeing over time: A systematic review. *Social Science Medicine, 161*, 169–177. doi:10.1016/j.socscimed.2016.06.005.

Smith, C. A. (2016). *Presenteeism in nursing: A mixed methods study of its relationship with nurse fatigue and patient safety* (Doctoral dissertation). Available from ProQuest Dissertations and Theses database. (UMI No. 10103952)

Soper, D. S. (2018). *A-priori sample size calculator for structural equation models*. Retrieved from http://www.danielsoper.com/statcalc

SPSS Statistics. (2016).

Stacy, M., Bloudek, L., Schwartz, M., Brin, M., & Papapetropoulos, S. (2012). Cervical dystonia substantially impacts employment status, absenteeism, and presenteeism: Baseline results from cervical dystonia patient registry for the observation of onabotulinumtoxinA efficacy (CD PROBE). *Movement Disorders, 27*, s365–s365. Retrieved from https://onlinelibrary.wiley.com/toc/15318257/27/S1

Stamm, B. H. (2005). *The ProQOL manual*. Brooklandville, MD: Sidran Press.

Stata/SE 15.0 for Mac. (2017).

Steege, L. M., & Dykstra, J. G. (2016). A macroergonomic perspective on fatigue and coping in the hospital nurse work system. *Applied Ergonomics*, *54*, 19–26. doi:10.1016/j.apergo.2015.11.006

Steege, L. M., & Rainbow, J. G. (2017). Fatigue in hospital nurses — "Supernurse" culture is a barrier to addressing problems: A qualitative interview study. *International Journal of Nursing Studies*, *67*, 20–28. doi:10.1016/j.ijnurstu.2016.11.014

Taelman, J., Vandeput, S., Spaepen, A., & Van Huffel, S. (2009). Influence of mental stress on heart rate and heart rate variability (pp. 1366–1369). Berlin: Springer. doi:10.1007/978-3-540-89208-3_324

Takase, M. (2010). A concept analysis of turnover intention: Implications for nursing management. *Collegian*, *17*(1), 3–12. https://doi.org/10.1016/j.colegn.2009.05.001

Taloyan, M., Aronsson, G., Leineweber, C., Hanson, L. M., Alexanderson, K., Westerlund, H., & Coyne, J. (2012). Sickness presenteeism predicts suboptimal self-rated health and sickness absence: A nationally representative study of the Swedish working population. *PLoS ONE*, *7*(9), 1–8. doi:10.1371/journal.pone.0044721

Team RC. (2016). R: A language and environment for statistical computing.

Thompson, A., Ospina, M., Dennett, L., Waye, A., & Jacobs, P. (2015, December). *IHE report: A systematic review of the measurement properties of self-report instruments that assess presenteeism*. Alberta, Canada: Institute of Health Economics.

Umann, J., Guido, L. de A., & Grazziano, E. da S. (2012). Presenteeism in hospital nurses. *Presenteísmo En Enfermeros Hospitalarios.*, *20*(1), 159–166. doi:10.1590/s0104-11692012000100021

Urden, L. D., & Roode, J. L. (1997). Work sampling: A decision-making tool for determining resources and work redesign. *Journal of Nursing Administration*, *27*(9), 34–41.

U.S. Department of Health and Human Services, Health Resources and Services Administration, National Center for Health Workforce Analysis. (2014). *The future of the nursing workforce: National- and state-level projections, 2012-2025.* Rockville, MD: Author.

U.S. Department of Labor, Bureau of Labor Statistics. (2016a). *Nonfatal occupational injuries and illness requiring days away from work, 2015*. Retrieved from https://www.bls.gov/news.release/pdf/osh2.pdf

U.S. Department of Labor. Bureau of Labor Statistics. (2016b). *Occupational employment and wages, May 2016*: *29-1141 registered nurses*. Retrieved from https://www.bls.gov/oes/current/oes291141.htm

U.S. Department of Labor, Buruea of Labor Statistics (2018). *Occupational outlook handbook: Registered nurses*. Retrieved from https://www.bls.gov/ooh/healthcare/registered-nurses.htm.

