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Consequences of Providing Nursing Care in the Neonatal Intensive Care Unit

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CONSEQUENCES OF PROVIDING NURSING CARE IN THE NEONATAL

INTENSIVE CARE UNIT

by

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ABSTRACT
CONSEQUENCES OF PROVIDING NURSING CARE IN THE NEONATAL
INTENSIVE CARE UNIT

By

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Compassion fatigue is a negative consequence of providing nursing care. It impacts

nurses physically, emotionally, and psychologically. The purpose of this cross-sectional

study was to examine a model of negative consequences of providing nursing care

including compassion fatigue, secondary traumatic stress, and burnout in the Neonatal

Intensive Care Unit (NICU). The conceptual model of consequences of providing nursing

care was identified, and then specifically applied to NICU nurses for this study. The

conceptual model consists of five main concepts: patient factor, personal factor, work

environment factor, positive consequences of providing nursing care, and negative

consequences of providing nursing care. The research question of the current study was

how the personal factor (e.g., age, years of nursing experiences, self-compassion) and the

work environment factor (e.g., nursing foundations for quality of care, collegial nurse-

physician relations, single family room NICU) influence the relationship between the

patient factor (i.e., intensity and frequency of contact with the infant and family, clinical

characteristics of the infant) and negative consequences of providing nursing care. It was

hypothesized that the indirect effect of self-compassion in the relationship between the patient factor and negative consequences of providing nursing care would differ depending on levels of the personal factor or the work environment factor. Data were collected from 174 registered nurses who were 18 years of age or older and direct care providers in the staff position in NICUs in Wisconsin using an online survey. The online survey consisted of nine questionnaires which assessed demographics, personal and professional characteristics, personal experiences, clinical nursing experiences, perceptions regarding the working environment, feelings, and attitudes related to nursing care. A series of moderated mediation analyses were conducted using a different combination of independent variables (components of the patient factor) and moderators (components of the personal or the work environment factor) in each analysis. Out of 16 analyses, 5 analyses indicated significant results: the indirect effect of self-compassion in the relationship between the frequency of working 13 hours or more at stretch and negative consequences of providing nursing care was moderated by nursing foundations for quality of care and single family room NICU; the indirect effect of self-compassion in the relationship between the strength of the nurse-infant/family relationship and negative consequences was moderated by nursing foundations for quality of care and collegial nurse-physician relations; and the indirect effect of self-compassion in the relationship between the number of days that the nurse cared for the infant and negative consequences was moderated by collegial nurse-physician relations. The findings revealed important aspects that might reduce negative consequences of providing nursing care in the NICU: high level of nursing foundations for quality of care, positive collegial nurse-physician relations, single family room NICU, high level of self-compassion, decreased the

intensity of contact with the infant and family, increased the frequency of contact with the infant and family, and strong nurse-infant/family relationship. In this exploratory study, the data supported several elements of the model of negative consequences of providing nursing care in the NICU. It provided an initial important step to understanding a mechanism of negative consequences of providing nursing care in the NICU. The study results may inform the development of interventions for negative consequences of providing nursing care at the individual level, the unit level, or the organizational level. Additional research is needed to examine other relevant factors of consequences of providing care to obtain empirical data to further test the model. In addition, studies in other nursing specialties are necessary to develop the nursing knowledge of compassion fatigue and other negative consequences of providing care.

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Chapter 1

Introduction

The shortage of nurses is a significant threat to the future of the healthcare system in the United States. The average vacancy rate was 17% in 2013 (AMN Healthcare, 2013). This shortage is expected to grow due to the aging workforce. A large number of nurses will retire in the next 10 years and, there might not be enough young nurses to fill the vacancies (Auerbach, Buerhaus, & Staiger, 2007; Juraschek, Zhang, Ranganathan, & Lin, 2012). In order to decrease the nursing shortage, it is critical to improve nurse retention. One means may be to prevent or minimize negative consequences of providing nursing care.

Compassion fatigue is defined as "one of the negative consequences of providing nursing care that is biopsychosocial responses originating from emotional engagement when providing compassionate care for the relief of suffering" (Sano, Schiffman, & Darmody, 2015b, p. 27). It can be seen in professionals such as nurses and therapists who provide care with compassion for patients in emotional pain. Although these professionals absorb information surrounding a traumatic event or prolonged suffering, they also absorb the patient's emotional pain or the traumatic event itself. The resulting emotional stress impacts professionals physically, emotionally, and psychologically. Moreover, these emotional products affect professional actions toward patients; and reflect on their view toward their work and profession. Thus, compassion fatigue is described as a cost of care or an occupational hazard (Figley, 1995; White, 2006).

Nurses are one of the groups of professionals who are at risk for compassion fatigue. Compassion is an essential component of providing quality nursing care.

Moreover, it is a moral or spiritual dimension in nursing which empowers nurses. Although compassion is an important perspective which has an inherent influence on the professional characteristics of nursing, it also can bring negative consequences that may influence nursing performance and quality of care (Davison & Williams, 2009; Schantz, 2007; von Dietze & Orb, 2000). Furthermore, compassion fatigue is related to other similar concepts, secondary traumatic stress (Figley, 1995; Stamm, 2010; Valent, 2002) and burnout (Coetzee & Klopper, 2010; Stamm, 2010). Compassion fatigue as a negative consequence of providing nursing care can be one possible factor of retention of nurses.

Statement of the Problem

Compassion fatigue as a concept has not been delineated with a consistent and integrated definition (Sabo, 2006; Stamm, 2010; White, 2006). This conceptual issue provides limitations to identifying a description of compassion fatigue and creates difficulty for investigating this phenomenon (Joinson, 1992; Sabo, 2006; White, 2006). Although compassion fatigue in nurses has been investigated in several nursing areas, the concept of compassion fatigue has not been consistently defined and measured among studies. Other terms, specifically secondary traumatic stress and burnout, have been used to describe compassion fatigue in nurses. This conceptual confusion makes it difficult to measure and identify compassion fatigue in nurses. In addition, the small sample sizes used in most studies are a limitation to the generalizability of studies. Thus, it is critical to identify compassion fatigue as a nursing phenomenon and its related factors in nursing practice. In particular, compassion fatigue in Neonatal Intensive Care Unit (NICU) nurses is not clearly identified due to the lack of studies in this area of nursing. The purpose of

this study was to examine a model of negative consequences of providing nursing care, including compassion fatigue, secondary traumatic stress, and burnout in the NICU.

Conceptual Framework

A conceptual model of consequences of providing nursing care has been identified for this study based on analysis from an existing model of compassion fatigue commonly used for care providers developed by Stamm (2010) and a concept analysis of compassion fatigue in nursing practice conducted by Coetzee and Klopper (2010) using a conceptual framework of secondary stress and trauma responses identified by Valent (2002). The development of the conceptual model will be fully described, and the conceptual model will be then specifically applied to NICU nurses in Chapter 2. Dissertation Figure 1 presents the application of the model of consequences of providing nursing care to NICU Nurses. The conceptual model consists of five main concepts: patient factor, personal factor, work environment factor, positive consequences of providing nursing care, and negative consequences of providing nursing care. In the model, compassion fatigue is considered as one element of negative consequences of providing nursing care. The overview of the conceptual model is described and then, conceptual definitions of study variables are explained.

Overview of the Proposed Conceptual Model

In the proposed conceptual model (Manuscript 2 Figure 1), there are relationships among the five main concepts. The patient factor can be considered as a predictor of positive and negative consequences of providing nursing care, whereas positive/negative consequences of providing nursing care are considered as outcomes in the model. Nurses are directly or/and indirectly exposed to a factor that influence positive/negative

consequences of providing nursing care through nursing actions in the nursing practice setting. The personal factor and the working environment factor might influence the relationship between the patient factor and both positive/negative consequences of providing nursing care. There might also be a relationship between positive and negative consequences of providing nursing care.
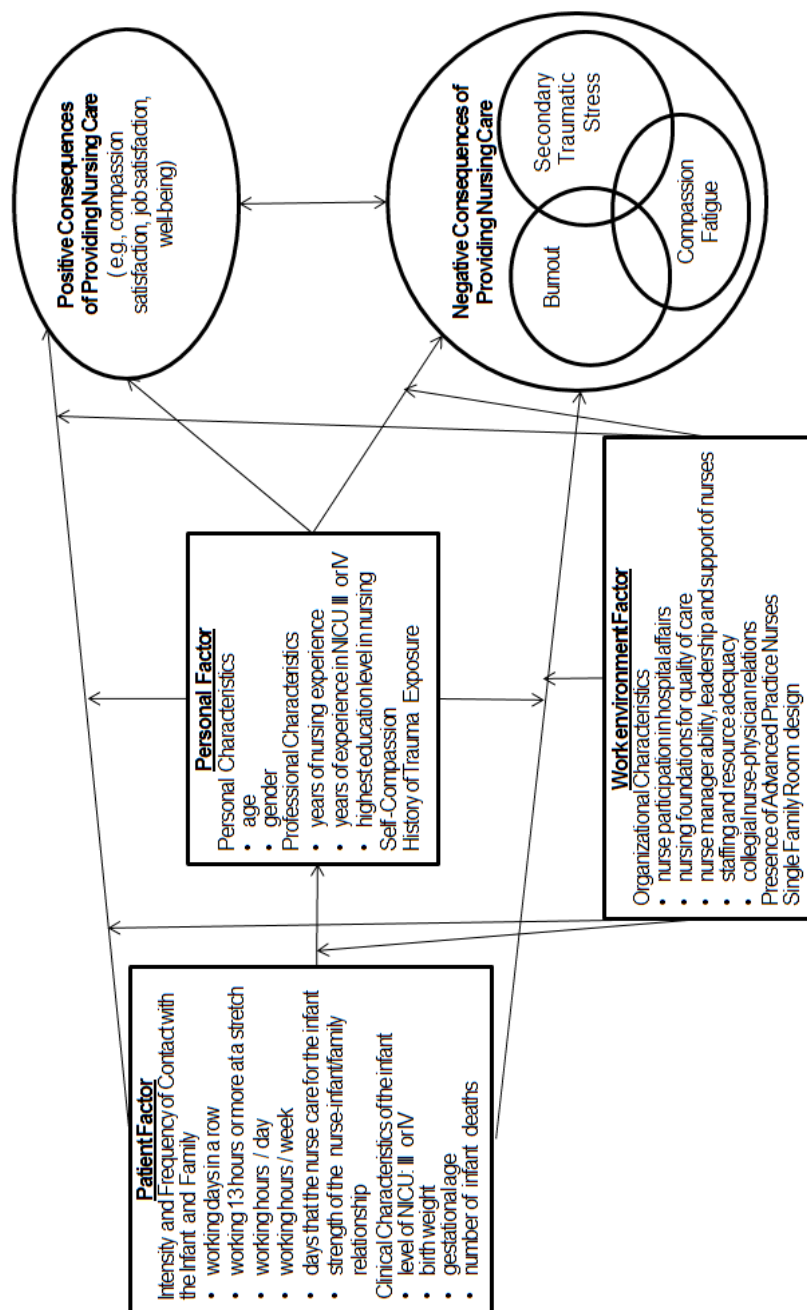
Dissertation Figure1. Model of Consequences of Providing Nursing Care in the Neonatal Intensive Care Unit. Copyright 2015 by Riko Sano.

Conceptual Definitions of the Five Concepts

The five main concepts are defined, and study variables are identified in the next section.

Patient factor. The patient factor is defined as "incorporating any aspects related to patient characteristics or conditions that impact care provision in a practice setting" (Sano, Schiffman, & Darmody, 2015a, p. 59). It is described by the intensity and frequency of contact with the infant and family and clinical characteristics of the infant in order to identify how much nurses are exposed to traumatic events or situations through providing nursing care. In the NICU, traumatic events or situations for nurses can be the individual exposure to critically ill infants and suffering of the families who face their infants' severe condition which might influence their quality of life. The intensity and frequency of contact with the infant and family are described by the length of time spent in direct care and the frequency of providing direct care. The clinical characteristic of the infant that might influence compassion fatigue in NICU nurses is described by the acuity of the infant. In this study, 10 study variables were identified as components of the patient factor: number of working days in a row, frequency of working 13 hours or more at a stretch, number of working hours per day, number of working hours per week, number of days that the nurse care for the infant, strength of the nurse-infant/family relationship, level of NICU (III or IV), birth weight, gestational age, and number of infant deaths nurses experienced.

Personal factor. The personal factor is defined as "nurses' characteristics and experiences in nursing practice and in their lives" (Sano et al., 2015a, p. 61). The personal factor might indirectly influence the relationship between the patient factor and

both positive/negative consequences of providing nursing care. It might function as a mediator explaining a causal pathway between the patient factor and positive/negative consequences of providing nursing care. It also might take a role as a moderator that alters the direction or strength of the relationship between the patient factor and positive/negative consequences of providing nursing care depending on its levels (Preacher, Rucker, & Hayes, 2007). The personal factor is described by personal characteristics, professional characteristics, self-compassion, self-management, and history of trauma exposure. In this study, seven study variables were identified as the personal factor: age, gender, years of experience as a registered nurse, years of experience in the NICU III or IV, the highest education level in nursing, self-compassion, and history of trauma exposure.

Work environment factor. The work environment factor is defined as "the characteristics of a practice setting and practice situations that contribute to productivity in the healthcare system" (Sano et al., 2015a, p. 64). It might play a role as a moderator that alters the direction or strength of the relationship between the patient factor and positive/negative consequences of providing nursing care depending on its levels (Preacher et al., 2007). It also might moderate the indirect effect of the personal factor in the relationship between the patient factor and positive/negative consequences of providing nursing care. The work environment factor is described by organizational characteristics and clinical leadership support. There were five organizational characteristics identified by Lake (2002) that might impact outcomes of patients, nurses, and the healthcare system: nursing participation in hospital affairs, nursing foundations for quality of care, nurse manager ability, leadership, and support of nurses, staffing and

resource adequacy, and collegial nurse-physician relations. The presence of Advanced Practice Nurses (APNs) was identified as clinical leadership support, as they have competencies to empower nurses in the practice setting. Finally, single family room (SFR) NICU was added as a unique feature in the NICU work environment. A SFR NICU allows the infant and the family to have their private room compared to the traditional open unit where nurses care for several babies and their families in the same room. The SFR NICU can promote the relationship between the infant and the family. It also allows nurses to provide care to promote the infant's development.

Negative consequences of providing nursing care. Negative consequences of providing nursing care include compassion fatigue, secondary traumatic stress, and burnout in the model. Although different negative consequences of providing nursing care might exist other than these three elements, the model includes only these three. Compassion fatigue is defined as "one of the negative consequences of providing nursing care that is biopsychosocial responses originating from emotional engagement when providing compassionate care for the relief of suffering" (Sano et al., 2015b, p. 27). It is strongly related to compassionate nursing care with a strong connection between nurses and patients or their families in suffering. Secondary traumatic stress is defined as "one of the negative consequences of providing nursing care resembling post-traumatic stress symptoms and derived from indirect exposure to traumatic events through providing nursing care for those who are directly traumatized" (Sano et al., 2015b, p. 29). It is related to exposure to the patient's or the family's trauma through providing nursing care. Finally, burnout is defined as "the one of the negative consequences of providing nursing care related to physical and cognitive strain and negative behaviors or attitude toward

work resulting from conflicts within the work setting" (Sano et al., 2015b, p. 30). It is a response to work or work environmental stressors, such as staffing or workload. The three study variables, compassion fatigue, secondary traumatic stress, and burnout, were considered as observed dependent variables of negative consequences of providing nursing care.

Positive consequences of providing nursing care. Positive consequences of providing nursing care are any positive aspect derived from nurses' actions that might include compassion satisfaction, job satisfaction, or well-being. In this study, this concept was not included in the analysis in order to focus on negative consequences of providing nursing care.

Research Question and Hypothesis

The present study examined a model of negative consequences of providing nursing care applied to NICU nurses, involving the patient, the personal, the work environment factors, and negative consequences of providing nursing care (compassion fatigue, secondary traumatic stress, and burnout). More specifically, the research question that guided to the study was how the personal factor (e.g., age, gender, self-compassion, history of trauma exposure) and the work environment factor (e.g., organizational characteristics, clinical leadership support) influence the relationship between the patient factor (e.g., intensity and frequency of contact with infant) and negative consequences of proving nursing care. It was hypothesized that the indirect effect of self-compassion in the relationship between the patient factor and negative consequences of providing nursing care would differ depending on levels of the personal factor or the work environment factor.

Significance of the Study

Compassion fatigue should be addressed as a significant issue in nursing, as it negatively influences nurses' psychophysical health and the quality of nursing care. Moreover, it might impact nurse retention that is a serious issue in health care. Consequently, compassion fatigue can be a risk factor to decrease patient safety and patient, nurses, and the organizational positive outcomes in the healthcare system.

Compassion fatigue in NICU nurses is a significant area of research due to many stressors in the NICU that are related to burnout (Braithwaite, 2008; Kain, 2006). There are potential events that may lead to the development of vulnerability to negative consequences of providing nursing care while performing nursing care in the NICU. NICU nurses are exposed to critically ill infants and suffering of the families who face their infants' severe condition which might influence quality of life of the infants. Although the advance of knowledge and technology contributes to decrease mortality of preterm infants in critical conditions, there are risks for subsequent cognitive and neurodevelopmental disabilities that cause multiple medical problems and long term health issues in their lives. Moreover, the NICU environment, including nursing actions, influences infants' multiple developmental disorders with long term effects for their health (Aucott, Donohue, Atkins, & Allen, 2002). Thus, caring for these infants and their families can generate a significant emotional stress that can be considered as a negative consequence of providing nursing care. The accumulation of the negative feelings or negative experiences may lead nurses to have anxiety and trauma. Also, as nurses strongly advocate for infants and make emotional commitments to the infants, they may feel responsible for negative outcomes of infants, such as death, neonatal complications

from their prematurity, disabilities, developmental problems, and subsequent

consequences that cause long term health problems (Braithwaite, 2008; Kain, 2006).

Thus, it is critical to identify negative consequences of providing nursing care including

compassion fatigue with the similar concepts, secondary traumatic stress and burnout,

among NICU nurses in order for appropriate intervention to be developed.

Assumptions

The assumption of this study was that all participants responded to all survey

questions honestly and to the best of their abilities.

Limitations and Delimitations

Since the population involved in this study was only NICU nurses in Wisconsin,

the study results may not be generalizable beyond the specific populations illustrated

from the sample of this study. In addition, correlational findings do not allow identifying

cause-and-effect relationships of negative consequences of providing nursing care

including compassion fatigue, secondary traumatic stress, and burnout. Additionally, as

this study was conducted at a specific point of time and the results were drawn from

nurses' perception, the perspectives of the study are limited.

Summary

In this dissertation, Chapter 1 has presented an introduction to this study and

identified the purpose and goals of the study. Chapter 2 consists of two sections. The first

part describes the conceptual framework of this study. It includes two manuscripts about

the science of compassion fatigue. The first manuscript discusses nursing perspectives on

the concept of compassion fatigue. The second manuscript presents the development of a

conceptual model of consequences of providing nursing care based on an existing model

of compassion fatigue, a concept analysis of compassion fatigue in nursing practice, and a conceptual framework of secondary stress and trauma responses. The developed model illustrates compassion fatigue as a negative consequence of providing nursing care in nursing practice along with other similar concepts, secondary traumatic stress and burnout. It also describes the application of the developed model to NICU nurses. The second part of Chapter 2 is a literature review which aimed at exploring compassion fatigue as negative consequences of providing nursing care among nurses who work in a healthcare agency. The methods and procedures for data collection and analysis are presented in Chapter 3. Chapter 4 consists of two parts. The first part presents all findings of this study including the presentation of relevant quantitative data. The next part is a data-based manuscript reporting selected results that are more applicable to nursing practice in order to reduce negative consequences of providing nursing care. Chapter 5 provides the discussion of overall study results and synthesis of the manuscripts.

Chapter 2

Theoretical Framework and Literature Review

This chapter consists of two parts. The first section describes the theoretical framework of this study and the other part is review of literature. The theoretical framework section begins with a manuscript which will be submitted to the *International Journal of Nursing Studies*. Compassion fatigue was explored as a concept. It identified nursing perspectives on the concept of compassion fatigue. First, the issues around the concept of compassion fatigue were described with other similar concepts, secondary traumatic stress and burnout. The three concepts were considered as negative consequences of providing nursing care and defined by each unique characteristic.

The next part of the theoretical framework section is the second manuscript which will be submitted to *Advances in Nursing Science.* It presents the development of a model of consequences of providing nursing care. Different interpretations of the concept of compassion fatigue were discussed and critiqued in order to deepen the knowledge of compassion fatigue: an existing model of compassion fatigue developed by Stamm (2010), a concept analysis of compassion fatigue in nursing practice conducted by Coetzee and Klopper (2010), and a conceptual framework of secondary stress and trauma responses identified by Valent (2002). The proposed model illustrates compassion fatigue as a negative consequence of providing nursing care and other concepts that might be related to compassion fatigue. The concepts of the proposed model are identified: patient factor, personal factor, work environment factor, positive consequences of providing nursing care, and negative consequences of providing nursing care. In the last part of the theoretical framework section, the proposed model was specifically applied to unique

features of NICU nursing. The last part of Chapter 2 is a literature review of research

regarding compassion fatigue in nurses in order to explore compassion fatigue as

negative consequences of providing nursing care among nurses who worked in a

healthcare agency.

Section 2. 1.1. Manuscript 1 "Nursing Perspectives on the Concept of Compassion Fatigue"

The manuscript as presented is written closely to the author guidelines, but

formatted for the dissertation. It will be formatted according to the specifications of the

International Journal of Nursing Studies prior to submission.

Nursing Perspectives on the Concept of Compassion Fatigue

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Abstract

Nurse retention is a serious issue in health care. It is essential to improve nurse retention and reduce the nursing shortage in order to maintain and improve quality of nursing care. Compassion fatigue can be a risk factor that may impact nurse retention, as it has negative psychophysical effects on nurses in clinical practice. These negative effects of compassion fatigue can influence the nurse-patient relationship and quality of nursing care; moreover, they can potentially and negatively affect patient safety. Consequently, they can decrease patient, nurse, and organizational outcomes in the health care system. The purpose of this paper is to deepen the knowledge of compassion fatigue for the nursing profession. The issues that make it difficult to understand and investigate the phenomenon of compassion fatigue in nursing practice are explicated. The concept of compassion fatigue is described as one of the negative consequences of providing nursing care along with two other negative consequences, secondary traumatic stress and burnout. Each concept is defined in order to distinguish compassion fatigue from the two other related concepts. In addition, issues in measuring compassion fatigue are discussed. Finally, relevant factors that influence negative consequences of providing nursing care are suggested for future research. These findings can enhance the understanding of compassion fatigue from a nursing perspective.

Keywords: nurses, compassion fatigue, burnout, and secondary traumatic stress

SUMMARY STATEMENT

Why is this research or review needed?

- Compassion fatigue has negative biopsychophysical effects on nurses.

- Compassion fatigue among nurses may affect patient outcomes and quality of care.

- Confusion in describing compassion fatigue with other related concepts, secondary traumatic stress and burnout, as the negative consequences of providing care, creates conceptual ambiguity.

- Identifying relevant factors that influence the development of compassion fatigue, secondary traumatic stress, and burnout are key to developing meaningful interventions for compassion fatigue in nursing practice.

What are the key findings?

- The concept of compassion fatigue as a negative consequence of providing care has been primarily described from the perspectives of two related concepts: secondary traumatic stress and burnout.

- There are overlaps among the three concepts (compassion fatigue, secondary traumatic stress, and burnout)

- Compassion fatigue, secondary traumatic stress, burnout are defined as negative consequences of providing nursing care, and differentiations among three concepts are described.

- There are issues in measuring compassion fatigue among studies.

- There are relevant factors that influence the negative consequences of providing nursing care that can be related to patients, nurses, and work.

How should the findings be used to influence policy/practice/research/education?

- Further studies within the nursing profession are needed to clarify the concept of compassion fatigue, to identify its associated risk factors and outcomes, and to develop strategies for prevention and intervention.

- A clear and consistent definition of compassion fatigue should be used in nursing in order to understand, prevent, and manage this negative consequence of providing nursing care.

Nursing Perspectives on the Concept of Compassion Fatigue

Nurse retention is a major problem in health care, and the shortage of nurses is a significant threat to the future of the healthcare system in the United States. The average vacancy rate for nurses has significantly increased and reached 17% in 2013 in health care (AMN Healthcare, 2013). This shortage of nurses will continue growing, as it involves the effects of economic, social, technological, workplace, and demographic forces. A significant reason for this shortage of nurses is the aging workforce. A large number of nurses will retire, but there may be an insufficient number of young nurses to fill the vacancies (Auerbach, Buerhaus, & Staiger, 2007; Juraschek, Zhang, Ranganathan, & Lin, 2012). This is a significant issue in nursing. It is important to improve nurse retention which can aide in easing the escalating nursing shortage, in order to maintain and improve quality of nursing care. There might be associated factors that impact nurse retention in nursing practice, and it is critical to identify these factors.

Compassion fatigue can be considered as one possible factor that may influence nurse retention. It influences not only nurses as individuals, but also the quality of care, the health care organization, and nursing as a profession. Most of all, providing a better environment that supports nurses facing work-related stress encourages quality nursing care and fulfilling the needs of health care. Therefore, it is significant to investigate compassion fatigue in nurses and understand the negative consequences of providing nursing care.

Nurses are one of the groups of healthcare professionals who might be at high risk for compassion fatigue (Boyle, 2011; Joinson, 1992; Sabo, 2006; White, 2006). Compassion fatigue was first applied to nurses by Joinson (1992) in a study that

investigated nurses' burnout. Joinson described compassion fatigue as a form of burnout and identified its characteristics: (a) "emotionally devastating," (b) "caregivers' personalities lead them toward it," (c) "the outside sources that cause it are unavoidable," and (d) "almost impossible to recognize without a heightened awareness of it" (Joinson, 1992, p. 116). Joinson emphasized that nurses have inherent stress and a psychological vulnerability to compassion fatigue. Additionally, risk factors are unavoidable; she warned that "because your profession sets you up for compassion fatigue, you'll almost certainly experience it at some point" (Joinson, 1992, p. 119).

Although compassion fatigue was addressed more than two decades ago by Joinson (1992), compassion fatigue is still a relevant issue today. The reasons for this issue can be related to challenges to the provision of health care, as the healthcare system has evolved to meet healthcare needs reflected in the acuity level of patients who are hospitalized and in the many different types of highly sophisticated treatments in use. Another reason can be related to the inherent characteristics of nursing, "to protect, promote, and optimize health; to prevent illness and injury; to alleviate suffering; and to advocate for individuals, families, communities, and population" (American Nurses Association, 2010, p. 11). These professional characteristics, being dedicated to provide care, might influence the development of nurses' vulnerability to compassion fatigue. In order to prevent and manage compassion fatigue, it is important to understand this concept. In this paper, the concept of compassion fatigue is described as one of the negative consequences of providing nursing care along with two other related concepts, secondary traumatic stress and burnout. These three concepts are defined in depth and differentiations among the three concepts are identified. Additionally, issues of

measuring compassion fatigue are discussed. For the implications for future research, relevant factors of compassion fatigue that have appeared among previous studies are identified.

Compassion Fatigue in Helping Professionals

Compassion fatigue has been described in professionals who are caring for others. People who rescue victims and those who begin to view themselves as survivors are the most vulnerable to compassion fatigue (Figley, 1995). Compassion fatigue exists in healthcare professionals, such as counselors, psychotherapists, and healthcare providers working with traumatized people, victims, and vulnerable populations. Previous studies found that compassion fatigue is a significant issue in those healthcare professions and suggested the importance of continuing research in this area (Meadors, Lamson, Swanson, White, & Sira, 2009; Ray, Wong, White, & Heaslip, 2013; Robins, Meltzer, & Zelikovsky, 2009; Smart et al., 2014). Figley (1995) explains the causes for the relationship between vulnerability and compassion fatigue among therapists. Those explanations can be applied to the vulnerability of nurses who are healthcare professionals in work environments similar to therapists. Facing the extreme intensity of trauma on a daily basis is the most associated factor. Trauma is often seen in the critical care or acute care nursing areas such as the emergency room or an intensive care unit. There are four additional key factors that indicate vulnerability to compassion fatigue: empathy, experiences of some personal traumatic events, unresolved trauma, and children's trauma (Figley, 1995). All of these specific indicators can be considered as risk factors for compassion fatigue in nurses in the clinical field. It is critical to be aware that nurses are exposed on a daily basis to risk factors that may develop compassion fatigue.

Challenges of Defining Compassion Fatigue

Compassion fatigue has been described as "a cost of care" (Figley, 1995, p. 1), "negative aspects of providing care" (Stamm, 2010, p. 8), or "consequences of caring work" (Sabo, 2006, p. 136). The concept has also been described as secondary traumatic stress or burnout (Sabo, 2006; Stamm, 2002; White, 2006). This ambiguity and the overlap among different terms are limitations to identifying a clear and consistent definition and description of compassion fatigue. The ambiguity creates difficulty for reliable identification of the concept as well as for designing interventions to prevent and address the problem. This issue might be a result of the use of the concept in different healthcare professions, different work environments, and different roles of professionals as healthcare providers. In order to identify compassion fatigue in nurses, it is valuable to understand how the concept of compassion fatigue is described in professionals who help others, and how it is described specifically for nurses.

Compassion Fatigue as a Concept

Although compassion fatigue is a concept describing the negative consequences of providing care, other terms are used. This becomes an issue and creates confusion in understanding compassion fatigue. Particularly, compassion fatigue and secondary traumatic stress are terms often used to define the negative consequence of providing care. These terms are interchangeably used with the distinctions between them not clearly identified (Coetzee & Klopper, 2010; Meadors et al., 2009; Stamm, 2010). Additionally, burnout is another concept describing compassion fatigue in various ways. Compassion fatigue has been considered as a form of burnout (Joinson, 1992), burnout is an element of compassion fatigue (Stamm, 2010), or burnout is an empirical indicator of compassion

fatigue and one cause of physical effects (Coetzee & Klopper, 2010). In order to

understand the concept of compassion fatigue, it is vital to understand the relationships

among compassion fatigue and the other two concepts, secondary traumatic stress and

burnout.

Relationships among the Three Concepts

Compassion fatigue has been differently explained by using two terms, secondary

traumatic stress and burnout. Secondary traumatic stress occurs by indirect exposure to

traumatic event (Figley, 1995) and its symptoms include intrusion, avoidance, and

arousal (Bride, Robinson, Yegidis, & Figley, 2004). Burnout is a psychological reaction

to job stress including emotional, physical, cognitive exhaustion and disengagement from

work (Demerouti, Bakker, Vardakou, & Kantas, 2003). It is important to understand how

these two terms have been used to describe compassion fatigue.

