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Psychological Stress in Critical Care Nurses

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Abstract

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Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

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Abstract

Increased levels of stress in the workplace have led the American Psychological Association to predict a looming public health crisis. Critical care nurses (CCNs) are highly exposed to stressors in the workplace, more than other nurses. Tens of billion dollars were reported lost in productive work time yearly due to ill health from depression alone. An important gap remains in understanding the relationships of stressors with the amount of stress. Supported by the biopsychosocial stress theory, the purpose of this study was to determine the relationship between frequencies of perceived stressors (IVs) as a source of perceived levels of stress (DV) or allostasis. The mixed-methods study included an online questionnaire and an e-mail interview of 400 hospital-based CCNs from professional nurses' associations in the United States. The Nursing Stress Scale was used to determine the kinds and frequencies of IVs, while the Psychological Stress Measure was used to assess the DV. Multiple regression analysis assessed the strength and direction of the relationships between IVs and DV. Interviews fell short of the minimum sample size for saturation and were not analyzed. Quantitative findings indicated workload as the most frequently perceived stressor, correlating positively with allostasis ($p = .0005$). Death and dying, conflict with other nurses, and lack of support for CCNs were also statistically significant ($p < .05$). Implications to practice and social change include promoting changes in policy with management support to reduce workload, death and dying, conflict with other nurses, and lack of social support for CCNs. Personal behavior changes like relaxation and physical exercises as coping methods may also reduce levels stress.

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Dedication

This dissertation is dedicated to all of the critical care nurses who voluntarily participated in this study, convinced that the end is in sight for those unnecessary workplace stressors that challenge the true nursing care of critically ill patients, families, and significant others in the hospital environment. Special dedication is reserved for Olutooke Bolade Monica, my spouse - the critical care nurse story of my life and a first-hand example of the impact of critical care workplace stressors on the levels of stress. This study may be that first step in the beginning of the end of that wait for action aimed to stem the tide of stress in the critical care nurse.

Acknowledgments

My sincere thanks go to Dr. Amy Sickel, Dr. Debra Wilson, and Dr. Tony Wu for their unrelenting supervision and support to see this dissertation come to fruition. Dr. Sickel was exemplary. The encouragement provided by my dissertation classmates was noteworthy. My family and friends stood by me through thick and thin and endured the wait for an answer to the familiar question "When are you finishing?" Moreover, I thank the gatekeepers at the American Critical-Care Nurses Association and the Tennessee Nurses Association for their part in providing access to the huge number of member participants. I appreciate the support of everyone, one and all. "Sine me nihil."

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Chapter 1: Introduction to the Study

Psychological stress in the workplace is a global phenomenon that could have an impact on the worker's work, home, and social life. The American Psychological Association (APA, 2007) observed work as the most significant cause of stress in U.S. society. Stewart, Ricci, Chee, Hahn, and Morganstein (2003) viewed depression as a consequence of stress and estimated the cost of lost productive work time from depression alone at 44 billion dollars yearly. The APA (2007) reported an increase in stress from 59% of the population in 2006 to 74% in 2007. Recently, the APA (2012) predicted a stress-induced public health crisis.

Professionals in the health care industry have been among the most highly stress-prone employees in the workplace, particularly nurses (McVicar, 2003). The reason might be due to expanded roles, inadequate knowledge and skills, new settings for health care facilities, and changing laws and regulations, among others (Bailey, 1980). Hay and Oken (1972) asserted that the different aspects of stress in the workplace might affect nurses more than other health care workers.

The purpose of this study was to examine gaps in the existing stress research on the experiences of critical care nurses (CCNs) in their hospital-based work environment. I used a mixed-methods approach by collecting both quantitative and qualitative data. On the quantitative side, I compared types of nurses' perceived stressors with the amount of perceived psychological stress, and explored the predictive relationship between stressors and psychological stress. On the qualitative side, I conducted interviews to identify the most stressful conditions in critical care, to explore in depth the phenomenon of the

relationship between stressors and stress, and to identify the coping mechanisms used by CCNs. Results from this study addressed a gap in knowledge within the stress research, and provided empirical evidence and recommendations for positive social change nurses' behaviors to cope with workplace stress. Implications include change in corporate policy to reduce or eliminate stress in CCNs, which could lead to a positive change in corporate image and employees' job retention and security.

In Chapter 1, I present a background of the literature related to the scope of the research topic, review the gap in knowledge on CCNs' stress, and provide a rationale for the study. I describe relevant theories and concepts in detail in Chapter 2 and review the literature on workplace stress. Chapter 3 addresses the instruments chosen for the quantitative and the qualitative methods, as well as the methods of data analysis. Chapter 4 presents the results of the data analysis, while Chapter 5 includes a discussion of the results and concludes with suggestions for reducing or eliminating stress to nurses in the critical care environment.

Background

The literature review of workplace stress in CCNs indicated that Lazarus's (1966) stress theory of individual perception of an external source of stress may be used to examine an individual's physical, psychological, and coping responses (Lazarus & Folkman, 1984; Sterling & Eyer, 1988). Previous studies on nurses' stress focused mainly on quantitative measurement of the external factors that may affect health. For example, Gray-Toft and Anderson (1981) proposed the Nursing Stress Scale (NSS) to measure the frequency of stressors. Some researchers interpreted the instrument as a

measure for stress (AbuAlRub & Al-Zaru, 2008; Brunero, Cowan, & Fairbrother, 2008; McGrath, Reid, & Boore, 2003). Mrayyan (2009) applied a modified NSS to measure the kinds of stressors among intensive care nurses and wards in Jordan. To address a gap in misinterpreting the NSS, I applied an online questionnaire in the original NSS to measure the kinds of stressors perceived by individual nurses in the critical care workplace. I also measured the amount of stress experienced by CCNs by using another instrument developed by Lemyre and Tissier (2003) for measuring psychological stress: the Psychological Stress Measure (PSM-9).

In the qualitative component of the study, I explored the lived experiences of CCNs during e-mail interviews. Participants' expressed the impact of stressors on ther levels of stress and the coping methods used to minimize the effect of stress developed in the workplace. The outcomes from the study provided suggestions for a positive social change that might reduce stress in CCNs.

Problem Statement

Previous studies addressed stress in CCNs using either quantitative surveys (Bailey, Steffen, & Grout, 1980; Mrayyan, 2009; Stone, Jebsen, Walk, & Belsham, 1984) or qualitative interviews (Moola, Ehlers, & Hattingh, 2008). In one of the quantitative studies on CCNs, Mrayyan (2009) examined the differences in stressors between intensive care nurses and other hospital nurses, social support behaviors, and the predictors of the stressors and support behaviors. Mrayyan found that stressors were higher in intensive care nurses than in other hospital nurses, and suggested more support for intensive care nurses.

In a qualitative study of the perceptions of stress in CCNs in the workplace, Moola et al. (2008) explored stressful events in critical care nursing. Using a focus group and individual interviews, Moola et al. showed that CCNs experienced stress as a result of the shortage of skilled CCNs, nurses not showing up for work, doctors' orders, lack of understanding by supervisors, lack of cooperation by coworkers, and agency nurses working as temporary nurses in critical care. Moola et al. suggested monitoring adopted plans for coping with stress, using counseling services for CCNs, introducing stress awareness education and resiliency skills in the workplace, and establishing communication between managers and nurses to support staff with equipment shortages.

Despite these studies and efforts to create awareness and eliminate or reduce the amount of stress in CCNs, stress in the workplace continues to increase (APA, 2007). Stress may be on the verge of reaching a public health crisis (APA, 2012). The high attrition rate of CCNs (Bailey, 1980) continues unabated, and stress reflected in negative behaviors in critical care nurses is noticeable. A gap in the stress research is the measure of the perceived amount of stress in CCNs (Moola et al., 2008) and the relationship between perceived stressors and amount of perceived stress. The PSM-9 (Lemyre & Tessier, 2003) is one of the few instruments available for measuring the amounts of perceived psychological stress in the individual. Lemyre and Tessier (2003) recommended the PSM-9 for research in health and well-being in the workplace. In this study, I measured the perceived types of stressors with the NSS and the perceived amounts of psychological stress with the PSM-9 to examine the relationship between stressors and stress.

Purpose of the Study

I examined a gap in the existing stress research on the experiences of CCNs at their hospital-based work environment. First, the study involved measuring the types of perceived stressors and perceived amount of stress in CCNs. Second, I analyzed the relationship between the types of stressors and the amounts of nurses' psychological stress. Third, I explored the stress coping methods used by CCNs. Results could be used to reduce or eliminate stress in CCNs.

In this mixed-methods study, I collected both quantitative and qualitative data for the assessment of the types of perceived stressors and their relationship to the amount of stress in a population of CCNs. In the quantitative approach, the independent variables (IVs) or predictors were the stressors and the dependent variable (DV) or criterion variable was the amount of psychological stress. Quantitative data collection involved the NSS for measuring the perceived stressors and the PSM-9 for assessing the amount of psychological stress.

The phenomenological qualitative approach involved interviews to explore in depth the lived experiences of CCNs, the impact of the amount of stress in critical care, and the coping strategies adopted by the CCNs. I drew conclusion from the results and made suggestions for positive social change in the critical care environment. The recommendations may empower individual employees to cope better with stress and may encourage corporate review of policies that would facilitate stress reduction in critical care.

Research Questions and Hypotheses

Quantitative Research Questions

RQ1: What are the kinds of perceived stressors (IVs) encountered by CCNs? The perceived stressors were measured with the NSS.

RQ2: What is the amount of psychological stress (DV) perceived by nurses in critical care? The PSM-9 was used to determine the amount of psychological stress.

RQ3: What is the strength and direction of the relationship between perceived stressors (IVs) and the amount of perceived stress (DV) in CCNs? The strength and direction of the relationship between the perceived stressors and the perceived stress was determined, using the regression function of the IBM SPSS Statistics 21 (Laureate Education Inc., 2013) for statistical analysis.

Quantitative Hypotheses

Ho1: Nurses in critical care do not perceive any type of stressors as measured by the NSS.

Ha1: Nurses in critical care perceive types of stressors as measured by the NSS.

Ho2: Nurses in critical care do not perceive any amount of stress as measured by the PSM-9.

Ha2: Nurses in critical care perceive amounts of stress as measured by the PSM-9.

Ho3: There is no relationship between the types of stressors (IVs) perceived by CCNs as measured by the NSS and the amount of psychological stress (DV) perceived by CCNs as measured by PSM-9.

Ha3: There is a relationship between the types of stressors (IVs) perceived by CCNs as measured by the NSS and the amount of psychological stress (DV) perceived by CCNs as measured by PSM-9.

Qualitative Research Questions

RQ4: How do you, as a critical care nurse, see yourself as experiencing stress differently from other nurses in this hospital?

RQ5: How is your health affected differently by stress when compared to other nurses who do not work in critical care?

RQ6: How do you cope with stress and what would you teach a new nurse about the stress level in critical care?

Theoretical and Conceptual Framework for the Study

Theoretical Foundation

The central concept underlying the study was that psychological stress involves engagement of perceived threat and results in unease and/or physical and psychological ill health for CCNs in the workplace. The theoretical framework of this concept was based on a combination of a biological, psychological, and social model of stress: the biopsychosocial model (Lemyre & Tessier, 2003). This model includes external workplace stressors (Selye, 1973) and the phenomenon of internal homeostasis (Chrousos & Gold, 1992) within individual nurses' processes of appraisal (Lazarus & Folkman, 1984) and ability to cope with stressors. Lemyre, Tessier, and Fillion (1990) developed a measure of psychological stress, based on a biopsychosocial model of stress outside the scope of psychopathology. The model (Lemyre & Lalande-Markon, 2009) assumed that

the state of psychological stress is reliant on an individual's perception of the environment as stressors and the ability to cope with the resulting stress.

Selye (1973) proposed the general adaptation syndrome (GAS) as the physiological reaction to a stressor that has an impact on an individual to produce stress. Previously, Selye (1936) described three steps of the GAS, consisting of alarm reaction/activation, resistance/adaptation, and exhaustion. Selye (1973) posited that stress may be expressed either as a physical or as a psychological interpretation of the impact. Lazarus and Folkman (1984) expanded the psychological component of Selye's stress theory as a cognitive theory that the individual appraises and perceives the stressors as demands and has varying degrees of capability to cope with the demands. Chrousos and Gold (1992) interpreted Selye's stress as a phenomenon of physical and psychological stress responses to maintain homeostasis in the individual. A biopsychosocial perspective of stress (Lemyre & Lalande-Markon, 2009; Lemyre & Tissier, 2003; Lemyre et al., 1990) combined the physical and the psychological components of stress as well as recognizing a social component to the phenomenon. Lemyre and Lalande-Markon (2009) posited that a biopsychosocial model suggests a holistic approach to making an assessment in a person's environment by integrating social, psychological, and biological factors to improve diagnosis and intervention.

In the case of CCNs, the stress theories relate to how defining the kinds of stressors in the critical care environment may show a relationship to the amount of stress perceived by CCNs in the context of the coping methods adopted. Brunero et al. (2008)

related stress to perception of the stressor and the ability of nurses to cope with its management. Chapter 2 presents the evolution and details of the theories.

Conceptual Framework

The biopsychosocial model of stress was used to ground this study as it relates to the impact of stressors on the physical, psychological, and social experiences perceived by CCNs in the workplace. The relationship between the kinds of perceived stressors and the amount of stress experienced in critical care nursing creates a phenomenon that leads to the development of a coping strategy by nurses in critical care. The connections among the stressors, stress, and coping mechanisms were assessed by using a mixed-methods approach of collecting quantitative and qualitative data simultaneously.

Using a quantitative survey of CCNs, I measured the kinds of perceived stressors and the amount of stress experienced by individual critical care nurses in the workplace. I used a linear regression analysis of the measurements provided to examine the relationship between the kinds of stressors and the amounts of stress. Simultaneously in the qualitative interviews, I explored how CCNs manage stress in the critical care environment. Using the mixed-methods approach, I integrated the stressor effect on the stress perception of CCNs from the quantitative study with the coping methods and stress responses from the qualitative study. The NSS was the instrument for perceived stressors, the PSM-9 was used for measuring perceived psychological stress, multiple regression analyses were used for examining the relationship between the stressors and stress in the phenomenon, and interviews were conducted to explore the coping methods used by CCNs on perceived stress.

Nature of the Study

I used a mixed-methods approach to examine the relationship between the kinds of perceived stressors and the amount of stress perceived by nurses in critical care and to explore nurses' coping methods for reducing or eliminating levels of stress in critical care. The participants were all registered nurses (RNs) from two nurses' associations in the United States (American Association of Critical-Care Nurses [AACN] and Tennessee Nurses Association [TNA]). In the quantitative study, the variables were the perceived stressors by CCNs as the predictors or independent variables (IVs), while the amounts of perceived stress by CCNs represented the criterion or dependent variable (DV). The NSS was used to measure the kinds of perceived stressors, and the PSM-9 was used to measure the amount of perceived psychological stress in the CCNs. The SSPS software for the multiple regression analyses was used to determine the relationship between the IVs and the DV.