Vanhook, P. M. (2007). Cost-utility analysis: A method of quantifying the value of registered nurses. *Online Journal of Issues in Nursing*, *12*(3). doi:10.3912/OJIN.Vol12No03Man05

Villarejo, M. V., Zapirain, B. G., & Zorrilla, A. M. (2012). A stress sensor based on galvanic skin response (GSR) controlled by ZigBee. *Sensors (Switzerland)*, *12*(5), 6075–6101. doi:10.3390/s120506075

Warren, C. L., White-Means, S. I., Wicks, M. N., Chang, C. F., Gourley, D., & Rice, M. (2011). Cost burden of the presenteeism health outcome: Diverse workforce of nurses and pharmacists. *Journal of Occupational and Environmental Medicine*, *53*(1), 90–99. doi:10.1097/JOM.0b013e3182028d38

Weis, D., & Schank, M. J. (2009). Development and psychometric evaluation of the nurses professional values scale—revised. *Journal of Nursing Measurement*, *17*(3), 221–231. doi:10.1891/1061-3749.17.3.221

Welton, J. M., & Harper, E. M. (2016). Measuring nurse care value. *Nursing Economic$*, *34*(1), 7–14.

West, P., Abbott, P. A., & Probst, P. (2014). Alarm fatigue. *Online Journal of Nursing Informatics*, *18*(2).

Widera, E., Chang, A., & Chen, H. L. (2010). Presenteeism: A public health hazard. *Journal of General Internal Medicine*, *25*(11), 1244–1247. doi:10.1007/s11606-010-1422-x

Williamson ,W. J. J., & Johnston, J. (1988). Understanding, evaluating and improving nursing productivity. *Nursing Management*, *19*(5), 49–55. doi:10.1097/00006247-198805000-00010

Wilson, J. R. (2014). Fundamentals of systems ergonomics/human factors. *Applied Ergonomics*, *45*(1), 5–13. doi:10.1016/j.apergo.2013.03.021

Winona Pit, S., & Hansen, V. (2016). The relationship between lifestyle, occupational health, and work-related factors with presenteeism amongst general practitioners. *Archives of Environmental and Occupational Health*, *71*(1), 49–56. doi:10.1080/19338244.2014.998329

Wolf, E. J., Harrington, K. M., Clark, S. L., & Miller, M. W. (2013). Sample size requirements for structural equation models: An evaluation of power, bias, and solution propriety. *Educational and Psychological Measurement*, *73*(6), 913–934. doi:10.1177/0013164413495237

World Bank. (2018). *World Bank open data*. Retrieved from https://data.worldbank.org/

World Health Organization. (2005). *World alliance for patient safety: WHO draft guidlines for adverse event reporting and learning systems from information to action*. Geneva, Switzerland: Author.

World Health Organization. (2017). *Density of nursing and midwifery personnel (total number per 1000 population, latest available year).* Retrieved from http://www.who.int/gho/health_workforce/nursing_midwifery_density/en/

Xyrichis, A., & Ream, E. (2008). Teamwork: A concept analysis. *Journal of Advanced Nursing, 61*(2), 232–241. doi:10.1111/j.1365-2648.2007.04496.x

Yarbrough, S., Martin, P., Alfred, D., & McNeill, C. (2017). Professional values, job satisfaction, career development, and intent to stay. *Nursing Ethics*, *24*(6), 675–685. doi:10.1177/0969733015623098

Yildirim, A., & Yildirim, D. (2007). Mobbing in the workplace by peers and managers: Mobbing experienced by nurses working in healthcare facilities in Turkey and its effect on nurses. *Journal of Clinical Nursing*, *16*(8), 1444–1453. doi:10.1111/j.1365-2702.2006.01814.x

Yu, J. H., Asche, C. V., & Fairchild, C. J. (2011). The economic burden of dry eye disease in the United States: A decision tree analysis. *Cornea, 30*(4), 379-387. doi:10.1097/ICO.0b013e3181f7f363