Figley (1995) considers compassion fatigue as the same concept of secondary

traumatic stress that is one of the post-traumatic stress disorders (PTSD). The term PTSD

is generally used when one has directly encountered trauma; however, secondary

traumatic stress occurs by indirect exposure to traumatic events through providing direct

care for the one traumatized. Although he explains compassion fatigue as a specific

secondary traumatic stress that is a result of deep involvement with those who directly

traumatized, he interchangeably used these two terms. Figley (1995) believes that

burnout is a related concept of secondary traumatic stress. According to him, as

secondary traumatic stress is derived from indirect experiences, this type of stress

reaction may have been covered by other related concepts such as burnout or

dissatisfaction. Moreover, he points out that as a great variety of symptoms of secondary

traumatic stress appear differently depending on the person, the situation, or the type of traumatic stress, these complex symptoms make it difficult to identify secondary traumatic stress.

As well as Figley (1995), Stamm (2010) believes compassion fatigue as the same concept of secondary traumatic stress; however, her interpretation of relationships among the three concepts, compassion fatigue, secondary traumatic stress, and burnout, is different with Figley's interpretation. She describes that compassion fatigue is a negative aspect of professional quality of life defined as "the quality one feels [i]n relation to their work as a helper" (p. 8). She describes secondary traumatic stress and burnout as elements of compassion fatigue.

Valent (2002) extends Figley's description of compassion fatigue. He considers compassion fatigue and burnout are trauma responses of secondary stress or secondary traumatic stress phenomena. According to Valent, countertransference is a mechanism of secondary traumatic stress. It occurs when healthcare professionals absorb information surrounding a traumatic event or prolonged suffering; they also absorb that traumatic event or the suffering itself. These processes are necessary to understand experiences of the people suffering and their needs. Also, empathy is key for the professionals to absorb traumatic information. On the other hand, these processes also can lead the professionals to emotional stress or trauma. These stressors and trauma can impact relationships with patients (Valent, 2002).

Valent considers compassion fatigue and burnout a specific type of secondary traumatic stress. As Figley (1995) points a great variety of symptoms of secondary traumatic stress, Valent also recognizes these various symptoms and conceptualizes them

by identifying eight survival strategies to cope with secondary stress of those who help others in suffering and their trauma *responses*. According to Valent (2002), compassion fatigue is a trauma response that is the result of unsuccessful and maladaptive biological, psychological, and social responses. The survival strategy of compassion fatigue is identified as "Rescuing (Caretaking)" (p.21), and its appraisal of means is "must save others" (Valent, 2002, p. 22). "Must save others" is an indicator in judging a situation and oneself as a success or failure in helping others. When one fails to save others, trauma responses appear as unsuccessful and maladaptive responses. Unsuccessful biological responses are sympathetic and parasympathic arousal. The psychological responses are self-concerns, including burden and depletion. Resentment including neglect and rejection can be seen as the social response (Valent, 2002). The unsuccessful psychological and social responses become "strain, stress, and distress" (p.26) that are derived from "care; empathy and devotion; and responsibility, nurture, and preservation, respectively" (p.26). As the feeling of failure accumulates, these feelings finally reach a traumatic level described as compassion fatigue. Valent explains that "the distress and trauma of not having done enough to avert suffering or death is a common secondary stress and secondary trauma responses in helpers" (p.26).

Valent (2002) describes burnout as another trauma response resulting from unsuccessful and maladaptive biological, psychological, and social responses. The survival strategy of burnout is identified as "Asserting (Goal Achievement)" (p. 21), and its appraisal of means is "MUST ACHIEVE GOAL" (Valent, 2002, p. 22). If one fails to achieve the goal, the unsuccessful biological, psychological, and social responses appear. Biological responses may include increasing or depleting of epinephrine and

norepinephrine and increasing blood pressure. Psychological responses are described as

impotence, including frustration and loss of control. Social responses are failure

including willfulness and low morale. Along with these responses, common secondary

symptoms may appear, such as poor work performance, irritability, or sleep difficulties.

When these responses finally reach a traumatic level, they may become burnout (Valent,

2002). Valent (2002) views compassion fatigue and burnout as a specific type of

secondary traumatic stress and provides unique characteristics of each phenomenon.

On the other hand, Newell and Macneil (2010) conceptually distinguish the three

phenomena, compassion fatigue, secondary traumatic stress, and burnout, by stressing

unique features of each concept. Newell and Macneil (2010) explain compassion fatigue,

secondary traumatic stress, and burnout as emotional and psychological risks associated

with providing care to vulnerable populations. These risks are conceptualized separately;

trauma-related stress and professional burnout. Compassion fatigue and secondary

traumatic stress are identified as trauma- related stress, while burnout is identified as

professional burnout that patricianly occurs by chronic exposure to vulnerable population.

Professional burnout is explained by emotional exhaustion, depersonalization, and

rescued sense of personal accomplishment. Newell and Macneil use Figley's (1995)

definition to describe secondary traumatic stress, a type of PTSD resulting from indirect

exposure to traumatic event when helping others. An empathic relationship with one who

directly traumatized is explained as a factor of secondary traumatic stress. Compassion

fatigue is another trauma-related stress. Although Newell and Macneil define compassion

fatigue as "a syndrome consisting of a combination of symptoms of secondary traumatic

stress and professional burnout" (2010, p. 61), compassion fatigue as trauma-related

stress is conceptually distinguished from burnout as professional burnout. They also distinguish compassion fatigue from secondary traumatic stress by describing the chronic use of empathy in a daily clinical practice and cumulatively progress as unique features of compassion fatigue. The cumulative progress is more like characteristics of burnout, but it is not a characteristic of secondary traumatic stress, immediate progress.

By looking at different interpretations of the relationships among compassion fatigue, secondary traumatic stress, and burnout, the three concepts are explained using a different conceptualization or framework. Figley (1995) explains compassion fatigue and burnout within the concept of secondary traumatic stress. Stamm (2010) describes three concepts within the concept of professional quality of life. Valent (2002) identifies compassion fatigue and burnout in the framework of trauma responses of secondary stress using the concept of secondary traumatic stress. Finally, Newell and Macneil (2010) explain compassion fatigue, secondary traumatic stress, and burnout in the framework of emotional and psychological risks and categorized them into two concepts, trauma-related stress and professional burnout. Valents' work provides differentiation between compassion fatigue and burnout. Newell and Macneil's work provide differentiations among the three concepts. Even though some similarities and differences in interpretation can be found among Figley (1995), Stamm (2010), Valent (2002), and Newell and Macneil (2010), it is difficult to compare or apply an interaction to others, as three phenomena are viewed from different conceptualizations and frameworks.

Compassion fatigue and secondary traumatic stress are often considered as the same concept, whereas burnout and these two concepts are considered a similar concept. Moreover, by looking at burnout, Valent considers burnout as a trauma response of

secondary traumatic stress along with compassion fatigue, while Newell and Macneil (2010) explain burnout as an emotional and psychological risk associated with providing care to vulnerable population along with compassion fatigue and secondary traumatic stress. On the other hand, Stamm (2010) describes burnout as one element of compassion fatigue along with secondary traumatic stress. In addition, burnout is considered as an empirical indicator of compassion fatigue (Coetzee & Klopper, 2010). Burnout is viewed differently as an antecedent to compassion fatigue/secondary traumatic stress, an attribute of compassion fatigue/secondary traumatic stress, or a type of secondary traumatic stress. These different interpretations can be the result of a wide variety of symptoms that occur by exposure to secondary stress. One might experience not only one phenomenon, but also a combination of two or all three, compassion fatigue, secondary traumatic stress, and burnout. Therefore, it can be difficult to conceptualize separately three phenomena using symptoms. Moreover, each phenomenon needs to be conceptualized independently and defined separately from the others. In order to distinguish compassion fatigue, secondary traumatic stress, and burnout, they are considered as negative consequences of providing nursing care in this present paper. Table 1 presents the definition of each concept and key aspects.

Definition of Compassion Fatigue

Compassion fatigue is defined as one of the negative consequences of providing nursing care that is biopsychosocial responses originating from emotional engagement when providing compassionate care for the relief of suffering. It is strongly associated with nursing actions that emphasize a connection between the nurse and patients or their families. As Figley (1995), Valent (2002), and Newell and Macneil (2010) similarly

discuss some kinds of emotional engagement of healthcare providers when describing compassion fatigue, compassion fatigue stems from nursing actions with emotional engagement and interpersonal intensity caused by providing nursing care for those who are suffering (see Table 1). Nurses feel distress or guilt when their actions are unsuccessful in helping patients and when they encounter difficulties in keeping a balance between empathy and objectivity. When nurses develop compassion fatigue, they tend to devote themselves even more to providing care in order to fulfill the patient's need (Boyle, 2011; Sabo, 2006; White, 2006). In addition, the risk factor of compassion fatigue might be not only indirect exposure, but also direct exposure to a traumatic event. For example, a patient's death can be a traumatic event for nurses because of extreme or long-term care given to a patient and the family. In this example, compassion fatigue might occur by direct exposure. Moreover, compassion is an important key to distinguishing compassion fatigue from the two related concepts, secondary traumatic stress and burnout.

  Compassion. Compassion is a vital aspect of compassion fatigue. According to Neff (2003), it is explained that "compassion involves being open to and moved by the suffering of others, so that one desires to ease their suffering. It also involves offering others patience, kindness and nonjudgmental understanding, recognizing that all humans are imperfect and make mistakes" (p. 224). Compassion is an essential component of nurses, providing initial justification and judgment; it is a moral or spiritual dimension in nursing which empowers nursing. Although other terms like caring, empathy, and sympathy are used widely and interchangeably as a significant perspective of nursing care, the concept of compassion differs from all those related terms. It implies deliberate

actions taken by a care provider to participate in care which focuses on reducing

another's suffering or pain (Davison & Williams, 2009; Schantz, 2007; von Dietze & Orb,

2000).

Valent (2002) describes that care, empathy, or devotion are the components of

compassion. Moreover, empathy that is one of the components of compassion has been

often described as an associated factor of compassion fatigue (Meadors et al., 2009;

Najjar, Davis, Beck-Coon, & Carney Doebbeling, 2009; Sabo, 2006). Valent (2002) also

stresses that empathy is a vital key for professionals to help them absorb traumatic

information that leads to understanding patient suffering and need. In addition, study

results showed that compassion fatigue was associated with empathy in pediatric

healthcare providers (Robins et al., 2009) and hospice nurses (Abendroth & Flannery,

2006). Although empathy has often described as an associated factor of compassion

fatigue, compassion can be considered as the important concept related to compassion

fatigue derived from emotional engagement, as compassion implies deliberate actions

taken by a care provider. Other terms, such as empathy, do not include this perspective.

Definition of Secondary Traumatic Stress

Secondary traumatic stress is defined as one of the negative consequences of

providing nursing care resembling post-traumatic stress symptoms and derived from

indirect exposure to traumatic events through providing nursing care for those who are

directly traumatized. This description of secondary traumatic stress is similar to previous

authors' views (Figley, 1995; Newell & MacNeil, 2010; Valent, 2002). Nurses are

exposed to another's trauma by sharing the stressful experiences with patients and

families. These indirect exposures to trauma lead to the development of secondary

traumatic stress. They may not directly face a traumatic event; in other words, the traumatic event is an experience of others (patients) and not an experience of nurses, but nurses may deeply internalize the experiences of patients. Thus, the unique feature of secondary traumatic stress is an indirect exposure to traumatic events and secondary stress through providing care to traumatized population (see Table 1).

Definition of Burnout

Burnout is the one of the negative consequences of providing nursing care related to physical and cognitive strain and negative behaviors or attitude toward work resulting from conflicts within the work setting. It is a response to job stress or work environment stress, such as staffing or work load and causes physical and emotional exhaustion from prolonged and excessive work stress (see Table 1). This description is derived from a conceptualization of burnout identified by Demerouti and colleagues (2003). They found two core components of burnout: physical and cognitive exhaustion occurs by a cumulative and prolonged exposure to job stress and disengagement from work indicating "distancing oneself from one's work and experiencing negative attitudes toward the work object, work content, or one's work in general" (Demerouti et al., 2003, p. 14). When these negative effects of burnout appear in providing nursing care, they can possibly decrease patient safety and quality of nursing care. Although burnout might be closely related to compassion fatigue and secondary traumatic stress, it is another negative consequence of providing nursing care that is not an antecedent or attribute of the other two concepts.

By understanding the three concepts in depth, each definition and key aspect are identified as negative consequences of providing nursing care. In addition, the concept of

compassion fatigue is distinguished from secondary traumatic stress and burnout (see

Table1). Next, from the review of previous studies, issues in assessing compassion

fatigue are found in addition to the conceptual ambiguity of compassion fatigue among

studies.

Compassion Fatigue in Nursing

In nursing, Todaro-Franceschi (2013) discusses compassion fatigue; however, she

supports Stamm's interpretation of compassion fatigue and emphasizes that the quality of

professional life is importance for nurses and providing nursing care. It is important to

identify the conceptual definition of compassion fatigue beyond Stamm's work and

empirical evidences to support the definition. Compassion fatigue has been investigated

in several areas: psychiatric nurses (2013); oncology nurses (Lauvrud, Nonstad, &

Palmstierna, 2009); emergency room nurses (Perry, Toffner, Merrick, & Dalton, 2011;

Potter et al., 2010); hospice nurses (Dominguez-Gomez & Rutledge, 2009; Hooper, Craig,

Janvrin, Wetsel, & Reimels, 2010); trauma unit nurses (Abendroth & Flannery, 2006;

Yoder, 2010) and pediatric nurses (Heinen et al., 2013; Mason et al., 2014). Although the

research shows that compassion fatigue exists among nurses, the concept of compassion

fatigue is not consistently defined and/or measured among the studies. In addition, issues

in measuring compassion fatigue are seen among the studies.

Issues in Measuring Compassion Fatigue

The Professional Quality of Life Scale (ProQOL) developed by Stamm (Li, Early,

Mahrer, Klaristenfeld, & Gold, 2014; Maytum, Heiman, & Garwick, 2004; Meadors et al.,

2009; Robins et al., 2009) purports to measure compassion fatigue as a negative outcome

of helping others. The ProQOL has been commonly used in nursing studies to investigate

compassion fatigue.(2010). Stamm describes that compassion fatigue is a negative outcome of helping others and contains two aspects: secondary traumatic stress and burnout. These two aspects are subscales of the ProQOL, and each aspect is assessed. In spite of the common use of the ProQOL, this scale has not been supported by a theory of compassion fatigue. The diagrams of professional quality of life developed by Stamm (2010) are used to describe compassion fatigue and the ProQOL; however, the concept of professional quality of life has not been supported theoretically and empirically. Furthermore, this scale is not desinged to evaluate how the two aspects, secondary traumatic stress and burnout, indicate compassion fatigue that only two different aspects are independently evaluated. Additionally, as Stamm (2010) interchangeably uses two terms, compassion fatigue and secondary traumatic stress, the results of the secondary traumatic stress subscale are differently referred to across the studies.

This inconsistency and lack of clarity seen in the ProQOL raises questions as to what concept this scale measures and whether this scale captures the unique concept of compassion fatigue. Moreover, secondary traumatic stress and burnout are described as elements of compassion fatigue according to Stamm; however, it is not clearly identified whether each subscale of the ProQOL focuses on the specific characteristics of secondary traumatic stress and burnout that are shared with compassion fatigue. Another question is raised whether the ProQOL identifies different perspectives of secondary traumatic stress and burnout in comparison with other scales that solely investigate each concept of secondary traumatic stress and burnout. These issues make it difficult to generalize the study results, as the definition of compassion fatigue is not clear and consistent throughout research.

Although a negative outcome of helping others is considered as the aspect of compassion fatigue in studies using the ProQOL, symptoms of secondary traumatic stress are considered as the aspects of compassion fatigue in other studies. Dominguez-Gomez and Rutledge (2009) and Beck and Gable (Abendroth & Flannery, 2006; Heinen et al., 2013; Hooper et al., 2010; Lauvrud et al., 2009; Li et al., 2014; Smart et al., 2014; Yoder, 2010) considered compassion fatigue as a kind of PTSD. They used the Secondary Traumatic Stress Scale (STSS) measuring symptoms of secondary traumatic stress, including intrusion, avoidance, and arousal (2012). Two different concepts, a negative outcome of helping others and symptoms of PTSD, have been seen as compassion fatigue and investigated using two different measurements, ProQOL and STSS. In addition, the STSS does not include any aspects of burnout, while burnout is an element of compassion fatigue in the ProQOL. Thus, the concept of compassion fatigue is not consistent among the studies. Burnout assessed by the ProQOL butnout subscale was consistatnly reported as burnout as elements of progessinal quality of life among studies. There is no study presenting burnout as compassion fatigue assessed by a mesurement for burnout itself beside the ProQOL.

Issues in Differences among Professions

Another problem seen among studies of compassion fatigue is that different healthcare professionals were used as study participants. The participants in studies included physicians, nurses, and certified nursing assistant (Bride et al., 2004), nurses, allied health, mental health worker, and case managers (Smart et al., 2014), physicians, nurses, chaplains, child life specialists, and other medical and mental health staff (Ray et al., 2013), and physicians, nurses, mental health practitioners, and allied health

practitioners (Meadors et al., 2009). Differences and uniqueness in the working environments or characteristics of patient care among different healthcare professions may change outcomes. Each profession takes a different role in the healthcare system. This can influence the results and present difficulty in the description of compassion fatigue in nurses. Just as the use of different professions in research can influence outcomes, a sample from different nursing specialties can influence study results.

Issues in Differences among and Nursing Specialties

Although nursing is one discipline, the specific areas in which nurses practice, such as intensive care units, emergency rooms, and home health care, may present different conditions that are or are not related to compassion fatigue. As each specialty has unique characteristics of the work environment and nursing care, nurses in a different specialty might show differing levels of compassion fatigue and risk factors. Therefore, research needs to be conducted within each nursing specialty in order to identify compassion fatigue and factors surrounding the negative consequences of providing nursing care within the profession of nursing.

Future Research

Although issues exist in the measurement of compassion fatigue, relevant factors that influence negative consequences of providing nursing care have been found among the studies. These factors are important to comprehend the concept of compassion fatigue as a negative consequence of providing nursing care. They might be related to patients, nurses, and work.

Factors related to patients might influence nurses' vulnerability to negative consequences of providing nursing care. Previous studies showed significant

relationships between area of nursing and the level of burnout (Robins et al., 2009); and working hours and the level of compassion fatigue and burnout (Young, Derr, Cicchillo, & Bressler, 2011). As direct care involves interactions with patients, quality and quantity of direct care can be important aspects of factors related to patients. Nurses, themselves, might have characteristics that affect negative consequences of providing nursing care. Previous studies found that compassion fatigue was related to personal issues, limits, and experiences among nurses working in hospitals and home care (Yoder, 2010), professional boundaries with patients among pediatric nurses (Yoder, 2010), and personal and professional characteristics among oncology nurses (Maytum et al., 2004). In addition, factors related to work might impact negative consequences of providing nursing care. Maytum et al. (2004) found that organizational issues including lack of support, resources, and time to provide sufficient care to patients, were associated with compassion fatigue and burnout in pediatric nurses. Lack of support has been identified as a trigger of compassion fatigue among nurses in other previous studies (Perry et al., 2011). Thus, the factors related to patients, nurses, and work need to be investigated in order to understand a mechanism of negative consequences of providing nursing care.

Conclusion

Compassion fatigue is a complex concept, and no clear definition was discerned from previous studies. From the review of literature, compassion fatigue can be described as a negative consequence of providing nursing care that shares certain characteristics with secondary traumatic stress and burnout. The definitions of the three concepts, compassion fatigue, secondary traumatic stress, and burnout were provided, and unique characteristics of each concept were identified. These definitions and the unique

characteristics of each concept help to distinguish compassion fatigue from the other two

concepts, secondary traumatic stress and burnout. The implementation of the definitions

and the relevant factors to nursing practice can help to develop a model of negative

consequences of providing nursing care. Furthermore, it is critical to appropriately assess

each aspect of the negative consequence of providing nursing care. That includes

reconsidering the use of the ProQOL, the use of other scales independently assessing

secondary traumatic stress and burnout, and investigation within the same and across

nursing specialties.

Although it is difficult to identify and describe compassion fatigue, it is

meaningful to understand it as a significant issue in the nursing profession. Development

of a model for compassion fatigue in nursing practice is a critical next step for future

nursing research. A model of compassion fatigue will provide the basis for developing a

measurement tool for compassion fatigue in nursing practice. As the concept of

compassion fatigue is revealed, future research is needed to support the concept with

empirical evidences.

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Table 1

Definition Component of Negative Consequences of Providing Nursing Care

Component	Definition	Key Aspect
Compassion Fatigue	Biopsychosocial responses originating from emotional engagement when providing compassionate care for the relief of suffering	• Compassion • Emotional engagement • Interpersonal intensity
Secondary Traumatic	Resembling post-traumatic stress symptoms and derived from indirect exposure to traumatic events through providing nursing care for those who are directly traumatized	• Indirect exposure to traumatic events • Secondary stress • Providing care to traumatized population
Burnout	Physical and cognitive strain and negative behaviors or attitude toward work resulting from conflicts within the work setting	• Conflict at the work place • Job stress • Work Environment stress

Section 2. 1.2. Manuscript 2 "Model of Consequences of Providing Nursing Care"

The manuscript as presented is written closely to the author guidelines, but formatted for the dissertation. It will be formatted according to the specifications of *Advances in Nursing Science* prior to submission.

Model of Consequences of Providing Nursing Care

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Contribution of the Paper

What is already known about the topic?

- Compassion fatigue is a concept of the negative consequences of providing care; however, its definition is not clear and consistent in application to nursing practice.

- Characteristics of compassion fatigue share that of similar concepts of negative consequences of providing care: secondary traumatic stress and burnout.

- A model of compassion fatigue for nurses has not developed from theoretical and empirical perspectives.

What this paper adds?

- A model of consequences of providing nursing care was developed based on the analysis of an existing model and a proposed concept of compassion fatigue using a conceptual framework of secondary stress and trauma responses.

- Three factors related to consequences of providing nursing care were identified: patient, personal, and work environment

- The proposed model clarified the multiple concepts involved in compassion fatigue as a negative consequence of providing nursing care and the relationship among these concepts.

Abstract

Compassion fatigue should be addressed globally as a significant issue in nursing, as it negatively impacts nurses' health and quality of nursing care. Consequently, it can be a threat to patient safety and patient outcomes. A better understanding of compassion fatigue is needed that will provide direction for developing intervention strategies to decrease compassion fatigue. The purpose of this paper is to describe the development of a model of consequences of providing nursing care. First, an existing model of compassion fatigue commonly used for care providers is critiqued. Next, a concept of compassion fatigue proposed in nursing is analyzed using a conceptual framework of secondary stress and trauma responses. In analyzing different interpretations, factors relevant for compassion fatigue are identified, and then factors existing in nursing practice are revealed. In the proposed model, compassion fatigue is considered as one of the negative consequences of providing nursing care. The negative consequences of providing nursing care also include secondary traumatic stress and burnout. There are other concepts associated with compassion fatigue: the positive consequences of providing nursing care, the patient factor, the personal factor, and the work environment factor. These three types of factors are described for nursing practice. The patient factor includes the intensity and frequency of contact with the patient and family and clinical characteristics of the patient. The personal factor includes personal characteristics, professional characteristics, self-compassion, self-management, and history of trauma exposure. The work environment factor includes organizational characteristics and clinical leadership support. Finally, relationships among the concepts are explained. Studies are needed to test the model and investigate compassion fatigue and its effects on nurses, patients, and the healthcare system.

Keywords: burnout, comparison fatigue, secondary traumatic stress, nurses

Model of Consequences of Providing Nursing Care

Compassion fatigue is "one of the negative consequences of providing nursing care that is biopsychosocial responses originating from emotional engagement when providing compassionate care for the relief of suffering" (Sano, Schiffman, & Darmody, 2015, p. 27). It can be seen in nurses who provide care for people suffering from physical and emotional pain. It is considered as a cost of care or an occupational hazard (Figley, 1995; Valent, 2002). Compassion fatigue has been considered as a significant issue among nurses (Joinson, 1992; Sabo, 2006; White, 2006). It should be addressed globally as a significant issue in nursing, in view of the fact that nurses provide care to vulnerable people with health problems in all areas of the world. Sources of compassion fatigue are many and can negatively affect nurses' health. Treating people suffering from disasters, tragedies of war or individuals, or deep poverty can all be factors related to compassion fatigue. In addition, when the negative effects of compassion fatigue appear in providing nursing care, they can be a threat to maintaining patient safety and positive outcomes. Compassion fatigue needs to be recognized as a global issue, and strategies to prevent and treat it are needed. The inherent characteristics of nursing, such as compassion or advocacy, can influence vulnerability to compassion fatigue. It should be recognized that negative consequences of providing nursing care can negatively impact nurses, patients, and healthcare systems across the world.

The purpose of this paper is to describe the development of a model of consequences of providing nursing care, specifically focusing on negative consequences including compassion fatigue, secondary traumatic stress, and burnout. Based on the analysis of three different descriptions of the concept of compassion fatigues, multiple concepts that influence compassion fatigue are defined. Furthermore, the relationships

among concepts are identified. Empirical evidence from previous studies supports each concept and its definition.

Different Interpretations of the Concept of Compassion Fatigue

Although theory is an essential component needed to identify and understand a phenomenon in a discipline, a theory of compassion fatigue is not yet developed in nursing. A model is a key critical process necessary in the identification of the body of knowledge implying core meaning and the appearance, its effects, and relevant factors (Polit & Beck, 2008). Two different descriptions of compassion fatigue have been identified (Coetzee & Klopper, 2010; Stamm, 2010). These are described and critiqued using a conceptual framework of secondary stress and trauma responses of those who help others directly traumatized defined by Valent (2002).

Model of Professional Quality of Life (Stamm, 2010)

A model of professional quality of life was developed for people who are taking care of others in suffering including professionals and non-professionals (Stamm, 2010). Compassion fatigue is described by Stamm (2010) as a negative aspect of professional quality of life defined as "the quality one feels [i]n relation to their work as a helper" (p. 8). This model illustrates the overall concept of professional quality of life, and the multiple elements that can be associated with professional quality of life along with the interrelationships among these elements. Professional quality of life is associated with three environments as proposed by Stamm: work environment, client environment, and personal environment. The model contains the two perspectives of compassion satisfaction and compassion fatigue, and these perspectives are derived from the three environments. According to Stamm (2010), compassion satisfaction is a positive aspect of professional quality of life that is the pleasure derived from one's work, while

compassion fatigue is a negative aspect when caring for people who are suffering from emotional pain. Additionally, compassion fatigue has two different of aspects: burnout and secondary traumatic stress. Stamm believes that compassion fatigue is an element and a negative aspect of professional quality of life.

On the other hand, some confusion can be found in the model of professional quality of life. The model leaves the definition of the three environments ambiguous, as each environment is not clearly described and defined. Additionally, it is not clear how compassion fatigue relates to the other elements, since each element and its relationship with others are not described. Compassion fatigue can be interpreted as a predictor of burnout and secondary traumatic stress in the model, in spite of the fact that Stamm describes burnout and secondary traumatic stress as an aspect of compassion fatigue. In addition, it is uncertain whether the two elements, "exhaustion" (Stamm, 2010, p. 10) and "frustration/anger" (p.10) are symptoms of compassion fatigue or predictors of burnout in the model. Although "traumatized by work" (p.10) should be a risk factor of compassion fatigue, compassion fatigue appears to be a risk factor of traumatized by work in the model. These inconsistencies and lack of clarity raise the questions of whether the model shows cause-and effect relationships or conceptual relationships, and what kinds of relationships exist in the model. As each element links to other elements which portrayed with several different types and colors of lines without any description, the model does not present what each line means, what kinds of relationships each line represents, and how overall relationships among concepts of quality of life are described.

Therefore, the model of professional quality of life proposed by Stamm is ambiguous in identifying the full aspects of compassion fatigue. Although Stamm introduces this model as "theoretical path analysis" (Stamm, 2010, p.10), this model is

not supported with theoretical and empirical evidence. Moreover, this model can be applied to anyone who is helping a person in suffering, as the model is broadly developed for not only professionals, but also non-professionals. The model of professional quality of life might have possibilities to the understanding of compassion fatigue in nurses; however, modifications of the model are needed in order to obtain more accurate concepts related to nursing and to develop the knowledge of compassion fatigue in nursing.

Compassion Fatigue in Nursing Practice (Coetzee & Klopper, 2010)

Coetzee and Klopper (2010) have more in-depth exploration into the concept of compassion fatigue compared with the model of professional quality of life developed by Stamm (2010). They conducted a concept analysis of compassion fatigue in nursing practice. "Risk," "cause," "process," and "manifestations" are identified as categories of compassion fatigue. "Risk" is defined as the "chance or probability of developing compassion fatigue" (p. 237), and three specific factors are identified: contact with patient, use of self, and stress. Coetzee and Klopper consider "cause" that it "produces or brings about compassion fatigue" (p.237). They explain "process" as "the sequence of events or course of compassion fatigue" (p. 237), and as progressive and cumulative. As a result of exploring prolonged, continuous, and intense "risks", three different levels of sequences are demonstrated: compassion discomfort, compassion stress, and compassion fatigue. Compassion discomfort causes changes that are temporary and removable by rest. The characteristics of compassion stress are increased stress and decreased endurance levels. Finally, compassion fatigue is characterized by energy expenditure that outstrips restorative process and the power of recovery. Coetzee and Klopper identify the physical, social, emotional, spiritual, and intellectual effects of compassion fatigue as

"manifestations". These effects are seen as consequences and empirical indicators. Coetzee and Klopper (2010) specify the connotative (theoretical) definition and the denotative (operational) definitions of compassion fatigue. Compassion fatigue is defined within nursing practice with explanations of nurse's vulnerability and the risk factors which are hidden in that profession.   Coetzee and Klopper's perspective of compassion fatigue can be compared with a conceptual framework of secondary stress and trauma responses developed by Valent (2002). Valent (2002) proposed eight survival strategies to cope with various types of secondary stress and trauma responses of those who help others in suffering from trauma. By comparing Coetzee and Klopper's description of compassion fatigue with Valent's criteria of helpers' stress and trauma responses, similarities can be found among risk factors of compassion fatigue.

Coetzee and Klopper identify three risk factors: contact with patients, use of self, and stress. These factors can be seen in Valent's description of compassion fatigue. Valent (2002) explains that compassion fatigue is a trauma response of secondary stress that is the result of an unsuccessful biological, psychological, and social response a situation in which rescuing or care-taking is a part. This can be interpreted that Valent also believes contact with patients is a risk factor, just as do Coetzee and Klopper. In addition, there is another risk factor that Valent and Coetzee and Klopper share, use of self derived from responsibilities. Valent defines the appraisal of stressor of compassion fatigue as "must save others" (Valent, 2002, p. 22). "Must save others" is an indicator in judging a situation and oneself as a success or failure in helping others. The survival strategy of compassion fatigue is identified as "Rescuing (Caretaking)" (p.21), and its appraisal of means is " must save others" (Valent, 2002, p. 22). This means that individuals will tend to judge themselves if they feel stress (failure) or not (succeed); in

other words, it can become their intention of stress (failure) because they have a strong responsibility to save others. This point can be seen in one risk factor, use of self, defined by Coetzee and Klopper. They point out that when the responsibility cannot be relieved enough, it will be a burden. It can be considered that both Valent and Coetzee and Klopper share that use of self derived from responsibilities is a risk factor for compassion fatigue.