In the qualitative study, I used e-mail interviews to explore the lived experience of the nurses, including the most significant types of perceived stressors, the perceived stress, and the coping methods adopted by the nurses at work. Individual responses from the interviews were collated for analysis. However, the responses did not reach saturation for manual analysis that would have led to the emergence of themes and patterns in the phenomenon of stress response and coping in CCNs.

Definitions

The key concepts in this study included the following:

Allostasis: In the context of exposure of an individual to a stressor (physical or psychological), McEwen and Gianaros (2010) defined allostasis as a dynamic process that ensures maintenance of homeostatic control through an active process of adaptation. It is an internal process of stress response within the individual for maintaining internal homeostasis to cope with the existence of a stressor (Chrousos & Gold, 1992). This study was concerned with the measurement of the kinds of perceived stressors that trigger the process of allostasis, including perceived psychological stress responses and the coping methods to manage the responses.

Allostatic load: McEwen and Gianaros (2010) defined allostatic load from the dimension of regular body maintenance and repair from sustained stress and lifestyle changes manifesting as disease. In the context of this study, allostatic load represente an overwhelming stress response in a persistent and prolonged exposure to stressors, which might be interpreted as burnout (Maslach, Schanfeli, & Leiter, 2001).

Burnout: Burnout represents an overwhelmed stress response to persistent and prolonged exposure to significant stressors at work. Maslach et al. (2001) explained that burnout manifests as the burnout syndrome consisting of overwhelming exhaustion, cynicism, and detachment from the job or depersonalization. Burnout is a progression from the last stage of exhaustion in the stress response of Selye (1936) that manifests itself partly as allostatic load. In keeping within the scope of this study, the amount of stress was measured up to the stage of exhaustion in perceived stress (allostasis) of critical care nurses. However, measurement of burnout in CCNs was excluded, unless

reported during the interview, to minimize the time spent on additional survey questionnaires.

Coping: In the context of workplace stress, coping refers to the efforts and strategies that individuals use to contain the perceived stressor demands that may be appraised as threatening. Folkman and Lazarus (1985), in their research on individuals taking an examination, suggested the key phases in coping are the anticipatory stage, the confrontational stage, the waiting stage, and the outcome stage. The anticipatory phase is characterized by uncertainty or ambiguity of awareness and regulation of feelings and emotions linked to the stressor. The confrontational stage engages the stressor in a task or reassurance. The waiting stage comes after completing the task and releasing tension. At this stage, the individual may realize that the period of working toward success is nonexistent. The outcome stage dispels all uncertainties (positive or negative) and the focus turns to the significance of the outcome (benefit or harm).

Homeostasis: McEwen and Wingfield (2003) considered homeostasis to be an ambiguous concept within the stress process definition. Homeostasis is the process of maintaining the physiological parameters essential for life, including blood glucose, oxygen tension, and core temperature (Goldstein & Kopin, 2007). McEwen (2009) posited that these parameters may change in set points and limits due to environmental conditions. In this study, homeostasis was referred to as the normal or steady state of body equilibrium, including psychological and social, as well as physiological (Goldstein & Kopin, 2007), of the individual nurse to perform her or his duties in the workplace without hindrance.

Stress: Modern definitions of stress state it to be the resultant physical and psychological experience of a threat or a stressor to homeostasis. Stress has a specific response that depends on the particular challenge, the individual's perceptions of the stressor, and the ability to cope with the challenge (Goldstein & McEwen, 2002). McEven and Wingfield (2003) defined stress as a dangerous challenge to the body's state of equilibrium. In the ordinary use of the word, McEwen and Wingfield referred to stress as an incident or repeated incidents leading to either a distressing response or to a stimulating challenge. In the literature, stress was inconsistently used, referring either to the event or to the negative response to the event. Moreover, stress is useful for describing the state of disequilibrium during a stress response. Selye (1936) described the generic three steps of the stress response, consisting of alarm reaction/activation, resistance/adaptation, and exhaustion.

Lazarus and Folkman (1984) defined stress (psychological) as an individual's perception of demands relative to a person's capability to meet these demands. Lemyre and Lalande-Markon (2009) defined psychological stress as a burden or unease that arises from the constant exposure of the individual. In this study, stress was referred to as the state of imbalance or tension in an individual's homeostasis (physical/biological, psychological, or social), in response to a stressor (physiological, psychological, or social; internal or external).

Stressor: The stressor is the event or incident that causes stress in the individual. This definition always refers to the factor initiating the responses in the individual to maintain homeostasis (Chrousos & Gold, 1992). Lazarus (1966) defined a stressor as an

external event or condition that impinges on specific characteristics of the individual. In this study, stressors referred to the events or experiences that CCNs perceived as stressful at the workplace during the course of a shift.

Workplace stress: Workplace stress is synonymous with work stress, occupational stress, job stress, or role stress. It is stress (physiological, psychological, social), actual or perceived in the individual's experience in the workplace. Sawatzky (1996) referred to actual stress as the frequency and perceived stress as the intensity of stressful work events. In this study, the amount of stress referred to the amount (intensity) of psychological stress perceived by critical care nurses; physiological stress was not documented in this study unless reported during the interview.

Assumptions

The first assumption in this study was that CCNs were a group of professionals most likely to show high amounts of psychological stress in the workplace due to the critical care environment experiences in their routine professional care for patients. Second, I assumed a positive relationship among the external stressors (IVs) in the critical care setting and psychological stress (DV) in nurses working in critical care, resulting in negative attitudes and behaviors of nurses. Third, in studying psychological stress, I assumed a medium effect size in the relationship (Cohen, 1988; Green, 1991). Fourth, some level of variance in correlation existed among the predictor variables, but not significant enough at 0.06 to affect the medium effect size assumed in the sample size calculation (C. T. Diebold, personal communication, November 11, 2013). The fifth assumption was that the study of a sample of CCNs using power analysis would produce

statistically significant effects of individual IVs. Sixth, in choosing convenience sampling, I assumed that the results would reflect a local population that would neither be representative of nor generalizable to a wider population of CCNs. Finally, I assumed that participants would respond accurately and truthfully to the survey and interview questionnaires.

Scope and Delimitations

The study focused on both the quantitative and qualitative gaps in the research of stress in critical care nursing. The scope was limited to convenience sampling of CCNs from Tennessee Nurses Association (TNA, 2016) and members of the AACN from all U.S. states, except Kansas and Wyoming (AACN, 2016). This convenience sample included medical and surgical hospitals in the United States employing licensed registered nurses (U.S. Department of Labor, 2013a). Other health care workers in the critical care units from the same hospitals were excluded from the study. Similarly, RNs and other health care professionals from other hospitals were excluded from the study. This convenience sampling delimits generalizing the results to a global population of CCNs.

The scope of the study included an online quantitative questionnaire and measurements that assessed seven types of perceived stressors from the critical care workplace related to amounts of perceived stress in CCNs. The seven subscales of the NSS (Gray-Toft & Anderson, 1981) were used to measure the stressors, and the PSM-9 (Lemyre & Tessier, 2003) was used in the online questionnaire to measure the amounts of stress perceived by critical care nurses. The relationship between the kinds of stressors

and the amounts of stress was assessed by analyzing data with the IBM SPSS Statistics 21 (Laureate Education Inc., 2013) or the PASW GradPack 18 Predictive Analytic Software (SPSS Inc, 2009).

In the qualitative interviews, I explored the coping strategies that CCNs used to reduce perceived stress. Interview participants were recruited separately to reach a saturation sample for thematic analysis. To recruit the consenting participants, invitations were published through the listservs of TNA and AACN for email interviews.

Limitations

One limitation in this study was the inability to establish a direct cause-effect relationship between the stressors and psychological stress given the correlational nature of the research design. The possibility of other limitations included the validity and reliability of the instruments available for measurement, the survey and interview methods used, sampling selection and interview biases, and the perception of the stressors and stress by critical care nurses.

The developers of the two quantitative instruments for assessment, the NSS (Gray-Toft & Anderson, 1981) and the PSM-9 (Lemyre & Tessier, 2003), validated the instruments. Mrayyan (2009) used a modified NSS for assessment of job stressors in intensive care units. Lemyre and Lalande-Markon (2009) used the PSM-9 in appropriate populations like hospitals. In this study, I did not carry out extensive psychometric tests of these original instruments, which have been validated in populations of nurses similar to my sample. I used Cronbach's alpha coefficient on both the NSS and PSM-9 to verify internal consistency of the instruments.

Survey and interview methods have their own limitations in convenience sampling and self-reports. For example, participation in the study might have been biased toward motivated participants, and nonparticipant responses might have been significantly different. This could create a sampling selection bias in the study. In addition to the level of motivation and interest of participants when the data collection began, fears of confidentiality breaches of personal information and responses might have impacted the results. The expectation was that participants would provide responses to the measurements truthfully without giving responses that might be socially desirable to the profession (Opdenakker, 2006; Podsakoff & Organ, 1986; Walliman, 2006). A convenience sample in this study, as opposed to a random sample, might not be representative of all the CCNs working nationally, limiting generalization of the outcomes to the members of the AACN and the TNA. Interviewer bias in this study could be limited by following an interview protocol, with the participants' consent.

The multiple regression analyses used to test the quantitative hypotheses would show the relationship between the measured external stressors (IVs) and psychological stress (DV) in CCNs. Relationships among the IVs were likely to affect the overall relationship with stress; however, the assumption was that the effect would be minimal within a squared semi-partial correlation coefficient of .06 (C. T. Diebold, personal communication, November 11, 2013). The residuals would translate to other external stressors as well as internal stressors that were not be measured in the study. This study was limited to the measurements in the design and might not include all of the possible stressors that have an impact on stress in CCNs.

Appraisal and perception of stressors and stress were not absolute, but relative to individual nurses who worked in critical care from different backgrounds, experiences, and priorities for development in the workplace. The critical care environment was also a dynamic environment, with changes taking place frequently in service procedures, technology, policies with laws and regulations, and staffing. It was possible that one could only get a snapshot of the stress situation over several months before significant changes occurred. The study outcome and its implementation might be limited to the priorities given to particular areas of service on a regular basis by the corporate health provider at the time of study, like marketing, medical, nursing, clinical, or cultural priorities. It was plausible that when data collection for the study began, priorities focused on change for the nurse or culture in the workplace would be welcomed. The expectation was that many CCNs would be interested and available to participate in the study.

Significance of the Study

One gap in a review of stress research was the absence of quantitative assessment of the amount of psychological stress perceived by CCNs. Another gap was establishing the relationship between specific types of stressors and the amount of perceived stress by CCNs. In this study, quantitative instruments were used to measure stressors and stress in a CCN population. Historically, the NSS (Gray-Toft & Anderson, 1981) had been erroneously applied for assessing stress; what it really measured was the type of stressors that had an impact on stress in individuals. This study underscored the use of the NSS as the instrument for measuring external stressors in CCNs. Lemyre and Tessier (2003)

established the usefulness of the PSM-9 in different industries, including hospitals. However, there was a gap in the use of the PSM-9 for research of CCNs, professionals who were very likely to be at high risk for stress at work. This survey provided empirical evidence regarding the phenomenon of stress in CCNs.

The qualitative interviews with CCNs addressed the stressors, stress, and coping strategies to fill an additional literature gap by adding to the current knowledge of the constantly changing workplace environment for CCNs. One significant contribution of the interviews was the nature and type of stressors that medical technological advancement has brought to CCNs' practice in the second millennium. The interviews also revealed some of the coping strategies that nurses employed to remain in their stressful workplace. Results from both quantitative and qualitative studies provided an in-depth assessment of the CCNs' stress.

The results of this study may be used for positive change in hospital procedures and policies for nurses. The recommendations may raise the level of nursing practice from a stressed workplace to a more tolerable environment for nurses. The research provided evidence from a large sample for best practice that may be generalized only to CCNs in the U.S. (Pallant, 2013). However, the methods may be replicable in similar populations locally, regionally, nationally, and internationally.

Summary

Chapter 1 provided an overview of the scope of stress research among critical care nurses, including key stress concepts, gaps in knowledge, and a rationale for the study of the lived experiences of critical care nurses. I used a mixed-methods to provide

an in-depth study of the types of workplace stressors and the amount of stress perceived by nurses in a hospital critical care setting. The quantitative component included two reliable and validated instruments to measure the independent variables (stressors) that were correlated by multiple regression analyses to the dependent variable (psychological stress). The qualitative interviews provided in-depth information from participants on their lived experiences with specific stressors and how the events in the workplace might have impacted the amount of stress perceived. The results from this study may be used to change policy and procedures for reducing or eliminating stress in critical care nurses, improving health of nurses working in a critical care environment, enhancing corporate image, and attracting future nurse professionals to hospital critical care units. In Chapter 2, I review the literature on the theories and research underlying this study.

Chapter 2: Literature Review

Stress has become a household word used by individuals overwhelmed by circumstances in their lives. The American Psychological Association (APA, 2007) reported work as the most significant source of stress in the U.S. society, which showed an increase in stress from 59% of the population in 2006 to 74% of the population in 2007. Cryer, McCraty, and Childre (2003) observed an increase in workplace stress in more than 100 corporations. Corporate America includes hospitals with a predominant nurse workforce that McVicar (2003) believed to be a professional group more prone to high levels of workplace stress than other workers.

The APA (2012) suggested the United States might be on the verge of a stress-induced public health crisis as a result of the impact of stress on individuals in the population. Bailey (1980) posited that stress could be the 20th century disease, with its toll on society's welfare through diseases triggered by stress, such as coronary thrombosis, rheumatoid arthritis, peripheral vascular disease, essential hypertension, and cancer (Pelletier, 1977). Stewart et al. (2003) found that depression from stress cost 44 billion dollars every year in lost productive work time, while Nicholson et al. (2006) estimated that the cost of the worker's absence to an employer was higher than the employee's wage across all occupations. Bailey observed that excessive stress on individuals adversely affected performance at work, with resignation as a usual response to job stress that manifested in symptoms of low morale, absenteeism, reduced energy levels, and diminished productivity.

In the contemporary workplace, Bailey (1980) conceded that the nurse may be specifically vulnerable to workplace stress due to expanded roles in accountability, knowledge, skills, and role classification; new modes and settings for organization and delivery of health care; changing laws, regulations, and procedures in nursing practice; changes in nursing education and academic programs; and lack of agreement among nurses regarding professional issues on practice entry requirements and development. Researchers studied stress among nurses, mainly by the use of quantitative methods (Bailey et al., 1980; Brunero et al., 2008; Lambert, Lambert, Petrini, Li, & Zhang, 2007; McGrath et al., 2003; Mrayyan, 2009). McVicar (2003) identified a research gap with the nursing population as an absence of adequate tools to evaluate the intensity and health consequences of distress in individual nurses. Previous studies showed that researchers used the Nursing Stress Scale (NSS) to measure the level of stress (Brunero et al., 2008; Lambert et al., 2007; McGrath et al., 2003). However, in reality the scale measured stressors (Mrayyan, 2009) but not stress. To address this anomaly, another instrument might be required to measure the level of stress.