Finally, Valent and Coetzee and Klopper share the opinion that stress is a risk factor, and that compassion fatigue is progressive and cumulative. Coetzee and Klopper define stress as a risk factor and describe the progressive and cumulative process: compassion discomfort, compassion stress, and then compassion fatigue. Also, Valent explains compassion fatigue progresses with the feelings that become strain, stress, and distress, and then reach the traumatic level which is compassion fatigue. This usually happens when the professionals view themselves as failing. Although Valent and Coetzee and Klopper use different terms to describe the level of negative feelings, they view compassion fatigue as a result of progressive and cumulative stress. Thus, the three risk factors of compassion fatigue defined by Coetzee and Klopper are the same risk factors which Valent identifies (Coetzee & Klopper, 2010; Valent, 2002) .

Comparing Interpretations of Compassion Fatigue

Although Valent (2002) and Coetzee and Klopper (2010) point out the same risk factors of compassion fatigue, differences can be found among the descriptions by Coetzee and Klopper, Valent, and Stamm (2010). Interestingly, Coetzee and Klopper (2010) do not view compassion fatigue as secondary traumatic stress. They point out that compassion fatigue and secondary traumatic stress are similar, but different. This interpretation is different from Stamm's explanation that secondary traumatic stress is

one component of compassion fatigue and Valent's explanation that compassion fatigue is a specific type of secondary traumatic stress and a form of burnout (Stamm, 2010; Valent, 2002).

Valent (2002) and Stamm (2010) believe that compassion fatigue is associated with a traumatic event; especially, the traumatic event that occurs when professionals are in a rescuing-caretaking situation. In addition, the model of professional quality of life developed by Stamm (2010) identifies three environments as antecedents in which possibly traumatic events occur. In comparison, Coetzee and Klopper (2010) do not indicate that a traumatic event is the cause of compassion fatigue and do not include environmental aspects which can be external factors to developing compassion fatigue. Coetzee and Klopper focus on internal factors of nurses describing why and how nurses develop compassion fatigue and effects of compassion fatigue on nurses. They provide a nursing knowledge of compassion fatigue in nurses which point toward its consequences and conditions and provide step-by-step development showing empirical indicators in nurses.

Based on the analysis of the concept of compassion fatigue, compassion fatigue in nurses can be identified and factors related to compassion fatigue can be described specifically for nurses in the nursing practice setting by developing a model for nurses.

Development of the Model of Consequences of Providing Nursing care

A model of consequences of providing nursing care (Figure 1) was developed based on the analysis of the descriptions of compassion fatigue by Stamm (2010), Coetzee and Klopper (2010), and Valent (2002). In the proposed model, compassion fatigue is included as negative consequences of providing nursing care along with the related concepts of secondary traumatic stress and burnout. The model consists of

multiple concepts, and each concept and relationships with other concepts are described with empirical support.

Negative Consequences of Providing Nursing Care

It is vital to clarify compassion fatigue in the proposed model. In this model, compassion fatigue is considered as one of the negative consequences of providing nursing care, as are burnout and secondary traumatic stress. Although different negative consequences of providing nursing care might occur other than compassion fatigue, secondary traumatic stress, and burnout, only these three components are included in this model. Meadors, Lamson, Swanson, White, & Sira (2009) found that compassion fatigue, secondary traumatic stress, and burnout are conceptually overlapping among pediatric healthcare providers; however, these three concepts each have their own unique features which do not overlap with the other concepts. Considering these results, in the proposed model, the three concepts are considered as components of negative consequences of providing nursing care, and they are overlapping (see Figure 1). The uniqueness and the definition of each concept are clarified, and then how compassion fatigue overlaps with burnout and secondary traumatic stress is explained.

Compassion fatigue. Compassion fatigue is defined as "one of the negative consequences of providing nursing care that is biopsychosocial responses originating from emotional engagement when providing compassionate care for the relief of suffering" (Sano et al., 2015, p. 27). It is associated with emotional engagement and the interpersonal relationship with patients and their families. In addition, both direct and indirect exposure to traumatic events is the risk factor of compassion fatigue (Sano et al., 2015).

Secondary traumatic stress. The definition of secondary traumatic stress is "one of the negative consequences of providing nursing care resembling post-traumatic stress symptoms and derived from indirect exposure to traumatic events through providing nursing care for those who are directly traumatized" (Sano et al., 2015, p. 29). Nurses absorb information of patients' trauma when sharing traumatic experiences of patients and families, internalize painful experiences of patients and the families as if nurses faced to the trauma, and develop secondary traumatic stress (Sano et al., 2015).

Overlap of compassion fatigue and secondary traumatic stress. The concepts of compassion fatigue and secondary traumatic stress are overlapping, since indirect exposure to a traumatic event is a risk factor of both compassion fatigue and secondary traumatic stress. Compassion fatigue is also developed by direct exposure to these events. Although compassion fatigue is considered as a specific secondary traumatic stress, it also has unique characteristics related to direct exposure. Thus, it can be considered that secondary traumatic stress is a part of compassion fatigue, and compassion fatigue is a part of secondary traumatic stress.

Burnout. Burnout is considered as "the one of the negative consequences of providing nursing care related to physical and cognitive strain and negative behaviors or attitude toward work resulting from conflicts within the work setting" (Sano et al., 2015, p. 30). The risk factor of burnout is environmental work stressors, and physical and emotional exhaustion appears in nurses as a result of prolonged and excessive work stress. Nurses feel a lack of achievement at work when they develop burnout (Sano et al., 2015).

Overlap of compassion fatigue and burnout. As with secondary traumatic stress, the overlap of compassion fatigue and burnout include both characteristics. It relates not only to the work environment, but also to nursing actions with emotional

engagement. Consequences of both burnout and compassion fatigue lead to a sense of emotional exhaustion in nurses. Thus, in the proposed model, burnout can be a part of compassion fatigue, and compassion fatigue can be a part of burnout.

Overlap of compassion fatigue, secondary traumatic stress, and burnout.
These three components of negative consequences of providing nursing care are conceptually overlapping in the proposed model. They are essential characteristics of compassion fatigue and both of the characteristics of burnout and secondary traumatic stress. Just as compassion fatigue originated from emotional engagement, this perspective should be included as an essential component. Thus, the overlap of the three components, compassion fatigue, secondary traumatic stress, and burnout, can be described as negative consequences of providing nursing care resulting from secondary exposure to a traumatic event, adverse effects of emotional engagement, and conflicts within the nursing practice.

Positive Consequences of Providing Nursing Care

Although Coetzee and Klopper (2010) do not include positive aspects of providing nursing care as a factor of compassion fatigue, there might be positive consequences of providing nursing care in parallel with negative consequences. Stamm (2010) uses the term, compassion satisfaction, to explain a positive aspect of professional quality of life, while compassion fatigue is described as a negative aspect of professional quality of life. Previous studies using the ProQOL showed that compassion satisfaction negatively correlates to compassion fatigue in healthcare providers (Robins et al., 2009; Yoder, 2010). In addition, PTSD symptoms negatively correlate to compassion satisfaction in psychiatric nurses in a violent environment (Lauvrud, Nonstad, & Palmstierna, 2009). Hinderer et al. (2014) found that compassion satisfaction were predictor of secondary traumatic stress.

By considering these study results using the ProQOL, compassion satisfaction can be a positive consequence of providing nursing care that might impact compassion fatigue; however, the concept of professional quality of life has not clearly defined and supported by theoretical evidence. Compassion satisfaction is one perspective of the professional quality of life and does not have a theoretical definition. In addition, the proposed model aims at understanding of consequences of providing nursing care; in other words, it does not look at the perspective of professional quality of life defined by Stamm (2010). Compassion satisfaction might be one of the positive consequences of providing nursing care. There are other concepts that possibly can be considered as positive consequences of providing nursing care, such as job satisfaction and nurses' well-being. While the proposed model recognizes the positive consequences of providing nursing care, the main focus of the model is on clarifying the concepts involved in the negative consequences of providing nursing care. In the proposed model (Figure 1), there are relevant factors that influence negative/positive consequences of providing nursing care in nursing practice. These factors are categorized into three types: patient, personal, and work environment (Sano et al., 2015). Next, each type of factor is defined and components associated are identified with empirical support from the review of previous studies.

Patient Factor

The patient factor is defined as incorporating any aspects related to patient characteristics or conditions that impact care provision in a practice setting. The patient factor presents the unique features of the nursing specialty related to nursing care, including patients' conditions and events that nurses are exposed to through their nursing performance (Sano et al., 2015). The patient factor can be considered as a possible risk

factor of positive and negative consequences of providing nursing care, as Li, Early, Mahrer, Klaristenfeld, and Gold (2014) found that stress exposure was significantly related to compassion fatigue among pediatric nurses. Nurses are directly or/and indirectly exposed to a possible risk factor through providing care to their patients. Coetzee and Klopper (2010) support this definition of the patient factor in the proposed model, since they define "contact with patient" as one of the risk factors of compassion fatigue. The patient factor influences how much nurses are exposed to traumatic events or situations through their contact with patients Thus, the patient factor describes the intensity and frequency of contact with the patient and family and clinical characteristics of the patient

Intensity and frequency of contact with the patient and family. The intensity and frequency of contact with the patient and family can describe an aspect of the patient factor which might influence positive and negative consequences of providing nursing care. Yoder (2010) found that nurses who worked 8-hour shifts identified a higher risk of compassion fatigue and burnout than those who worked 12-hour shifts. Hinderer et al. (2014) found that compassion fatigue and burnout were positively correlated with number of working hours per shift. These results are not consistent with Yoder (2010)'s study result, and more studies are needed to investigate the relationship between negative consequences of providing nursing care and number of working hours. It might be important to assess a pattern of the intensity and the frequency of direct care provided by nurses in a different shift length including the length of time spent in direct care and the frequency of providing direct care. Also, compassion fatigue was associated with the relationships between patients and their families among pediatric health care providers (Robins et al., 2009). Strength of the relationship with the patient and family possibly

impacts the amount of direct care. Thus, the variables of the intensity and frequency of contact with the patient and family can be clarified with length of time spent in direct care, frequency of providing direct care, and the nurses' relationships with the patient and family.

Clinical characteristics of the patient. The other component of the patient factor can be clinical characteristics of the patient. Maytum, Heiman, and Garwick (2004) identified that "caring for children with chronic conditions and their families" (p.174) was a trigger of compassion fatigue and burnout in a qualitative study. Another qualitative study conducted by Yoder (2010) also found that providing care for patients who were in serious condition was a trigger situation of compassion fatigue. In addition, compassion fatigue in hospice nurses was positively associated with a high frequency of patient death (Abendroth & Flannery, 2006). These unique clinical characteristics of the patient might influence positive and negative consequences of providing nursing care.

Personal Factor

The personal factor is defined as nurses' characteristics and experiences in nursing practice and in their lives. It contains personal and professional characteristics including their nursing and personal experiences which might influence how nurses perceive and deal with an event at work. Their perceptions and perspectives might relate to positive and negative consequences of providing nursing care (Sano et al., 2015).

Personal characteristics of nurses. Personal characteristics can be important information to understand the individual nurses. Valent (2002) pointed out that complex symptoms of compassion fatigue appear differently depending on the person, and that demographics such as age and gender can influence positive and negative consequences of providing nursing care.

Professional characteristics of nurses. Professional characteristics can be key components in the personal factor. Compassion fatigue is derived from experiences at work, and how an event is perceived. Yam, Rossiter, and Cheung (2001) found that nurses felt they lacked knowledge, expertise, skills in caring for the families of dying infants in their study. Burston and Stichler (2010) found that compassion fatigue was negatively associated with knowledge and skill, one of the dimensions of caring nurse. Also, Simmons (2005) identified the importance of developing a sense of purpose, meaningful work, and making a difference in nursing practice as a prevention of nurse burnout. Considering these study results, positive and negative consequences of providing nursing care might be related to the professional characteristics of nurses. The characteristics include years of nursing experience, years of experience in the specialty field in nursing, and the highest education level in nursing.

Self-compassion. Although self-compassion is not included in either explanation of compassion fatigue by Stamm (2010) and Coetzee and Klopper (2010), it can be another significant component of the personal factor which might be associated with positive and negative consequences of providing nursing care. Compassion is a fundamental course of action taken by nurses and an essential and inherent aspect in providing nursing care. It motivates nurses to respond to the suffering of patients and their families (Sano et al., 2015). Self-compassion implies the concept of compassion and promotes desire to relieve one's own suffering by acknowledging one's own suffering; consequently, it enhances deliberate actions toward others by sharing their suffering and desire to help (Neff, 2003a, 2003b). Self-compassion should be considered as a component of the personal factor that influences positive and negative consequences of providing nursing care.

Self-management. Self-management including stress management skills, and coping strategies can be another component associated with the personal factor. Monroe (2008) found that self-care strategies (cognitive, emotional, spiritual, and physical coping resources) were negatively related to compassion fatigue among psychiatric nurses. Hinderer et al. (2014) found that there are relationships between coping strategies and compassion fatigue and burnout among trauma nurses. Their study showed that compassion fatigue was negatively correlated with number of hobbies and positive coworker relationships; and burnout was negatively correlated with coping strategies including strength of supports, participation in exercise, use of meditation, and positive coworker relationships (Hinderer et al., 2014). Melvin (2012) also identified "setting boundaries/healthy coping strategies" (p. 609) as key to maintain the ability to providing nursing care and prevent compassion fatigue among hospice and palliative care nurses. Another study found that health promotional behaviors were positively associated with compassion satisfaction and negatively associated with compassion fatigue and burnout (Neville & Cole, 2013). As work and life balance is a recommended intervention to manage compassion fatigue (Boyle, 2011), self-management is a significant factor in coping with work related stress that might influence negative consequences of providing nursing care.

History of trauma exposure. History of trauma exposure needs to be given attention as a component of the personal factor that can be associated with consequences of providing nursing care. Trauma exposure is considered as a predictor indicating vulnerability to compassion fatigue (Figley, 1995). Monroe (2008) found that previous personal trauma was significantly and positively associated with compassion fatigue. In addition, another study showed the significant relationship between preexisting and

existing PTSD symptoms and compassion fatigue; and existing PTSD symptoms and burnout (Li et al., 2014).

Work Environment Factor

The work environment factor is defined as the characteristics of a practice setting and practice situations that contribute to productivity in the healthcare system. It describes organizational characteristics which impact outcomes of patients, nurses, and the healthcare system (Sano et al., 2015).

Organizational characteristics. Organizational characteristics that influence nurses and nursing care in the practice field can be important aspects of the work environment factor in the proposed model. Maytum et al. (2004) identified three types of triggers of compassion fatigue and burnout related to work in pediatric nurses using a qualitative study: "professional roles," "work overload," and "healthcare system issues" (p. 174). This finding can support the definition of the work environment factor in the proposed model. The type of trigger in the professional roles was described as a "role-specific trigger" related to "lack of support and a feeling of being on your own" (p. 175). The triggers related to work overload were explained as "being unable to give good care because of lack of time, repeated needs to put in overtime or double shifts, needing to work overtime and be at home, and having too many projects to do" (p. 176). The healthcare system issues type of triggers "included unreasonable policies, staffing shortages, insurance frustrations, excessive paperwork, needing to justify their position, and a feeling of general healthcare system dysfunction" (p. 175). These three types of triggers can be considered as a part of the work environment factor of the proposed model, as they impact productivity in the healthcare system.

Yoder (2010) also identified, in a qualitative study of oncology nurses, that a system issue was the trigger situation of compassion fatigue. The system issue was related to workload described as "high census, heavy patient assignments, high acuity, overtime, and extra work days" (p. 194) and management decisions related to vague references to deal with stressful situations. In addition, Perry, Toffner, Merrick, and Dalton (2011) found that lack of time and ability to provide quality care were a risk factor of compassion fatigue of oncology nurses. These findings can support the definition of the work environment factor in the proposed model. Also, the findings are considered as organizational characteristics which might be associated compassion fatigue in nursing practice. Thus, a key component of the work environment factor can be organizational characteristics including workload, organizational system issues related to the care delivery, or organizational supports.

Clinical leadership support. Clinical leadership support can be another component of the work environment factor. In the healthcare system, the growth of the clinical nurse leaders' role has been seen due to the result of the rapid evolution of health care, complexity of health problems, changing needs and expectations of the patient, public, and the healthcare system, and managed care aimed at low cost and high quality (Stavrianopoulos, 2012). In addition, effective nursing leadership is essential to maintaining patient safety in nursing practice (Page, 2008). The clinical nurse leaders' professional competencies can be a strong support as an organizational resource for other nurses who are facing difficult situations and can positively impact consequences of nursing care. Thus, clinical leadership can be another component of the work environment factor in the proposed model.

Components of the three types of factors, patient, personal, and work environment are identified. Next, relationships among all components of the proposed model are further explained as paths to positive and negative consequences of providing nursing care (see Figure 1).

Paths to Positive and Negative Consequences of Providing Nursing Care

The three types of factors, patient, personal, and work environment, are considered to have a direct or indirect impact on positive and negative consequences of providing nursing care. The patient factor is possible predictive factors (risk factors or facilitators) that directly impact positive and negative consequences of providing nursing care. The patient factor may have an indirect association with both consequences of providing nursing care through the personal factor and/or the work environment factor. Moreover, the personal factor might play a role of a mediator explaining a causal relationship. The personal factor might also function as a moderator that alters the direction or strength of the relationship between the patient factor and positive/negative consequences of providing nursing care depending on its levels. The work environment factor possibly plays a role as a moderator only. It might moderate the relationship between the patient factor and positive/ negative consequences of providing nursing care; and moderate the indirect effect of the personal factor in the relationship between the patient factor and positive/negative consequences of providing nursing care. Finally, positive/negative consequences of providing nursing care could be related, as both consequences can result from the patient factor; however, whether the result can be positive and/or negative is dependent on how the stressor (i.e., the patient factor) is filtered by the personal factor and the work environment factor.

In nursing practice, nurses are exposed to an event in nursing practice (the patient factor) through nursing actions and perceive the event that they experience. While experiencing the event, the personal factor and the work environment factor might influence their perceptions. For example, self-compassion, a component of the personal factor, might influence how nurses perceive the event positively or negatively. If nurses work in a high quality work environment such as having effective clinical leadership support, it can help them cope with difficult situations. As a result, these nurses can perceive the event as less traumatic than other nurses who do not have any clinical leadership support. The event might be more or less traumatic for nurses through self-compassion or depending on the clinical leadership support level. Thus, positive/negative consequences of providing nursing care are the outcomes that are impacted by the personal factor and the work environment factor.

Relationships among all components of the proposed model are identified as paths to positive and negative consequences of providing nursing care. These paths indicate that the three types of factors, patient, personal, and work environment, may directly or indirectly impact positive and negative consequences of providing nursing care.

Conclusion

By analying the interpretation of Stamm and Coetzee and Klopper using Valent's criterion of helpers' stress and trauma, a model of consequences of providing nursing care was developed. Compassion fatigue is re-conceptualized for nurses as one of the negative consequences of providing nursing care along with the other two negative consequences, secondary traumatic stress and burnout. The three types of factors which relate to consequences of providing nursing care are defined within nursing practice.

In order to identify the concept of compassion fatigue in nursing, it is a valuable step to develop a model of consequences of providing nursing care. The proposed model needs to be tested in order to obtain empirical evidence that provides the foundation for predicting the occurrence of compassion fatigue. Through nursing research, it is important to identify the linkage of findings providing a base of the comprehensive and logical structures of compassion fatigue. More studies are needed to define the concept of compassion fatigue as negative consequences of providing nursing care and the relationships among compassion fatigue, secondary traumatic stress, and burnout and to develop the knowledge of compassion fatigue in nursing.

Compassion fatigue is "one of the negative consequences of providing nursing care that is biopsychosocial responses originating from emotional engagement when providing compassionate care for the relief of suffering" (Sano et al., 2015, p. 14). It has been recognized as an issue in nursing. By analyzing two different interpretations of compassion fatigue using a conceptual framework of secondary stress and trauma responses, a conceptual model of consequences of providing nursing care was identified. Using the model, a more coherent understanding of compassion fatigue can be obtained, and intervention strategies to prevent and reduce compassion fatigue can be developed.

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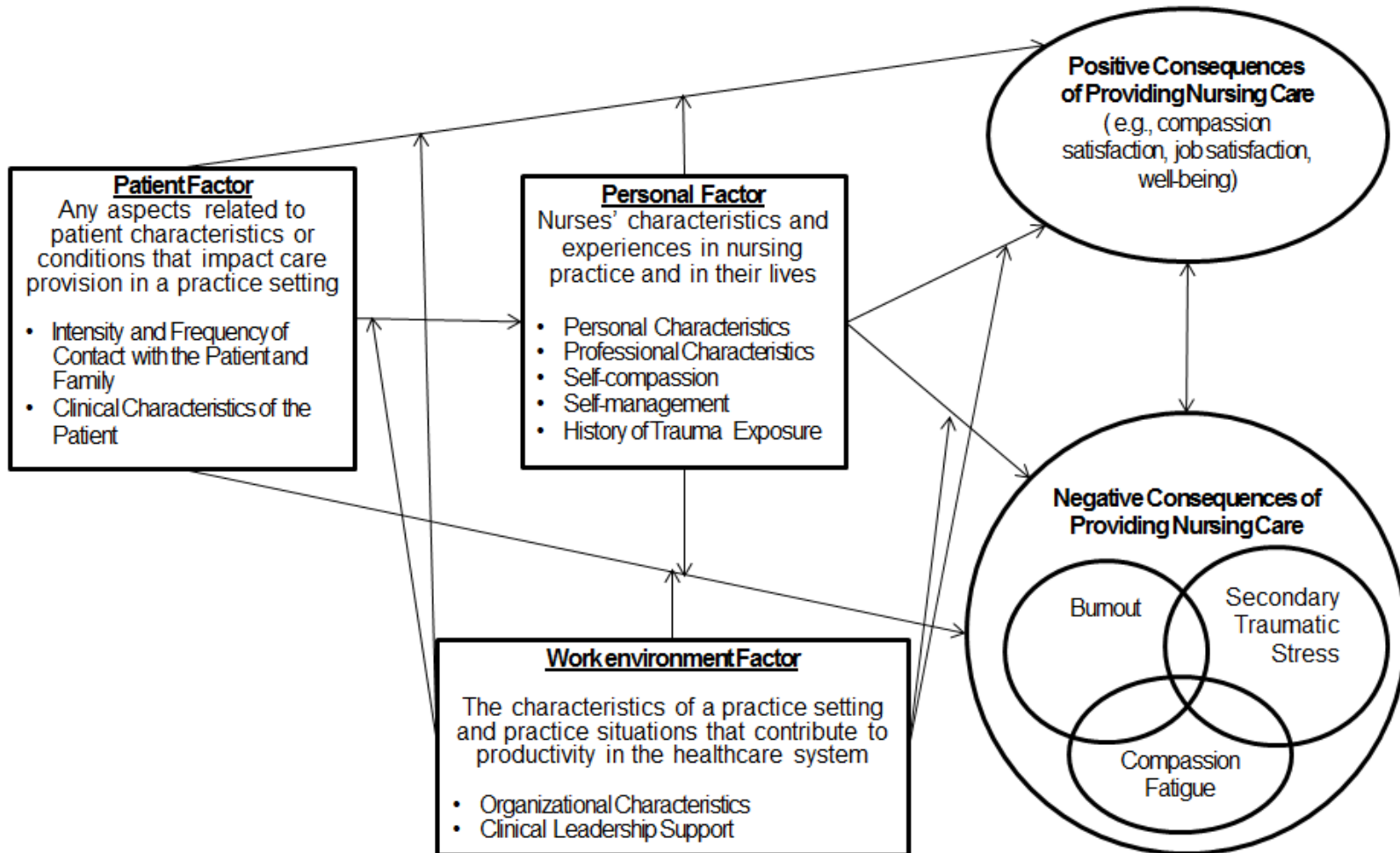
Figure 1. Model of Consequences of Providing Nursing Care. Copyright 2015 by Riko Sano.

Section 2.1.3. The Application of the Model of Consequences of Providing Nursing Care to NICU Nurses

In the last part of the theoretical framework section, the model of consequences of providing nursing care is specifically applied to unique features of NICU nursing. Compassion fatigue in NICU nurses is not clearly known due to the lack of studies in pediatric nursing. Furthermore, no studies have focused on only NICU nurses. Therefore, the proposed model (Manuscript 1 Figure 1) needs to be specifically applied to the unique features of the personal level of NICU nurses (see Dissertation Figure 1). The NICU is considered a specialized environment, which might have higher risks to makes nurses more vulnerable to compassion fatigue and other negative consequences of providing nursing care. There are many of stressors that increase burnout and stress among in nurses (Braithwaite, 2008; Kain, 2006). It is valuable to investigate negative consequences of providing nursing care in the NICU using the model of consequences of providing nursing care. The uniqueness of NICU nurses are identified in the application of the model (Dissertation Figure 1). Additional components of the patient factor and the work environment factor are included as characteristics of NICU nursing in the model for NICU nurses. There are no additional components of the personal factor.

Patient Factor

The clinical characteristics of the infant, which might influence compassion fatigue in NICU nurses is the acuity of the infant. The acuity of the infant relates to neonatal complications, disabilities, developmental problems, and subsequent consequences that cause long term health problems. When nurses strongly advocate for

infants and make emotional commitments with the infants, they may feel responsible for the negative outcomes of infants.

The acuity of the infant is described by the level of NICU (III to IV) which is categorized into three different levels of the capability of advanced neonatal care (American Academy of Pediatrics Committee on Fetus and Newborn, 2012). The other variables describing the acuity are birth weight and gestational age, and number of infant deaths to which nurses have been exposed. Infant deaths are significant factors that might be associated with negative consequences of providing nursing care. Either direct or indirect experiences of infant deaths can lead nurses to have anxiety and trauma (Braithwaite, 2008; Kain, 2006; Yam et al., 2001). Loss of patients was identified as a risk of compassion fatigue among hospice and palliative care nurses (Melvin, 2012).

Work Environment Factor

The single family room (SFR) design can be considered as a unique component of the work environment factor which might impact productivity in the healthcare system. This transition from the open unit to the SFR promoted nutritional progress of infants, such as shorter interval to enteral feeding and maternal breast milk start, decreased apnea events and the rate of nosocomial sepsis incidence, and provided quieter environment (Domanico, Davis, Coleman, & Davis, 2011). Other studies investigated the perceptions of various kinds of healthcare providers in the NICU. Their perceptions, such as quality of the work environment, patient care and care delivery, or overall satisfactions were significantly greater in the SFR in comparison with NICU staff in the open unit (Cone, Short, & Gutcher, 2010; Stevens, Helseth, Khan, Munson, & Smith, 2010). Additionally, the SFR was quieter while using common NICU equipment except high-frequency

ventilation according to Liu (2012). On the other hand, there are negative effects of the SFR design on nurses. A systematic literature review by Shahheidari and Homer (2012) found decreased communication and interaction including talking, supporting, and ongoing education among nurses. This environmental improvement might affect negative consequences of providing nursing care in the NICU. It is valuable to see whether this environmental change has been implemented in the NICU and how it influences NICU nurses. Thus, the NICU room design can be one component in the work environment factor of the proposed model for NICU nurses. In order to identify negative consequences of providing nursing care in the NICU, the proposed model (Dissertation Figure 1) of NICU nurses needs to be examined to see the accuracy and feasibility of the proposed model using the variables describing the unique features of NICU nursing.

Section 2. 2. Literature Review

This section provides literature review of research regarding compassion fatigue in nurses. The purpose of this literature review is to explore compassion fatigue as negative consequences of nursing care in nurses who worked in a healthcare agency. Since none of research has focused on NICU nurses, the literature search broadly focused on nurses in any healthcare setting. This review describes compassion fatigue in nurses identified through quantitative and qualitative studies. In addition, associated factors of compassion fatigue and the relationships between the factors and compassion fatigue are revealed.

Search Strategy

The PRISMA statement is used for reporting of the literature review (Moher, Liberati, Tetzlaff, & Altman, 2010). This literature review involved these databases;

CINAHL Plus with Full Text, MEDLINE, and PsycINFO, in EBSCO host. The key words used were compassion fatigue, secondary traumatic stress, NICU, pediatric nurses, and nurses. The first search used a search-term combinations, "compassion fatigue and NICU and Nurses" with no limitation of published date. None of studies found investigated compassion fatigue in NICU nurses. For obtaining more articles about compassion fatigue in NICU nurses, the combination of compassion fatigue and NICU without limitation of published date was used, and one study was found (Meadors, Lamson, Swanson, White, & Sira, 2009) . The next search was extended to pediatric nursing. The search-term combination used was "compassion fatigue, pediatric, and nurses" with no limitation of published date, and two studies were found (Robins, Meltzer, & Zelikovsky, 2009).

Finally, the focus of the literature search was extended to nurses in any nursing specialty. The search included research articles that were published from December 2007 to November 2012 and were written in English to review research within last five years. In order to find a study which considered secondary traumatic stress as compassion fatigue and to avoid a study of secondary traumatic stress which did not contain the perspectives of compassion fatigue, search term combinations used were compassion fatigue and nurses; compassion fatigue and secondary traumatic stress and nurses. In the final search, 68 articles were found and screened. The eligibility criteria for selecting articles were full-text research articles which are (a) a study, (b) published from December 2007 to November 2012, (c) written in English, and (d) investigating compassion fatigue as a negative consequence of nursing care in healthcare agencies. Following this eligibility criteria, 42 articles were excluded after screening abstracts, and

26 articles were reviewed. Out of 26 articles, 4 concept analyses and 7 reviews of literatures or books were eliminated. The other studies eliminated were a study focusing on compassion fatigue related to medical error (Maiden, Georges, & Connelly, 2011), focusing on public health nurses who cared for hurricane victims (Frank & Adkinson, 2007), and investigating interventions to manage compassion fatigue in nurses (Aycock & Boyle, 2009). This literature search ended up with 13 studies; thus, in addition to the 2 studies from the previous search, a total of 15 studies were reviewed. In the next section, the results of the literature review are identified.

Review Results

The results of the literature review are identified. First, scales used in the quantitative studies are introduced before presenting the review results. A total of 16 articles from the literature search are then described in chronological order. Studies of compassion fatigue published in the same year are presented in alphabetical order. In this review, the participants of some studies included not only nurses, but also other healthcare providers. In this review, it is important to understand how compassion fatigue was measured. The instrument used in the study also can identify how the author interpreted compassion fatigue. Three instruments to measure compassion fatigue were used in the studies included in this literature review.