Mrayyan (2009) observed a paucity of research on the scale of stress in nurses who work in critical care, including intensive care units (Bailey et al., 1980), recovery rooms, emergency departments, renal dialysis units (Williams et al., 2001), cardiovascular care units, and observation units (Jagminas & Patridge, 2005; Mace, Graff, Mikhail, & Ross, 2003). Existing quantitative tools may fail to adequately explore the concepts of job stressors and stress in hospital nurses (Mrayyan, 2009), particularly the lived experiences of nurses in critical care. There is a need to reevaluate perceived

stress in the lived experience of hospital-based critical care nurses (CCNs), including the physiological, psychological, and social consequences. In addition to existing quantitative tools, qualitative methods would provide an in-depth approach to research on stress and stressors. A rare combination of these approaches might expose the kinds of perceived stressors and amounts of perceived stress experienced by CCNs. The results from my study may provide suggestions for workplace policy changes that may minimize stress among CCNs.

Purpose of the Study

I examined a gap in the existing stress research on the perceived stressors and stress experiences in hospital critical care nursing. The study involved identifying the perceived stressors and exploring the relationship between nurses' types of stressors and amount of psychological stress. I used a mixed-methods approach to assess the kinds of stressors and amount of stress, to analyze the relationship between the stressors and stress, and to explore the coping methods used by a sample of critical care hospital nurses. Quantitative instruments included the NSS for measuring the stressors and the Psychological Stress Measure (PSM-9) for assessing the amount of psychological stress. During the qualitative interviews, I explored the coping methods reported by the participants. Chapter 2 presents the theoretical foundation of the concept of stress, the key variables in the concept, and a review of literature related to the study.

Literature Search Strategy

The search approach for previous studies on the topic of workplace stress was systematic, including research from the early development of the concepts through contemporary understanding and application in the social and biological sciences. The review of literature on stress included centuries of research from the late 19th century, when the concept was first addressed, through the establishment of measurement instruments, to the research of stress on people in contemporary social life and occupations. First, I used the Google Scholar search engine to identify previous work using the following search terms: *work stress*, *workplace stress*, *job stress*, *occupational stress,* and *role stress*. After examining results from Google Scholar search, I selected relevant studies published in the EBSCOhost databases available from the Walden University library including PsycINFO, PsycARTICLES, Academic Search Complete/Premier, ProQuest Central, Science Direct, SocINDEX with Full Text, Mental Measurements Yearbook, PsycTESTS, PsycEXTRA, and PsycBOOKS. The library also provided databases in the health sciences, including medicine and nursing.

The Google search generated additional results such as university websites, organizational websites, and scholarly websites. Textbooks and articles from the Walden University PhD program in psychology served as further sources of relevant literature. On a regular basis, the results obtained from databases and other sources in this literature review were updated through notification by Google Scholar alerts.

Theoretical Foundation and Concepts

Stress in critical care could have several ramifications in scope, with implications for staff, employers, and the health care industry. Le Moal (2007) described stress as one of the most cited constructs in research, and one that is difficult to define. Cummings and Cooper (1998) observed interests and research on stress in four different disciplines: medicine, psychology, sociology, and management. Koolhaas et al. (2011) questioned the use of stress for both slight and severely challenging conditions. During a period of more than 20 years, Le Fevre, Matheny, and Kolt (2003) noted increased concern about workplace stress in both employees and employers. Workplace stress became a risk for litigation and damage claim to employers (Rees, 1997). The main theories relevant to this study were the concepts of allostasis, allostatic load, burnout, coping, homeostasis, stress, stressor, and workplace stress, as they applied to nurses in the critical care unit. In the following sections, I review the source of the theories, characteristics and definitions, applications, choice of theories, and the research questions in the present study.

Historical Development of Stress Concepts

The concept of stress in human professional disciplines dated to the time of early Western civilization with the Greeks. In reviewing antecedents to this concept, Chrousos and Gold (1992) recalled the thoughts of Heraclitus (540-480 BC) that *constant change* was innate in all objects. Empedocles (495-435 BC) proposed that *harmony* was essential for survival. Hippocrates (460-375 BC) viewed health as harmony, disease as *disharmony*, and nature as the *healer*. Epicurus (341-270 BC) suggested that *coping* with emotions and *impermeability* of the mind improved an individual's life quality. Bernard

(1878) introduced the idea of a *milieu intérieur* (internal environment), and Cannon (1929) coined the term *homeostasis* and the *fight or flight reaction* to threats, including pain and emotions.

Stress. Selye (1973, 1980) developed and popularized the concept of stress, a word originating from physics, while describing physical and psychological responses to unfavorable situations that threatened homeostasis. Selye (1936) described the general adaptation syndrome (GAS) in experimental rats that resulted from exposure to noxious conditions like cold, excessive exercise, or injury. The response described was nonspecific, irrespective of the damaging situation or substance, showing GAS in three stages of: alarm reaction, resistance, and exhaustion. In 1956, Selye applied the term stressor to represent the external factor impacting the person, while stress represented the physiological consequence or psychological interpretation (Code & Langan-Fox, 2001; Selye, 1956, 1973, 1980) by the individual to the influence of a stressor. In the physical sciences literature, stress represented the external influences as an engineering term for the external force capable of deforming bodies (Goldstein & Kopin, 2007; Le Fevre et al., 2003), which was equivalent to Selye's stressor. Goldstein and Kopin noted that Selye's definition of the word stress was a misnomer for the word *strain* that was used in the physical world for similar reactions. However, in the biological, psychological, and social science literature, stress meant the reactions to stressors, including physiological (Mayer, 2000; Selye, 1956), psychological (Code & Langan-Fox, 2001; Selye, 1980), and behavioral reactions at work and in other social situations (Vasse, Nijhuis, & Kok, 1998).

Eustress and distress. Selye (1956, 1973, 1980) further explained stress in the contemporary world and suggested two types of stress. Selye named the first type *eustress*, which referred to positive or good stress from the Greek root word *eu* for good. Eustress represented the constructive type of stress shown by emotions and related to empathy that could be beneficial to and compatible with good health (Lazarus, 2007). Colligan and Higgins (2005) gave examples of eustress including stressors for stimulating productive work during challenges, like a woman's labor during the delivery of a baby, a successful competition, marriage, or buying a new home. The second type, *distress,* referred to reactions to negatively appraised stressors like unpleasant work pressure stress or a catastrophic event (Colligan & Higgins, 2005). Lazarus (2007) explained that distress represented the destructive type that could be detrimental to health as shown by anger and aggression. McVicar (2003) viewed stress as a continuum containing eustress on one end of the spectrum, mild/moderate distress in the middle, and severe distress on the opposite end.

Colligan and Higgins (2005) posited that the type, intensity level, and duration of the stressor would determine a positive outcome (eustress) or a negative crippling emotional disturbance, burnout, or other illness (distress). Holmes and Rahe (1967) defined and scored standard stressful life events on a measurement scale while Kanner, Coyne, Schaefer, and Lazarus (1981) as well as DeLongis, Coyne, Dakof, Folkman, and Lazarus (1982) scored daily hassles and uplifts as approaches for measuring stress. Lazarus (1984) suggested that measuring hassles and uplifts supplemented the measure of life events alone and were more comprehensive for predicting health outcomes.

In an alternative classification of stress, Lazarus (1966) distinguished three kinds of psychological stress: harm/loss, threat, and challenge. Harm/loss related to existing negative impact of stress while threat implied the possibility of damage or loss. Challenge acknowledged a positive outcome, despite existing barriers standing in the way of success. In this classification, Lazarus argued that each type of stress would require a different strategy for coping psychologically, physiologically, and behaviorally.

New Concepts and Mechanisms in Stress

The more modern concepts of stress included threat to homeostasis, with a specific response depending on the particular challenge, the individual's perceptions of the stressor, and the ability to cope with the challenge (Goldstein & McEwen, 2002). In homeostasis, Goldstein and Kopin (2007) posited that acceptable ranges of measurable values also had variations depending on the environment. For example, levels of body temperature, heart rate, and blood pressure could change on a diurnal basis. Such variations would precipitate a person's adaptation to different stressors.

Phenomenology in stress syndrome. Chrousos and Gold (1992) described the stress syndrome as a phenomenon of physical and emotional stressors triggering responses to maintain homeostasis. Chrousos and Gold described central neural responses involving facilitation of pathways for functions, including aggression. Concurrent inhibition of pathways for vegetative functions like reproduction also occurred to preserve energy that would be available to the stress syndrome. The peripheral responses included redirection of oxygen and nutrients to provide increased cardiovascular tone. As a consequence, heart rate, blood pressure, and respiratory rate were raised. Moreover,

gluconeogenesis (formation of glucose sugar) and lipolysis (dissolution of fat) were activated as vital energy substrates. Chrousos and Gold posited that the central and peripheral responses depended on the individual's prompt response to both the stressors as well as to negative feedback mechanisms that might prevent excessive stress response. Ability to respond quickly to stressors, including immune reactions, would prevent loss of adaptive quality that could result in the process of pathological change.

Physiology of the stress system. Gold, Goodwin, and Chrousos (1988a) suggested that coordination of the stress syndrome was an established system, essential for survival of the individual. Gold et al. (1988a) identified the main components in the system as the corticotropin-releasing hormone (CRH) and the locus ceruleus-norepinephrine or autonomic (sympathetic component) nervous system (ANS). In a stressful situation, like intraventricular administration of CRH (a naturally widespread hormone in the hypothalamus of the brain), the pituitary-adrenal axis and the sympathetic component of the ANS were activated. The resultant activity led to increased glucose, heart rate, and blood pressure. Other effects included arousal and cautious constraint; however, the system inhibited vegetative functions, like feeding and reproduction (Gold, Godwin, & Chrousos, 1988b).

During stimulation of the sympathetic division of the ANS located in the brain stem, Gold et al. (1988a) posited that norepinephrine (NE) was released, enhancing arousal, vigilance, and anxiety. On inhibition by stress, the parasympathetic division of the ANS (closely associated with the sympathetic counterpart) produced effects similar to activating the sympathetic arm. Gold et al. also reported the direct link of the stress

system with the systems for reproduction, growth, and immunity. For example, Gold et al. posited that the CRH from the hypothalamic-pituitary-adrenal (HPA) axis suppressed the release of luteinizing hormone (for reproduction) through the hypothalamus. Similarly, the stress system impacted the inflammatory immune responses via changes in leukocyte activity and decrease in cytokine production like interleukins. The outcome affected CRH secretion by the hypothalamus via the negative feedback with immunosuppressive effects of glucocorticoids (Munck, Guyre, & Holbrook, 1984).

Pathophysiology of the stress system. Chrousos and Gold (1992) posited that the stress syndrome was acute in duration, limiting the growth and immunosuppressive effects. Sterling and Eyer (1988) introduced and defined the term *allostasis* as the establishment of a steady state, through natural adjustments to acceptable levels of factors that regulate the cardiovascular system during rest and activity. Such factors included stress hormones – adrenaline and cortisol (McEwen & Lasley, 2007). These hormones, secreted by the adrenal gland medulla and cortex respectively (Cannon, 1914), in response to perceived stressor by the individual, resulted in body changes that maintained allostasis. Goldstein and McEwen (2002) asserted that such alterations were effective for a short time.

Chronic and excessive stress system activation lead to prolonged release of CRH in the HPA (Chrousos & Gold, 1992) and overexposure of the individual to adrenaline and cortisol. Over time, cumulative unpleasant effects occurred, including anorexia, loss of weight, depression, peptic ulcer, and immunosuppression (Selye, 1936). Chronically raised cortisol, for example, resulted in high blood pressure, suppression of the immune

system, depressive illness (Chrousos & Gold, 1992; McEwen & Lasley, 2007) and diminished bone mineral density in women with depression (Michelson et al., 1996). Gold et al. (1988a, 1988b) asserted that the stress response in depression represented a dysregulation of the response, avoiding the self-limiting negative feedback system of the HPA. Effects included stroke from chronic raised blood pressure and depression.

Other conditions were associated with sustained release and activity of CRH, including anorexia nervosa (Gold et al., 1986; Kaye et al., 1987); panic anxiety (Gold, Pigott, Kling, Kalogeras, & Chrousos, 1988; Roy-Byrne et al, 1986); obsessive-compulsive disorder (Insel, Kalin, Guttmacher, Cohen, & Murphy, 1982); excessive exercise (Luger et al., 1987); chronic active alcoholism (Wand & Dobs, 1991); alcohol and narcotic withdrawal (Mendelson et al., 1988; Risher-Flowers et al., 1988); malnutrition (Malozowski et al., 1990); and premenstrual tension syndrome (Rabin et al., 1990). Such risks, arising from the consequences of prolonged allostasis, defined the state of *allostatic load*.

Cognitive theory of stress. Lazarus & Folkman (1984) defined stress as an individual's perception of demands, relative to the person's capability to meet these demands. Richard Lazarus (1966) first proposed the concept of psychological stress, based on the construct of appraisal. Lazarus's idea of appraisal was that stress and emotions depended on an individual's evaluation of transactions with the environment. In the adaptive process, Lazarus identified two central elements – cognitive appraisal of a stressor and coping strategies for adjustment to the stressor. Lazarus considered a stressor as an external event or condition that impinged on specific characteristics of the

individual. Lazarus also posited that coping strategies were linked with emotions for successful coping or maladjustment. In the presence of stress, Lazarus (2007) observed that emotions were always present - the so called *stress emotions*; the reverse (emotions without stress) was a possibility, but not always so.

Emotions, according to Richard Lazarus (2007), consisted of 15 different varieties, including anger; envy; jealousy; anxiety; fright; guilt; shame; relief; hope; sadness; happiness; pride; love; gratitude; and compassion (p. 38). Each emotion would express a person's appraisal of an adaptation process with an external stressor. A consistent expression of a particular emotion on various encounters with the environment in different contexts would represent a personality trait of an individual's relationship to the world. Le Moal (2007) concluded that Lazarus's elucidation of emotion provided a richer, broader, and a more clinically useful concept for stress. In Susan E. Pollock's (1984) contention based on the findings of Selye (1936, 1956, 1973, 1980), Lazarus (1966), and Roy (1971), the concept of stress was a complex physiological and psychological phenomenon that included a stressor; perception of the stressor; mediating factors; and the manifestations of the response (Sawatzky, 1996). Referring to nurses, Pollock (1984) considered demographic variables, like age, employment status, education, and nursing experience as external mediating factors. Pollock also classified hardiness (Kobasa, 1979) as a key internal mediating factor that determined the individual's level of physiological and psychological adaptation by mediating stress perception and coping adequately.