The instrument used in most of the studies was the Professional Quality of Life Scale (ProQOL; Stamm, 2010). The ProQOL is a self-report measure to assess compassion fatigue, with three subscales: compassion satisfaction, burnout, and secondary traumatic stress. The secondary traumatic stress subscale refers compassion fatigue in this scale. The score in each subscale shows a level of compassion satisfaction,

burnout, and compassion fatigue in three ranges: high, average, and low. Another instrument is the Compassion Satisfaction and Fatigue Test (CSFT). This is the previous version of the ProQOL and was renamed to ProQOL in the late 1990s (Stamm, 2010). The subscales are same as that of the ProQOL. The last instrument is the Secondary Traumatic Stress Scale (STSS) measures symptoms of secondary traumatic stress including intrusion, avoidance, and arousal. It identifies four levels of secondary traumatic stress from little or no secondary traumatic stress to severe secondary traumatic stress (Bride, Robinson, Yegidis, & Figley, 2004). The next section provides the summary of studies.

Summary of Studies

Monroe (2008) examined the relationship between compassion fatigue and self-care and among psychiatric nurses in a dissertation study using a descriptive and correlational design. The participants were 51 psychiatric RNs (response rate of 25%) from three institutions in California. The CSFT was used to measure compassion fatigue and four predictive factors of compassion fatigue were analyzed: previous personal trauma of the nurses, trauma patients, having a suppose (being married), and self-care strategies (cognitive, emotional, spiritual, and physical coping resources). The results identified that having previous personal trauma and caring for patients suffering from trauma were significantly and positively associated with compassion fatigue. Also, having a spouse and all self-care strategies were significantly and negatively associated with compassion fatigue. Finally, the study found that predicted factors of compassion fatigue were having previous personal trauma and social coping resources as self-care strategies.

Perry (2008) identified factors which facilitated avoiding compassion fatigue in nurses in Canada using a descriptive phenomenological qualitative approach. The participants were seven RNs who were considered as exemplary nurses by their colleagues and primarily provided direct care to patients with cancer in an acute palliative care unit, a hospice, and an adult oncology unit. In this study, exemplary nurses were defined that " they were acknowledge by their colleagues as those nurses they would want to care for them or their family members if they were ill with cancer" (p. 88) and they "did their work in a remarkable way and achieved outstanding outcomes for their patients and, subsequently, were positively affected themselves" (p. 88). Semi-structured conversations between participants and researchers were used to discuss compassion fatigue. For data collection, conversations were transcribed, and analyzed for the three recurring themes: "recurrence of idea, repetition of ideas, and forcefulness with which idea are expresses" (p. 88). Themes were identified: "moments of connection", "making moments matter", and "energizing moments". "Moments of connection" was described as "establishing a connection with their patient" (p. 89). "Making moments matter" was explained that "valuing the opportunities to establish meaningful relationships with their patients" (p. 90). The last theme, "energizing moments" was explained that nurses "brought energy to their work that spilled over into their patient encounters" and "enacting their nursing role with positive energy resulted in many encouraging out comes for both the patients and themselves" (p. 90).

Austin, Goble, Leier, and Byrne (2009) identified compassion fatigue in nurses from in various nursing specialties (areas were not reported) in a local healthcare organization in Canada using a phenomenological qualitative approach. The participants

of this study were five RNs (response rate was not reported) who self-reported having or had experienced compassion fatigue. Data were collected using a one to one unstructured interview. The participants described clinical situations in which feelings related to compassion fatigue occurred, while caring for patients. Data were transcribed, and the transcripts were thematically analyzed. The results showed six themes: "running on empty", "shielding myself", "being impotent as a nurse", "losing balance: it overwhelms everything", "the kind of nurse I was", and "trying to survive". The first theme, "running on empty", indicated "feeling so fatigued that they are empty, having nothing to give emotionally to their patients" (p. 202). Next, "shielding myself" was described as "distancing themselves from patients and families, focusing more on their technical skills or providing just the basics" (p. 204). In the third themes, "being impotent as a nurse", "the sense of impotence" was found in the participants (p. 205). Next, "losing balance: it overwhelms everything" was explained that "having compassion fatigue was overwhelming and it caused the nurses to lose balance in their lives, a balance that they knew they desperately needed" (p. 206). The fifth theme, "the kind of nurse I was", was explained that the participants described themselves "the way they used to be as a nurse" (p. 207). The last theme, "trying to survive", was described that the participants "no longer felt they were living up to their expectations of being nurses" (p. 208). On the other hand, "they hadn't quit nursing, though each had seriously considered it. Rather, they had developed means of surviving" (p. 208).

The exploratory comparative study conducted by Dominguez-Gomez and Rutledge (2009) aimed at investigating compassion fatigue in emergency room nurses in a healthcare system in California. Secondary traumatic stress symptoms considered as

compassion fatigue were measured using the STSS including the subscales of intrusion, avoidance, and arousal. The participants were 69 RNs (response rate of 63%) with a minimum of six months' experience in the emergency units, and 82% of them were staff nurses. The mean time worked per week was 41 hours. The result showed that 85% of emergency nurses reported at least one symptom (intrusion, avoidance, or arousal) in a week's time; however, 92% of nurses had not sought assistance for work-related stress.

Lauvrud, Nonstad, and Palmstierna (2009) identified the prevelance of compassion fatigue, burnout, compassion satisfaction, and post-traumatic stress and how these four study variables were related each other in psychiatric nurses in Norway. In this descriptive and cross-sectional study, the participants were 67 full-time staff nurses (response rate of 70%) who worked in acute and long term psychiatric unit where nurses experience higher frequency of violence than the average general acute setting. The results showed a high frequency of violence, and that approximately 96% of nurses are exposed to real threats containing serious physical violence within 30 days. Compassion fatigue was measured using the ProQOL (unknown version), the results showed a low level of compassion fatigue, burnout, and posttraumatic stress symptoms and a low level of compassion satisfaction. It was reported that longer length of psychiatric nursing experience and lower compassion satisfaction were significantly and positively correlated with increased of posttraumatic stress symptoms.

Meadors et al. (2009) explored compassion fatigue in pediatric healthcare providers ($N = 168$) with a small numbers of nurses ($n = 23$). This correlational study aimed at exploring the overlap and differences among four concepts: PTSD, secondary traumatic stress, compassion fatigue, and burnout. Also investigated was how secondary

traumatization and the personal and professional elements affected PTSD, secondary traumatic stress, compassion fatigue, and burnout in pediatric healthcare providers. The participants worked in the pediatric intensive care unit, neonatal intensive care unit, or/and general pediatric unit within the last year in the United States. Different professions were included: physicians, nurses, chaplains, child life specialists, and other medical and mental health staff. The ProQOL (unknown version) was used to measure compassion fatigue, burnout, and compassion satisfaction. In addition, symptoms of secondary traumatic stress were measured using the STSS. Meadors et al. (2009) identified that the four concepts significantly overlapped and were positively related. Also examined was the predictive validity for compassion satisfaction, burnout, PTSD, and secondary traumatic stress on the variance in compassion fatigue using a hierarchical linear regression analysis. The result showed that the total model including all four measures account for 70% of the variance in compassion fatigue. Importantly, the strongest effect on compassion fatigue was secondary traumatic stress. The second strongest effect was PTSD followed by burnout with compassion satisfaction. Demographics and the type of traumatizing events were not associated with compassion fatigues (Meadors et al., 2009).

The next study is a dissertation study conducted by Reese (2009) which investigated the relationship between spirituality and compassion fatigue in emergency healthcare providers using a descriptive correlational study. The participants were 89 emergency healthcare providers (response rate of 27.4%) including RNs (7.4% of the total of 89), flight paramedics, physicians, and chaplains in a level I trauma center in Virginia. Compassion fatigue was measured using ProQOL (the version not reported).

Data were analyzed using three hierarchical regressions to examine the relationship between compassion fatigue, burnout, and compassion satisfaction with five predictors: age, job title, years of experience, religious well-being, and existential well-being. The result showed that the model including all five predicators explained 14% of the variance in compassion fatigue. Only age was significantly and negatively associated with the level of compassion fatigue and accounted for five percent of the variance in compassion fatigue. The next results showed that all five predicators explained 29% of the variance in burnout. Burnout was significantly and negatively associated with age and existential well-being, while it was significantly and positively associated with years of experiences. Also RNs identified higher levels of burnout than other health care workers. The final results showed that although all predictors were not significantly associated with compassion fatigue, nurses showed lower levels of compassion satisfaction than other healthcare providers.

Robins et al. (2009) investigated the impact of providing care, relevant factors of compassion fatigue, and the relationship between compassion fatigue and empathy and spirituality and coping in pediatric healthcare providers in a children's hospital in Philadelphia. The participants of this correlational study were 314 healthcare providers (response rate was not reported) consisting of physicians, nurses, mental health practitioners, and allied health practitioners from various divisions in the hospital: oncology, cardiology, nephrology, emergency services, intensive care units, rehabilitation/child development, psychology, social work, and anesthesiology. Out of 314 participants, 43% ($n = 136$) were nurses. Compassion fatigue was measured using the CSFT, which is the previous version of the ProQOL. The results found that 39% of

participates showed average to high levels of compassion fatigue. Also, averages to high levels of burnout were seen in 21% of the all participants. There were no differences in levels of compassion fatigue by other demographic characteristics. Meanwhile, higher levels of compassion satisfaction were reported in those who were long-term employees than short-term employees, part-time employees than full-time employees, and non-trainees rather than trainees (interns and fellows). The results showed that compassion fatigue was positively associated with burnout, although it was negatively associated with compassion satisfaction. Robins et al. (2009) also examined predictive variables of compassion fatigue by a multiple regression analysis: years in direct care, internal coping, and the capacity for empathy which consisted of perspective taking, empathic concern, personal distress, and fantasy. Fifteen percent of the variance was explained in compassion fatigue by the five predictors: years in direct care, internal coping, and three components of the capacity for empathy (perspective taking, fantasy, and personal distress). The results showed that compassion fatigue was strongly and positively associated with years in direct care. In addition, compassion fatigue had a strong relationship with the capacity for empathy. Two components of empathy, fantasy and personal distress, had a positive relationship with compassion fatigue, while the other component, perspective taking, had a negative relationship. The study results need to be considered with caution in that more than half of the participants were not nurses.

In addition, Robins et al. (2009) compared the results with two comparison groups. The data of the two groups of trauma workers and health care professionals were obtained from other studies. The trauma workers comparison group consisted of 370 professionals who had trained to take care of people facing a single traumatic event, such

as natural disaster. This group included business volunteers, caregivers in training, trauma professionals, and Red Cross staff from the United States, Canada, and South Africa. The health professional comparison group consisted of 280 nurses and medical trainees (no more information was reported about this group). Compared to the two comparison groups, there were no significant differences in compassion fatigue levels between two groups with the sample of this study (pediatric healthcare providers). On the other hand, the sample of this study showed higher levels of compassion satisfaction and burnout than both comparison groups. More specifically, the nurses in this study sample identified significantly higher levels of both burnout and compassion satisfaction than the trauma workers group, while the physicians and allied health professionals in this study sample identified significantly higher levels of burnout than this comparison group. In addition, the nurses in this sample identified significantly higher level of compassion satisfaction than the health professional comparison group, while the physicians and allied health professionals in the sample identified significantly higher levels of burnout than this compassion group (Robins et al., 2009).

Burtson and Stichler (2010) investigated the relationships between nursing caring and compassion fatigue, burnout, stress, compassion satisfaction, job satisfaction. This was a correlational study with 126 nurses (response rate of 28%) working in surgical units, emergency rooms, and critical care units in a single academic center. Over 70% of them worked in surgical units and 98% of them were RNs (types of other 2% of nurses were not reported). The ProQOL (unknown version) was used to measure compassion fatigue, burnout and compassion satisfaction. Although compassion fatigue was not associated with overall dimensions of nurse caring, it was negatively associated with

knowledge and skill which is one of the dimensions of nursing caring. Whereas the nurse caring was positively related to compassion satisfaction, it was negatively associated with burnout. Also, the level of compassion fatigue and burnout had a positive strong relationship. Although the participants were from different specialties, the differences among nursing specialties were not reported, it should be noted that over 70% were surgical unit nurses.

Hooper, Craig, Janvrin, Wetsel, and Reimels (2010) compared compassion fatigue using the ProQOL (version IV) in emergency room nurses and nurses who worked in other specialty fields including, oncology, nephrology, and medical-surgical intensive care unit. This exploratory cross-sectional study was conducted with full-time and part-time RNs with a work schedule that included more than eight hours per week and those who worked as staff nurses and more than one year. Out of 109 nurses (response rate of 82%), over 80% of nurses had average to high levels of compassion fatigue and burnout. Over 70% of them showed average to high levels of compassion satisfaction. There was no difference between emergency nurses and other nurses in different specialties. None of sociodemographic variables, number of years as an RN, years in specialty area, primary shift, education, and ethnicity were associated with compassion fatigue, burnout, and compassion satisfaction.

Potter et al. (2010) examined the prevalence of compassion fatigue and burnout in oncology healthcare providers in a cancer center in the Midwestern United States. Although this study was conducted in healthcare providers broadly, the majority of the participants were nurses. The participants of this study were 153 oncology healthcare providers (response rate of 34%) which included 132 RN (86%), medical assistants, and

radiology technicians in inpatient nursing units and outpatient clinics. This was a descriptive and cross-sectional study, and compassion fatigue was measured with the ProQOL (version IV). The participants exhibited a low level of compassion fatigue and burnout and an average level of compassion satisfaction. Although more participants who worked in inpatient units showed higher levels of compassion fatigue, there were no differences of the level of compassion fatigue, and burnout by the work setting, years of healthcare experience, years of oncology experience, age, and level of education (Potter et al., 2010).

Yoder (2010) conducted a study using both quantitative and qualitative approaches. The quantitative part of this study explored the prevalence of compassion fatigue in hospital and home care nurses and the relationships with burnout and compassion satisfaction. The qualitative part of this study identified the type of situations which can be triggers of compassion fatigue and the type of strategies to manage compassion fatigue. The participants of this study were 71 RNs (response rate of 60%) working in home care, emergency department, intensive care unit, progressive care unit, oncology unit, and medical–surgical units. The ProQOL (version IV) was used for this study. The participants reported a low level of compassion fatigue and burnout, and an average level of compassion satisfaction. Nurses who worked 8-hour shifts identified a higher level of compassion fatigue and burnout than those who worked 12-hour shifts, although there were no significant differences in levels of compassion satisfaction, compassion fatigue, and burnout among nurses who worked during days, evenings, and nights. By comparing compassion satisfaction by areas of work, intensive care unit nurses reported significantly a higher level of compassion satisfaction than emergency

department nurses, although there were no significant differences among nurses working in the other areas. Moreover, compassion satisfaction was negatively correlated with many items of the compassion fatigue subscale and the burnout subscale of the ProQOL.

In the qualitative part of this study, trigger situations and coping strategies of compassion fatigue were described by written narrative responses through the questionnaire, and the narratives were analyzed using content analysis. The trigger situations identified were categorized into three: "caring for patients", "system problems", and "personal issues" (Yoder, 2010, p. 194). The first category, "caring for patients" identified the three themes related to trigger situations of compassion fatigue: "patient condition/status", "challenging behavior", and "futile care" (p. 194). Next, the "system issues" category identified the two themes: "workload" and "management decisions" (p. 194). Finally, the "personal issues" category showed two themes: "personal limits" and "personal experiences"(p. 194). The coping strategies categorized into work related strategies and personal strategies. Work related strategies identified were "change personal engagement", "change nature of work involvement", "debrief informally", "take action to change/manage current situation", and "develop ritual" (p.194). Personal strategies were "life outside work", "spiritual or religious", "introspection", and "attitude modification" (p. 194).

Perry, Toffner, Merrick, and Dalton (2011) also conducted a descriptive exploratory qualitative study. They identified the experience of compassion fatigue in oncology RNs in Canada. The participants were recruited through a national recruitment advertisement. Nineteen RNs (response rate was not reported) participated in the study, and 11 of them were practicing in oncology, 5 participants were not practicing in

oncology, and the others did not responded. The inclusion criteria were having advanced

education for cancer care, spending the majority of time on direct patient care, being

employed as clinical oncology nurses, and self-identified as having or had experiences of

compassion fatigue. Data were collected using a questionnaire and a narrative by

participants describing experiences with compassion fatigue through the research website.

Data were categorized into five themes: "defining compassion fatigue" (Perry et al., 2011,

p. 93), "causes of compassion fatigue" (p. 93), "factors that worsen compassion fatigue"

(p. 94), "factors that lessen compassion fatigue" (p. 95), and "outcome of compassion

fatigue" (p. 95). In the first theme, "defining compassion fatigue", the participants

showed that they were not able to identify whether they experienced compassion fatigue

due to their limited knowledge of compassion fatigue. In the second theme, "causes of

compassion fatigue", lack of support, lack of knowledge about compassion fatigue, lack

of time/ability to provide quality care were identified. "Factors that worsen compassion

fatigue" were being unable to ease suffering, co-existing stresses, and excessive

attachment/involvement. "Factors that lessen compassion fatigue" were colleague support,

work-life balance, connecting with others, acknowledgement, and maturity and

experience. Finally, "outcomes of compassion fatigue" were profound physical and

psychological fatigue, negative effects on relationships, and considering leaving the

profession (Perry et al., 2011).

Young, Derr, Cicchillo, and Bressler (2011) conducted an exploratory descriptive

study to identify the prevalence of compassion fatigue, burnout, and compassion

satisfaction in heart and vascular nurses and compared the results by work setting: the

intensive care unit or intermediate care unit. The participants of this study were RNs in a

staff position. There were 45 intensive care unit nurses and 25 intermediate care unit nurses in an academic medical center in Pennsylvania. Compassion fatigue was measured using the ProQOL (version IV). Intensive care unit nurses reported a low level of compassion fatigue and an average level of burnout and compassion satisfaction, while intermediate care unit nurses reported a low level of compassion fatigue and burnout, and a high level of compassion satisfaction. Although there were no differences in levels of compassion fatigue between two groups, significant differences were found in burnout and compassion satisfaction. Intensive care unit nurses reported a higher level of burnout and a lower level of compassion satisfaction than intermediate case unit nurses.

Beck and Gable (2012) using a mixed methods convergent parallel study design investigated symptoms of secondary traumatic stress as compassion fatigue in labor and delivery nurses and the nurses' experiences during traumatic births. The participants were 464 labor and delivery nurses (response rate of 15%) who were members of the Association of Women's Health, Obstetric, and Neonatal Nurses. Quantitative data were collected using the STSS and showed that 63% of the participants exhibited some degree of secondary traumatic stress. The most severe symptom identified was arousal followed by intrusion and avoidance. Qualitative data were collected from 70% of the participants by asking nurses to describe the experiences of being present at traumatic births. The most frequent traumatic birth described was infant/fetal demise followed by maternal death, and shoulder dystocia. Using content analysis, the descriptions provided six themes of the experiences during traumatic birth: "magnifying the exposure to traumatic births" (Beck & Gable, 2012, p. 753), "struggling to maintain a professional role while with traumatized patients" (p. 755), "agonizing over what should have been" (p. 755),

"mitigating the aftermath of exposure to traumatic births" (p. 756), "haunted by secondary traumatic stress symptoms" (p. 756), and "considering foregoing careers in labor and delivery to survive" (p. 757).

Discussion

From this literature review, compassion fatigue and secondary traumatic stress were often considered as the same concept. Only the study conducted by Meadors et al. (2009) investigated the conceptual differences among the terms, compassion fatigue, secondary traumatic stress, burnout, and PTSD. The ProQOL was commonly used to measure compassion fatigue along with the subscales of burnout and compassion satisfaction. Also, the relationships among compassion fatigue, burnout, and compassion satisfaction were investigated.

The relationship among compassion fatigue, burnout and compassion satisfaction. The common result of the relationship among the three concepts, compassion fatigue, burnout, and compassion satisfaction was that compassion fatigue had a positive relationship with burnout (Hooper et al., 2010; Meadors et al., 2009; Robins et al., 2009). On the other hand, the relationship with compassion satisfaction and compassion fatigue was not clearly identified. Some studies showed that compassion satisfaction was negatively correlated with compassion fatigue and burnout (Meadors et al., 2009; Yoder, 2010). Although other studies did not reported the relationship, some studies showed that low to average levels of compassion fatigue and burnout with average to high levels of compassion satisfaction (Potter et al., 2010; Yoder, 2010; Young et al., 2011), although another study showed average to high levels of compassion fatigue with average to high levels of compassion satisfaction (Hooper et al., 2010). In

addition, Lauvrud et al. (2009) reported a low level of compassion fatigue and burnout with a low level of compassion satisfaction. More investigations are needed to identify the relationships among the three concepts, compassion fatigue, burnout, and compassion satisfaction.

  Relevant factors to compassion fatigue. Furthermore, the literature review revealed relevant factors to compassion fatigue. Although the generalizability and transferability of the study results need to be considered, these factors supported the proposed model of consequences of providing nursing care previously described. The working setting might be a factor with an impact on compassion fatigue. The levels of compassion fatigue were significantly different by different working settings (Robins et al., 2009; Yoder, 2010). Although Young et al. (2011) reported that there were no differences of the level of compassion fatigue by work settings, the level of burnout and compassion satisfaction were significantly different by work settings. Moreover, the hours of shift was negatively correlated with compassion fatigue (Yoder, 2010), while the length of time on direct patient care was positively correlated with compassion fatigue (Robins et al., 2009). These factors, the work setting, the hours of shift, and the length of time on direct patient care can be components of the patient factor of the proposed model, as these components follow the definition of the patient factor, "incorporating any aspects related to patient characteristics or conditions that impact care provision in a practice setting" (Sano et al., 2015a, p. 61). By considering that compassion fatigue might have some relationships between burnout and compassion satisfaction, these results can support the proposed model that the patient factor relates to positive and negative consequences of providing nursing care.

Additionally, in the literature, there are factors which can support the relationships between the personal factor and positive and negative consequences of providing nursing care in the proposed model. The longer term of being employed positively related to compassion fatigue and compassion satisfaction (Robins et al., 2009). Also, Monroe (2008) found that compassion fatigue had a positive relationship with experiences of the personal trauma caring for trauma patients, although it had a negative relationship with self-care management and being married. By following the definition of the personal factor, " nurses' characteristics and experiences in nurse practice and in their lives" (Sano et al., 2015a, p. 63), those findings can be considered as the components of the personal factor. Other components which can relate to the personal factor are empathy and nursing care. Empathy was negatively associated with compassion fatigue (Robins et al., 2009). Although overall dimensions of nursing care was not correlated with compassion fatigue, one of the dimensions of nursing caring, knowledge and skill, was negatively correlated with compassion fatigue. Moreover, nurse caring was positively correlated compassion satisfaction, while it was negatively correlated with burnout (Burtson & Stichler, 2010). As caring and empathy are components of compassion according to Valent (2002), these results support that compassion is one component of the personal factor in the proposed model (Sano et al., 2015a). Moreover, study results identified by Robins and colleagues (2009) and Burtson and Stichler (2010) support that the personal factor influences positive and negative consequence of nursing care.

On the other hand, Potter et al. (2010) and Meadors et al. (2009) identified that there were no differences of the level of compassion fatigue by any demographic data or

participants' experiences, and Dominguez-Gomez and Rutledge (2009) showed that there were no differences of the symptoms of secondary traumatic stress when they are considered as compassion fatigue. The reason for these inconsistencies can be that the study of compassion fatigue in nurses has not been conducted enough to identify compassion fatigue and other related factors in order to generalize the study results in nursing. Furthermore, each study focused on a different nursing specialty. This can affect the differences in the study results.

The use of the ProQOL. Although most of studies used the ProQOL to measure compassion fatigue, the scale has not been supported by a theory of compassion fatigue. The model of Professional Quality of Life by Stamm (2010) describes compassion fatigue for this scale; however, this model has not supported with scientific data. Additionally, as Stamm (2010) interchangeably uses the two terms, compassion fatigue and secondary traumatic stress, the concept of compassion fatigue is not clear throughout studies. This is because the theory of compassion fatigue has not developed, and compassion fatigue as a phenomenon and its definition has not identified in nursing. It causes difficulties in generalization of study results, as the definition is not clear and consistent in the research. Research should be derived from a theoretical perspective of compassion fatigue. A model can be a representation implying hypotheses to an underlying theory of compassion fatigue. It can also identify factors that relate to compassion fatigue in nursing practice. By using a model, research can identify core meaning and the consequences of compassion fatigue including related factors in nursing.

Differences among professions. Another problem seen in this review is that some of studies used different professions as study participants (Meadors et al., 2009;

Reese, 2009; Robins et al., 2009).There might be differences and uniqueness in the working environment or characteristics of patient care among different professions. Each profession takes a different role in the healthcare system. It can influence the results and present difficulties in describing compassion fatigue in nurses. In addition to the use of different professions in research, a sample from different nursing specialties can influence the study results. As each specialty has unique characteristics of the work environment and nursing care, nurses in a different specialty might show different levels of compassion fatigue, and risk factors might be different. Therefore, research needs to be conducted within a nursing specialty in order to identify compassion fatigue and factors surrounding the negative consequences of nursing care in the specific field of nursing.

Methodological issues. Some methodological issues need to be pointed out. Only two studies reported that the study sample provided sufficient power to detect an appropriate effect size in the study (Burtson & Stichler, 2010; Robins et al., 2009). Other studies reported that the sample was small size (Hooper et al., 2010; Meadors et al., 2009; Potter et al., 2010). The other studies did not report how the sample size was determined in the study. Moreover, samples of most studies were not randomly selected. The sample size and the sampling used provide limitations to generalizability of the findings. Furthermore, qualitative study results are not able to be generalized. Thus, the lack of the generalizability needs to be considered in this literature review.

Conclusion

This literature review showed that compassion fatigue in nursing has not been identified as a phenomenon, and the studies in this review are the beginning stage of nursing research. This area needs to more research attention in nursing practice.

Moreover, compassion fatigue in NICU nurses needs to be identified, as the current studies are limited to compassion fatigue in pediatric nursing. Therefore, there are gaps in understanding of compassion fatigue in nurses. In order to reduce these gaps, research which investigates compassion fatigue in NICU nurses is valuable.

Summary

Chapter 2 described the theoretical framework of this study and presented a literature review. The theoretical framework section provided two manuscripts about the science of compassion fatigue. The first manuscript presented nursing perspectives on the concept of compassion fatigue. The second manuscript presented the development of a model of consequences of providing nursing care. In the last part of the theoretical framework section, the proposed model was specifically applied to NICU nurses. Finally, the last part provided a literature review of research regarding compassion fatigue in nurses supporting the dissertation research questions.

Chapter 3

Method

This chapter provides a detailed description of all aspects of the design and procedures of this study. It includes the purpose of the study, design, setting, data collection and management, analytical procedures, and ethical considerations.

Study Design

This study examined a model of negative consequences of providing nursing care, including compassion fatigue, secondary traumatic stress, and burnout, using a moderated mediation analysis in a cross-sectional correlational design. The moderated mediation analysis aimed at examining whether the conditional indirect effect of self-compassion in the relationship between the patient factor (i.e., intensity and frequency of contact with the infant and family, clinical characteristics of the infant) and negative consequences of providing nursing care (compassion fatigue, secondary traumatic stress, and burnout) was dependent on levels of the personal factor (e.g., age, years of experiences in NICU III or IV) or the work environment factor (e.g., presence of APNs, SFR NICU). A series of the moderated mediation analyses were conducted using a different combination of an independent variable and a moderator in the tested model (Dissertation Figure 2). The tested model was derived from the conceptual model of consequences of providing nursing care in the NICU (Dissertation Figure 1). It focused on only negative consequences of providing nursing care.

Setting

The American Academy of Pediatrics defines level III unit as NICU and level IV unit as regional NICU for infants who are in the most complex and severe condition

(American Academy of Pediatrics Committee on Fetus and Newborn, 2012). There were 17 hospitals that had a level III or IV NICU in the state of Wisconsin. Out of 17 NICUs, 11 NICUs agreed to participate in the study, and 2 NICUs declined. Four NICUs did not respond to the study invitation.
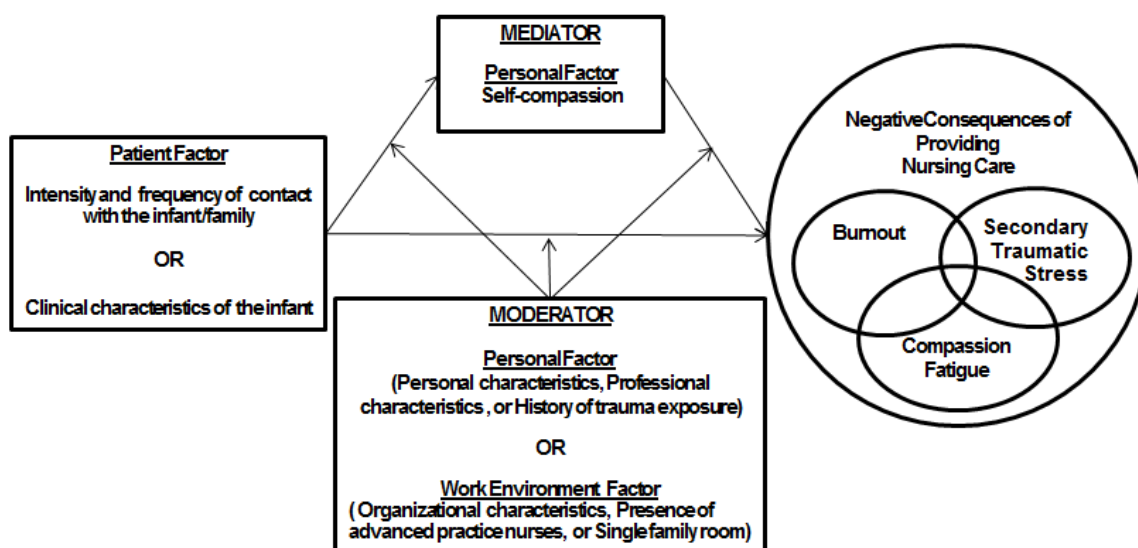
Dissertation Figure 2. Tested Model for the Moderated Mediation Analysis of Negative Consequences of Providing Nursing Care in the Neonatal Intensive Care Unit

Sample

The final sample was 174 registered nurses (RNs) working in levels III or IV NICUs, who met the inclusion criteria: (a) 18 years of age or older and (b) direct care providers in the staff position. Nurse managers and nurses in an advanced practice role were excluded because this study focused on RNs who regularly provide direct patient care. Participants consisted of only level III and IV NICU nurses because they provide care to infants who undergo more complex and severe situations compared to nurses in other levels of neonatal care. As their caseloads involve severe cases, they are at risk of developing compassion fatigue, secondary traumatic stress, and burnout. The invitation email for this study was sent out to approximately 600 nurses in 11 NICUs in Wisconsin.

A total of 242 nurses accessed to the online-survey, 18 nurses were not eligible to participate, 24 nurses declined to take the survey, and 26 nurses did not complete the survey. The final sample was 174 nurses (approximate response rate of 30%).