Workplace stress. Occupational stress is synonymous with workplace stress, job stress, work stress, or role stress. Le Fevre, Matheny, and Kolt (2003) examined three models of stress at the workplace. These models included the *person-environment fit* (P-E fit) theory, cybernetic theory, and control theory (Spector, 1998). In the P-E fit theory, stress and stressors referred to the degree of misfit between the worker and the workplace (Edwards, Caplan, & Van Harrison, 1998). Fits and misfits could arise between the demands on individuals from the job environment regarding the role and group norms; however, the individual's ability to fulfill the demands in terms of training, skill, time, and energy might cause fits and misfits (Le Fevre et al., 2003). The physical and psychological needs of the individual (Maslow, 1943) and the capacity of the workplace to provide these needs with pay, benefits, inclusiveness, and development (Herzberg & Mausner, 1959) might also result in either fit or misfit. The P-E fit theory proposed a mismatch for the individual in an environment (Edwards, Caplan, & Van Harrison, 1998), creating stressors and resultant stress.

The cybernetic theory in workplace stress (Cummings & Cooper, 1998) had its origin in Cannon's research on the fight or flight response to threat (Cannon, 1914), homeostasis (Cannon, 1929), and the general-adaptation-syndrome (Selye, 1936, 1956). The idea was that individuals sought to maintain an equilibrium state in response to external challenge (Le Fevre et al., 2003). A concept of an optimum amount of stress at workplace resonated with Yerkes Dodson Law (Yerkes & Dodson, 1908), suggesting that increasing stress could be beneficial in performance to an optimum level, after which performance declined, like a graphic inverted U (Certo, 2003).

In the occupational control theory, Spector (1998) proposed that the degree of individual's perception of control over stressors at work determined the experience of stress by the individual. Le Fevre et al. (2003) posited that control in the workplace would include total freedom to control the schedule and assignment at one end of the continuum, to complete submission, without individual's control on duty or workload at the opposite end. An intermediate or middle position would be some personal choice in certain aspects of the schedule and workload. In addition to perception, Bandura (1982) suggested that locus of control (LoC) and self-efficacy (SE) could influence stressors and stress. Spector posited that control would be seen as a moderating variable in the theory.

In the case of nurses, Brunero, Cowan, and Fairbrother (2008) attributed the occurrence of stress to their perception of the source and the ability of nurses to cope with source management. Krantz, Grunberg, and Baum (1985) posited that the effect of stressors might compromise the physical and mental health of individuals. Moreover, Colligan and Higgins (2005) noted that peoples' personalities and coping methods could be threatened. McVicar (2003) identified psychological indicators of distress to include feeling of unease, apprehension, sadness, depression, short temper, or poor sleep. McVicar posited that severe distress would manifest psychologically as burnout in the form of emotional exhaustion, depersonalization or disengagement, and diminished personal achievement.

Burnout. A review of the *burnout syndrome* showed that burnout is not the same as the stress syndrome (Chrousos & Gold, 1992). Burnout syndrome was a concept of work burnout as a psychological syndrome, arising from chronic interpersonal stressors

on the job (Maslach, Schanfeli, & Leiter, 2001). Whereas the components of the stress syndrome were typified in the GAS stages of alarm reaction, resistance, and exhaustion (Selye, 1936), Maslach et al. (2001) posited that the burnout syndrome demonstrated three components of overwhelming exhaustion, cynicism and detachment from the job (depersonalization); McVicar (2003) added a fourth - ineffectiveness with lack of accomplishment. The psychiatrist, Freudenberger (1975) first described the burnout syndrome at an alternative health care agency, while the social psychologist, Maslach (1976), reported burnout within the context of emotions at the workplace. The last stage of exhaustion in the GAS would represent the first and necessary component of the burnout syndrome; however, Maslach et al. argued that focusing on exhaustion alone would compromise the context of and insight into the phenomenon in both stress and burnout. Maslach and Jackson (1981) provided the inventory for burnout, measurable with three versions of the Maslach Burnout Inventory (MBI).

A summary of the stress concept and burnout. In an attempt to summarize the constructs about the stress concept, three dimensions emerge. The first is the role of the external environment on the individual – stressor (Selye, 1973). The second involves the appraisal of the person to perceive the external environment as a stressor (Lazarus & Folkman, 1984). The third considers the internal process or phenomenon that goes into place in the individual to maintain the internal homeostasis against the existence of the stressor (Chrousos & Gold, 1992) - the stress response/allostasis and coping. This entire process represented a biopsychosocial model of the stress concept (Lemyre & Tessier, 2003) to which the quantitative and qualitative research questions were related. The

allostatic load would represent the state of overwhelming stress response to high stress in a persistent and prolonged stressor exposure – burnout (Maslach et al., 2001), outside the scope of this study.

The conceptual framework of the study. The biopsychosocial model of stress (Lemyre & Tissier, 2003) grounded this study as it related to the impact of stressors on the physical, psychological and social experiences perceived by CCNs at the workplace. The relationship between the kinds of perceived stressors and the amount of stress experienced in critical care nursing would create a phenomenon, leading to the development of a coping strategy by nurses in critical care. The connections among the stressors, stress, and coping mechanisms were assessed by utilizing a mixed method approach of quantitative and qualitative methods simultaneously. In the quantitative survey, the kinds of perceived stressors and the amount of stress experienced by individual CCNs at the workplace were measured. These measurements were analyzed for a relationship between the IVs and the DV. Simultaneously in the qualitative interviews, the methods utilized by the CCNs to contain stress in the critical care environment were explored.

Gray-Toft and Anderson (1981), in the United States, applied the stressor concept in the development and use of the NSS instrument for measuring the frequency of the kinds of stressors in nurses. Lemyre and Tissier (2003) in Canada, articulated the stress concept in the biopsychosocial model in providing the PSM-9 instrument for the amount of psychological stress in the workplace. Moola, Ehlers, and Hattingh (2008) demonstrated the usefulness of the interview method to reveal a phenomenon in South

African CCNs' perception of the stressors, the effect stress on the CCNs, and the need for support systems for the nurses to adequately cope with the stress. The current study has benefited from these previous pieces of research in applying the mixed methods design for an in-depth study of the relationships and phenomenon of stress and coping in American CCNs.

Literature Review Related to Key Variables and Concepts

The key variables of the stress theory would include individual perception of the external source of stress - the stressors (Lazarus, 1966), the balance of individual's physiological (physical), emotional, psychological, and coping response(s) to the stressors - level of stress/allostasis (Lazarus & Folkman, 1984; Sterling & Eyer, 1988), and the consequences of prolonged exposure to stress (allostatic load/distress/burnout). Stressors have been measured as IVs with instruments, like the Holmes and Rahe's (1967) Social Readjustment Rating Scale (SRRS) or the Gray-Toft and Anderson's (1981) NSS. Physical or biological responses in stress have been measured as biochemical responses to stressors, like levels of circulating stress hormones – adrenaline and cortisol (McEwen & Lasley, 2007), or immunoglobulin levels (Deinzer & Schüller, 1998). Lemyre and Tessier (2003) provided the PSM-9 for measuring psychological stress response as a DV.

Distress would correspond to physiological and psychological health consequences of stress in disease. Physiological consequences might include fainting episodes or reactions, increased blood pressure, stroke (cardiac or cerebral), diabetes, renal disease, other medical disease, and deficiencies in the immune system.

Psychological health consequences could manifest, essentially, as emotional disorders in psychopathologies and mental illness, with or without physical illness. In its mild to moderate form, distress could present as sadness, depression, short temper, fatigue, or insomnia (McVicar, 2003). This review of variables related to the key stress concepts discusses measurement of nurses' stressors in critical care (IVs) and psychological stress (DV).

Studies Related to Constructs of Stressors, Stress, and Distress in Nurses

The health care professions have been a focus of stress research in recent decades, with medical personnel, including nurses, dominating the group of participants (Arsenault, Dolan, & Van Ameringen, 1991; Landsbergis, 1988). In these studies, the constructs investigated were job stressors, stress or mental strain, distress, and coping. In Lee's (1987) review, the stressors in medical professional groups (including nurses) were consequences of interdependency of the groups in the hospital setting, individual's socio-cultural background, and personality. Lee suggested that personal characteristics mediated the relationship between stressors and stress, while stressors that were related to the professional's role on the job had a negative impact on distress. Coping with distress reflected positive work relationships and social support among the professionals, reducing distress.

Approaches Used by Researchers to Address the Constructs

The biopsychosocial model of stress grounded this study as it related to the impact of stressors on the physical, psychological and social experiences perceived by CCNs at the workplace. The relationship between the kinds of perceived stressors and the

amount of stress experienced in critical care nursing would create a phenomenon that could lead to the development of a coping strategy by nurses in critical care. The connections among the stressors, stress, and coping mechanisms were assessed by utilizing a mixed method approach of quantitative and qualitative methods simultaneously.

In a quantitative survey of CCNs, the kinds of perceived stressors and the amount of stress experienced by individual critical care nurse at the workplace were measured. The measurements were analyzed for a relationship between the kinds of stressors and the amounts of stress. Simultaneously in the qualitative interviews, the methods used by CCNs to contain stress in the critical care environment, to address the issues of stress, stressors, causes, and coping strategies were explored. Rarely have both methods been combined for use as mixed methods in the same study. Moreover, most studies on stress experienced by critical care nurses have focused on intensive care units (ICUs), with little or no studies on other critical care units like the cardiovascular observation units or the surgical progressive care units. This dissertation combined both approaches of quantitative and qualitative to inquire any relationship between kinds of nurses' perceived stressors and perceived amounts of stress in all critical care units. Quantitative research enquired about the stressors (IVs) and the amount of psychological stress (DV) in nurses working at the critical care units. The qualitative research questions identified the most stressful experiences of a critical care nurse, their psychological health, and coping.

Quantitative approaches in literature. Early quantitative methods focused on quantifying the level of stressors and stress.

***Instruments for measuring stressors*.** McGrath and Burkhart (1983) considered the SRRS (Holmes & Rahe, 1967) as the most widely used instrument for measuring psychosocial stress in individuals. The original SRRS consisted of 43 life events that Holmes and Rahe considered stressful in clinical psychological life experiences of Americans. These items included family events, marriage, work, domicile, relationships, education, religion, leisure and health. The criterion for selection of an event was the degree of change impacted on the individual, not necessarily psychological, emotional or social. In assigning weights to these life change events, Holmes and Rahe assigned an arbitrary value of 500 to marriage as the reference value to which all the other 42 events scored. For example, death of a spouse scored twice (1000), while change in living conditions scored one-half (250) from the convenience sample of developing the SRRS.

Some of the weaknesses of the SRRS instrument included checklists to address the adult, child, adolescent, and the elderly populations (Turner & Wheaton, 1995). Moreover, using marriage as a reference value in a society that has increasingly reconstructed the original definition of marriage with rising divorce rates, single parenthood, legalization of same sex relationships and parenthood; educational level; gender workforce shift; and employer-employee relationships might not be appropriate for use in the same society, four decades after the original development of the SRRS (Scully, Tosi, & Banning, 2000). Scully et al. modified the SRRS in the light of a contamination hypothesis suggested by Dohrenwend, Dohrenwend, Dodson, and Shrout

(1984). Scully et al. explained that desirable events would represent events with positive valences - like an outstanding personal achievement, while foreclosure of a mortgage would be undesirable with negative valences. Controllable events could be prevented, like taking out any type of loan; however, the tragic death of a spouse would be considered uncontrollable. Contamination would include life events resulting from stress, instead of causing stress, for example, a change in sleeping habits.

Participants in the survey of Scully et al. (2000) included graduate nursing students, among others. The stress-related symptoms in the study derived from the Symptom Checklist-90 (Derogatis, Lipman, & Covi, 1973), a multidimensional self-report symptom inventory from the Hopkins Symptoms Checklist (Derogatis & Cleary, 1977). Scully et al. found that life change events remained predictors of stress-related symptom scores, confirming the robust nature of the SRRS as an instrument for identifying stress-related outcomes. However, the SRRS was not specific for nurses; therefore, it was imperative to apply another quantitative instrument for studying stress in nurses at their workplace.

Gray-Toft and Anderson (1981) provided NSS, consisting of 34 nursing situations in the hospital to measure stressors on a four-point scale of how frequently nurses found the situations stressful. Gray-Toft and Anderson established the validity of the NSS with high test-retest reliability at .92 Cronbach's alpha. Several studies used the instrument for stress research in nurses, including assessing baseline and post-intervention stress levels in nurse participants (Brunero et al., 2008), assessing specific sources of workplace stress

in hospital nurses (Lambert et al., 2004; Lambert et al., 2007), and surveying nurses' stressors in the intensive care units and hospital wards (Mrayyan, 2009).

In a particular reference to CCNs, Majd Mrayyan (2009) identified appropriately the use of the NSS to measure job stressors, but not stress. The study modified the scores of the original NSS scale of 34 items on a 4-point Likert scale, recording overall Cronbach's alpha of .90 (compared to the original Cronbach alpha of .92). Mrayyan (2009) also reported comparable Cronbach alpha for each of the seven subscales. An arbitrary mean score above 2 signaled the existence of a nursing stressor.

Other instruments existed in studies for measuring nursing stressors in addition to the NSS, like Harris's (1989) the Nurse Stress Index (NSI) that showed adequate replication or psychometric parameters in reliability and validity, similar to the NSS. However, Sawatzky (1996) argued that neither the NSS nor the NSI drew their lists of stressors from critical care nurses – general staff registered nurses and management level nurses were the participants. Sawatzky applied the Critical Care Nursing Stress Scale to study actual and perceived stress in CCNs by modifying the Stress Audit (Bailey et al., 1980) specific to intensive care nursing. Bailey et al. found that the Stress Audit was a useful instrument for identifying stressors in ICUs nurses and for identifying the psychological needs of nurses in order to change policy in the ICUs workplace. Bailey et al. (1980) identified stressors for ICUs nurses classifiable into seven categories. The major three categories for stress, according to 80% of the participants in the audit, were in the management of the unit; interpersonal relationships; and patient care. Conversely,

the study (Bailey et al.) also provided three top categories as sources of greatest satisfaction – patient care; knowledge and skills; and interpersonal relationships.

Instruments for measuring stress. There was paucity in literature with the measurement of psychological stress, compared to the plethora of studies that quantified stressors in reality. The burnout syndrome had an edge in measurement with availability of the MBI (Maslach et al., 2001). The three stages of the GAS in the stress response (Selye, 1936, 1950) could be measured with the Present State Examination (Wing, Cooper, & Sartorius, 1974); the Brief Symptom Inventory (Derogatis, 1975); the Beck Depression Inventory (Bech, Ward, Mendelson, Mock, & Erbaugh, 1961); and the Perceived Stress Scale (Cohen, Kamarck, & Mermelstein, 1983).

Lemyre and Tessier (2003) observed that these instruments served the assessment of pathological disorders due to their validation with clinical populations. Lemyre and Tessier also argued that the statistical distributions of the instruments were not normal, being insensitive below the critical diagnostic threshold. The Psychological Stress Measure (PSM) based its theoretical framework on a biopsychosocial model of stress (combining Selye's, Lazarus', and Chrousos' models) that recognized environmental stressors and individual's perception of coping with the stressors (Lemyre & Tessier, 2003). Developed outside the area of psychopathology, Lemyre and Tessier posited that the PSM would be ideal for assessing psychological stress at various social settings, including health research at the workplace. The original PSM consisted of 49 items obtained from stress focus groups (Lemyre, Tessier, & Fillion, 1990). The psychometric

parameters for the PSM included internal consistency of between .35 and .85, a Cronbach alpha coefficient of .95 and a normal distribution at the core of the stress construct.

Lemyre and Tessier (2003) also developed two other versions of the original PSM for use in research. The first was a two parallel 25-item version, for longitudinal follow-up protocols and repeated measurements, having a Cronbach alpha coefficient of .92 and .93. The second was a much shorter 9-item version (PSM-9) suitable for a variety of research applications, including hospitals. Lemyre and Tessier posited that the PSM-9 shows similar psychometric qualities and normality of distribution to the original PSM. The above reviews on the frequency of stressors (Gray-Toft & Anderson, 1981; Mrayyan, 2009) and the amounts of psychological stress (Lemyre & Tessier, 2003) encountered by CCNs at the workplace related to the quantitative research questions in this study.

Qualitative approaches in literature. Early studies on stress in ICU nurses focused on qualitative approaches, like anecdotes (Sawatzky, 1996). These studies were descriptive in nature, including vivid accounts of the work environment and stress for ICU nurses (Bailey, 1980; DeMeyer, 1967; Hay & Oken, 1972). DeMeyer described the atmosphere of the ICUs as an environment that evoked a variety of charged stimuli to the visitor. Hay and Oken likened the situation to that of a tension-charged strategic war bunker, with a sense of drama and frightfulness that struck the outsider. Narrating the nurse's experience at the ICUs, Hay and Oken mimicked work to an incessant repetitive routine of monitoring vital signs, which combined with the unrelenting stimuli to decrease work overload threshold for the nurse, contributed to stress during crises. The nurse's feelings appeared like a hamster on a treadmill (Hay & Oken, 1972), or seen as an

individual running around like a “headless chicken”. Graphic first impressions and images of the ICUs displayed, to some extent:

> “An array of noisy, complex machinery with flashing lights, crowded work space, the hustle and bustle of grim-faced nurses, physicians, and other health care providers as they respond to a “Code Blue”, and the helpless, lifeless form of a human being who is so much in need of complex life support systems and specialized care” (Bailey, 1980, p. 6).

Bailey et al. (1980) admitted to attrition rate of ICUs nurses that was high and critical shortage of nurses, mainly due to the stressful nature of the job. Subsequently, interviews with graduate nurses about the nature of the ICUs job-related stress provided insight into the need for further studies (Bailey, 1980). Some of such qualitative studies were, not only descriptive from the researcher’s observations but also, reflective of the nurse’s interview narratives of stress appraisals in the ICUs work environment.

Moola, Ehlers, and Hattingh (2008) carried out a qualitative study for stress in South African CCNs, using focus group interviews with target hospital CCNs and individual interviews with nurse managers. Moola et al. showed the nurses’ perceptions about stressful events, the effects of stress on CCNs, and needs for support systems. The nurses described their perceptions in terms of eustress (meaning ability to cope with stress) and distress (meaning inability to cope with stress). The nurses also indicated that stress levels were not measurable and were not controllable, based on the amount of exposure to stress. The CCNs recognized the effects of stress to include physical and emotional symptoms, like frustration; irritability, anger; emotional fear; sensitivity; and

temperament. Personality types also emerged as influential to the reactions and coping with stressful events by CCNs, including traits such as hardiness; self-esteem; extroversion; coherence; and control (internal versus external). The feedback from such qualitative interviews led to suggestions of effective coping strategies and further recommendations for reducing stress for CCNs.

The above study reviews on the sources of stressors in CCNs with coping methods (Bailey, 1980; Bailey et al., 1980, Brunero, Cowan & Fairbrother, 2008; Lambert et al., 2004; Lambert et al., 2007; Moola et al., 2008) related to the qualitative research questions to address the gap in the literature of stress in CCNs at the workplace.

Summary of Studies

A chronological review of studies of the constructs of stress, stressors, and coping strategies showed that both quantitative and qualitative methods revealed aspects of these constructs. The quantitative studies provided statistically reliable and valid instruments for measuring stressors and stress. The qualitative methods of observation, interviews, and feedback described the lived experiences of individual professionals at their workplace, with focus in this review on critical care nurses in particular. A combination of these two research strategies, including both quantitative and qualitative methods, provided the tools for answering research questions proposed for the inquiry in this dissertation.

The quantitative research questions were:

1. What are the kinds of perceived stressors (IVs) encountered by critical care nurses?
2. What is the amount of stress (DV) perceived by nurses in critical care?

3. What is the strength and direction of the relationship between perceived stressors (IVs) and the amount of perceived stress (DV) in critical care nurses?

The qualitative research questions were:

1. How do you, as a critical care nurse, see yourself as experiencing stress differently from other nurses in this hospital?
2. How is your health affected differently by stress when compared to other nurses who do not work in critical care?
3. How do you cope with stress and what would you teach a new nurse about the stress level in critical care?

Studies of stress in critical care nurses found in the literature were limited essentially to intensive care units, as a generic nursing specialty, in hospitals. Paucity of studies exists in other notable areas of critical care, like the cardiovascular observation units, the surgical progressive care units and many other critical care units. The next chapter provides the details of the study design with the methodology for data collection and analysis.

Chapter 3: Research Method

The purpose of this study was to fill gaps in the existing stress research on the experiences of critical care nurses (CCNs) in their hospital-based work environment. I explored nurses' perceived stressors and examined the predictive relationship between nurses' self-reported perceived stressors and psychological stress. I used mixed-methods approach including both quantitative and qualitative data for the assessment of the perceived amount of stress and its relationship to stressors in a population of critical care hospital nurses. Two quantitative instruments were used, the Nursing Stress Scale (NSS) for measuring the stressors and the Psychological Stress Measure (PSM-9) for assessing the level of psychological stress. In the qualitative e-mail interviews I explored the lived experiences of critical care nurses regarding the most stressful stressors encountered in critical care. This chapter presents the setting, research design, researcher's role, methods for the study, threats to validity, and ethical issues of trustworthiness.

Setting of the Study

Relevance of Setting to Study

This study's setting involved two professional nurses' associations, the American Association of Critical Care Nurses (AACN) and the Tennessee Nurses Association (TNA), both located in the United States. Globally, critical care units (CCUs) by definition are synonymous with intensive care units (ICUs), with CCNs forming an important part of the hospital critical care team. Bailey (1980) posited that nurses were more susceptible to workplace stress than other professionals due to expanded roles of accountability in provider care. McVicar (2003) also asserted that nurses were prone to

high levels of workplace stress. Albar Marin and Garcia-Ramirez (2005) showed that hospital critical care nurses were more prone to high levels of stress than nurses in other settings and units of a hospital. Recently, Mrayyan (2009) confirmed that job stressors were higher in critical care units than in other units of a hospital. Given these findings, critical care nursing units were appropriate for studying several kinds of stressors and high amounts of stress among CCNs.

Attributes of the Study Environment

Physical setting, scope, and size of the organization. All critical care units as defined by Mrayyan (2009) were, in theory, included in this study. According to Mrayyan critical care units include intensive care units (ICU), post-anesthetic recovery rooms, emergency departments, renal dialysis units, and cardiovascular care units (CCUs). Furthermore, ICUs include general ICU, medical ICU, surgical ICU, intermediate ICU, neuro ICU, neonatal ICU, emergency room, recovery room, and operating room. These units constituted the critical care unit environment for recruiting the CCNs for this study. The units' nursing procedures include, but are not limited to, vital signs (pulse, blood pressure, respiration, and temperature) of the patients at regular intervals. Telemetry is used to monitor patients' electrocardiogram (ECG/EKG) normal cardiac rhythms and arrhythmias (abnormal cardiac rhythms) continuously, constituting a critical procedure on the units. Blood and urine chemistry tests and other tests ordered by physicians are part of the procedures for investigating cardiac conditions in these units.

It is not unusual to see families and friends of patients visiting at any hour of the day or night. Nurses might welcome the first-time visitor or stranger to an environment bustling with activity of busy staff performing life-saving tasks.

Key members of the organization. The workforce consists of registered nurses (RNs) assigned to additional and continuing training experience and education in critical care nursing, patient care technicians (PCTs) assisting nurses with patient care procedures and 12-lead EKG, health unit coordinators (HUCs) assisting as secretaries to the unit, monitor technicians monitoring telemetry of patients at the research setting and patients from some other critical care units in the hospital, a physician, a physician assistant, and a nurse practitioner on site during parts of day and night shifts. Housekeeping staff are also on site to keep the rooms, work areas, and bathrooms clean. A charge nurse (CN) is on duty at the nurses' station. The unit nurse manager (NM) and one of several assistant nurse managers (ANMs) or representative CN are available for each shift (day or night). Specialist physician cardiologists and/or their physician assistants (PAs) or nurse practitioners (ARNPs) visit the unit to consult with individual patients before they are home discharged or transferred to a specialized unit, progressive care unit (PCU), or ICU. All staff work 12-hour day or night shifts normally, except for the physicians, ARNPs, and PAs. In this study, all of the RNs, including the ARNPs, ANMs, and the NMs available on all shifts were invited to participate voluntarily, with the option to decline or withdraw at any stage of the process. Declining or withdrawing from participation would not incur any form of adverse consequences, consistent with the principle of beneficence and nonmaleficence (American Psychological Association, APA, 2002).

Research Design and Rationale

Research Questions

The main objective of the study was to examine the relationship between nurses' perceived stressors and amount of stress in critical care, using a mixed-methods approach. The following research questions guided the study:

Quantitative research questions:

1. What are the kinds of perceived stressors (IVs) encountered by critical care nurses?
2. What is the amount of stress (DV) perceived by nurses in critical care?
3. What is the strength and direction of the relationship between perceived stressors (IVs) and the amount of perceived stress (DV) in critical care nurses?

Qualitative research questions:

4. How do you, as a critical care nurse, see yourself as experiencing stress differently from other nurses in this hospital?
5. How is your health affected differently by stress when compared to other nurses who do not work in critical care?
6. How do you cope with stress and what would you teach a new nurse about the stress level in critical care?

Central Concept and Phenomenon

In this study, the central concept was psychological stress involving the state of perceived tension, engagement, unease, and/or ill health (physical and psychological), as may be described by critical care nurses. The theoretical framework of the concept was

based on a biopsychosocial model of stress (Lemyre & Tessier, 2003) that included external workplace stressors (Selye, 1973) and the phenomenon of internal homeostasis (Chrousos & Gold, 1992) within individual nurses' processes of appraisal (Lazarus & Folkman, 1984) and ability to cope with stressors. Lemyre and Tessier (1990) developed this model outside the scope of psychopathology, with the state of psychological stress reliant on how an individual perceived the environment as stressors and capability to cope.

Figure 1 shows a graphic representation of a model consisting of biological/physiological, psychological, and social components (biopsychosocial) that was applied in this study based on the biopsychosocial stress model (Lemyre & Lalande-Markon, 2009; Lemyre & Tissier, 2003; Lemyre, Tissier & Fillion, 1990). This model includes the appraisal and perception of relationships among stressors (internal and external environments), stress (biological and psychosocial), and coping. Lemyre and Tessier (2003) posited that the state of stress could have an impact on physical and mental health through mediators in the neural, endocrine, and immune systems depending on an individual's structural and functional vulnerabilities. Disorders might result from stress amounts, exposure, or other underlying pathologies. Lemyre and Tessier concluded that psychological stress represents a hinge construct linked to psychological phenomena and measurable parameters.

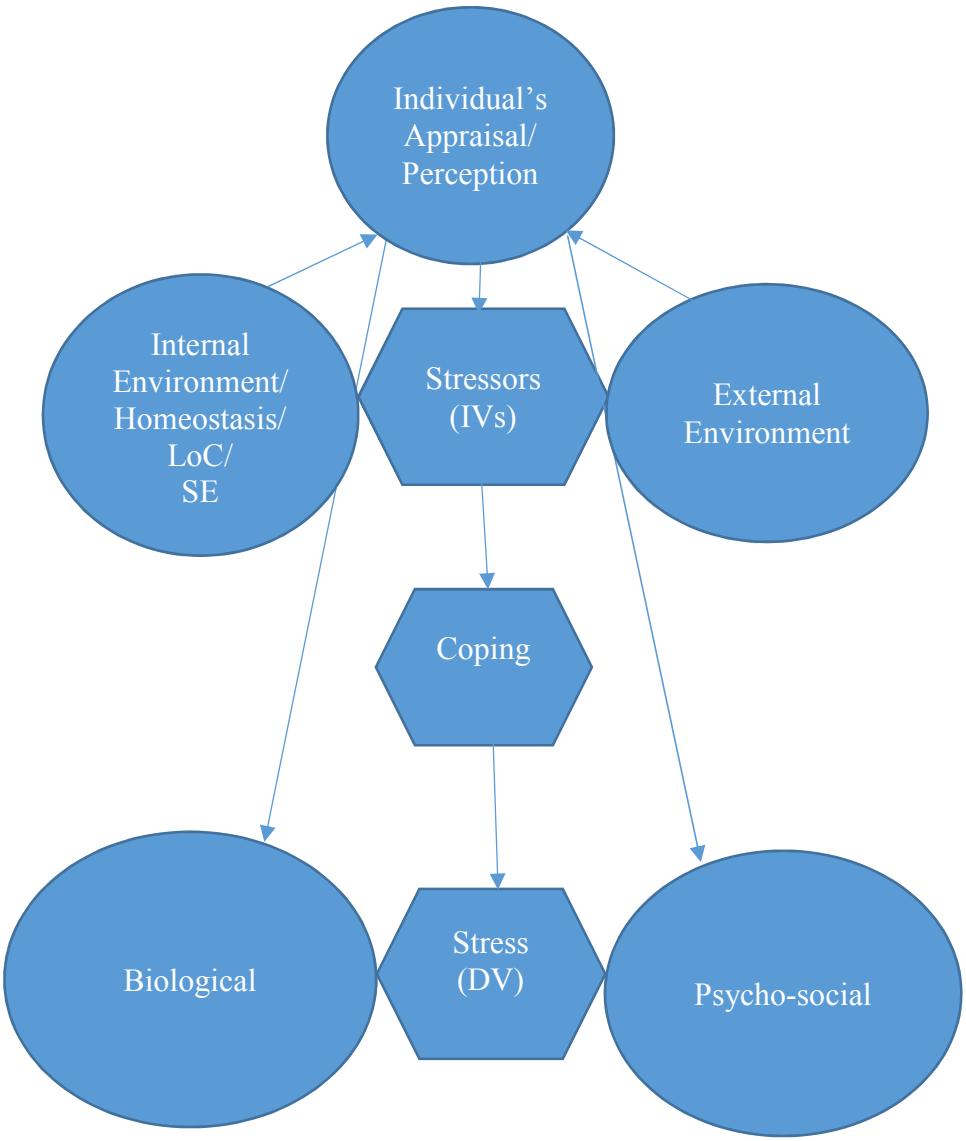

Figure 1. A biopsychosocial model of workplace stress: The relationships of stressors, stress and coping by critical care nurses (Lemyre & Lalande-Markon, 2009).