Participants were all female except three participants who did not indicate their gender. Participants were between years of age 21 to 70. The average years of experience as a RN was 18.4 years ($SD = 2.49$), and the average years of experiences as a RN in the NICU was 14.5 years ($SD = 11.15$). Most participants had a bachelor's degree ($n = 135$, 77.6%); 20 (11.5%) had an associate's degree or a diploma); and 7 (6.3%) had a master's or doctoral degree (See Manuscript 3 Table 1).

Measurement

Study variables were collected using questionnaires via online data collection. The online survey began with the questionnaire assessing the demographics followed by the clinical experiences of nurses, the scales assessing the negative consequences of providing nursing care, the personal factor, and the work environment factor. Dissertation Table 1 displays the study variables used in the moderated mediation analysis along with the concepts of the model and measurement used.

Patient factor. The clinical experiences questionnaire (see Appendix B) developed by the student principal investigator of this study included study variables assessing two components of the patient factor: the intensity and frequency of contact with the infant and family and clinical characteristics of the infant.

Intensity and frequency of contact with the infant and family. The intensity and frequency of contact with the infant and family was measured by the length of time spent in direct care and the frequency of providing direct care in this study. Participants

Dissertation Table 1

Study Variables and Measurements

Concept of the Model	Component of the Concept	Study Variable	Type of Variable	Measurement
Patient Factor Any aspects related to patient characteristics or conditions that impact care provision in a practice setting	A. Intensity and frequency of contact with the infant and family	1. Working days in a row 2. Working 13 hours or more at a stretch 3. Working hours per day 4. Working hours per week 5. Days that a nurse care for the infant 6. Strength of the nurse-infant/family relationship	Continuous Continuous Continuous Continuous Continuous Continuous	Clinical experiences questionnaire
	B. Clinical characteristics of the infant	7. Level of Neonatal Intensive Care Unit (NICU; III or IV) 8. Birth weight 9. Gestational age 10. Number of infant deaths nurses experienced	Categorical Continuous Continuous Continuous	
Personal Factor Nurses' characteristics and experiences in nursing practice and their lives	A. Personal characteristics	1. Age 2. Gender	Continuous Categorical	Demographic questionnaire
	B. Clinical characteristics of the infant	3. Years of experience as a registered nurse (RN) 4. Years of experience in level III or IV NICU as a RN 5. Highest education level in nursing	Continuous Continuous Categorical	
	C. Self-compassion D. Self-management	6. Self-compassion in nurses	Continuous	SCS
	E. History of trauma	7. History of trauma exposure	Continuous	LEC
Work Environment Factor The characteristics of a practice setting and practice situations that contribute to productivity in a health care system	A: Organizational characteristics	1. Nurse participation in hospital affairs 2. Nursing foundations for quality of care 3. Nurse manager ability, leadership, and support of nurses 4. Staffing and source adequacy 5. Collegial nurse-physician	Continuous Continuous Continuous Continuous Continuous	PES-NWI
	B. Clinical leadership support C. NICU Room Design	6. Presence of Advanced Practice Nurses 7. Single family room NICU	Categorical Categorical	Clinical experiences questionnaire
Negative Consequences of Providing Nursing Care Any negative aspects of providing nursing care	A. Compassion fatigue	1. Compassion fatigue	Continuous	ProQOL
	B. Secondary traumatic stress	2. Secondary Traumatic Stress	Continuous	STSS
	C. Burnout	3. Burnout	Continuous	OLBI

Note. PES-NWI= Practice Environment scale of the Nursing Work Index. SCS= Self-Compassion Scale. ProQOL= Professional Quality of Life Scale. STSS = Secondary Traumatic Stress Scale. OLBI=Oldenburg Burnout Inventory. LEC= Life Event Checklist.

responded with their work schedule over the past six months. To capture their typical

work schedule, 12 variables identified by Trinkof et al. (2011) were used to measure

work schedule characteristics: a) working days in a row; b) working hours per day; c)

working hours per week; d) working 13 hours or more at a stretch; e) number of

weekends worked per month; f) number of breaks lasting 10 minutes or more including

meals; g) frequency of less than 10 hours off between shifts; h) frequency of working on

a scheduled day off/vacation day; i) frequency of working while sick; j) frequency of

working mandatory overtime; k) frequency of required to be on call; and l) shift type.

Also, other two variables were included to understand their typical work schedule: full-

time or part time, and major changes in to the work schedule in the past six months.

In addition, in order to understand direct care that participants provided, they were

asked about average percentage of time spent in direct care per day. Direct care was

defined as providing bedside care to infants and their families, and the definition was

indicated in the questionnaire. Finally, two questions were specifically asked about direct

care for the infant in the most complex condition whom participants were responsible in

the last working week, as these might influence the intensity and frequency of contact

with the infant and family: number of days that the nurse cared for the infant and their

perceptions of the strength of the nurse-infant/family relationship.

Clinical characteristics of the infant. Clinical characteristics of the infants were

measured by the acuity of the infant as referred by the participants. In the clinical

experiences questionnaire, participants were asked about the infant in the most complex

condition for whom they were responsible in the last working week. The questions

included the current level of NICU III or IV, birth weight, gestational age, the differences

of the infant's acuity and the severity of illness from those for whom they normally cared, and the regularity of providing care for the infant in the most complex condition. The other question assessing clinical characteristics was the number of infant deaths participants experienced in the NICU where they worked at the time of study.

Personal factor. The personal factor was measured by self-compassion, history of trauma exposure, and demographic information.

Self-compassion. The Self-Compassion Scale (SCS) was used to measure compassion in nurses (Neff, 2003a, 2009). The SCS is a 26 item self-report questionnaire that assesses perceived self-compassion on a 5-point Likert scale, ranging from 1 *(almost never)* to 5 *(almost always)*. There are six subscales measuring three components of compassion. The subscales consist of pairs of subscales opposing characteristics; self-kindness versus self-judgment; common humanity versus isolation; mindfulness versus over-identified. The total mean self-compassion score was used for this study. High scores indicate higher self-compassion. In the current study, the Cronbach's alpha was .93 for the overall score.

History of trauma exposure. The Life Events Checklist (LEC) was used to measure history of trauma exposure (Gray, Litz, Hsu, & Lombardo, 2004). The LEC is a self-report measure that assesses levels of exposure to potentially traumatic events, such as natural disaster or fire or explosion, in a lifetime. Participants were asked to check all options appreciable to them for each item (1= *happened to me,* 2 = *witnessed it,* 3 = learned about it, 4 = *not sure*, and 5 = *does not apply*). They rated their experience to 16 potentially traumatic events and any other stressful event that is not included in the 16 events. Only direct exposure, "*happened to me*", was assigned a score of one, and the

other categories were coded with zero. The Kuder-Richardson 20 reliability coefficient was .57 for all items.

Personal and professional characteristics. The demographic questionnaire (Appendix A) was used to measure personal and professional characteristics including age, gender, the highest education level in nursing, years of experience as an RN, and years of experience in level III or IV NICU.

Work environment factor. The work environment factor was measured by organizational characteristics, presence of APNs in the unit, and SFR NICU.

Organizational characteristics. The Practice Environment Scale of the Nursing Working Index (PES-NWI) was used to assess organizational characteristics (Lake, 2002). The PES-NWI is a 31 item self-report questionnaire assessing individual perception of the environmental characteristics in the nursing practice setting scored on a 4-point Likert scale, ranging from 1 *(strongly disagree)* to 4 *(strongly agree)*. Cronbach's alphas for each subscale in the current study were acceptable. There are five subscales: nurse participation in hospital affairs (9 items, $\alpha=.86$), nursing foundations for quality of care (10 items, $\alpha=.85$), nurse manager ability, leadership and support of nurses (5 items, $\alpha=.88$), staffing and resource adequacy (4 items, $\alpha=.83$), and collegial nurse-physician relations (3 items. $\alpha=.81$). A mean score of each subscale was used for this study. Higher scores indicate that nurses perceive the organizational characteristics of their healthcare organization as more positive.

Presence of Advanced Practice Nurses (APN). In this study, clinical leadership support was specifically focused on APNs. In the healthcare system, the growth of the APN role has been attributed to the rapid evolution of health care, complexity of health

problems, changing needs and expectations of the patient, public, and the healthcare system, and managed care with low cost and high quality. APNs are registered nurses who meet both educational and certification requirements (Keane & Becker, 2009; Komnenich, 2005). Direct clinical practice is a central competency of the APN practice, and APNs have competencies to empower nurses in the practice setting (Hamric, 2009). Their professional competencies can be a strong support for other nurses who are facing difficult situations and can positively impact consequences of nursing care. It might be important to view whether APNs are dedicated to patient care with staff nurses in the unit. Thus, the presence of dedicated APNs for the specific patient population of the NICU can be a component of the work environment factor. In the clinical experiences questionnaire, participants were asked about the presence of APNs in the NICU and their perceptions about the APN as a resource if one was present in the unit (see Appendix B).

NICU room design. The NICU room design is a unique component of the work environment factor in the NICU. Participants were asked in the clinical experiences questionnaire (Appendix B) if the single family room (SFR) design had been implemented in the NICU.

Work environment descriptive variables. Participants responded about the hospital and the NICU at which they worked at the time of the study in order to understand their work environment in the clinical experiences questionnaire. These descriptive variables included location, magnet hospital designation, and number of beds (see Appendix B). Magnet hospital designation is a national recognition developed by American Nurses Credentialing Center that recognizes healthcare systems for high quality nursing (American Nurses Credentialing Center, 2014).

Negative consequences of providing nursing care. Three questionnaires assessed negative consequences of providing nursing care consisting of three study variables: compassion fatigue, secondary traumatic stress, and burnout.

Compassion fatigue. The Professional Quality of Life Scale Version 5 (ProQOL) was used to assess compassion fatigue (Stamm, 2010). It is a 30 item self-report questionnaire that accesses positive and negative feelings and behaviors resulted from caring others who experience suffering and trauma scored on a 5-point Likert scale from 1 (*never*) to 5 (*very often*). There are three subscales: compassion satisfaction, secondary traumatic stress, and burnout. Each mean score is independently used to indicate the level of each concept. In the current study, only the secondary traumatic stress subscale was used as a measure of compassion fatigue. The compassion satisfaction subscale was not used, as the focus was only negative consequences of providing nursing care. Secondary traumatic stress and burnout were measured by different scales.

Stamm (2010) believes that the concept of compassion fatigue and secondary traumatic stress are same and uses these two terms interchangeably. Although the subscale used the term of secondary traumatic stress, it has been identified as a subscale to measure compassion fatigue. The mean score of the secondary traumatic stress subscale has been used to describe compassion fatigue in previous studies (Hooper et al., 2010; Meadors et al., 2009; Yoder, 2010). The current study used the secondary traumatic stress subscale to measure compassion fatigue. Higher scores indicate higher levels of compassion fatigue. The Cronbach's alpha was acceptable (10 items, $\alpha = .84$) for the secondary traumatic stress subscale.

The compassion satisfaction subscale was not used since the focus was only negative consequences of providing nursing care. The burnout scale was not used to measure burnout because, in the ProQOL, burnout is considered as an element of compassion fatigue (Stamm, 2010). This is a different perspective of burnout in the present study, one of negative consequences of providing nursing care along with other similar concepts, compassion fatigue and secondary traumatic stress. A previous study using a meta-analysis found that two concepts measured by the ProQOL secondary traumatic stress subscale and the ProQOL burnout subscale were strongly associated each other (Cieslak et al., 2014). It also showed difficulties in distinguishing between these two because of the overlap of the two constructs. In order to examine burnout considered as one of negative consequences of providing nursing care, other measurement focusing on only the concept of burnout was used.

Secondary traumatic stress. The Secondary Traumatic Stress Scale (STSS) is a 17 item scale designed to assess secondary traumatic stress symptoms similar to the symptoms of PTSD for professionals who are indirectly exposed to traumatic events through caring traumatized people (Bride et al., 2004). This self-report questionnaire is on a 5-point Likert scale, ranging from 1 (*never*) to 5 (*very often*). There are three subscales: avoidance, arousal, and intrusion subscales. The total mean score was used in the current study. Higher scores indicate higher levels of secondary traumatic stress. The Cronbach's alpha was .92 for the overall score.

Burnout. The Oldenburg Burnout Inventory (OLBI) was used to measure burnout (Demerouti, Mostert, & Bakker, 2010).The OLBI a 16 item self-report questionnaire assessing burnout on a 4-point Likert scale, ranging from 1 *(strongly agree)* to 4 *(strongly*

disagree). There are two subscales: exhaustion and disengagement from work subscales. The total mean score was used in this study. Higher scores indicate higher levels of burnout. The Cronbach's alpha for the overall score was .81.

Procedures

Through the group coordinator of the Wisconsin Vermont Oxford Network collaborative group, an invitation email was sent to representatives in the target NICUs that belong to the VON (Vermont Oxford Network, 2014). The student principal investigator directly sent the invitation email to the representative in the NICUs that did not belong to the VON. Follow up phone calls were made to confirm the decision to participate in the study to the representative in the NICU that did not respond to the initial massage. When the representatives of the NICUs approved the distribution of the online survey link, the online survey link was sent to the nurses via email. There were two methods for distribution of the online survey depending on each hospital's policy and preference. For nurses whose hospital provided individual email addresses, each nurse received the individual link to the survey. For nurses for whom the hospital did not provide an individual email address, the link to the survey was sent to the NICU representative, and the link was distributed to individuals through the representative.

Flyers were posted at each unit and in the unit newsletter. Follow-up reminders were sent two, four, and five weeks after the initial email in order to achieve a higher response rate (Polit & Beck, 2008). Participants began answering the questionnaires with demographic questionnaire, clinical experience questionnaire, the ProQOL, the STSS, the PES-NWI, the SCS, the LEC, the OLBI, and the indicators of compassion fatigue in nurses.

Data Management

For data management, Statistical Package for the Social Science (SPSS version 22) was used. The responses on the web-based survey were transferred to SPSS from Qualtrics. For confidentiality and privacy protection, a unique identification number was assigned to participants, and all identifying information was deleted. The website for completing the survey used encryption technology to help safeguard participants' answers, and only the researcher had access to responses on the web-based survey. The identifying information, such as email addresses and IP addresses from participants, was not included in the data extracted from the Qualtrics site. These de-identified data files were stored in the university's secure transfer program where they were only accessible to the research team. Files were downloaded to a laptop computer that was password protected for analysis and deleted from the laptop when the analyses were completed.

Data Analysis

Preliminary analytical procedures. Missing data was analyzed using the Little's Missing Completely At Random (MCAR; Little & Rubin, 2002) test and was imputed by the maximum likelihood estimation method. Descriptive statistics were used to describe the basic features of data. Independent variables and moderator variables in a series of the moderated mediation analyses were selected based on correlation coefficients among study variables.

Missing data and imputation. In order to minimize effects of missing data on conclusions derived from these data, missing data were analyzed using the Little's MCAR test (Little & Rubin, 2002) in SPSS (version 22). The Little's MCAR test examines whether missing values occur at random by a chi-square test based on chosen

categorical variables, where a non-significant result indicates missing values occur completely at random. Full-time (full-time or part-time), and magnet hospital designation (yes or no), presence of APNs (yes or no) were used as categorical variables in the Little's MCAR test. Also, participants were excluded if they did not respond to any items of a measure included in analyses. Two study variables, NICU level and the number of infant deaths a nurse experienced, were not used in the analysis, as the number of participating NICUs was not sufficient to compare differences between level III and IV, and 40.8% of nurses did not have experience of infant death in the NICU.

Little's MCAR test showed that the missing values were MCAR for items for ProQOL, χ^2 (67) = 42.14, p = .99, items for STSS, χ^2 (96) = 115.35, p = .09, items for PES-NWI, χ^2 (317) = 301.33, p = .73, items for OLBI, χ^2 (50) = 48.28, p = .54, and items for SCS, χ^2 (340) = 355.00, p = .28. Therefore, these missing values were imputed. For items for the patient factor, although the values were not MCAR, χ^2 (44) = 77.92, p = .001, only 1.64% of the total values were incomplete data. Multiple imputations can be used when missing values consist of up to 30% or more of the entire data (Streiner, 2002). Maximum likelihood imputation is a highly powerful and effective imputation as with multiple imputation (Schafer & Graham, 2002); thus, missing values of independent variables were imputed as well as other missing values.

To impute missing data, the maximum likelihood estimation method was used, as it has demonstrated better performance on treating missing data than other methods, such as case deletion, mean substitution, and single imputation (Schafer & Graham, 2002). Using IBM SPSS AMOS (version 22), the maximum likelihood imputation was

performed and produced the highest probability of the parameter values using both complete and incomplete data in the data set (Baraldi & Enders, 2010).

Descriptive statistics. Descriptive statistics were used to review the basic features of the data in this study. Pearson's correlations were also computed to evaluate bivariate relationships among variables. Spearman rho was used for a ranked variable, the highest education level in nursing.

Selection of study variables used in the analysis. From the patient factor, the variables that assess the intensity and frequency of contact with the infant and family and clinical characteristics of the infant were treated as independent variables. Self-compassion from the personal factor was treated as a mediator. Moderators were the other components of the personal factor (age, gender, years of nursing, years of NICU nursing, the highest education in nursing, and history of trauma exposure) and all components of the work environment factor (five organizational characteristics, present of APNs, and SFR NICU).

In order to determine which study variables would be used in a moderated mediation analysis, independent variables and moderators were selected based on the correlation coefficients. The independent variables used in the analysis were selected from the components of the patient factor significantly correlated with any one of negative consequences of providing nursing care (compassion fatigue, secondary traumatic stress, or burnout). The moderator variables were selected from the components of the personal or the work environment factor that were significantly correlated with multiple selected independent variables, in addition to the categorical variables of the components of the work environment factor.

Dependent variable. Negative consequences of providing nursing care were treated as a latent dependent variable in this analysis. This latent variable consisted of three observed variables, compassion fatigue, secondary traumatic stress, and burnout.

Primary Analytical procedure. A series of moderated mediation analyses were conducted by structural equation modeling to test conditional indirect effects using the bootstrapping method in Mplus (version 7). The Mplus code for the moderated mediation model 5 developed by Hayes (2011) was used. These analyses examined whether each model fit the data and described the indirect effect between a selected independent variable (a component of the patient factor) and negative consequences of providing nursing care through self-compassion depending on levels of a selected moderator (a component of the personal/work environment factor). The maximum likelihood estimation was used as a computational method.

Indirect effects in the moderated mediation model were investigated using bootstrapping that is a valid and powerful method for testing indirect effects recommended by Hayes (2009). He describes bootstrapping as follows:

Bootstrapping generates an empirical representation of the sampling distribution of the indirect effect by treating the obtained sample of size *n* as a representation of the population in miniature, one that is repeatedly *resampled* during analysis as a means of mimicking the original sampling process. (Hayes, 2009, p. 412)

According to Hayes (2009), the causal steps approach described by Baron and Kenny (1986) has the lowest power compared to other methods to examine the effects of intervening variables because regression analyses need to be performed multiple times. The existence of indirect effects is deduced logically by a statistical significance of

indirect effects in these regression analyses, and a significant relationship between an independent variable and dependent variable is a prerequisite for a possible mediator to be significant mediator. This approach has a high possibility for a type II error because of its low power. Instead, Hayes (2009) suggested that indirect effects should be tested using bootstrapping without a prerequisite of a significant direct effect. Following the suggestion by Hayes (2009), in the current study, the statistical significance of the direct relationship between the independent variable and negative consequences of providing nursing care was not used as antecedent to examine indirect effects in the model and bootstrapping was used to examine the statistical indirect effect.

Bootstrap samples of 5,000 were used. This bootstrapping method produces percentile based confidence intervals for a total indirect effect of the mediator. According to Hayes (2009), the statistical significance of the indirect effect is determined as follows:

Regardless of which is used, if zero is not between the lower and upper bound, then the analyst can claim that the indirect effect is not zero with ci% confidence. This is conceptually the same as rejecting the null hypothesis that the true indirect effect is zero at the 100- ci% level of significance. (Hayes, 2009, p. 412)

Therefore, bootstrap confidence intervals that do not include zero indicate a significant indirect effect. The bootstrapping methods allow estimating the magnitude of the effect on a continuous distribution (Little, Preacher, Selig, & Card, 2007). Considering this strength of the bootstrapping method, in this study, both 90% and 95% bootstrap confidence intervals were used to determine a statistical significance of the total indirect effect. Three conventional goodness-of-fit indices were used to evaluate global model fit:

root mean square error of approximation (RMSEA), comparative fit index (CFI), and standardized root mean residual (SRMR).

Dissertation Figure 2, the conceptual model, is the path diagram representing the idea that the coefficients for the indirect effect of self-compassion on the path between the patient factor and the negative consequences are moderated by the personal factor or the work environmental factor. Dissertation Figure 3 is the analytical model for the current study representing Dissertation Figure 2 in a different way. In Dissertation Figure 3, the latent dependent variable (negative consequences of providing nursing care) is predicted from the independent variable (a component of the personal factor), the mediator (self-compassion), the moderator (a component of the personal/work environment factor), and two product terms that represent interactions between the independent-mediator variable and the mediator-moderator variable (Preacher et al., 2007).

In a moderated mediation analysis, only one independent variable and one moderator were allowed to be used because interaction terms need to be calculated between an observed independent variable and an observed moderator variable; and an observed mediator variable and an observed moderator variable. The conceptual model consists of multiple concepts, and each concept includes several different components; thus, these different features of variables of each concept cannot form one latent variable. For these reasons, the number of independent, moderator, or mediator variable to be used in the analysis was limited to only one observed variable in the moderated mediation model. Therefore, a series of moderated mediation analyses were required to examine whether the tested model fit the data. The direct effect between the moderator and the

latent dependent variable was controlled (see the Mplus code in Appendix C; Hayes, 2011).
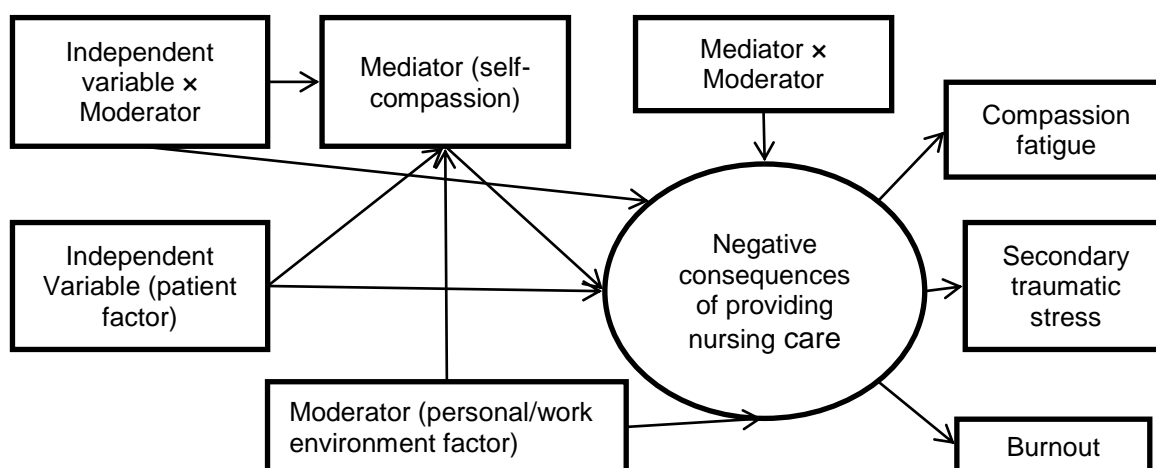
Dissertation Figure 3. Analytical Model of Negative Consequences of Providing Nursing care in the Moderated Mediation analysis

Follow-up Procedure

For the moderated mediation models showing a significant indirect effect of self-compassion, further mediation analyses were performed in order to compute each path coefficients between the independent variable and negative consequences of providing nursing care through self-compassion. Moderators were categorized into two groups (the high and low level of the moderator) using the median score and then, each group was tested separately.

Ethical Considerations

Approval from the Institutional Review Board (IRB) at the University of Wisconsin-Milwaukee (UWM) and participating hospitals that required separate IRB review were obtained. The centralized IRB was contacted at the hospitals with more than one NICU. Three hospitals required separate IRB review, and one of them required the approval from their human resources department as well as their IRB. Another hospital deferred to the UWM IRB. Although two hospitals did not require IRB review, they

required the approval from their nursing research committees. The other hospital did not require either their IRB review or any other review, as this study focused on nurses and no identifying or specific information about any individual patients or their families was collected. The first page of the survey contained the study informed consent form. It emphasized that participation is completely voluntary. Once nurses agreed to participate in this study, they anonymously completed the survey on the online survey site.

Summary

Chapter 3 discussed in detailed the methods utilized for the present study. Chapter 4 examines in detail the results of this study.

Chapter 4

Results

Chapter 4 consists of two sections. The first part organizes and reports all findings of this study including the presentation of relevant quantitative data. The next part provides a data-based manuscript reporting selected results that will be submitted to the *Nursing Research*.

Section 4.1. Result: Preliminary and Primary Results

This section reports preliminary results including descriptive analysis and correlational analysis and primary results of the moderated mediation analyses.

Descriptive analyses. Overall, data from 174 NICU nurses were analyzed. Dissertation Table 2 describes work environment at which participants worked at the time of the study. More than 70% of nurses worked at a magnet hospital. More than 30% of nurses worked in a NICU where the SFR design had been implemented. Approximately 60% of nurses worked in a NICU where an APN was present.

Dissertation Table 3 displays the work schedule over the past six months for the participants. More than half of the participants (59.20%) worked full time in the NICU. The average working days in a row was 2.79 days (*SD* = 0.83). The average working hours was 32.33 hours (*SD* = 7.67) per week and 10.95 hours (*SD* = 2.01) per day. The shift types were varied. Approximately 70% of participants worked rotating shifts, and 63.7% of nurses worked night shifts. The average percentage of time spent in direct care per day was 84.05% (*SD* = 22.60) with a median of 90%. In the online survey, direct care was defined as providing bedside care to infants and their families.

Manuscript 3 Table 4 displays the most complex case that nurses were responsible for over the last week they worked. The average birth weight of infants was 1404.76g (*SD* = 942.86), and the average gestational age was 29.38 weeks (*SD* = 4.95). The average days that the nurse cared for the infant the last week s/he worked was 1.97 days (*SD* = 1.02).

Dissertation Table 4 displays the means and standard deviations of compassion fatigue, secondary traumatic stress, burnout, self-compassion, and the five organizational characteristics.

Dissertation Table 2
Work Environment (N =174)

Variable	Frequency	%
Magnet hospital designation	125	71.8
Location of the hospital at which nurses worked		
Urban area	130	74.7
Suburban area	36	20.7
Rural area	8	4.6
Single Family Room Neonatal Intensive Care Unit (NICU)	59	33.9
Number of beds in the NICU (Individual report)		
10-20	35	20.1
21-30	42	24.1
31-40	25	14.4
41-50	27	15.5
> 50	45	25.9
Presence of Advanced Practice Nurse (APN)	101	58.0
Neonatal Clinical Nurse Specialist	57	32.8
Neonatal Nurse Practitioner	82	47.1
Pediatric Clinical Nurse Specialist	3	1.7
Pediatric Nurse Practitioner	4	2.3
APN who the most closely worked with the nurses, if multiple APNs were present in the NICU (*n* =72)		
Neonatal Clinical Nurse Specialist	4	5.6
Neonatal Nurse Practitioner	67	93.1
Pediatric Clinical Nurse Specialist	1	1.4
Perception of the APN as a resource		
Not at all resourceful	8	4.6
Little resourceful	5	2.9
Somewhat resourceful	20	11.5
Much resourceful	32	18.4
Very resourceful	37	21.3

Dissertation Table 3
Work Schedule Over Past Six Months (N =174)

Variable	Frequency	%	Mean	SD
Average % of time spent in direct care/day over the past 6 months			84.05	22.60
Working days in a row			2.79	0.83
Working hours per week			32.33	7.67
Working hours per days			10.95	2.01
Number of weekends worked per month			2.89	0.98
Number of breaks lasting 10 minutes or more including meals			1.76	1.20
Full time	103	59.20		
Working 13 hours or more at a stretch				
Never or Not applicable (N/A)	32	18.40		
Few times	95	54.60		
Once a month	22	12.64		
Every other week	17	9.77		
Once a week	6	3.45		
More than once a week	2	1.15		
Less than 10 hours off between shifts				
Never or N/A	93	53.45		
Few times	56	30.46		
Once a month	9	5.17		
Every other week	9	5.17		
Once a week	4	2.30		
More than once a week	5	2.87		
Working on a scheduled day off/vacation day				
Never or N/A	46	26.44		
Few times	91	52.30		
Once a month	13	7.47		
Every other week	15	8.62		
Once a week	2	1.15		
More than once a week	4	2.30		
Daily	2	1.15		
Working while sick				
Never or N/A	64	36.78		
Few times	99	56.90		
Once a month	7	4.02		
Every other week	1	0.57		
Once a week	1	0.57		
Working mandatory overtime (Yes)	75	43.10		
Required on call (Yes)	101	58.40		
Major changes to the work schedule (Yes)	40	23.00		
Shift Type				
Day only	13	7.47		
Evening only	9	5.17		
Night only	30	17.24		
Day& Evening	41	23.56		
Day& Night	15	8.62		
Evening & Night	30	17.24		
All three	36	20.69		

Note. Some percentages do not add up to 100% because of missing data.

Dissertation Table 4

Means and Standard Deviations of Negative Consequences of Providing Nursing Care, Self-compassion, and Organizational Characteristics (N =174)

Variable	*Mean*	*SD*
Negative Consequences of Providing Nursing Care		
Compassion Fatigue	2.05	0.57
Secondary Traumatic Stress	1.81	0.62
Burnout	2.34	0.38
Self-compassion	3.34	0.65
Organizational Characteristics		
Nurse participation in hospital affairs	2.85	0.56
Nursing foundations for quality of care	3.18	0.49
Nurse manager ability, leadership, and support of nurses	2.82	0.80
Staffing and source adequacy	2.95	0.67
Collegial nurse-physician relations	3.34	0.57

Based on the test author's scoring instruction, participants showed a low level of compassion fatigue (Stamm, 2010), a mild level of secondary traumatic stress (Bride, 2007), and a moderate level of self-compassion (Neff, 2009). They perceived five organizational characteristics of their hospital as positive (Lake, 2002). Although there is no scoring instruction for the OLBI, previous studies showed that the mean scores were 2.32 ($SD = 0.58$) for the exhaustion subscale and 2.23 ($SD = 0.68$) for the disengagement subscale among Greek employees from different occupational groups (Demerouti et al., 2003) and 2.17 ($SD = 0.57$) for the exhaustion subscale and 2.07 ($SD = 0.55$) for the disengagement subscale among employees of a company in the South African construction industry (Demerouti et al., 2010). The participants in this current study showed similar scores.