Justification of the Mixed-Methods Approach

I used a quantitative approach to measure the perceived stressors (IVs), the amount of perceived psychological stress (DV), and the relationship between them. I used a qualitative approach to explore, through in-depth interviews, the stress experiences of CCNs and their coping strategies. The two approaches occurred simultaneously to answer the research questions. Quantitative data were collected through an online survey questionnaire while qualitative data were collected through e-mail interviews. Quantitative data analysis involved multiple regressions using the SPSS package, while qualitative analysis involved descriptive and narrative analysis to identify themes. Both sets of results were needed to answer the research questions addressing the relationship between perceived stressors and the amount of perceived stress by CCNs.

Role of the Researcher

A personal conflict of interest and coercion of participants were probable ethical issues in this study. The participants were registered nurses working in critical care units as bedside nurses. I worked on telemetry monitoring as a nonsupervising colleague for the critical care team environment, but did not work at the patient's bedside on a regular basis. My full-time day shift role was uninterrupted for over 5 years in the critical care environment. During this period, I was exposed to events, behaviors, and encounters of my coworkers with stress. To avoid biases and mitigate conflict of interest during the study, I limited my role to observer or primary data collection instrument (Miller, 1992) in my contacts with the nurse participants and the nurse management team. I set personal experiences aside as the researcher and became open to understand participants' lived

experiences (Nieswiadomy, 1993). To minimize the threat of perceived coercion in the sample (APA, 2002), I recruited participants from among the RNs and the managers (ANMs & NM) who were above me at the CCUs, not from subordinates.

Incentives were not used in this study other than the goodwill of participants to identify the need to stem the tide of stress in the workplace that might contribute to resigning (Bailey, 1980), seeking employment at other health care facilities, or quitting critical care nursing. I was committed to implementing the code of conduct and ethical guidelines APA, 2002) with institutional approval and consent for research, with assurances from the research site management to minimize risks for participants at the workplace. I applied to the institutional review board at Walden University to seek approval for compliance with the university's ethical standards and the U.S. federal regulations, prior to data collection for the study. The Walden University approval number for the study was 01-07-15-0126454. Personal information and individual responses to the questionnaires in both the survey and the interviews were preserved, data privacy will be maintained for no longer than 5years, and feedback results would be made available to the participants after the study through presentations or e-mail to all participants and nonparticipants in the community of CCNs.

Methodology

Population

A population of critical care nurses (CCNs) formed-the sample of participants from the memberships of AACN and the TNA. All RNs, ARNPs, ANMs, and NMs working in any hospital critical care unit in Tennessee state and other states in the United

States were requested to participate in the study voluntarily, irrespective of the duration of employment at the unit. The minimum requirement for participation of the CCNs was the RN license obtained after successfully completing a national licensing examination. The examination normally takes place, after a period of education for a diploma in a nursing program or associate's degree in nursing, or a bachelor's degree in nursing (US Department of Labor Bureau of Labor Statistics, 2013a). Some of the RNs might continue their education to obtain a master's degree in nursing, administration, public health, education, and a doctorate. The American Association of Critical-Care Nurses (AACN) showed that a few CCNs had obtained certification in critical care nursing (CCRN) or in progressive care (PCCN), as part of the continuum of critical care (AACN, 2013).

The American Association of Critical-Care Nurses (AACN) has a membership of more than 100,000 critical care nurses (CCNs) with 240 chapters located in all states of the USA (except two, Kansas and Wyoming); in addition, internationally in three other countries of China, Japan, and Germany (AACN, 2016). The Tennessee Nurses' Association (TNA) is a constituent of the American Nurses Association representing American registered nurses (TNA, 2016).

Sampling Strategy

In this study, a design approach that allowed the use of both the quantitative and qualitative methods simultaneously (Creswell, 2009) was applied. The quantitative survey identified critical care unit stressors and measured perceived amounts of psychological stress. The phenomenology of critical care stressors, including associated

stress and coping strategies were explored in the qualitative interviews that would explain the results in depth (O'Cathain, Murphy, & Nicholl, 2007) and provide insights into the phenomenon (Onwuegbuzie & Collins, 2007).

The quantitative component. Sampling for the quantitative survey included a convenience sample (Babbie, 1990) of a minimum of 116 RNs obtained from both day and night shifts. A sample of 30 participants would represent a controversial rule-of-thumb using the ratio of sample size to three predictor variables of 10:1 (Maxwell, 2000), without accounting for effect size. Cohen (1988) posited that a typical study in the behavioral sciences would have a medium effect size value of $f^2 = 0.15$ or $R^2 = .13$. In addition to effect size, two other values complemented the input parameters required for conducting the power analysis in a study – alpha and power.

Cohen (1988) specified the probability of a Type I error or alpha (α) as .05 and the power or the probability of the Type II error (1-β) as .80. In applying Cohen's parameters of alpha = .05 and power = .80, Green (1991) calculated a sample size of 73 for three predictor variables in a new two-step rule-of-thumb, compared to 76 that was based on Cohen's power analysis method. Green based the calculation on the overall multiple R, irrespective of the statistical effects of individual predictors. Table 1 shows the total sample size of 77 (for three predictors) and 103 (seven predictors) computed for multiple regressions, using the G*Power 3.1.7 software program for statistical power analyses (Faul, Erdfelder, Buchner, & Lang, 2009; Faul, Erdfelder, Lang, & Buchner, 2007). These computations referred only to a statistically significant multiple R.

In this study, the power analysis for seven predictor variables (IVs), representing the seven subscales of stressors on the NSS (Gray-Toft & Anderson's (1981) were applied. The G*Power 3.1.7 software program (Faul et al., 2009) computed the total sample size with a linear multiple regression equation for fixed model and R^2 deviation from zero, using a priori given α (.05), power (.80), and medium effect size ($f^2 = 0.15$). The G*Power 3.1.7 (Faul et al., 2009) computed a total sample size of 103 participants for all seven predictors to a statistically significant multiple R. In addition, I took into account the semipartial correlation square of .06 for individual predictor, using the seven predictors of the measurement instrument.

Table 1

*Computed Total Sample Size for Predictor Variables in a Linear Multiple Regression Model, using G*Power 3.1.7 (Faul et al., 2009)*

Input Parameters					Output Parameters				
No of Predictors	Effect size f^2	α error prob	1-β error prob/ Power	Non-centrality Parameter (λ)	Critical F	Numerator df	Denominator df	Total Sample size	Actual Power
3	0.15	0.05	.80	11.55	2.730	3	73	77	.802
5	0.15	0.05	.80	13.80	2.320	5	86	92	.804
7	0.15	0.05	.80	15.45	2.107	7	95	103	.800

If the minimum effect of interest (and practical importance) of a single predictor was a squared semipartial correlation of .06 within an overall 7-predictor model effect of $R^2 = .13$, then a sample size of 116, with alpha = .05 and power = .80 would be required for the quantitative component of the study (C.T. Diebold, personal communication,

November 11, 2013). The amount of psychological stress formed the dependent variable (DV), measured with Lemyre and Tissier's (2003) Psychological Stress Measure (PSM-9). The participants in these two instruments constituted the convenience sample for a realistic data collection, given consideration to time limitation, cost and response rate at a fast-paced critical care unit workplace environment.

The qualitative component. The qualitative part of this study was grounded on the phenomenology paradigm within the Husserlian traditions (Husserl, 1962). In this tradition, reduction and bracketing were applied during interviews in order to minimize bias and reveal a phenomenon (Crotty, 1996; Wimpenny & Gass, 2000). Paley (1997) posited that the Husserlian approach would apply detachment of the researcher to suspend prior assumptions, as opposed to the Heideggerian phenomenology (Heidegger, 1962) that advocated close involvement of the interviewer. Creswell (1998) suggested ten or fewer interviews in a phenomenological research while Morse (1994) proposed six or more than six participants for interview samples. Onwuegbuzie and Leech (2007) pointed out that the goal of qualitative research was expected to interpret theories for local populations. Onwuegbuzie and Leech posited that the researcher (as the instrument) could justify sample sizes based on theory outline within the context of the setting.

Consideration of saturation as a factor in qualitative design would avoid too small samples (to support informational redundancy and theoretical saturation) and too large samples to undertake an in-depth analysis of cases (Sandelowski, 1995). Guest, Bunce, and Johnson (2006) showed that saturation could exist within the first 12 interviews, with metathemes present after half of these interviews. Sandelowski also focused on a

purposeful sampling strategy and the intended goal in qualitative research to determine a sampling size. The qualitative phenomenological interviews in this study would involve twelve participants from a convenience sampling that would be purposeful to achieve an in-depth explanation and analysis of a relationship phenomenon, between stressors and stress in CCNs. The 12 participants were recruited from invitations and written consent extended to all members of the AACN and TNA.

Instrumentation

The demographic data required in this study was minimized and optional to mitigate any breach in confidentiality and intrusion into personal information. Appendix A shows the demographic part of the questionnaires that was applied with the survey.

The quantitative component. Two instruments were applied for quantitative data, namely, the NSS and the PSM-9. The NSS measured the number and type of perceived stressors (predictors, IVs) that nurses experienced at the critical care unit and the PSM-9 measured the amount of perceived psychological stress (Lemyre & Tessier, 2003) or criterion/dependent variable (DV) in critical care nurses (CCNs) at work. The seven predictors measured by the NSS were death/dying; conflict with physician; inadequate preparation; lack of support; conflict with nurses; workload; and uncertainty concerning treatments.

Nursing stress scale. Gray-Toft and Anderson (1981) developed the NSS with 34 nursing situations in the hospital to measure frequency of stressors on a four-point scale of nurses' appraisals. The instrument was normed with nurses, including RNs from a private teaching hospital in the United States. Gray-Toft and Anderson (1981) showed

that, after two weeks readministering the NSS to the same group of nurses, the scale's test-retest coefficient was 0.81, the internal consistency was at a satisfactory level (Spearman-Brown coefficient of 0.79, Guttman split-half coefficient of 0.79, Cronbach's alpha of .89).

Factor analysis of the NSS items showed that, using the quartimax rotation with loadings of 0.30 or higher, seven stressors emerged – one physical, four psychological, and two social. Earlier, Nunnally (1967) showed that loadings smaller than 0.30 represented 10% of the variance. The seven stressors (factors) were Death and Dying (Factor I - psychological) Conflict with Physicians (Factor II - social), Inadequate Preparation to Deal with the Emotional Needs (Factor III - psychological), Lack of Staff Support (Factor IV - psychological), Conflict with other Nurses and Supervisors (Factor V - social), Workload (Factor VI - physical), and Uncertainty Concerning Treatment (Factor VII - psychological).

The seven factors represented the subscales from the addition of the scores from individual nurses on each of the 34 items (components) from each factor. Using quartimax, factor analysis of the correlations among the seven subscales showed a common stress factor (uni-factorial). The test-retest reliability coefficients for Factors I, II, V, & VI exceeded 0.70. Internal consistency reliability was more than .070 for all subscales, except Factors II and IV. Gray-Toft and Anderson posited that a total score obtained from addition of the overall frequency of events causing stress to a nurse from all 34 items would reflect the stress experienced by a nurse; higher scores would translate

to more frequent stress. External validity tests for the NSS showed significant positive correlations of the NSS scores with trait anxiety, state anxiety, and nurse's turnover.

Researchers from previous studies used the instrument as a measure of stress in nurses (Brunero, Cowan, & Fairbrother, 2008; Lambert, Lambert, Petrini, Li, & Zhang, 2007). In critical care nurses, Majd Mrayyan (2009) identified appropriately the use of the NSS to measure job stressors, but not stress. Participants for the NSS were critical care nurses and ward nurses from governmental hospitals, educational hospitals, and private hospitals in Jordan. Mrayyan used modified scores of the original NSS scale of 34 items on a 4-point Likert scale, recording overall Cronbach's alpha of .90 (compared to the original Cronbach's alpha of .89). The original scale provided one of four response scores for each item as follows: never (0), occasionally (1), frequently (2), and very frequently (3). Mrayyan modified the scores from 1 to 4, instead of from 0 to 3. Seven subscales emerged from the NSS instrument, and Mrayyan reported Cronbach's alpha in the study with intensive care (ICU) nurses as follows: death/dying (.83), conflict with physician (.82), inadequate preparation (.84), lack of support (.84), conflict with nurses (.82), workload (.83), and uncertainty concerning treatments (.82).

The original instrument measured the frequency of a stressor that a nurse perceived as stressful, not the amount of stress experienced (Gray-Toft & Anderson, 1981). It is plausible that a mean total score of 1 (occasionally) or above from Gray-Toft and Anderson's scoring would indicate the frequency of a perceived stressor. The NSS could use total mean score of all items from each participant or the total mean score from the subscales from each participant as a measure of the frequency of the existence of

stressful events. Mrayyan's study interpreted a mean score above 2 on the scale to represent the existence of a nursing stressor. In this study, I used the frequency score of 1 (occasionally), 2 (frequently), and 3 (very frequently) of the original instrument scale (1 and above) to indicate the presence of a stressor, either as an item event or as a subscale predictor event.

Psychological stress measure. Lemyre, Tessier, and Fillion (1990) designed the original Psychological Stress Measure (PSM) to quantify the amount of perceived psychological stress in focus groups, using 49 items. Lemyre and Tessier (2003) indicated that the content validity of the PSM derived from examination of the best feelings for stress, testing for constancy in content, and keeping the items that showed the following psychometric parameters: a) inter-item and item-total correlations of between .35 and .85; b) a Cronbach's alpha coefficient of .95 and; c) a normal distribution at the core of the stress construct. The PSM scale was uni-factorial in structure, maintaining a test-retest stability of .68 to .80 in permanent conditions.

Validation of the instrument occurred from group comparisons in different socio-economic levels, during school and out of school periods, as well as from benign and diagnostic biopsies. Lemyre and Tessier (2003) used classic depressive and anxiety scales for the convergence validity and established convergence validity with distinct factorial scores from the scale measurements. Lemyre and Tessier demonstrated concomitant validity by measuring stress related immunoglobulins from the saliva before and after school, as well as before and after vacation periods. The discriminatory power of the

PSM derived from clinical studies in patients with mental illnesses. Physical evaluation of child care workers for months provided the predictive power of the instrument.

Lemyre and Tessier (2003) developed two other versions of the original PSM for use in research. The first was a two parallel 25-item version, for longitudinal follow-up protocols and repeated measurements, having a Cronbach's alpha coefficient of .92 and .93. The second was a much shorter 9-item version (PSM-9), suitable for quantitative research in the workplace at industries, public service, hospitals, community services, and private practice. Each item constituted a factor on the measurement scale. Scoring of the amount of perceived stress with this instrument is on an eight-point Likert scale, from not at all (1 point) through extremely (8 points).