Correlation coefficients. Dissertation Table 5 shows the Pearson's correlation coefficients for dependent variables, the components of the patient factor, and the components of the work environment factor. Three components of negative consequences of providing nursing care: compassion fatigue, secondary traumatic stress, and burnout, were positively correlated with each other. Self-compassion was negatively correlated

with all three components of negative consequences of providing nursing care, whereas it was positively correlated with all five organizational characteristics from the work environment factor. All five organizational characteristics from the work environment factor were negatively correlated with the three components of negative consequences of providing nursing care. Thus, there were direct relationships between self-compassion and the three components of negative consequences of providing nursing care; self-compassion and the five organizational characteristics; and the three components of negative consequences of providing nursing care and the five organizational characteristics.

Selection of independent variables used in the analysis. Out of 12 work characteristic variables identified by Trinkof et al. (2011), 4 variables were selected to use as independent variables, as they assess the intensity and frequency of contact with the infant and family: working days in a row, working 13 hours or more at a stretch, working hours per day, and working hours per week. The first three variables, working days in a row, working 13 hours or more at a stretch, and working hours per day, were selected as an independent variable describing the intensity of contact with the infant and family, as they indicate continuity of working time of nurses. The other variable, working hours per week, was selected as an independent variable describing the frequency of contact with the infant and family, as it indicates a total number of working hours in a specific time period that increases chances of contact with the infant and family. Out of 12 work characteristic variables, the other 8 variables not selected as independent variables were treated as work schedule descriptive variables to understand a typical work schedule of nurses. Other independent variables were the number of days that the

nurse cared for the infant for assessing the frequency of contact with the infant and

family and the strength of the nurse-infant/family relationship for assisting both the

intensity and frequency of contact with the infant and family.

For assessing clinical characteristics of the infants, birth weight and gestational

age were treated as independent variables. The current level of NICU (III or IV), and the

number of infant deaths were not used as independent variables as the number of

participating NICUs was not sufficient to compare differences between level III and IV,

and experiences of infant death in the NICU. A total of eight components of the patient

factor were treated as independent variables.

Next, independent variables used in a moderated mediation analysis were

selected based on the correlation coefficients. Four components of the patient factor,

working hours per week, working 13 hours or more at stretch, days that the nurse care for

the infant in the most complex condition in the last working week, and the strength of the

nurse-infant/family relationship, were used as the independent variable in the analysis

because these variables were significantly correlated with at least one of negative

consequences of providing nursing care (compassion fatigue, secondary traumatic stress,

and burnout; see Dissertation Table 5).

Selection of moderator variables used in the analysis. Two organizational

characteristics from the work environment factor, nursing foundations for quality of care

and collegial nurse-physician relations, were selected to be used as a moderator in the

analysis because they were significantly correlated with multiple selected independent

variables from the patient factor. The other three organizational characteristics from the

work environment factor were not included in the analysis, as they were correlated with

only one or none of selected independent variables. Two organizational characteristics, nurse participation in hospital affairs and nurse manager ability, leadership, and support of nurse, were correlated with only the strength of the nurse-infant/family relationship. The last organizational characteristic, staffing and source adequacy was not correlated with any of the four selected independent variables (see Dissertation Table 5). Two categorical variables, presence of the APN, and SFR NICU, were also used in the analysis as a moderator. None of the components of the personal factor was used in the analysis as a moderator because they were not correlated with any of the four selected independent variables (see Dissertation Table 6).

Relationships between selected independent variables and negative consequences. For the relationship between the four selected independent variables from the patient factor and negative consequences of providing nursing care, working 13 hours or more at a stretch was positively and significantly correlated with compassion fatigue and secondary traumatic stress. On the other hand, the strength of the nurse-infant/family relationship was negatively and significantly correlated with secondary traumatic stress and burnout. In addition, days that the nurse cared for the infant in the most complex condition was negatively and significantly correlated with secondary traumatic stress. From these results, the intensity and frequency of contact with the infant/family is considered as a related factor to negative consequences of providing nursing care (see Dissertation Table 5).

Dissertation Table 5

Correlation Matrix for Dependent Variables, Components of the Patient Factor, Self-compassion, and Components of the Work Environment Factor

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Compassion fatigue																
2. Secondary traumatic stress	.75**															
3. Burnout	.44**	.52**														
4. Working days in a row	.11	.04	-.09													
5. Working hours per week	-.02	-.07	-.19*	.58**												
6. Working hours per day	-.04	.01	-.12	.03	.37**											
7. Working 13 hours or more at a stretch	.16*	.22**	.10	.17*	.24**	.18*										
8. Birth weight of the infant	-.13	-.11	-.08	-.15	-.08	-.05	.10									
9. Gestational age of the infant	-.09	-.10	-.07	-.12	-.06	-.07	.15	.91**								
10. Days that the nurse cared for the infant	-.12	-.22**	-.11	.24**	.24**	-.07	.03	-.08	.04							
11. Strength of the relationship with the infant and the family	-.14	-.20**	-.17*	.17*	.19*	-.03	.12	.02	.07	.39**						
12. Self-compassion	-.31**	-.44**	-.36**	-.01	-.00	.09	-.09	.03	-.05	.03	.15*					
13. Nurse participation in hospital affairs	-.21**	-.24**	-.45**	-.07	-.02	.04	-.09	.06	.05	.10	-.16*	.20*				
14. Nursing foundations for quality of care	-.26**	-.25**	-.47**	-.05	.16*	.04	-.03	.18*	.14	.15*	.24**	.21**	.75**			
15. Nurse manager ability, leadership, and support of nurses	-.16*	-.26**	-.48**	-.09	.04	.03	-.09	-.05	-.07	-.02	-.19*	.23**	.70**	.60**		
16. Staffing and source adequacy	-.30**	-.29**	-.60**	-.03	.09	.10	-.04	.07	.01	-.00	.12	.24**	.60**	.61**	.65**	
17. Collegial nurse-physician relations	-.21**	-.24**	-.32**	-.07	-.16*	.02	-.03	.08	.07	.20**	.23**	.16*	.51**	.62**	.34**	.37**

Note. * $p < .05$; ** $p < .01$; *** $p < .001$.

Dissertation Table 6

Correlation Matrix for Dependent Variables, Components of the Patient Factor, and Components of the Personal Factor

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Compassion fatigue															
2. Secondary traumatic stress	.75**														
3. Burnout	.44**	.52**													
4. Working days in a row	.11	.04	-.09												
5. Working hours per week	-.02	-.07	-.19*	.58**											
6. Working hours per day	-.04	.01	-.12	.03	.37**										
7. Working 13 hours or more at a stretch	.16*	.22**	.10	.17*	.24**	.18*									
8. Birth weight of the infant	-.13	-.11	-.08	-.15	-.08	-.05	.10								
9. Gestational age of the infant	-.09	-.10	-.07	-.12	-.06	-.07	.15	.91**							
10. Days that the nurse cared for the infant	-.12	-.22**	-.11	.24**	.24**	-.07	.03	-.08	.04						
11. Strength of the relationship with the infant and the family	-.14	-.20**	-.17*	.17*	.19*	-.03	.12	.02	.07	.39**					
12. Self-compassion	-.31**	-.44**	-.36**	-.01	-.00	.09	-.09	.03	-.05	.03	.15*				
13. Age category	.14	.19*	.07	.05	-.04	.15	.03	-.11	-.10	.05	-.02	.07			
14. Highest education in Nursing	-.05	.03	-.13	.05	.13	.09	.08	-.00	-.00	-.03	.01	.12	.21**		
15. Years of nursing experiences as a RN	.08	.13	.07	.01	-.04	-.24**	-.06	-.08	-.07	.05	.03	.07	.89**	.14	
16. Years of nursing experiences in the NICU	.04	.13	.07	-.04	-.08	-.22**	-.09	-.05	-.04	.02	.02	.05	.80**	.14	.91**

Note. * $p < .05$; ** $p < .01$; *** $p < .00$; RN = registered nurse; NICU = Neonatal Intensive Care Unit.

Primary results. A series of moderated mediation analyses were conducted by SEM. A total of 16 moderated mediation models using 4 selected independent variables (working hours per week, working 13 hours or more at stretch, days that the nurse care for the infant in the most complex condition in the last working week, and strength of the nurse-infant/family relationship) and 4 selected moderator variables (nursing foundations for quality of care, collegial nurse-physician relations, presence of the APN, and SFR NICU) were tested. Secondary traumatic stress was constrained to be one in each analysis, as it had stronger correlations with the other two observed dependent variables compared to other correlations among these three variables. As burnout caused negative variances in three models, burnout needed to be excluded from these three models. Excluding these 3 models, out of 13 models, there were 5 significant moderated mediation models based on bootstrap confidence intervals. Dissertation Table 7 showed the results of all 16 moderated mediation models. It presents point estimates and 90% and 95% bootstrap confidence intervals for the conditional indirect effects of self-compassion in the relationship between an independent variable and negative consequences of providing nursing care with high and low levels of a moderator. In Dissertation Table 7, moderated mediation models labeled from1 through 5 were statistically significant, and these significant results are shown in bold font, whereas the other models labeled from 6 through 13 were not statistically significant. Next, each significant model is explained.

Moderated mediation model 1 (the pair of variables: working 13 hours or more at a stretch and nursing foundations for quality of care). As Model 1 in Dissertation Table 7 shows, bootstrap confidence intervals revealed that there was an indirect effect of self-compassion in the relationship between working 13 hours or more at a stretch and

negative consequences of providing nursing care when the level of nursing foundations for quality of care was low (*B* = .044, 90% CI [.011, .074]), as the 90% confidence interval for the coefficient did not include zero. On the other hand, there was not such relationship when the level of nursing foundations for quality of care was high (*B* = .003, 90% CI [-.011, .013]).

The further mediation analysis examining the direction of each path coefficient showed that there were negative coefficients for the pathway between working 13 hours or more at a stretch and self-compassion (*β* = -.09) and the pathway between self-compassion and negative consequences (*β* = -.55) in the high level of nursing foundations for quality of care group. Also, in the low level of the group, there were negative coefficients for the pathway between working 13 hours or more at a stretch and self-compassion (*β* = -.20) and the pathway between self-compassion and negative consequences (*β* = -.65).

*Moderated mediation model 2 (the pair of variables: working 13 hours or more at a stretch and SFR NICU).*As Model 2 in Dissertation Table 7 shows, bootstrap confidence intervals revealed that there was an indirect effect of self-compassion in the relationship between working 13 hours or more at a stretch and negative consequences of providing nursing care when the SFR design had not implemented in the NICU(*B* = .036, 90% CI [.013, .067]), as the 90% confidence interval for the coefficient did not include zero. There was not such relationship when the design had implemented in the NICU (*B* = .000, 90% CI [.000, .000]).

The further mediation analysis showed that there were positive coefficients for the pathway between working 13 hours or more at a stretch and self-compassion (*β* = .01)

and the pathway between self-compassion and negative consequences ($\beta = .63$) in the open unit NICU group. In the SFR NICU group, there was a positive coefficient for the pathway between working 13 hours or more at a stretch and self-compassion ($\beta = .15$) and the negative coefficient for the pathway between self-compassion and negative consequences ($\beta = -.54$).

   Moderated mediation model 3 (the pair of variables: days that the nurse cared for the infant and collegial nurse-physician relations). Bootstrap confidence intervals revealed that there was an indirect effect of self-compassion in the relationship between days that the nurse cared for the infant and negative consequences of providing nursing care when the level of collegial nurse-physician relations was high ($B = .037$, 90% CI [.010, .076]) and low ($B = -.095$, 90% CI [-.191, -.041]), as the 90% confidence interval for the coefficient did not include zero (see Model 3 in Dissertation Table 7).

   The further mediation analysis showed that there was a negative coefficient for the pathway between days that the nurse cared for the infant and self-compassion ($\beta = -.14$) and the pathway between self-compassion and negative consequences ($\beta = -.53$) in the high level of collegial nurse-physician relations group. In the low level of the group, there was a positive coefficient for the pathway between days that the nurse cared for the infant and self-compassion ($\beta = .29$) and a negative coefficient for the pathway between self-compassion and negative consequences ($\beta = -.53$).

   Moderated mediation model 4 (the pair of variables: the strength of the nurse-infant/family relationship and nursing foundations for quality of care). Bootstrap confidence intervals revealed that there was an indirect effect of self-compassion in the relationship between the strength of the nurse-infant/family relationship and negative

consequences of providing nursing care when the level of nursing foundations for quality of care was high (B =- .017, 90% CI [-.038, -.020]), as the 90% confidence interval for the coefficient did not include zero (see Model 4 in Dissertation Table7). On the other hand, there was not such relationship when the level of nursing foundations for quality of care was low (B = -.005, 90% CI [-.047, .034]).

The further mediation analysis showed that there was a positive coefficient for the pathway between the strength of the nurse-infant/family relationship and self-compassion (β = .15) and a negative coefficient for the pathway between self-compassion and negative consequences (β = -.52) in the high level of nursing foundations for quality of care group. Also, in the low level of the group, there was a positive coefficient for the pathway between the strength of the nurse-infant/family relationship and self-compassion (β = .10) and a negative coefficient for the pathway between self-compassion and negative consequences (β = -.70).

Moderated mediation model 5 (the pair of variables: the strength of the nurse-infant/family relationship and collegial nurse-physician relations). Bootstrap confidence intervals revealed that there was an indirect effect of self-compassion in the relationship between the strength of the nurse-infant/family relationship and negative consequences of providing nursing care when the level of collegial nurse-physician relations was high (B = -.030, 90% CI [-.068, -.003]), as the 90% confidence interval for the coefficient did not include zero (see Model 5 in Dissertation Table 7). On the other hand, there was not such relationship when the level of collegial nurse-physician relations was low (B = -.005, 90% CI [-.045, .038]).

The further mediation analysis showed that there was a positive coefficient for the
pathway between the strength of the nurse-infant/family relationship and self-compassion
($\beta = .12$) and a negative coefficient for the pathway between self-compassion and
negative consequences ($\beta = -.50$) in the high level of collegial nurse-physician relations
group. Also, in the low level of the group, there was a positive coefficient for the
pathway between the strength of the nurse-infant/family relationship and self-compassion
($\beta = .29$) and a negative coefficient for the pathway between self-compassion and
negative consequences ($\beta = -.53$).

Dissertation Table 8 displays fit indices for each significant moderated mediation
model.

Dissertation Table 8

Fit Indices for Significant Moderated Mediation Models based on 90% Bootstrap Confidence Intervals

Model	Independent variable	Moderator	RMSEA	CFI	SRMR
1	Working 13 hours or more at a stretch	Nursing foundations for quality of care	.096	.945	.046
2	Working 13 hours or more at a stretch	Single family room	.041	.990	.036
3	Days that the nurse care for the infant	Collegial nurse-physician relations	.094	.942	.054
4	Strength of the nurse-infant/family relationship	Nursing foundations for quality of care	.074	.967	.034
5	Strength of the nurse-infant/family relationship	Collegial nurse-physician relations	.066	.971	.069

Note. RMSEA = Root mean square error of approximation; CFI = comparative fit index; SRMR = standardized root mean residual.

For determining model fit, RMSEA less than .10 (Browne & Cudeck, 1993), CFI greater
than .90 (Hu & Bentler, 1999), and SEMSR less than .08 (Hu & Bentler, 1999) were used
as cutoff scores for the acceptable model fit; thus, fit indices for all models are considered
a good fit.

Dissertation Table 7

Conditional Indirect Effect of Self-compassion in the Relationship Between Independent Variables and Negative Consequences of Providing Nursing Care Depending on Levels of Moderator

Model	Independent Variable	Moderator	Level	B	95%LL	90%LL	90%UL	95%UL
					Bootstrap Confidence Interval			
1	**Working 13 hours or more at a stretch**	**Nursing foundations for quality of care**	High	.003	-.011	-.011	.013	.013
			Low	**.044**	**.011**	**.011**	**.074**	**.074**
2	**Working 13 hours or more at a stretch**	**Single family room**	Yes	.000	.000	.000	.000	.000
			No	**.036**	**.000**	**.013**	**.067**	**.074**
3	**Days that the nurse care for the infant**	**Collegial nurse-physician relations**	**High**	**.037**	**.004**	**.010**	**.076**	**.082**
			Low	**-.095**	**-.205**	**-.191**	**-.041**	**-.032**
4	**Strength of the nurse-infant/family relationship**	**Nursing foundations for quality of care**	**High**	**-.017**	**-.047**	**-.038**	**-.020**	**.000**
			Low	-.005	-.055	-.047	.034	.044
5	**Strength of the nurse-infant/family relationship**	**Collegial nurse-physician relations**	**High**	**-.030**	**-.080**	**-.068**	**-.003**	**.003**
			Low	-.005	-.052	-.045	.038	.043
6	Working 13 hours or more at a stretch	Collegial nurse-physician relations	High	.002	-.033	-.028	.032	.036
			Low	.045	-.006	-.001	.093	.106
7	Working 13 hours or more at a stretch	Presence of APNs	Yes	.000	.000	.000	.000	.000
			No	.001	.040	.033	.042	.046
8	Work hours per week	Collegial nurse-physician relations	High	.001	-.006	-.004	-.006	.008
			Low	.001	-.005	-.004	-.006	.006
9	Work hours per week	Single family room	Yes	.000	.000	.000	.000	.000
			No	.001	-.006	-.005	.006	.006
10	Days that the nurse care for the infant	Presence of APNs	Yes	.000	.000	.000	.000	.000
			No	-.014	-.072	-.058	.032	.039
11	Days that the nurse care for the infant	Single family room	Yes	.000	.000	.000	.000	.000
			No	-.004	-.050	-.042	.039	.053
12	Strength of the nurse-infant/family relationship	Presence of APNs	Yes	.000	.000	.000	.000	.000
			No	-.023	-.065	-.056	.014	.020
13	Strength of the nurse-infant/family relationship	Single family room	Yes	.000	.000	.000	.000	.000
			No	-.016	-.061	-.053	.018	.023
14	*Work hours per week	Nursing foundations for quality of care	High	.001	-.004	-.003	.005	.006
			Low	.001	-.010	-.007	.008	.010
15	*Work hours per week	Presence of APNs	Yes	.000	.000	.000	-.004	-.002
			No	-.011	-.021	.-019	-.003	-.002
16	*Days that the nurse care for the infant	Nursing foundations for quality of care	High	.013	-.017	-.011	.041	.047
			Low	-.072	-.178	-.162	-.008	-.003

Note. B = Unstandardized coefficient; LL = lower limit; UL = upper limit; Statistically significant results shown in bold font; * = a model without burnout.

The next part of Chapter 4 is a data-based manuscript reporting that will be submitted for publication. In the manuscript, two moderated mediation models using nursing foundations for quality of care and collegial nurse-physician relations as a moderator were reported, as these findings are more feasible to apply to nursing practice than other findings in order to decrease negative consequences of providing nursing care.

Section 4. 2. Manuscript 3 "Moderated Mediation Model of Negative Consequences of Providing Nursing Care in the NICU"

The manuscript as presented is written closely to the author guidelines, but formatted for the dissertation. It will be formatted according to the specification of *Nursing Research* prior to submission.

Moderated Mediation Model of Negative Consequences of Providing Nursing Care in the

NICU

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Abstract

Background: There are negative consequences of providing nursing care in nursing practice; however, its mechanism has not been fully understood, and studies investigating these negative consequences among Neonatal Intensive Care (NICU) Nurses are limited. *Objectives:* This cross-sectional study examined a model of negative consequences of providing nursing care including compassion fatigue, secondary traumatic stress, and burnout in the NICU. This study investigated whether the indirect effect of self-compassion in the relationship between the strength of the nurse-infant/family relationship and negative consequences of providing nursing care was conditional depending on levels of two organizational characteristics, nursing foundations for quality of care or collegial nurse-physician relations. *Method:* Using an online survey, data were collected from 174 registered nurses in the level III and IV NICUs in a Midwestern state. Two moderated mediation analyses using a different moderator were conducted by structural equation modeling using the bootstrapping method. *Result:* Results showed that there was the indirect effect of self-compassion in the relationship between the strength of the nurse-infant/family relationship and negative consequences of providing nursing care when the level of nursing foundations for quality of care or collegial nurse-physician relations was high, whereas there was no such relationship when these levels were low. *Discussion:* The study findings showed a mechanism of negative consequences of providing nursing care in the NICU. More investigations are required to identify other factors that might impact the negative consequences.

Keyword: compassion fatigue, secondary traumatic stress, burnout, NICU

Moderated Mediation Model of Negative Consequences of Providing Nursing Care in the

NICU

Providing nursing care often results in negative physiological, behavioral, and

psychological consequences. Research has focused on compassion fatigue, secondary

traumatic stress, and burnout as these negative consequences. These negative

consequences can impact professionals physically, emotionally, and psychologically;

affect professional attitudes toward patients and quality of care; and reflect on their view

toward their work and profession. Although they might be influenced by factors related to

work environments and nurses' intrapersonal characteristics, a mechanism of negative

consequences has not been fully understood (Sano, Schiffman, & Darmody, 2015a). To

reduce the negative consequences, an investigation in one nursing specialty is valuable as

each specialty has unique characteristics for nursing care. The present study examined a

model of negative consequences of providing nursing care in the NICU, involving

compassion fatigue, secondary traumatic stress, burnout, and the strength of the nurse-

infant/family relationship, self-compassion, and the organizational environmental

characteristic using moderated mediation approach among Neonatal Intensive Care Unit

(NICU) nurses

Although studies investigating the negative consequences among NICU nurses

are limited, providing nursing care in the NICU could result in high levels of general

fatigue (Fujimaru et al., 2012) and personal struggles including stress, frustration, and

burnout when caring for infants with neonatal abstinence syndrome (Murphy-Oikonen,

Brownlee, Montelpare, & Gerlach, 2010). Furthermore, higher moral distress that is

common among NICU nurses is associated with desire to leave the current position

(Cavaliere, Daly, Dowling, & Montgomery, 2010). It is valuable to investigate negative consequences of providing nursing care in order to obtain a better understanding of the mechanism of negative consequences of providing nursing care in the NICU and the protective factors.

Negative Consequences of Providing Nursing Care

Compassion fatigue has been getting more attention as one of significant issues in nursing (Boyle, 2011; Sabo, 2006; White, 2006). It is defined as "one of the negative consequences of providing nursing care that is biopsychosocial responses originating from emotional engagement when providing compassionate care for the relief of suffering" (Sano, Schiffman, & Darmody, 2015b, p. 27). In the present study, secondary traumatic stress is defined as a negative consequence of providing nursing care "resembling post-traumatic stress symptoms and derived from indirect exposure to traumatic events through providing nursing care for those who are directly traumatized" (Sano et al., 2015b, p. 29). Burnout is defined as another negative consequence of providing nursing care "related to physical and cognitive strain and negative behaviors or attitude toward work resulting from conflicts within the work setting" (Sano et al., 2015b, p. 30). Compassion fatigue, secondary traumatic stress, and burnout were treated as observed variables of negative consequences of providing nursing care and outcomes of the present study.

Strength of the Nurses-Infant/Family Relationship

There is little understanding of how the relationship between nurses and patients plays a role in the mechanism of developing negative consequences of providing nursing care. Sabo (2010) found that the nurse-patient relationship negatively and

psychologically impacted hematology/blood and marrow transplant nurses. Another study found that over-involvement with patients and exceeding professional boundaries were often triggers of compassion fatigue and burnout among pediatric nurses (Maytum, Heiman, & Garwick, 2004). These findings indicated that decreased strength of the nurse-patient relationship might be a possible risk factor of negative consequences of providing nursing care among NICU nurses caring for infants in acute conditions. It is important to include not only the relationship between the nurse and the infant, but also between the nurse and the family, as family involvement is a necessary perspective of patient care in the NICU.

Self-compassion

Self-compassion encourages facing and acknowledging one's own suffering and enhances the desire to relieve that suffering with deliberate actions toward oneself; consequently, it enhances compassionate feelings and attitudes toward others (Neff, 2003a, 2003b). Self-compassion is an essential element of providing quality nursing care and a possible factor related to the negative consequences (Valent, 2002). However, it has not been empirically tested as an associated factor of negative consequences of providing nursing care. Previous studies found that self-compassion mediated the effect of a mindfulness-based intervention on quality of life and perceived stress in young adults (Keng, Smoski, Robins, Ekblad, & Brantley, 2012) and the effect of a yoga-based psychological intervention on worry and fear among adults (Gard et al., 2012). In the current study, self-compassion was investigated as a mediator in the relationship between the strength of the nurse-infant/family relationships and negative consequences of providing nursing care.

Organizational Characteristics

In this study, two organizational characteristics were examined as moderators in the moderated mediation model.

Nursing foundations for quality of care. Nursing foundations for quality of care is defined as the standards for patient care at the unit including nursing philosophy, the provision of nursing care, a quality assurance program, and education programs for nurses (Lake, 2002). Shang, Friese, Wu, and Aiken (2013) found that oncology nurses who perceived a higher level of nursing foundations of quality of care were less likely to develop burnout. The level of nursing foundations of quality of care was negatively correlated with turnover intention in five years among hospital-based nurses (Lansiquot, Tullai-McGuinness, & Madigan, 2012). Although these previous studies showed that nursing foundations for quality of care had a direct effect on nurses, it has not examined whether it may play a role as a moderator in the relationship between sources of stress and negative effects on nurses.

Collegial nurse-physician relations. Collegial nurse-physician relations is defined as effective teamwork, positive relationships, and collaboration between nurses and physicians at work (Lake, 2002). Previous studies found that collegial nurse-physician relations had a direct relationship with turnover intention of nurses (Galletta, Portoghese, Battistelli, & Leiter, 2013), intention to leave nursing (Heinen et al., 2013), and decision latitude (Van Bogaert, Kowalski, Weeks, Van Heusden, & Clarke, 2013), and burnout (Li et al., 2013). Another study found that collegial nurse-physician relations moderated the relationship between the indirect care task accomplishment-satisfaction and post-shift positive/negative affect (Gabriel, Diefendorff, & Erickson, 2011). Gabriel

et al.'s finding suggests that collegial nurse-physician relations may play a role as a moderator in the relationship between work-related stress and negative consequences of nursing care.

Present Study

The present study examined a model of negative consequences of providing nursing care in the NICU (see Figure 1). The model of consequences of providing nursing care proposed by Sano, Schiffman, and Darmody (2015a) was used as a conceptual framework in the study. Factors (i.e., nurse-infant/family relationship) related to patients that might trigger the negative consequences (i.e., compassion fatigue, secondary traumatic stress, burnout) among NICU nurses were used as independent variables (e.g., Maytum et al., 2004; Sabo, 2010). Based on findings of previous studies suggesting that self-compassion could mediate the relationship between sources of distress and the negative consequences (e.g., Gard et al., 2012; Keng et al., 2012), we used self-compassion as a mediator between the nurse-infant/family relationship and the negative consequences. Two organizational characteristics defined by Lake (2002), nursing foundations for quality of care and collegial nurse-physician relations, were chosen as moderators in the analyses, as these characteristics can be feasibly changed in nursing practice even at the individual level in order to decrease negative consequences in nursing practice. The model was specifically developed to the NICU nurses. An online survey was used to assess negative consequences of providing nursing care, the strength of the nurse-infant/family relationship, self-compassion, nursing foundations for quality of care, collegial nurse-physician relations, clinical experiences, and demographics.

The hypothesis in the present study was that the indirect effects of self-compassion in the relationship between the strength of the nurse-infant/family relationship and negative consequences of providing nursing care would be conditional depending on levels of the organizational characteristic (nursing foundations for quality of care or collegial nurse-physician relations).

Method

Setting and Sample

The sample was registered nurses (RNs) working in level III or IV NICUs in a Midwestern state, and direct care providers in the staff position. The sample was recruited via a state group coordinator of Vermont Oxford Network collaborative group (Vermont Oxford Network, 2014) or an study investigator. The final sample consists of 174 nurses who completed the survey (approximate response rate of 30%). The participants were all female except three participants who did not indicate their gender and between 21 to 70 years of age. The average years of nursing experience in the NICU was 14.5 years ($SD = 11.15$), and 135 (77.6%) had a bachelor's degree in nursing (See Table 1).

Measurement

Nine questionnaires were used to assess negative consequences of providing nursing care, the strength of the nurse-infant/family relationship, self-compassion, nursing foundations for quality of care, collegial nurse-physician relations, clinical experiences, and demographics.

Negative consequences of providing nursing care. Three questionnaires were measured negative consequences of providing nursing care consisting of three study variables: compassion fatigue, secondary traumatic stress, and burnout.

Compassion fatigue. Compassion fatigue was assessed using the Professional Quality of Life Scale Version 5 (ProQOL; Stamm, 2010). The ProQOL is a self-report assessment on a 5-point Likert scale, ranging from 1 (*never*) to 5 (*very often*) with 30 items. The present study used only the secondary traumatic stress subscale to measure compassion fatigue, as the mean score of the secondary traumatic stress subscale purports to assess compassion fatigue (Stamm, 2010). Higher scores show higher levels of compassion fatigue. The Cronbach's alpha was .84 for the secondary traumatic stress subscale.

Secondary Traumatic Stress. The Secondary Traumatic Stress Scale (STSS; Bride, Robinson, Yegidis, & Figley, 2004) was used to assess secondary traumatic stress symptoms. The STSS is a 17 item self-report questionnaire on a 5-point Likert scale, ranging from 1 (*never*) to 5 (*very often*). This study used overall mean scores. Higher score show higher levels of secondary traumatic stress. The Cronbach's alpha was .92 for the overall scale.

Burnout. The Oldenburg Burnout Inventory (OLBI; Demerouti, Mostert, & Bakker, 2010) is a self-report questionnaire designed to assess burnout. It consists with 16 items on a 4-point Likert scale, ranging from 1 *(strongly agree)* to 4 *(strongly disagree)*. This study used overall mean scores, and higher scores show higher levels of burnout. The Cronbach's alpha for the overall scale was .81.

Strength of the nurse-infant/family relationship. The clinical experience questionnaire was an investigator developed instrument that included one item assessing the strength of the nurse-infant/family relationship. Participants were asked to score the strength of the relationship with the infant who was the most complex case that they were responsible for in the last working week and the infant's family on a 5-point Likert scale, ranging from 1 (*not at all*) to 5 (*extremely*).

Self-compassion. The Self-Compassion Scale (SCS; Neff, 2003a) was used to measure self-compassion in nurses. This self-report questionnaire is on a 5-point Likert scale, ranging from 1 *(almost never)* to 5 *(almost always)* with 26 items. The total mean score was used, and higher scores indicate higher levels of self-compassion. The Cronbach's alpha was .93 for the overall scale.

Nursing foundation for quality of care. Nursing foundations for quality of care was assessed using one of the five subscales of the Practice Environment Scale of the Nursing Working Index (PES-NWI; Lake, 2002). The PES-NWI was designed to assess individual perception of the organizational environmental characteristics in nursing practice. This 31-item self-report questionnaire is on a 4-point Likert scale, ranging from 1 *(strongly disagree)* to 4 *(strongly agree)*. The current study used a mean score of the nursing foundations for quality of care subscale, and higher scores indicate higher standards of nursing care. The Cronbach's alpha for this subscale was .85 for 10 items.