The PSM-9, had similar psychometric qualities of reliability, validity, internal consistency of .89, and normality of distribution as the original PSM (Lemyre & Lalande-Markon, 2009; Lemyre & Tissier, 2003). The content validity emerged from quantitative analysis of the best items that portrayed stress. Internal consistency showed inter-item correlations from 0.35 to 0.85, a Cronbach α coefficient of 0.95 with a normal distribution. Factor analysis of the scale was uni-factorial in structure, showing a test-retest reliability of 0.68-0.80. Lemyre and Tissier established convergence validity using recognized depressive and anxiety scales while concomitant validity with immune competence (salivary immunoglobulin levels) resulted from using a similar design to the one used for the PSM. Similarly, psychiatric patients validated the discriminatory power of the PSM-9. The instrument tested the predictive power in the health indicators of child care workers over eight months.

The qualitative component. Interviews were the data-collection method for the qualitative component of the study. During the interviews, a semi-structured protocol of three open questions was posed to all 12 participants by email, selected conveniently from the CCNs who were members of the AACN and the TNA.

Procedures for Recruitment, Participation, and Data Collection

The quantitative surveys started after the IRB's (Walden) approval for the proposal (Approval Number (01-07-15-0126454). An email was sent to the listservs of the AACN and TNA after obtaining the associations' permission to advertise the study on the websites, attaching an informed consent for participation and clear instruction in the event a participant wished to exit at any stage of the research. The email introduced and presented the research procedure, with a link to the survey on Survey Monkey. Survey questionnaires that were returned completed denoted consent for participation, and interview consents were returned by email with responses.

Taking part in the quantitative portion of the study was not a prerequisite for participating in the qualitative portion. There was no way to find out if any of the participants for the qualitative component also took part in the quantitative, except a participant volunteered to give such information. The recruitment focused on underscoring the beneficial outcome in identifying the key nurse stressors for developing realistic and workable coping strategies. Participants were free to exit the study at any stage of the process (from recruitment to analysis of data), without jeopardizing existing working relationships. All participants were alphanumerically coded and identified as such throughout the study to protect their anonymity.

Data Analysis

Quantitative components. During the analysis of quantitative data, the IBM SPSS Software was used, like PASW GradPack 18 Predictive Analytic Software (SPSS Inc., 2009) or IBM SPSS Statistics 21 (Laureate Education Inc., 2013). In this analysis, the predictors (IVs) were the seven predictor stressors obtained from the NSS (Gray-Toft & Anderson, 1981) data. The amount of perceived stress, the criterion variable (DV, was the amount of perceived psychological stress data from the PSM (Lemyre & Tessier, 2003). Regression computed, using the standard regression model that included all the seven IVs and the DV. The strength of the relationship between the predictors (IVs) and the criterion (DV), *R* (multiple *R*), is squared (R^2) to represented a value for the proportion of variation in DV that could be explained by the IVs; the remaining proportion denoted the covariates or confounding variables. These functions described (George & Mallery, 2010) were all accessible in the PASW GradPack 18 Predictive Analytic Software (SPSS Inc, 2009) and the IBM SPSS Statistics 21 (Laureate Education Inc., 2013).

The research questions and hypotheses were analyzed as follows:

RQ1: What are the types of perceived stressors (IVs) encountered by CCNs?

Ho1: Nurses in critical care do not perceive any kind of stressors as measured by the NSS.

Ha1: Nurses in critical care perceive kinds of stressors as measured by the NSS.

Analysis1: In the study, the perceived stressors were determined through descriptive analysis of the seven subscale stressors, including mean scores obtained from

`the survey of CCNs using the NSS (Gray-Toft & Anderson, 1981). A total mean score of 1 and above suggested the presence of a subscale stressor (predictor/IVs) in the analysis with the SPSS software.

RQ2: What is the amount of stress (DV) perceived by nurses in critical care?

Ho2: Nurses in critical care do not perceive any amount of stress as measured by the PSM-9.

Ha2: Nurses in critical care perceive amounts of stress as measured by the PSM-9.

Analysis2: The mean values of the amount of perceived psychological stress were obtained from the survey of CCNs, using the, PSM-9 (Lemyre & Tessier, 2003). Mean scores from the nine subscales of the instrument indicated the amount of psychological stress perceived by CCNs in the analysis with the SPSS software.

RQ3: What is the strength and direction for the relationship between perceived stressors (IVs) and the amount of perceived stress (DV) in CCNs?

Ho3: There is no relationship between the kinds of stressors (IVs) perceived by CCNs as measured by the NSS and the amount of psychological stress (DV) perceived by CCNs as measured by the PSM-9.

Ha3: There is a relationship between the kinds of stressors (IVs) perceived by CCNs) as measured NSS and the amount of psychological stress (DV) perceived by CCNs as measured by PSM-9.

Analysis3: The strength and direction of the relationship between the predictors (perceived stressors) and the perceived stress (the criterion) were determined, using the regression function of the IBM SPSS Statistics 21 (Laureate Education Inc., 2013).

Qualitative components. The qualitative research questions were as follows**:**

RQ4. How do you, as a critical care nurse, see yourself as experiencing stress differently from other nurses in this hospital?

RQ5. How is your health affected differently by stress when compared to other nurses who do not work in critical care?

RQ6. How do you cope with stress and what would you teach a new nurse about the stress level in critical care?

Analyses of qualitative data would fall within Husserl's phenomenological paradigm of epistemology (mode of awareness) and descriptive in narrative analysis, as a method that could provide meaning for the lived experiences (Sandelowski, 1994) of the CCNs expressed during the interviews. Such analysis of data was based on a paradigm of phenomenology of coping with stress by the participants at the workplace. The main instrument for data collection was the email interviews. Analysis of the interviews would be done in groups of a couple or so at a time before progressing to the next group, not a comparison of all 12 interviews together. Interview transcripts would be categorized for emerging themes before drawing conclusions.

Analysis of the data from the interview transcripts would be utilized to explain the perceived relationship between stressors and stress, with the moderating coping strategies used or suggested by participants. I used alphanumeric coding of data to secure

confidentiality and personal identity of participants in the interviews. Results of analysis of the qualitative data would contribute to the in depth explanation of relationships obtained from the quantitative analysis and recommendations for policy and operational change that would mitigate stress among in CCNs. Full responses to the email interviews were returned by only three CCN participants during the IRB-approved simultaneous data collection period of six weeks. Therefore, the qualitative samples did not reach saturation and the analysis as described above were abandoned. Subsequently, theintegration of both the quantitative and qualitative data was not done in the analysis.

Threats to Validity

One major issue on the outcome of a study was the question of how validly the reported results could be generalized in real life to the health care industry at large. Such validity depended on the design, the sampling, the instrumentation, data analysis, and conclusions drawn from the overall study. In a mixed methods design, both the quantitative and qualitative components should demonstrate a high level of validity peculiar to each method.

Quantitative Method

Two of the potential threats to the validity of this survey were drop outs or mortality and instrumentation (Creswell, 2009). First, participants drop outs would result in threats to internal validity either through a smaller number of returned sample size or uncompleted survey questionnaires, leaving gaps during analysis of data. Due to this possibility, more participants than the minimum sample size were recruited to minimize attrition. Sampling continued until at least 116 participants returned the completed survey

questionnaires. Second, the tools for measuring the variables that were used to test the hypothesis showed, in addition to reliability (test-retest reliability, factorial analysis), both internal and external validity (Creswell, 2009). Internal validity comes from content validity and internal consistency (inter-item and item-total correlations). External validity relates to comparison of different opposite groups in the society, convergence and divergence validity, concomitant validity, discriminatory power, and predictive power. The authors of both instruments applied in the quantitative component of the study – the NSS and the PSM-9 – had validated them accordingly.

Qualitative Method

Qualitative validity in this study refers to checking the accuracy of the (interview) findings with specific procedures while qualitative reliability means that there is consistency in the qualitative approach across different studies (Gibbs, 2007). In this study, the accuracy of the transcripts were checked with the email responses. The final edits formed the basis for transcripts that could be cross-checked independently. Creswell and Miller (2000) posited that accuracy of the findings in qualitative research may also be determined from the viewpoint of the researcher, the participant, or the readers in trustworthiness, authenticity, and credibility.

Creswell (2009) recommended triangulation, debriefing of participants, and avoidance of bias. In this study, the sample saturation of 10-14 interviewees would ensure triangulation of data sources to justify the themes that would result from data analysis. A follow up email interview with individual participants could be arranged to give the feedback of results from the interview and provide an opportunity for any

comments on the findings. The issue of bias was addressed by sticking to my role as the primary data collector and researcher and setting aside my opinions, experiences, and observations in the collecting data. My personal background and experience working in critical care would be invaluable for interpreting the findings of the study (Creswell, 2009).

Issues of Trustworthiness

Ethical Procedures

This proposal was submitted to the Walden IRB for formal institutional ethical approval of the methodology in the research design. The approval document (Walden University Number 01-07-15-0126454) was presented to the AACN and TNA. Digital data were stored as anonymous in personal computers and flash drives, encrypted and protected with password for access for five years. After this storage period, research data would be destroyed or deleted from the system. Dissemination of study outcome would occur through dissertation, professional conference presentations, scientific publications, books, and direct feedback to the participant groups – the CCNs. The credibility, transferability, and dependability were as detailed above under threats to validity and further discussed in Chapter 5. Appendix E shows my compliance with the certification for completion of the NIH web-based training course "Protecting Human Research Participants" (Certificate Number 1510955 dated 7/29/2014).

Summary

This chapter described the purpose of a mixed method research design for workplace stress in CCNs. The setting consists of two professional nurse associations, the

AACN and the TNA. The design consisted of a mixed method of both quantitative and qualitative approaches to establish a relationship between perceived stressors (IVs) and perceived stress (DV) by critical care nurses, using validated instruments to measure the frequency and type of perceived stressors (using the NSS). The PSM-9 measured the amount of perceived psychological stress in individual nurses.

In the quantitative component of the study, a multiple regression analysis program predicted a significant effect relationship between the perceived stressors (as predictors - IVs) with the amount of perceived psychological stress (as the criterion variable -DV) in CCNs. The qualitative component of the study utilized the interview method to develop an in-depth phenomenon of the relationship between the three critical care stressors and stress levels in critical care nurses. Coping strategies that would help to mitigate stress in critical care nurses could emerge from such interviews. The final results from data collection and analysis are reported in Chapter 4.

Chapter 4: Results

I examined psychological stress in critical care nurses (CCNs) using quantitative and qualitative data collection methods. Only the quantitative data were analyzed due to inadequate samples for saturation in the qualitative analysis. The research questions and hypotheses for analyses of the quantitative data were as follows:

Quantitative Research Questions

RQ1: What are the kinds of perceived stressors (IVs) encountered by CCNs? The perceived stressors were measured with the NSS.

RQ2: What is the amount of psychological stress (DV) perceived by nurses in critical care? The PSM-9 was used to determine the amount of psychological stress.

RQ3: What is the strength and direction of the relationship between perceived stressors (IVs) and the amount of perceived stress (DV) in CCNs? The strength and direction of the relationship between the perceived stressors and the perceived stress was determined, using the regression function of the IBM SPSS Statistics 21 (Laureate Education Inc., 2013) for statistical analysis.

Quantitative Hypotheses

Ho1: Nurses in critical care do not perceive any type of stressors as measured by the NSS.

Ha1: Nurses in critical care perceive types of stressors as measured by the NSS.

Ho2: Nurses in critical care do not perceive any amount of stress as measured by the PSM-9.

Ha2: Nurses in critical care perceive amounts of stress as measured by the PSM-9.

Ho3: There is no relationship between the types of stressors (IVs) perceived by CCNs as measured by the NSS and the amount of psychological stress (DV) perceived by CCNs as measured by PSM-9.

Ha3: There is a relationship between the types of stressors (IVs) perceived by CCNs as measured by the NSS and the amount of psychological stress (DV) perceived by CCNs as measured by PSM-9.

In this chapter, I describe the setting for the study including the demographics of the participants. I report results from analyses of quantitative data, followed by a description of assumption testing for the trustworthiness of data analysis. I conclude with a summary of the answers to the research questions.

Setting

A change in procedure was required for the setting as approved by the IRB (Appendix D). The setting changed from a hospital-based setting of one representative state critical care unit to an online setting of one national and one state-wide critical care nurses' association. The change increased the final sample size the final sample size (N = 400) to more than triple the minimum sample size calculated (N = 116) for the online questionnaires. However, participants in the qualitative online interview may have been limited by the duration of sample collection. Participants needed reminders to reassure them of the confidentiality of their responses and alleviate any fear of releasing personal information to management at the workplace.

Data Collection

The quantitative instruments used for data collection were already established. These were the Nursing Stress Scale (Gray-Toft and Anderson, 1981) and the Psychological Stress Measure (Lemyre & Lalande-Markon, 2009; Lemyre & Tessier, 2003). Both instruments were applied as online survey questionnaires without modifications to the questions, scores, and interpretation, after obtaining copyright licenses. Data collection lasted 6 weeks as planned and approved by the Institutional Review Board (IRB). The American Association for Critical-Care Nurses (AACN) and the Tennessee Nurses Association (TNA) distributed the questionnaires on their listservs via a link to Survey Monkey, and the participants' responses were recorded on the survey link to which I had subscribed.

Study Findings

Preliminary Statistics

A total of 449 participants responded to the quantitative questionnaires. The frequency distributions for each of the demographic variables were calculated using SPSS. Any errors suspected from the frequencies, including out of range responses, were checked on the data file and rectified, after referring to the original Survey Monkey responses. Data were screened for excessive missing cases corresponding to participants who did not respond to the demographic questionnaire section containing the inclusion criteria or the Registered Nurse (RN) licensure. Forty-eight cases were found missing and deleted, leaving a total of 401 cases in the data file. The remaining 401 cases were verified with the original Survey Monkey responses, and values were checked to ensure

they fell within the minimum and maximum range of possible values recorded for the variables (22-69 for Age in Years, 1-5 for Marital Status, 1-8 for Heritage, 1-4 for Nursing Licensure, 1-4 for Critical Care Certification, 1-8 for Educational Attainment, 1-6 for Work Shifts, and 0-47 for Experience Working at Critical Care Nursing in Years). I discovered at this stage that responses were not recorded for all participants on one item of the demographics (Gender), an error traced back to the Survey Monkey showed no record. The questionnaires had been entered as planned and approved; however, the gender variable was problematic for all participants because the Survey Monkey showed no record of the gender variable. Regrettably, it was not possible at this completion stage of data collection to know whether the omission was due to technical or human error. Tables 2 and 3 show the frequencies and percentages for the remaining participant demographic variables obtained from the original Survey Monkey responses.

Descriptive statistics were calculated using IBM SSPS with the continuous variables (Experience Working at Critical Care Nursing, Age) for value range, mode, mean, and standard deviation. There were no errors detected. Table 2 shows the range for age in Years while Table 3 shows the range for Experience Working at Critical Care in Years. Normality plots with tests on the continuous and dependent variable (total score of Psychological Stress Measure, PSM-9) showed one outlier with a low score on the histogram and box plot. Pallant (2013) defined points as outliers on IBM SPSS when located at more than 1.5 box-lengths above or below the edge of the box plot. Extreme points would extend more than three box lengths from the edge of the box (Pallant, 2013). Tabachnick and Fidell (2012) suggested that outliers, when present, may distort

statistics, leading to Type I and Type II errors. Subsequently, the low score outlier case was deleted from the data file and the remaining 400 cases were retained for the further analyses (Pallant, 2013).