Collegial nurse-physician relations. Collegial nurse-physician relations was also assessed using one of the subscales of the PES-NWI. A mean score was used, and higher scores indicate higher quality nurse-physician relations. The Cronbach's alpha for the subscale was .81 for three items.

Sample demographics. Participants responded about their demographics including age, gender, years of experience as an RN, years of experience in level III or IV NICU, and the highest education level in nursing.

Clinical experiences. Participants responded about their work environment, work schedule, clinical characteristics of the most complex case whom participants provided nursing care in the last working week.

Procedures

Approval from the Institutional Review Board (IRB) at the authors' institution and participating healthcare institutions that required separate IRB review was obtained. Target NICUs were contacted by either the group coordinator of the Wisconsin Vermont Oxford Network collaborative group (Vermont Oxford Network, 2014) or the study investigator. The online survey link was distributed to individual nurses via email though the representatives or the investigator, depending on the hospital's policy and preference. Flyers were provided to the participating NICUs and follow-up reminders were sent two, four, and five weeks after the initial invitation via email.

Data Analysis

Preliminary analytical procedures. The Little's Missing Completely At Random test (MCAR; Little & Rubin, 2002) was performed using SPSS (version 22). Missing data occurred randomly for all items except for the values for the independent variable and demographics items, $\chi^2 (44) = 77.92$, $p = .001$; however, only 1.64% of the total values for these items were incomplete data. Thus, missing data imputation with the maximum likelihood estimation was performed using IBM SPSS AMOS (version 22). The basic characteristics including means, standard deviations, and frequencies of the

data were reviewed using descriptive statistics. Pearson's correlations among study variables were performed to evaluate bivariate relationships.

Primary analytical procedure. Figures 2 and 3 represent the analytical moderated mediation models for the present study (Preacher, Rucker, & Hayes, 2007). Two moderated mediation analyses were conducted to examine whether the indirect effect of the strength of the nurse-patient relationship on negative consequences of providing nursing care through self-compassion was conditional depending on levels of the organizational characteristics (nursing foundations for quality of care or collegial nurse-physician relations.

The maximum likelihood estimation was used as a computational method, and 5,000 bootstrap samples were drawn. Bootstrap confidence intervals that did not include zero indicated a significant indirect effect (Hayes, 2009). Both 90% and 95 % bootstrap confidence intervals were used to test the significance of the total indirect effect because bootstrap confidence intervals allow estimating the magnitude of the effect on a continuous distribution. This is strength of the bootstrapping method, compared to a dichotomous decision making for the null-hypothesis testing (Little, Preacher, Selig, & Card, 2007). The global model fit was assessed using three conventional fit indices: root mean square error of approximation (RMSEA), comparative fit index (CFI), and standardized root mean residual (SRMR).

Follow-up Procedure

Follow up mediation analyses were performed to examine directions of path coefficients in the mediation models. Moderator variables were categorized into the high

and low level of the moderator group using the median score, and then each group was tested separately.

Results

Preliminary Results

Descriptive analyses. Table 2 displays the work environment in which participants work, and Table 3 displays the work schedule over the past six months of participants. Table 4 displays the most complex case that nurses were responsible for over the last working week. The means and standard deviations of compassion fatigue, secondary traumatic stress, burnout, self-compassion, two organizational characteristics are presented in Table 5. Table 6 shows the Pearson's correlation coefficients for study variables used in the moderated mediation analyses. Self-compassion had direct relationships with the three components of negative consequences of providing nursing care and two organizational characteristics. The three components of negative consequences of providing nursing had direct relationships with the two organizational characteristics. The strength of nurse-infant/family relationship was significantly and negatively correlated with secondary traumatic stress and burnout.

Primary Results

Two moderated mediation models were tested using two different moderators (nursing foundations for quality of care and collegial nurse-physician relations). Secondary traumatic stress had stronger correlations with the other two observed dependent variables compared to other correlations among these three variables; thus, it was constrained to be one in the analysis.

Moderated mediation model 1 using nursing foundations for quality of care as the moderator. When the level of nursing foundations for quality of care was high, there was a conditional indirect effect of self-compassion in the relationship between the strength of the nurse-infant/family relationship and negative consequences of providing nursing care, $B = -.017$, 90% CI (-.038, -.020), 95% CI (-.047, .000), whereas there was no such relationship when the level of nursing foundations for quality of care was low, $B = -.005$, 90% CI (-.047, .034), 95% CI (-.055, .044). Fit indices for this model were considered a good fit, RMSEA = .074, CFI = .967, SRMR = .034 using the cutoff scores, RMSEA less than .10 (Browne & Cudeck, 1993), CFI greater than .90 (Hu & Bentler, 1999), and SRMR lower than .08 (Hu & Bentler, 1999).

A follow up mediation analysis examining directions of path coefficient showed a positive path coefficient ($\beta = .15$) between the strength of the nurse-infant/family relationship and self-compassion and a negative path coefficient ($\beta = -.52$) between self-compassion and negative consequences in the high level of nursing foundations for quality of care group. In the low level of the group, the analysis showed a positive path coefficient ($\beta = .10$) between the strength of the nurse-infant/family relationship and self-compassion and a negative path coefficient ($\beta = -.70$) between self-compassion and negative consequences.

Moderated mediation model 2 using collegial nurse-physician relations as a moderator. When the level of collegial nurse-physician relations was high, there was an indirect effect of self-compassion in the relationship between the strength of the nurse-infant/family relationship and negative consequences of providing nursing care, $B = -.030$, 90% CI (-.068, -.003), 95% CI (-.080, .003), whereas there was no such relationship

when the level of collegial nurse-physician relations was low, B = -.005, 90% CI (-.045, .038), 95% CI (-.052, .043). Fit indices for this model were also considered a good fit, RMSEA = .066, CFI = .971, SRMR = .069.

A follow up mediation analysis examining directions of path coefficient showed a positive path coefficient (β = .12) between the strength of the nurse-infant/family relationship and self-compassion and a negative path coefficient (β = -.50) between self-compassion and negative consequences in the high level of collegial nurse-physician relations group. In the low level of the group, the analysis showed a positive path coefficient (β = .29) between the strength of the nurse-infant/family relationship and self-compassion and a negative path coefficient (β = -.53) between self-compassion and negative consequences.

Discussion

The findings of the present study supported the hypothesis (Figure 1) and showed a mechanism of negative consequences of providing nursing care. The study results support a possibility that self-compassion plays a role as a mediator in the relationship between the strength of the nurse-infant/family relationship and negative consequences of providing nursing care. This indirect effect of self-compassion was conditional depending on levels of nursing foundation for quality of care and collegial nurse-physician relations. As the strength of the nurse-infant/family relationship increased, the level of negative consequences of providing nursing care decreased, resulting from an increased level of self-compassion. Self-compassion functioned as a mediator depending on the levels of nursing foundation for quality of care and collegial nurse-physician relations.

When the level of nursing foundation for quality of care was high, as the level of the strength of the nurse-infant/family relationship increased, the level of self-compassion increased; consequently, negative consequences of providing nursing care decreased. On the other hand, when the level of nursing foundation for quality of care was low, there was no such relationship. This finding added a new perspective that nursing foundations of quality of care plays a role as a moderator compared to previous study results indicating the direct effects of nursing foundations for quality of care on burnout among oncology nurses (Shang et al., 2013) and turnover intention among hospital-based nurses (Lansiquot et al., 2012). The current study identified the indirect effects of nursing foundations for quality of care on nurses' negative consequences. Assessment of this protective factor becomes a priority for nurse leaders in a NICU. If the quality of care is determined to be high, maintenance becomes the strategic focus of the unit. If the value is low, however, strategies and initiates to improve quality of nursing care need to be implemented.

When the level of collegial nurse-physician relations was high, as the level of the strength of the nurse-infant/family relationship increased, the level of self-compassion increased; consequently, negative consequences of providing nursing care decreased. When the level of collegial nurse-physician relations was low, however, there was no such relationship. Previous studies reported that there were the direct effects of collegial nurse-physician relations on nurses' perception of quality of care in the oncology unit (Shang et al., 2013), emotional exhaustion among nurses assigned to a combat support hospital deployed in Iraq (Lang, Patrician, & Steele, 2012), moral distress among critical care nurses (McAndrew, Leske, & Garcia, 2011), and intentions to leave hospital nursing

among baccalaureate nurses (DiMattio, Roe-Prior, & Carpenter, 2010). In addition, Gabriel et al. (2011) showed that collegial nurse-physician relations moderated the relationship between the level of the indirect care task accomplishment satisfaction and both positive and negative affect. The findings of the present study indicated that collegial nurse-physician relations might play a more complex role than the findings of Gabriel et al.'s (2011) as a moderator for the indirect effect of self-compassion. This result can help to understand a mechanism of negative consequences of providing nursing care, as it identified the effects of interpersonal professional relationships with patients and physicians on nurses as a protective factor. Assessment of this protective factor becomes a priority for nurse leaders in a NICU. If collegial nurse-physician relations is determined to be positive, maintenance becomes the strategic focus of the unit. If the value is negative, however, strategies and initiates to improve collegial nurse-physician relations need to be implemented.

In the present study, the model of negative consequences of providing nursing care developed by Sano and colleagues (2015a) was used as a conceptual framework. This conceptual model allows investigating specific factors and causal relationships for negative consequences in the nursing practice setting; thus, this model can reveal meaningful information to nurses to understand its mechanism and prevent negative consequences at work compared to Stamm's model (2010) explaining compassion fatigue in people who help others and the concept of compassion fatigue identified by Coetzee and Klopper (2010) focused on the development of compassion fatigue in nurses.

The strength of the nurse-infant/family relationship was a potential factor influencing the negative consequences. Self-compassion and the two organizational

characteristics were protective factors influencing the relationship between the strength of the nurse-infant/family relationship and negative consequences. Identifying these factors as a moderator or mediator help to understand the mechanism of negative consequences in nursing practice.

Applications to Nursing Practice

Results of the present study suggest protective factors for developing interventions to prevent negative consequences of providing nursing care in the NICU. First, nurses should be aware that they are at risk for developing negative consequences of providing nursing care in their daily practice; however, it is preventable. The key to preventing negative consequences of providing nursing care include (a) building strong relationships with the infant and family, (b) providing high quality nursing care, (c) building positive collegial relationships with physicians, and (d) developing self-compassion. To support nurses, nursing administrators and nurse managers should provide nurses educational programs to enhance these aspects of nursing practice. In the clinical setting with multiple pressures to cut costs, it becomes imperative to understand specific relationships in order to optimally use limited recourses. Nurse leaders in the NICU need to be able to target resources to the areas of highest need. Knowing under which circumstances a factor can be protective and assessing the level of protective factor in the NICU workforce can facilitate NICU leaders' differentiated strategic initiatives and provide information to target these initiatives to the areas of highest need.

The results of this study are limited by use of convenience sample and the small sample size which did not allow comparison of nurses in different levels of NICU. The differences between NICU III and IV might impact the study results as the acuity of

infants would be different. There are also limitations of using cross-sectional data to investigate this research problem. Future longitudinal research is needed to identify a mechanism and interventions for negative consequences of providing nursing care.

The present study explored a possible mechanism of the development of negative consequences of providing nursing care. Professional relationships with patients and physicians, quality of nursing care, and self-compassion can be considered as important aspects for the mechanism. The study focused on one specific nursing specialty is at an early stage of research investigating negative consequences of providing nursing care. It is necessary to conduct studies in other nursing specialties and understand nurses' vulnerability to negative consequences of providing nursing care and its mechanism.

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Table 1

Demographics (N = 174)

Variable	Frequency	%	Mean	SD
Female	171	98.30		
Age				
21-30	37	21.30		
31-40	38	21.80		
41-50	35	20.10		
51-60	45	25.90		
61-70	14	8.10		
Highest education level				
Master/Doctoral	7	6.30		
Bachelor	135	77.60		
Associate/Diploma	20	11.50		
Years of experience				
Registered nurse			18.40	12.49
RN in NICU			14.50	11.15

Note. Some percentages do not add up to 100% because of missing data.

Table 2

Work Environment (N = 174)

Variable	Frequency	%
The location of the hospital at which nurses worked		
Urban area	130	74.70
Suburban area	36	20.70
Rural area	8	4.60
Magnet hospital designation	125	71.80
Single Family Room Neonatal Intensive Care Unit (NICU)	59	33.90
The number of beds in you NICU		
10-20	35	20.10
21-30	42	24.10
31-40	25	14.40
41-50	27	15.50
> 50	45	25.90

Note. Some percentages do not add up to 100% because of missing data.

Table 3

Work Schedule Over the Past Six Months (N = 174)

Variable	Frequency	%	Mean	SD
Working days in a row			2.79	0.83
Working hours per week			32.33	7.67
Working hours per days			10.95	2.01
Average % of time spent in direct care/day			84.05	22.60
Full time	103	59.20		
Shift type				
Day only	13	7.47		
Evening only	9	5.17		
Night only	30	17.24		
Day& Evening	41	23.56		
Day& Night	15	8.62		
Evening & Night	30	17.24		
All three	36	20.69		

Note. Some percentages do not add up to 100% because of missing data.

Table 4

The Characteristics of the Most Complex Case that Nurses were Responsible for Over the Last Working Week (N = 174)

Variable	Frequency	%	Mean	*SD*
Patient Clinical Characteristics				
Birth weight of the infant in grams			1404.76	942.86
Gestational age of the infant at birth			29.38	4.95
Days that the nurse cared for the infant in the last working week			1.97	1.02
Differences of this infant's acuity and severity of illness from the patients for whom a nurse normally provided care				
Not all different	71	40.81		
Slightly different	39	22.41		
Somewhat different	27	15.52		
Moderately different	22	12.64		
Extremely different	10	5.74		
Regularly of providing care for the infant				
On a regular basis as a primary nurse	40	23.00		
On a regular basis to cover the primary nurse	21	12.10		
Not on a regular basis/ being assigned the infant only on the day	46	26.40		
Not on a regular basis/ being assigned the infant more than one time	39	22.40		
Not on a regular basis/ being occasionally assigned the infant	21	12.07		
Strength of the nurse-infant/family relationship				
Not at all strong	42	24.14		
Slightly strong	28	16.09		
Somewhat strong	42	24.14		
Moderately strong	45	25.86		
Extremely strong	13	7.47		

Note. Some percentages do not add up to 100% because of missing data.

Table 5

Means and Standard Deviations of Dependent Variable, Self-compassion, and Moderators

Variable	Mean	SD
Compassion Fatigue	2.05	0.57
Secondary traumatic Stress	1.81	0.62
Burnout	2.34	0.38
Self-compassion	3.34	0.65
Nursing foundations for quality of care	3.18	0.49
Collegial nurse-physician relations	3.34	0.57

Table 6

Pearson Correlation Matrix for Study Variables in the Moderated Mediation Analysis

Variable	1	2	3	4	5	6
1.Compassion fatigue						
2.Secondary traumatic stress	.75**					
3.Burnout	.44**	.52**				
4.Strength of the nurse-infant/family relationship	-.14	-.20**	-.17*			
5.Self-compassion	-.31**	-.44**	-.36**	.15*		
6. Nursing foundations for quality of care	-.26**	-.25**	-.47**	.24**	.21**	
7. Collegial nurse-physician relations	-.21**	-.24**	-.32**	.23**	.16*	.62**

Note. * $p < .05$; ** $p < .01$; *** $p < .001$.
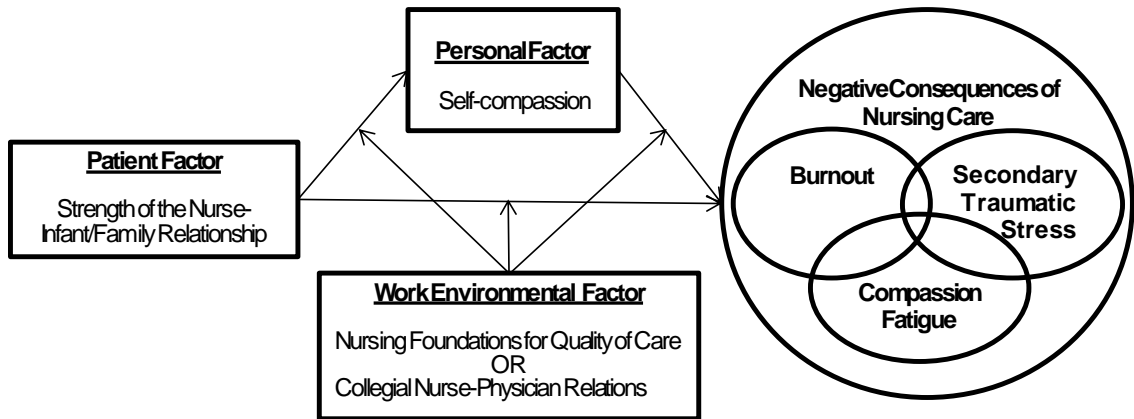
Figure 1. Conceptual Model of the Moderated Mediation Analysis for Negative Consequences of Providing Nursing Care in the Neonatal Intensive Care Unit
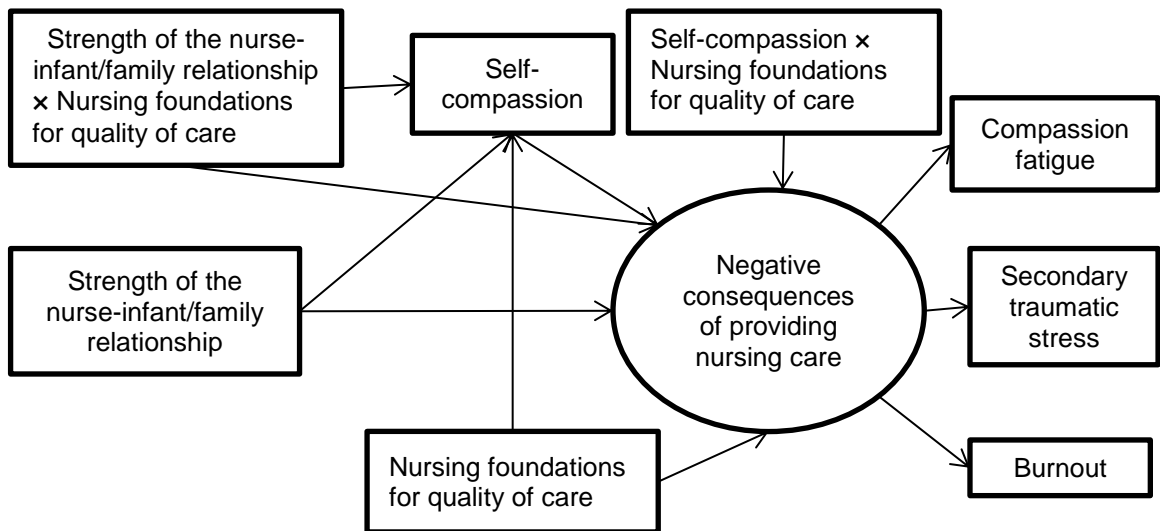
Figure 2. Analytical Model of Negative Consequences of Providing Nursing Care in the
Moderated Mediation Analysis Using Nursing Foundations for Quality of Care as the Moderator
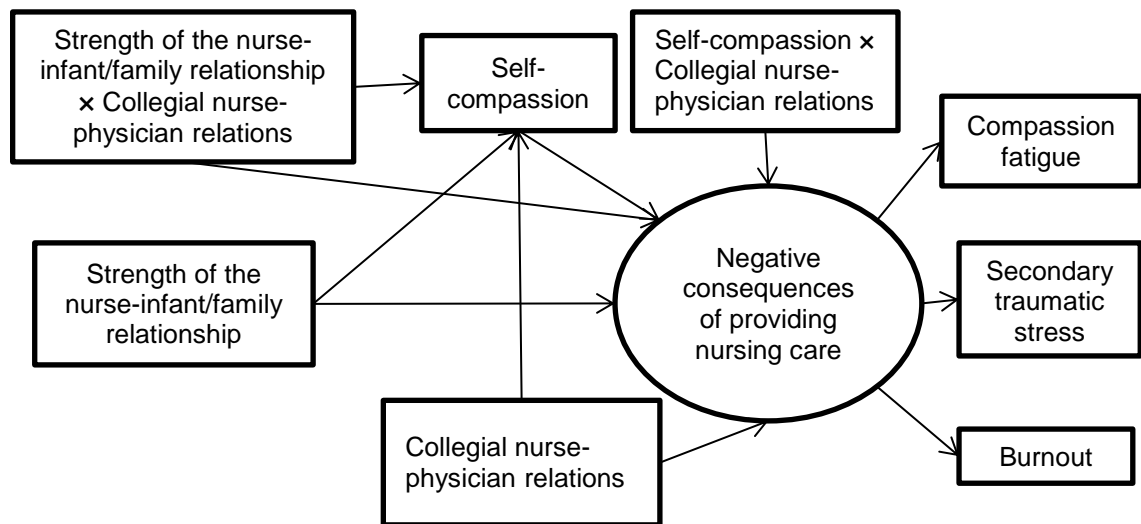
Figure 3. Analytical Model of Negative Consequences of Providing Nursing Care in the Moderated Mediation Analysis Using Collegial Nurse-physician Relations as the Moderator

Summary

The first part of the Chapter 4 provided all findings of this study including the presentation of relevant quantitative data. The next part was a data-based manuscript that focused on one of five significant results of a series of the moderated mediation analyses. The finding showed the effects of the professional relationship of nurses with patients and physicians in the NICU. This finding is more feasible to apply to nursing practice at the individual level as an intervention of negative consequences of providing nursing care than other findings.

Chapter 5

Discussion and Conclusions

Chapter 5 discusses overall study results and presents a set of concluding

statements of the three manuscripts for nursing practice and future research.

This study investigated whether the conditional indirect effect of self-compassion

in the relationship between the patient factor (working hours per week, working 13 hours

or more at a stretch, days that the nurse care for the infant in the most complex condition.

and the strength of the nurse-infant/family relationship) and negative consequences of

providing nursing care (compassion fatigue, secondary traumatic stress, and burnout) was

dependent on levels of a personal factor or a work environment factor (nursing

foundations for quality of care, collegial nurse-physician relations, the presence of APNs,

and the SFR NICU) using a moderated mediation approach. The results of this study

support several elements of the model for moderated mediation for negative

consequences of providing nursing care in the NICU (Dissertation Figure 1) originating

from the conceptual model of consequences of providing nursing care (Manuscript 2

Figure 1). The series of moderated mediation analyses in the present study showed that

the indirect effects of self-compassion in the relationship between the intensity and

frequency of contact with the infant and family and negative consequences of providing

nursing care differed depending on levels of nursing foundations for quality of care,

levels of collegial nurse-physician relations, and the NICU room design. The patient

factor was considered as a risk factor of negative consequences of providing nursing care

and had the direct and indirect relationship with negative consequences of providing

nursing care through the personal factor and the work environment factor. The personal

factor indirectly influenced the relationship as a moderator, while the work environment

factor indirectly influenced it as a moderator. Although a series of moderated mediation

analyses were required due to the limited number of variables in the analysis, results of

the present study showed that the tested model partially fit the data. It reveals a

mechanism of negative consequences of providing nursing care in the NICU. This is an

important initial step to develop a theory of consequences of providing nursing care.

In addition, the current study identified seven important aspects from the patient,

personal, and work environment factors that might prevent negative consequences of

providing nursing care in the NICU (see Table 9).

Dissertation Table 9

The Seven Important Aspects that Might Prevent Negative Consequences of Providing Nursing Care in the NICU

	Seven Important Aspects	Type of the Factor	Type of the Study Variable
1.	High level of nursing foundations for quality of care	Work environment	Moderator
2.	Positive collegial nurse-physician relations	Work environment	Moderator
3.	Single Family Room Neonatal Intensive Care Unit	Work environment	Moderator
4.	High level of self-compassion	Personal	Mediator
5.	Decreased the intensity of contact with the infant and family	Patient	Independent variable
6.	Increased the frequency of contact with the infant and family	Patient	Independent variable
7.	Strong nurse-infant/family relationship	Patient	Independent Variable

Next, all concepts used in the analyses as moderators are discussed. Discussion of

concepts used as a mediator and independent variables follows.

Moderators

Nursing foundations for quality of care. Nursing foundations for quality of care is

described by the standards for patient care at the unit including nursing philosophy, the

provision of nursing care rather than medical care (e.g., nursing model, nursing diagnosis,

nursing care plan, nursing care competency), a quality assurance program, and education

programs for nurses (Lake, 2002). The level of nursing foundations for quality of care moderated the indirect effect of self-compassion in the relationship between the intensity and frequency of contact with the infant and family and negative consequences of providing nursing care. When the intensity of contact with the infant and family (working 13 hours or more at a stretch) increased, nurses who worked in the NICU with lower standards of patient care who also had low self-compassion tended to develop negative consequences of providing nursing care. In addition, when nurses who had the strong nurse-infant/parent relationship and worked in the NICU with higher standards of patient care increased the level of self-compassion; consequently, they were unlikely to develop negative consequences of providing nursing care.

This finding provided another perspective of nursing foundations of quality of care as a moderator, compared to findings of previous studies investigating its direct effects on burnout among oncology nurses (Shang, Friese, Wu, & Aiken, 2013) and turnover intention in five years among hospital-based nurses (Lansiquot, Tullai-McGuinness, & Madigan (2012). These results showed how nursing foundations of quality of care directly impacted negative outcomes of nurses. By showing the results involving a risk factor for negative consequences of providing nursing care, the present study found that nursing foundations for quality of care possibly functions as a moderator in a mechanism of negative consequences of providing nursing care.

Collegial nurse-physician relations. Collegial nurse-physician relations is described by positive relationships between nurses and physicians at work, particularly addressing collegial relationship toward patient care in the clinical setting (Lake, 2002). The level of collegial nurse-physician relations was identified as another moderator for

the indirect effects of self-compassion in the relationship between the intensity and frequency of contact with the infant and family and negative consequences of providing nursing care. Nurses who had the strong nurse-infant/family relationship and positive collegial relationships with physicians were unlikely to develop negative consequences of providing nursing care. This outcome resulted from an increased level of self-compassion.

Previous studies found direct effects of collegial nurse-physician relations on perceptions of quality of care than nurses among oncology nurses (Shang et al., 2013), emotional exhaustion among nurses who had been assigned to a combat support hospital deployed in Iraq (Lang, Patrician, & Steele, 2012), moral distress among critical care nurses (McAndrew, Leske, & Garcia, 2011), and intention to leave hospital nursing among baccalaureate nurses (DiMattio, Roe-Prior, & Carpente, 2010) . These results indicate that collegial nurse-physician relations directly impacts negative outcomes of nurses in the practice setting. Moreover, Gabriel, Diefendorff, and Erickson (2011) showed the moderation effect of collegial nurse-physician relations between the indirect care task accomplishment satisfactions and post-shift positive effect; and task accomplishment satisfactions and post-shift negative affect. The present study added a new perspective of collegial nurse-relationship that moderated the mediation effect, as it played the role of a moderator in a mechanism of negative consequences of providing nursing care.

On the other hand, the results of the moderated mediation model 3 (the pair of variables: days that the nurse cared for the infant per week and collegial nurse-physician relations) showed when the number of days that the nurse cared for the infant in the most complex condition increased, nurses who had positive collegial relationships with

physicians tended to have a decreased level of self-compassion; consequently, they tended to have increased negative consequences of providing nursing care. Even when the number of days that the nurse cared for the infant increased, nurses who had negative collegial relationships with physicians were likely to have an increased level of self-compassion and consequently, have decreased negative consequences of providing nursing care. When nurses perceived lower levels of collegial nurse-physician relations, they might develop a sense of responsibility for their nursing actions; consequently, they might rely on their self-compassion to care for themselves, and not have increased negative consequences. In contrast, when nurses perceived higher levels of collegial nurse-physician relations, they might not need to rely on their self-compassion to care for themselves, as they can share responsibility for nursing care provided with physician, and then they might have increased negative consequences due to a decreased level of self-compassion.

It is important to note that, in the moderated mediation analysis, negative consequences were investigated through self-compassion. When looking at the path coefficient between collegial nurse-physician relations and negative consequences of providing care, collegial nurse-physician relations had a significant and negative relationship ($\beta = -.23$). Collegial nurses-physician relations can be a protective factor for negative consequences pf providing nursing care; however, this effect was not observed in the relationship between the number of days a nurse cared for the infant and negative consequences through self-compassion.

SFR NICU. In the tested model for the moderated mediation mode, SFR NICU also functioned as a moderator. When the intensity of contact with the infant and family

(working 13 hours or more at a stretch) increased, nurses who worked at the open-unit NICU tended to develop negative consequences of providing nursing care in spite of the fact that they increased the level of self-compassion. Previous studies found transition from an open-unit NICU to a SFR NICU provided significant improvements in nurses' perceptions of quality of work environment, quality of patient care, job quality, safety and security, interaction with technology, and overall satisfaction (Stevens et al., 2010). Other significant improvements were found in staff and parental privacy, the ability to concentrate to work, noise level, and ease of communication (Watson, DeLand, Gibbins, MacMillan York, & Robson, 2014). These findings showed that there are direct positive effects of the SFR NICU on nurses in the practice setting. The current study finding identified another advantage of the SFR design in the NICU as a moderator.

Presence of APNs. There were no indirect effects of self-compassion in the relationship between any components of the patient factor and negative consequences of providing nursing care when presence of APNs was a moderator. There are several reasons that might affect the results, such as differences in the level of the NICUs, the acuity of infants, or the number of beds in NICUs. In addition, APNs might be differently defined, named, or take different roles among hospitals. More investigations are needed to focus on APNs to examine the indirect effects.

Mediator: Self-compassion

Self-compassion was identified as a mediator in the moderated mediation. Previous studies found that self-compassion mediated the relationship between various predictors of psychological symptoms and negative psychological outcomes. These are included the relationship between victimization and psychological maladjustment in

adolescents (Játiva & Cerezo, 2014) and body image stress and psychological distress among breast cancer survivors (Przezdziecki et al., 2013). Although the mediation effect of self-compassion among nurses was not identified in previous research, the current study found the mediation effect of self-compassion between the intensity and frequency of contact with the infant/family and negative consequences of nursing care. This is an important finding to develop interventions for negative consequences of providing nursing care in nursing practice.

Independent Variable: Intensity and Frequency of Contact with the Infant and Family

Interesting relationships were found between the intensity and frequency of contact with the infant and family and negative consequences of providing nursing care. The component of the patient factor, working 13 hours or more at a stretch indicating the intensity of contact with the infant/family, had a significant positive relationship with compassion fatigue and secondary traumatic stress. The other two components of the patient factor indicating the frequency of contact with the infant/family had a significant negative relationship with negative consequences of providing nursing care: the significant negative relationship between working hours per week and burnout; and between days a nurse care for the infant and secondary traumatic stress. In addition, the strength of the nurse-infant/family relationship had a significant negative relationship with secondary traumatic stress and burnout. Considering these results, in this sample, the intensity of contact with the infant/family might be a risk factor that increases negative consequences of providing nursing care, whereas the frequency of contact with the infant/family and the strength of the nurse-infant/family relationship might be a

protective factor that decreases negative consequences of providing nursing care. Although the strength of the nurse-infant/family relationship was considered as an element of both the intensity of contact with the infant and family and the frequency of contact with the infant and family in the conceptual model, it may be more appropriate to consider each separately. In addition, the strength of the nurse-infant relationship should also be considered a separate element of the patient factor.

Implications to Nursing Practice

In the present study, the nurses did not report high level of negative consequences of providing nursing care. This may be due to a moderate level of self-compassion and positive perceptions of organizational characteristics, as negative consequences were significantly and negatively correlated with self-compassion and organizational characteristics in this study sample. This means that nurses were at increased risk of developing negative consequences when the level of self-compassion and organizational characteristics decreased. Therefore, it is important to identify interventions to prevent the development of negative consequences in nursing practice. The seven important aspects identified in the current study can support to develop interventions for nurses at the individual, unit, and organizational level.

Interventions at the individual level. Nurses should review and evaluate if nursing care provided in daily practice fulfills the infant and the family needs. It is important for nurses to build positive collegial relationship with physicians. It is important to help nurses recognize that the quality of their relationship with physicians plays a role in whether the nurse experiences negative outcomes of providing care. Nurses are encouraged to have a strong relationship with the infant and family;

particularly when the infant is in a critical condition. It might be beneficial for nurses to have a private space while caring the infant and the family, such as using a bedside screen, when nurses work at the open unit. Finally, nurses should learn strategies to enhance and manage self-compassion.

Interventions at the unit level. For interventions at the unit level, it is important to improve nursing standards for patient care or educational programs for nurses. Support at the unit level is a necessity. Nurse managers and clinical leaders are encouraged to create a work climate that strengthens collegial nurse-physician relations. Team work (Barbosa, 2013) and communication among healthcare professionals (McGrath, 2013) are important elements of quality care in the NICU. Li, Early, Mahrer, Klaristenfeld, and Gold (2014) found that group cohesion moderated the effect of current PTSD symptoms on burnout; and the effect of current stress exposure and PTSD symptoms on compassion fatigue among pediatric nurses. Considering these suggestions, interdisciplinary collaborations aiming for the patient-centered care help to have a good relationship with physicians and other health care providers. Interdisciplinary team conferences on a regular basis can be good opportunities for nurses to build better relationships with physician and other healthcare providers through discussing patient care.

Another recommendation is for nurse managers or clinical leaders to monitor levels of nurses' self-compassion in order to support nurses and maintain their psychophysical health. Nurses should be encouraged to learn strategies that enhance self-compassion by participating in educational programs. Nurse managers and clinical leaders should provide nurses opportunities to learn self-compassion at work. Neff (2009) has developed a website explaining self-compassion. Nurses can learn self-compassion

together through the website and share their experiences and feelings at meetings. It is also important to consider the room design of the NICU. Although, it might be a challenge and might not be possible to implement the SFR design in the NICU, it can be feasible for unit leaders to provide a private space where nurses can spend time with the infant and the family. One such strategy is to provide bedside screens on open units.

The current study identified important aspects for effective work schedule and staffing. It might be a protective factor to provide nursing care for the infant in a critical condition on a regular basis as it potentially increases the frequency of contact with the infant/family. In contrast, it might be a risk factor for negative consequences when nurses continually take care for the same patient for a long time, as it potentially increases the intensity of contact with the infant/family.

Interventions at the organizational level. Nursing administrators and hospital executives can periodically evaluate the quality of nursing care, as well as provide educational programs that promote nurses' professional communication skills and self-compassion. Role playing and scenario-based simulation can be effective training strategies to build communication skills. An intensive communication training involving role paying increased NICU physicians and nurses' self-perceived competence to communicate with the family of the infant in serious and life-threatening condition (Boss, Urban, Barnett, & Arnold, 2013). Also, scenario-based simulation training more effectively increased nurses' communication competency than traditional training (Li-Ling, Wen-Hui, & Suh-Ing, 2015). For the development of self-compassion, mindfulness based interventions can be strategies to strength self-compassion (Barnard & Curry, 2011; Neff, 2009). A potential intervention is the Mindfulness-Based Stress Reduction

(MBSR) program develop by Kabat-Zinn (1990). It is a health care program based on mindfulness mediation and yoga that emphasizes physical and psychological health and well-being. The effectiveness of the MBSR program to increase the level of self-compassion was found among RNs (Penque, 2009) and college students (Bergen-Cico, Possemato, & Cheon, 2013). Employee assistant programs can include the aspects of the health care program focusing on self-compassion and mindfulness.

It is also important to consider the design of the NICU, as the SFR design in the NICU can be a protective factor to decrease negative consequences of providing nursing care. Although it might not be feasible to implement the SFR design in the NICU, it is important to create private spaces where nurses can spend time with the infant and the family.

Recommendation

Even though this area of research is early in its development, several implications for practice have been identified from this study. In order to successfully develop and implement interventions, first, nurses should be aware that they are at risk to face negative consequences of providing nursing care in nursing practice. Self-awareness can be the most important key to prevent compassion fatigue. In addition, nurses should realize that they can prevent and decrease negative consequences in daily practice by understanding the factors that lead to negative consequences when providing nursing care.

The Applications of the Conceptual Model

The model of Professional Quality of Life described by Stamm (2010) identified the three environments (the work, the client, and the personal) as factors related to compassion fatigue. The findings of the current study extend Stamm's explanation and

reveal specific factors and causal relationships for developing negative effects in the practice setting. Consistent with Stamm's original proposal of compassion fatigue in people who help others, this study focused on NICU nurses.

In addition, these findings are new descriptions of compassion fatigue, compared to the concept of compassion fatigue identified by Coetzee and Klopper (2010). Whereas Coetzee and Klopper focused on nurses themselves and identified a mechanism of compassion fatigue in nurses and potential risk factors, the current study used a more holistic approach, involving other negative consequences of providing nursing care, characteristics of patients and nurses, and environmental factors. The present study provided a better understanding of compassion fatigue in NICU nurses by seeking potential risk factors that are hidden in the daily practice and the profession. The specific factors identified can help to develop interventions that can reduce the nurses' vulnerability to negative consequences of providing nursing care, risk factors, and protective factors in the NICU.

Limitations

There were several limitations in this study. First of all, the number of variables used in the analysis was limited. Only one independent variable and one moderator were allowed to be used in each moderated mediation analysis, as interactions need to be formed between an independent variable and a moderator variable; and a mediator variable and a moderator variable. Compassion fatigue, secondary traumatic stress, and burnout were considered as elements of negative consequences and were not independently investigated as a unique element because they share some characteristics with each other. Moreover, the tested model was derived from the conceptual model

describing a mechanism of consequences of providing nursing care in nursing practice. The conceptual model consists of multiple concepts, and each concept contains different features of variables; thus, it was impossible to form one latent variable using these different features of variables. A series of the moderated mediation analyses needed to be performed to examine the tested model.

In addition, there were not sufficient numbers of NICUs that were a level IV nursery to examine the impact of level. It is not clear whether the results were influenced by the level of NICU, such as differences in the size of the NICUs, the number of nurses, or the acuity of infants. More studies need to be conducted in other NICUs to obtain more empirical data in order to understand negative consequences of providing nursing care. Finally, as this was an exploratory study, negative consequences of providing nursing care was the focus, and only selected study variables were used in the analysis. There are more variables that might relate to negative consequences of providing nursing care, as the conceptual model (Dissertation Figure 1) indicates. Positive consequences of providing nursing care can be another potential factor that directly impact negative consequences of providing nursing care. Also, there might be effects of the independent variable and the moderator variables not used in the analysis on negative consequences of providing nursing care. Although the concept of self-management was considered as elements of self-compassion in this study, the concept itself might independently influence negative consequences of providing nursing care. Future studies should include these variables in order to understand a bigger picture of negative consequences of providing nursing and other relevant factors.

In the current study, 56.3% of variance in compassion fatigue can be accounted for by secondary traumatic stress. Although, it might be difficult to completely distinguish these two concepts, they can be described by each own unique characteristic. They should be considered as observed variables that are components of negative consequences of providing nursing care as a latent variable because of shared variance of the two concepts. This can lead to a better understanding of compassion fatigue and secondary traumatic stress as mechanisms of providing nursing care. Additionally, the ProQOL (Stamm, 2010) is the only existing scale designed to measure compassion fatigue; however, it is not enough to capture differences between compassion fatigue and secondary traumatic stress, as they are considered as the same concept in the ProQOL. For assessing secondary traumatic stress, it would be important to use a scale which focuses only on the concept of secondary traumatic stress, such as the STSS, in order to distinguish the two concepts.

Future Study

Additional research should be conducted in NICUs in other states in order to obtain sufficient numbers of level IV NICUs. This would allow for comparison between level III and IV and might reveal other risk and protective factors of negative consequences of providing nursing care associated with the acuity of the infants. Also, the concept of self-management can be independently investigated in order to develop intervention for negative consequences of providing nursing care, although it was considered as an aspect of self-compassion in the current study. Positive consequences of providing nursing care need to be identified in order to understand the relationship with negative consequences of providing nursing care.

More studies are needed to develop a deeper understanding of the consequences of providing nursing care. This might include the investigation of other risk or protective factors. Although it might be a challenge to completely distinguish the three concepts of compassion fatigue, secondary traumatic stress, and burnout, it is important to identify the uniqueness of each concept using appropriate measurements focusing on each concept. Finally, studies should be conducted in other areas of nursing, as each specialty has different characteristics of the provision of nursing care.

Synthesis of the Three Manuscripts for Nursing Practice

This dissertation presented three manuscripts describing negative consequences of providing nursing care in nursing practice. The first manuscript identified nursing perspectives on the concept of compassion fatigue. The conceptual issues of the concept of compassion fatigue were discussed including conceptual confusions among similar concepts of secondary traumatic stress and burnout. Compassion fatigues was described as one of negative consequences of providing nursing care along with the similar concepts, secondary traumatic stress and burnout. Each concept was defined with the unique characteristics, and key perspectives were identified. In addition, issues in measuring compassion fatigue among previous studies were identified. Finally, relevant factors that influence the development of compassion fatigue were discussed. These factors were categorized into three types: patient, personal, and work environment.

The second manuscript described the development of a conceptual model of consequences of providing nursing care based on the analysis of an existing model of compassion fatigue. A concept of compassion fatigue in nursing practice was proposed using a conceptual framework of secondary stress and trauma responses. In the proposed

model, compassion fatigue was identified as negative consequences of providing nursing care as with secondary traumatic stress and burnout. The definition of each concept identified in the first manuscript was used to develop the model. The model included multiple concepts and relevant factors of negative consequences of providing nursing care that identified in the first manuscript.

The last manuscript presented two results from the current study investigating whether the conditional indirect effect of self-compassion in the relationship between the strength of the nurse-infant/family relationship and negative consequences of providing nursing care differed depending on levels of the organizational characteristics, nursing foundations for quality of care or collegial nurse-physician relations among NICU nurses. The tested model of the moderated mediation analysis in the study was derived from the conceptual model identified in the second manuscript. The study specifically focused on the nurse-infant/family relationship as an independent variable, self-compassion as a mediator, and two organizational characteristics, nursing foundations for quality of care and nurse-physician relations as a moderator. The study found that the indirect effect of self-compassion in the relationship between the strength of the nurse-infant/family relationship and negative consequences of providing nursing care was dependent on the level of nursing foundations for quality of care and collegial nurse-physician relations.

Throughout three manuscripts, the conceptual model of consequences of providing nursing care was developed using a clear definitions for each model concept. The conceptual model was then specifically applied to NICU nurses, and modified to a feasible model to test using a moderated mediation analysis. The study results supported several elements of the tested model with empirical data and allowed to see a portion of

the mechanism of negative consequences of providing nursing care among NICU nurses. The study provided an important initial step to obtain the nursing knowledge of compassion fatigue as negative consequences of providing nursing care.

Conclusions

Compassion fatigue can be a very costly outcome of providing nursing care. Nurses should be aware of it as a negative consequence of providing nursing care along with other negative consequences such as secondary traumatic stress or burnout, as these are conceptually overlapping. These negative consequences impact professional nurses psychophysiologically and contribute negative outcomes of patients, nurses, and the healthcare system. In addition, they are possible explanations of nurse retention which is a great threat in health care; it influences not only nurses, but also patient safety, quality of care, and nursing as a profession. Nurses inherently have risk factors which develop the vulnerability of compassion fatigue because of the unique characteristics of their profession. Organizational recognition is critical, and organizations need to support nurses and avoid negative consequences of providing nursing care in the nursing practice setting as much as possible. The improvement of the work environment is key to preventing and managing compassion fatigue and other negative consequences of providing nursing care.

All nurses are at risk for developing compassion fatigue while working as a professional health caregiver. Compassion fatigue and other negative consequences of providing nursing care negatively impact the development of nursing as a profession and professional growth of nurses. Therefore, it is important to decrease negative

consequences of providing nursing care and increase positive consequences that can promote quality of nursing care and fulfilling the needs of health care.

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Appendix A: Demographics Questionnaire

Please provide your basic information.
What is your age (optional)? _____
If you prefer to not state your actual age:
    Which category best describes your age:

- o <= 20 years
- o 20-25
- o 26-30
- o 31-35
- o 36-40
- o 41-45
- o 46-50
- o 51-55
- o 56-60
- o 61-65
- o 65-70
- o <=70 years

Gender
- ○ Male
- ○ Female

Years of nursing experiences, as a Registered Nurse (RN)
Years of experience in LEVEL III (3) or IV (4) NICU as a RN
The highest education level in nursing
- ○ Bachelor degree
- ○ Master degree
- ○ PhD degree
- ○ DNP degree
- ○ Associate degree
- ○ Diploma degree

Year of graduation with your highest degree

Appendix B: Clinical Experiences Questionnaire

Please describe your NICU work schedule over the past 6 months.
Do you work part-time or full-time?
❍ Part-time
❍ Full-time

Type of shift you have worked in the past 6 months
❍ Day only
❍ Evening only
❍ Night only
❍ Day & evening
❍ Day & night
❍ Night & evening
❍ All three (Day, evening, & night)
❍ Other

If other, please specify.
Average number of days worked in a row, over the past 6 months
❍ 1 day
❍ 2 days
❍ 3 days
❍ 4 days
❍ 5 days
❍ 6 days
❍ 7 days or more days

Average number of hours worked per WEEK, over the past 6 months (hours/week)
_____
Average number of hours worked per DAYS over the past 6 months
❍ 1 hour/per
❍ 2 hours
❍ 3 hours
❍ 4 hours
❍ 5 hours
❍ 6 hours
❍ 7 hours
❍ 8 hours
❍ 9 hours
❍ 10 hours
❍ 11 hours
❍ 12 hours
❍ 13 hours
❍ 14 hours
❍ 15 hours
❍ 16 hours
❍ 17 hours

○ 18 hours
○ 19 hours
○ 20 hours
○ 21 hours
○ 22 hours
○ 23 hours
○ 24 hours

Average percentage of time you spent in direct care (in %) per day over the past 6 months. Direct care means providing bedside care to infants and their families.

_____ An average % of time you spent in direct care, per day

Average number of weekends worked per month over the past 6 months
○ None
○ 1 weekend
○ 2 weekends
○ 3 weekends
○ 4 weekends (every week)

Number of breaks lasting 10 minutes or more, including meals, during a typical workday over the past 6 months
○ 1 time
○ 2 times
○ 3 times
○ 4 times
○ ≥ 5 times

How often did you work 13 hours or more at a stretch in the past 6 months?
○ Never or N/A
○ Few times
○ Once a month
○ Every other week
○ Once a week
○ More than once a week

How often did you work with less than 10 hours off between shifts in the past 6 months?
○ Never or N/A
○ Few times
○ Once a month
○ Every other week
○ Once a week
○ More than once a week

How often did you work on a scheduled day off/vacation day in the past 6 months?
○ Never or N/A
○ Few times

○ Once a month
○ Every other week
○ Once a week
○ More than once a week

How often did you work while sick in the past 6 months?
○ Never or N/A
○ Few times
○ Once a month
○ Every other week
○ Once a week
○ More than once a week

Did you work mandatory overtime in the past 6 months?
○ Never or N/A
○ Yes, with more than a 8-hour notice
○ Yes, with 2-to 8-hour notice
○ Yes, with less than a 2-hour notice

Were you on call in the past 6 months? If so, how often were you called into work?
○ Never or N/A
○ Yes, but never called in
○ Yes, few times
○ Yes, approximately once a month
○ Yes, approximately once a week
○ Yes, more than once a week

Have there been major changes to your work schedule in the past 6 month?
○ Yes
○ No

If yes, please describe changes

Please answer the following questions about your work in your current NICU.

Is the healthcare agency at which you currently work a magnet hospital?
○ Yes
○ No

The healthcare agency at which you work is located in:
○ Urban area
○ Suburban area
○ Rural area

In 2012, the American Academy Pediatrics (AAP) redefined the descriptions of neonatal levels of care. Please read the descriptions below and answer the question.

1. LEVEL III (3) (NICU) : All LEVEL III(3) NICU have LEVEL II (2) special care nursery, capabilities plus:

- Provide sustained life support
- Provide comprehensive care for infants born <32 weeks gestation and weighing > 1500g and infants born at all gestational ages and birth weights with critical illness
- Provide prompt and readily available access to a full range of pediatric medical subspecialists, pediatric surgical specialists, pediatric anesthesiologists, and pediatric ophthalmologists.
- Provide a full range of respiratory support that may include conventional and/or high-frequency ventilation and inhaled nitric oxide.
- Perform advanced imaging, with interpretation on an urgent basis, including computed tomography, MRI, and echocardiography

2. LEVEL IV (4) (regional NICU): All LEVEL IV (4) NICUs have LEVEL III (3) capabilities plus:

- Located within an institution with the capability to promote surgical repair of complex congenital or acquired conditions
- Maintain a full range of pediatric medical subspecialists, pediatric surgical subspecialists and pediatric anesthesiologists at the site
- Facilitate transport and provide outreach education

What is the current level of your NICU (III or IV) based on the classification defined by the AAP in 2012?

○ Level III (3)
○ Level IV (4)

The number of beds in your NICU
- ❍ Less than 10 beds
- ❍ 10-15 beds
- ❍ 16-20 beds
- ❍ 21-25 beds
- ❍ 26-30 beds
- ❍ 31-40 beds
- ❍ 41-45 beds
- ❍ 46-50 beds
- ❍ 51-55 beds
- ❍ 56-60 beds
- ❍ 61-65 beds
- ❍ 66-70 beds
- ❍ 71 or more beds

Has the single family room design been implemented in your NICU?
- ❍ Yes
- ❍ No
- ❍ Unsure

If yes, what year was the single family room design implemented in your NICU?

In your unit, is there the Advanced Practice Nurse (APN)?
- ❍ Yes
- ❍ No

If yes, how many APNs are there in your NICU?
- ❍ 1
- ❍ 2
- ❍ 3
- ❍ 4
- ❍ 5
- ❍ 6
- ❍ 7
- ❍ 8
- ❍ 9
- ❍ 10
- ❍ more than 10

Select the type of APNs in the NICU. If you have more than one APN, select all appropriate types of the APNs. Please see the definition below:
Clinical Nurse Specialists (CNSs) support the patient/family, nurses, and the organization with their expertise and advanced knowledge in nursing and in their clinical specialty.
Nurse Practitioners (NPs) focus on acute care, perform assessment and diagnosis, develop and manage treatment plans, and provide patient/family education.

❑ Neonatal Clinical Nurse Specialist
❑ Neonatal Nurse Practitioner
❑ Pediatric Clinical Nurse Specialist
❑ Pediatric Nurse Practitioner
❑ Other

If other, please specify.

If you have multiple APNs, please indicate the one who most closely works with you on a regular basis.

❍ Neonatal Clinical Nurse Specialist
❍ Neonatal Nurse Practitioner
❍ Pediatric Clinical Nurse Specialist
❍ Pediatric Nurse Practitioner
❍ Other

If other, please specify.
How much do you perceive the APN as a resource to you as a bedside nurse? If you have multiple APNs, please answer about the APN who most closely works with you.

❍ 1 (Not at all resourceful)
❍ 2 (Little resourceful)
❍ 3 (Somewhat resourceful)
❍ 4 (Much resourceful)
❍ 5 (Very resourceful)

Please answer the following questions about the most complex case that you were responsible for over the last week you worked.
Birth weight of the infant in grams
Gestational age of the infant at birth
Age of the infant at the time you provided care

How different were this infant's acuity and severity of illness from the patients for whom you normally provide care?
- ❍ 1 (Not at all different)
- ❍ 2 (Slightly different)
- ❍ 3 (Somewhat different)
- ❍ 4 (Moderately different)
- ❍ 5 (Extremely different)

How regularly did you provide care for this infant (the most complex case in the last week you worked)?
- ❍ On a regular basis and I was a primary nurse for the infant.
- ❍ On a regular basis to cover the primary nurse.
- ❍ Not on a regular basis, and I was assigned the infant only on the day
- ❍ Not on a regular basis, and I was assigned the infant more than one time
- ❍ Not on a regular basis, but I was occasionally assigned the infant.
- ❍ Other

If other, please specify.
How many days did you care for this infant in the last week you worked?
- ❍ 1 day
- ❍ 2 days
- ❍ 3 days
- ❍ 4 days
- ❍ 5 days
- ❍ 6 days
- ❍ 7 days

How strong was the relationship you developed with this infant and the family (The most complex case in the last week you worked)?
- ❍ 1 (Not at all strong)
- ❍ 2 (Slightly strong)
- ❍ 3 (Somewhat strong)
- ❍ 4 (Moderately strong)
- ❍ 5 (Extremely strong)

How much was the mother of this infant the available to participate in care to support her infant (The most complex case in the last week you worked)?
- ❍ 0 = not observed
- ❍ 1 (Never)
- ❍ 2
- ❍ 3 (Somewhat)
- ❍ 4 (Much)
- ❍ 5 (A great deal)

How much was the father of this infant available to participate in care to support his infant (The most complex case in the last week you worked)?
- ❍ 0 = Not observed

❍ 1 (never)
❍ 2
❍ 3 (somewhat)
❍ 4 (much)
❍ 5 (a great deal)

How much were the other family members of this infant available to participate in care to support the infant (The most complex case in the last week you worked)?
❍ 0 = Not observed
❍ 1 (Never)
❍ 2
❍ 3 (Somewhat)
❍ 4 (Much)
❍ 5 (A great deal)

Please answer the following questions about infant deaths you experienced in your current NICU.
Have you experienced any infant deaths in your NICU during the past 6 months?
❍ Yes
❍ No

When was the most recent infant death in the past 6 month?
❍ Within 7 days
❍ 1 week ago
❍ 2-3 weeks ago
❍ 1 month ago
❍ 2 months ago
❍ 3 months ago
❍ 4 month ago
❍ 5 month ago
❍ 6 month ago

Have you experienced any death of infants whom you provided care during the past 6 months?
❍ Yes
❍ No

If yes, how many deaths of infants whom you provided care in the past 6 month?

Please check all apply that describe these deaths.
❍ The infant death was expected due to the critical situation of the infant
❍ The infant death was not expected: the infant had progressed
❍ Other

If other, please specify.
Did any of these infant deaths positively or negatively impact your work in your NICU and your life in the past 6 month?

○ Yes
○ No

If yes, when did the infant death happen that positively or negatively impact on you MOST in the past 6 month?
○ Within 7 days
○ 1 week ago
○ 2-3 weeks ago
○ 1 month ago
○ 2 months ago
○ 3 months ago
○ 4 month ago
○ 5 month ago
○ 6 month ago

Why and how did this death impact on you most?
Positive impacts:

Negatively impacts:
How strong was the relationship you developed with this infant and the family (The infant death which impacted on you most)?
○ 1 (Not at all strong)
○ 2 (Slightly strong)
○ 3 (Somewhat strong)
○ 4 (Moderately strong)
○ 5 (Extremely strong)

How much was the mother of this infant available to participate in care to support her infant (The infant death which impacted on you most)?
○ 0 = not observed
○ 1 (Never)
○ 2 (Little)

○ 3 (Somewhat)
○ 4 (Much)
○ 5 (A great deal)

How much was the father of this infant available to participate in care to support his infant (The infant death which impacted on you most)?
○ 0 = not observed
○ 1 (Never)
○ 2 (Little)

○ 3 (Somewhat)
○ 4 (Much)
○ 5 (A great deal)

How much were the other family members of this infant available to participate in care to support the infant (The infant death which impacted on you most)?
○ 0 = not observed
○ 1 (Never)
○ 2 (Little)
○ 3 (Somewhat)
○ 4 (Much)
○ 5 (A great deal)

Appendix C:
Mplus Code Used in the Moderated Mediation Analysis

```
TITLE: MODERATED MEDIATION
 DATA:
 FILE IS C:\Users\Owner\Documents\Mplus\wrw13carenurs.csv;
 FORMAT is FREE;

 VARIABLE:
 names are x y1 y2 y3 m w xw mw ;
 usevariables are x y1 y2 y3 m w xw mw;
 ANALYSIS:
 bootstrap = 5000;

MODEL:
 Y by y2 y1 y3;
 Y on m (b1)
 x
 w
 mw(b2)
 xw;
 m on x (a1)
 w
 xw(a3);
 mw with m;
 y2 with y1 y3;
 y1 with y3;
 MODEL CONSTRAINT:
 new (ind wmodval);
 wmodval =0.56040318016;
 ind=(a1+a3*wmodval)*(b1+b2*wmodval);
 output:
 cinterval (bcbootstrap) standardized;
```

Note: x = independent variable, Y = latent dependent variable, y1 = observed dependent variavle1 (compassion fatigue), y2 = observed dependent variable2 (secondary traumatic stress), y3 = observed dependent varieble3 (burnout), m = mediator, w = moderator, xw = interaction between independent variable and moderator, mw = interaction between mediator and moderator.

CURRICULUM VITAE

Riko Sano

Place of birth: Fujinomiya, Japan

Education
       B.S., Tokai University, School of Health Sciences, Department of Nursing, Japan,
       March 1999
       Major: Nursing

Awards and Honors
- 1st Place, Poster Presentation Award at the 16th Annual Building Bridges to Research-Based Nursing Practice Conference (May 2014), Milwaukee, WI.
- UW-Milwaukee Graduate Student Travel Award (May 2014), UW-Milwaukee, Graduate School
- Scholarship to Memory of Simon Ontscherenki (August 2013), UW-Milwaukee, College of Nursing
- Milton and Joan Morris Fellowship (June 2012), UW-Milwaukee, College of Nursing
- UW-Milwaukee Graduate Student Travel Award (May 2012), UW-Milwaukee, Graduate School
- Graduate Student Scholarship (May 2012), Sigma Theta Tau International Honor Society of Nursing, Eta Nu Chapter
- UW-Milwaukee Graduate Student Travel Award (May 2011), UW-Milwaukee, Graduate School
- Graduate Student Scholarship (May 2011), Sigma Theta Tau International Honor Society of Nursing, Eta Nu Chapter
- Annual Lamplight scholarships (May 2010), UW-Milwaukee, College of Nursing
- Graduate Student Scholarship (May 2010), Sigma Theta Tau International Honor Society of Nursing, Eta Nu Chapter
- Bohsei Scholarship Award (1995), Tokai University

Publication
Sano, R. & Mori, S. (2001). 超低出生体重児に対する炭酸ガス温水浴の有効性の検討 右下肢脱落の可能性を告知された児への実施を通して.[The effectiveness of the carbonic acid footbath on an extremely immature infant]. *日本看護学会論文集 小児看護 [Japanese Nursing Association, Pediatric Nursing],* 144-146.

Presentations
Sano, R., and Schiffman, R. (May 2014). *Compassion fatigue in Neonatal Intensive Care Unit nurse.* Poster session presented at the 16th Annual Building Bridges to Research-Based Nursing Practice Conference (May 9, 2014), Milwaukee, WI.

Moerchen, V. A., Sawin, K, J., & Sano, R. (November 2013). *Infusing interdisciplinary engagement in pre-professional undergraduate research: Outcomes from a Maternal and Child Health Pipeline Training Program.* Poster presentation presented at Association of   University Centers on Disabilities 2013 Conference (November 17-20, 2013), Washington, DC.

Sano, R., Sawin, K. J., & Brei, T. J. (March 2012). *How family variable influence developmental competencies in adolescents and young adults with Spina Bifida.* Poster session presented at the 2nd World Congress on Spina Bifia Research and Care, Las Vegas, NV.

Rauen, K., Sano, R., & Sawin, K. J. (March 2012). *Parent satisfaction with bowel/bladder programs to achieve continence in their child with Spina Bifida.* Poster session presented at the 2nd World Congress on Spina Bifia Research and Care, Las Vegas, NV.

Sano, R., Sawin, K. J., & Brei, T. J. (June 2011). *The relationship of family variables to developmental competences in adolescents and young adults with Spina Bifida.* Poster session presented at the 10th International Family Nursing Conference, Kyoto, Japan.

Sano, R., Sawin, K. J., & Brei, T. J. (May 2011). *Are family variables related to overall self-worth in adolescents and young adults with a neurological condition?* Poster session presented at the 13th Annual Building Bridges to Research Based Nursing Practice Conference, Milwaukee, WI.

Rauen, K., Sawin, K. J., Thometz. J., Bartelt, T., Sano, R., & Miranda, H. (March 2010). *Screening for mental health status related to school, peers and self-concept in physically- challenged youth with Spina Bifida.* Poster session presented at the 3rd Annual Interdisciplinary Pediatric Behavioral Health Research Conference, Milwaukee, WI.

Sano, R. & Mori, S. (November 2001). *超低出生体重児に対する炭酸ガス温水浴の有効性の検討下肢脱落の可能性を告知された児への実施を通して.[The effectiveness of the carbonic acid footbath on an extremely immature infant].* Poster session presented at 第32回日本看護学会小児看護学術集会 [the 32nd Japanese Society of Pediatric Nursing Conference], Kagoshima, Japan.

Teaching Experience

    Teaching Assistant**:** UW-Milwaukee, College of Nursing (September 2012 to present)

    Hybrid course: Interdisciplinary Research in Maternal Child Health

- To enhance the undergraduate student's participation in a research project and their practical experience in research.
- To develop an online course site

Research Experiences

    Project Assistant; UW-Milwaukee, College of Nursing

- Dr. Kathleen Sawin' Project (March 2009 to present): "The Feasibility of a longitudinal Spina Bifida Registry in Wisconsin" funded by the Center for Disease Control and Prevention. My responsibilities include subject

recruitment, data entry, data management, data analysis, and developing an online-survey.
- Dr. Julie Darmody's project (September, 2011 to September 2013): "An Exploratory Study of the Work of Clinical Nurse Specialists in the Acute Care Setting: Structure, process, outcomes, and cost". My responsibilities included literature review and developing an online-survey.