Table 2

Frequencies and Percentages for Personal Demographic Variables in Participants

Characteristics	*n*	%	Cumulative %
Age in years			
Subtotal	*374*	*93.5*	*93.5*
Missing	26	6.5	100.0
Total (N)	400	100.0	
Range = 47 (22-69)			
Marital Status			
Married or Partner or Cohabiting	271	69.0	69.0
Unmarried or No partner or Single	111	28.5	97.5
Divorced	6	1.5	99.0
Widow	3	.8	99.7
Separated	1	.3	100.0
Subtotal	*392*	*98.0*	*98.0*
Missing	8	2.0	100.0
Total (N)	400	100.0	
Heritage			
American Indian or Alaska Native	4	1.0	1.0
Asian (Chinese, Japanese, Indian, Filipino)	15	3.9	4.9
Black (African, African American, Caribbean Islander)	12	3.1	8.3
Hispanic or Latino	14	3.6	11.9
White European	323	83.7	95.3
Mixed (African-Indian Caribbean Islander, Middle Eastern White European, Roma, Non-Hispanic White Filipino, More than three Ethnic non-Hispanic	9	2.3	97.7
Other (Caucasian, Caucasian White, Roma, Not Hispanic)	9	2.3	100.0
Subtotal	*386*	*96.5*	*96.5*
Missing	14	3.5	100.0
Total (N)	400	100.0	

Note: "Subtotal" represents participants who answer the variable question and "Missing" represents participants who do not answer the variable questionnaire.

Table 3
Frequencies and Percentages for Work and Education Demographic Variables in Participants

Characteristics	*n*	%	Cumulative %
Nursing Licensure			
RN only	391	97.8	97.8
RN with ARNP	7	1.8	99.5
RN with APRN	1	.3	99.8
Combined RN with ARNP with APRN or Other	1	.3	100.0
Missing	0	0	100.0
Total (N)	400	100.0	
Critical Care Certification			
CCRN	172	75.8	75.8
PCCN	16	7.0	82.8
Other (RN-BC, CNRN, SCRN, CMSRN, TNCC, SC, CMC, CPN)	37	16.3	99.1
Combined (CCRN with PCCN or Other)	2	.9	100.0
Subtotal	*227*	*56.8*	*56.8*
Missing	173	43.3	100.0
Total (N)	400	100.0	
Educational Attainment			
Some professional school (or postsecondary) diploma	6	1.5	1.5
Associate degree	55	13.8	15.3
Bachelor degree	262	65.7	81.0
Master degree	74	18.5	99.5
Doctoral degree	2	.5	100.0
Subtotal	*399*	*99.8*	*99.8*
Missing	1	.3	100.0
Total (N)	400	100.0	
Work Shifts			
Day 12hr	197	49.5	49.5
Night 12hr	137	34.4	83.9
Day less than 12hr	5	1.3	85.2
Night less than 12hr	3	.8	85.9
Mixed Day 12hr with Night 12hr	53	13.3	99.2
Mixed Day less than 12hr with Night less than 12hr	3	.8	100.0
Subtotal	*398*	*99.5*	*99.5*
Missing	2	.5	100.0
Total (N)	400	100.00	
Experience Working at Critical Care Nursing in years			
Subtotal	*338*	*84.5*	*84.5*
Missing	62	15.5	100.0
Total (N)	400	100.0	
Range = 47 (0-47)			

Note: "*Subtotal*" represents participants who answer the variable question and "Missing" represents participants who do not answer the variable questionnaire.

Assumption Testing

Multiple regression analyses involved assumptions about the sample data including sample size, multicollinearity, outliers, normality, linearity, homoscedasticity, and independence of residuals (Pallant, 2013). Pallant noted that a sample size that is large enough will ensure generalizability and make results obtained repeatable. The power analysis size computed with the G*Power 3.1 (Faul et al., 2009) for the study was 103. In addition, after accounting for the squared semi-partial correlation effect of .06 in each of the seven independent variables, I calculated a minimum sample size of 116 (C.T. Diebold, personal communication, November 11, 2013). The study analysis was based on a sample size of 400, 284 in excess of the 116 indicated from power analysis.

Pallant (2013) referred to multicollinearity as a high correlation (r = .9 and above) between the dependent variable (DV) and the seven independent variables (IVs). In this study, the PSM-9 total scores (DV) correlated with the NSS subscale total scores (IVs) between .3 and .5; therefore, the multicollinearity assumption was not violated. In addition, Pallant (2013) noted that the cut-off for determining multicollinearity using the collinearity statistics is a tolerance value of less than .10 or a variance inflation factor (VIF) value of more than 10. The collinearity coefficients calculated with the variables in this study were tolerance values ranging from .5 to .7 and variance inflation factors (VIF) ranging from 1.5 to 2.2, confirming lack of multicollinearity.

Two outliers were displayed on the normality box plot of the independent variables, but the scores were not extremely high and therefore did not warrant deletion. Further identification of outliers was done for the dependent variable by using the

standardized residual plot on the standard multiple regression program (Pallant, 2013). Outliers were defined by Tabachnick and Fidell (2013) to have standardized residual values higher than 3.3 or less than -3.3. One dependent variable had a standardized residual value of -3.6. However, the case was retained in the data file because the value was not too different from the lower limit (-3.3) in the range of distribution. This case is also justified for retention because of a maximum Cook's Distance value of .04 calculated in the residuals statistics. Tabachnick and Fidell (2013) set a maximum Cook's Distance value of larger than 1 as potentially problematic. The normal probability plot (P-P) of the regression standardized residual and the scatterplot showed no major deviations from normality. Figure 2 shows the straight line relationship of the residuals with the predicted DV scores (linearity) while Figure 3 shows no major deviations from a centralized rectangle that would suggest violation of the assumptions (Pallant, 2013).

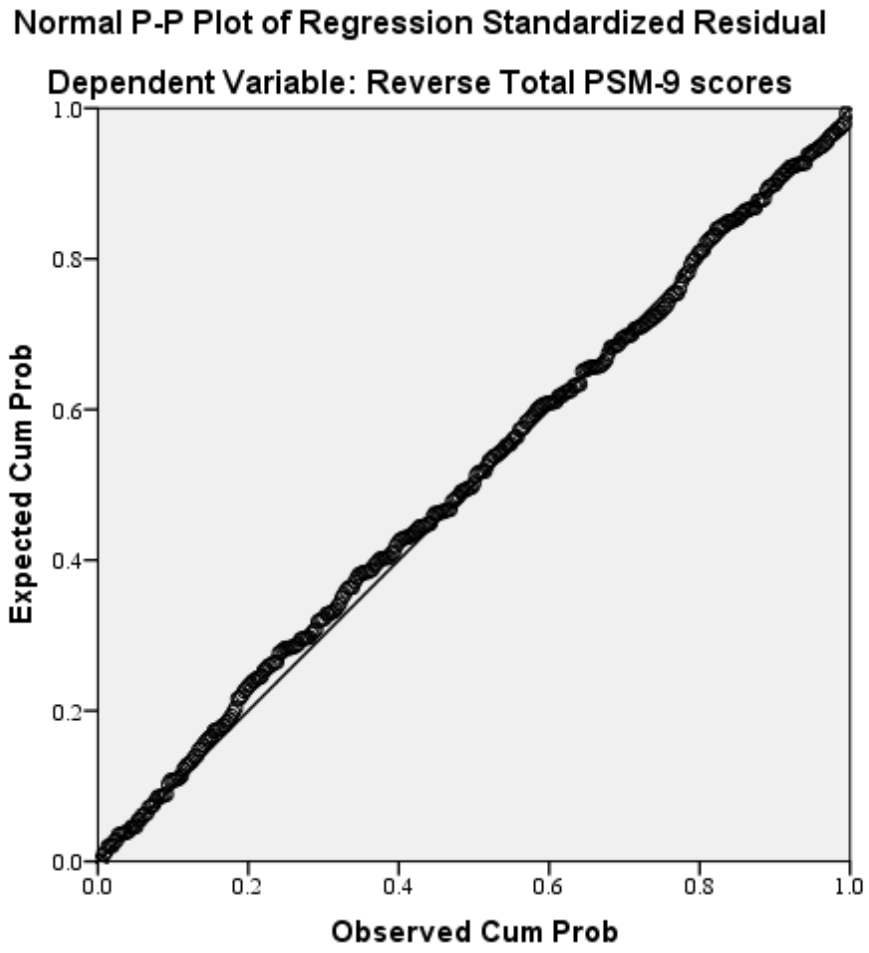

Figure 2. The normal P-P plot of regression standardized residual of total stress level scores.

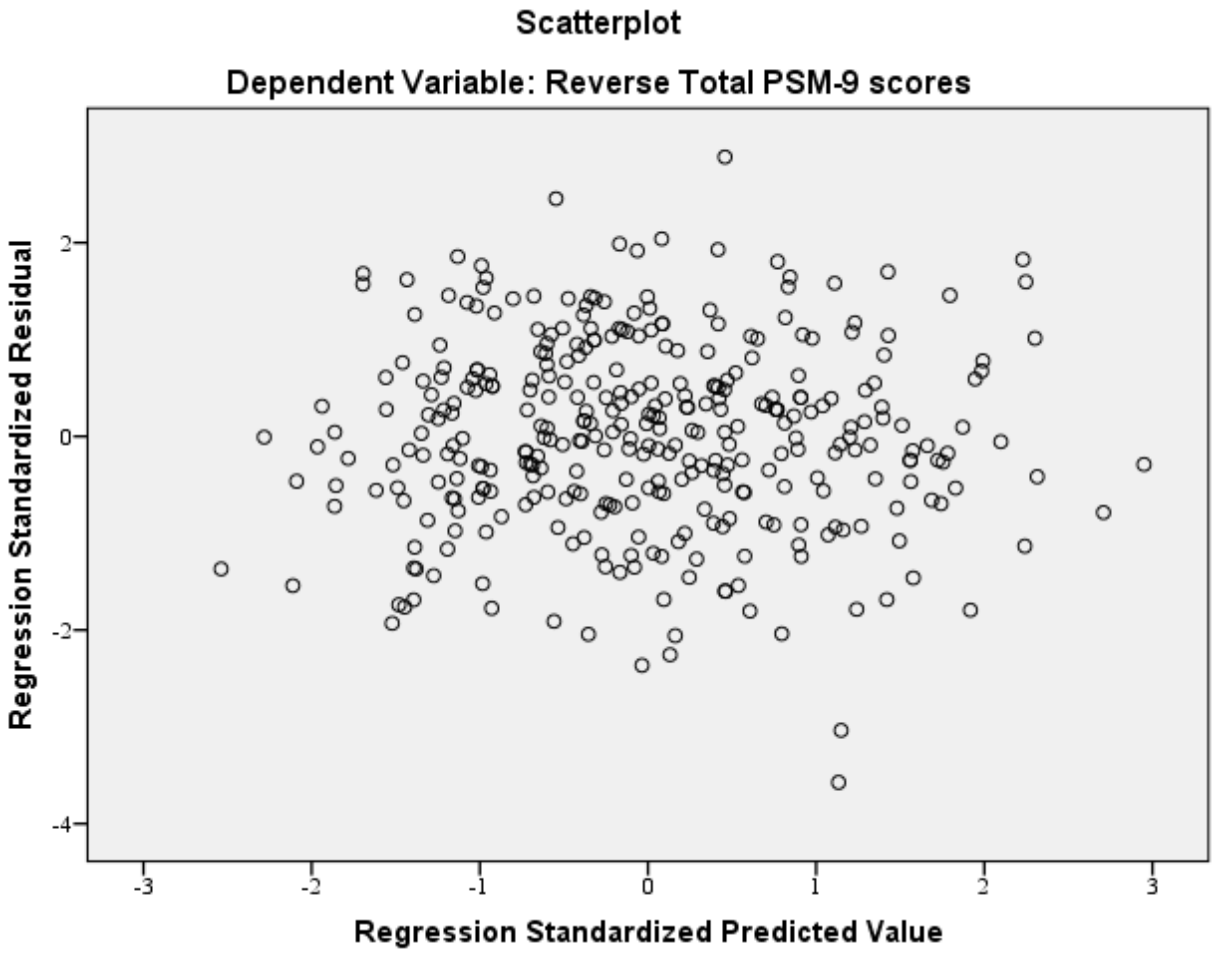

Figure 3. The residuals scatterplot for assumption testing.

Reliability Tests on the Psychological Stress Measure (PSM-9) and the Nursing Stress Scale (NSS)

The reliability scores for the two scales used in this study (PSM-9, NSS) were tested for internal consistency by using Cronbach's alpha coefficient as an indicator. DeVellis (2012) suggests higher than .7 as the ideal coefficient of a scale. The Cronbach's alpha coefficient calculated for the *NSS* was .92, identical with .92 reported by the instrument authors (Gray-Toft & Anderson, 1981). In regard to the PSM-9, two

negatively worded items on the scale were reversed to avoid very low coefficient values (Pallant, 2013). Subsequently, a calculated Cronbach's alpha coefficient of .90 was obtained for the PSM-9 in this study, comparable with .92 reported by the instrument authors (Lemyre & Tissier, 2003).

Main Analysis

The three research questions were assessed together with the standard multiple regression to determine the strength and direction of the relationship between the seven predictor variables (independent variables, IVs) and the criterion variable (dependent variable, DV). The IVs are Death and Dying, Conflict with Physicians, Inadequate Preparation, Lack of Support, Conflict with other Nurses, Workload, and Uncertainty concerning Treatment scores.

Research Question 1

RQ1: What are the types of perceived stressors (IVs) encountered by critical care nurses?

Ho1: Nurses in critical care do not perceive any kind of stressors as measured by the Nursing Stress Scale (NSS).

Ha1: Nurses in critical care perceive kinds of stressors as measured by the NSS.

The findings from the multiple regression analysis show four types of stressors (IVs) measured by the NSS, perceived to be significantly related to psychological stress levels (DV) in critical care nurses at the workplace. These stressors are Workload, Death and Dying, Conflict with other Nurses, and Lack of Support. The stress levels were measured by the Psychological Stress Measure (PSM-9). Therefore, the null hypothesis

that nurses in critical care do not perceive any kind of stressors as measured by NSS is rejected in favor of the alternative hypothesis. The summary Table 3 shows the level of significance of the stressors (IVs) in the model designed for this study.

Table 4

Multiple Linear Regression with Workload, Death and Dying, Conflict with other Nurses, Lack of Support, and other IVs predicting the Amount of Psychological Stress in Critical Care Nurses

Variable (IV, Stressor)	B	*SE*	β	t	*ρ*	sr^2
Workload	.691	.155	.242	4.461	.0005*	.059
Death and Dying	.526	.168	.173	3.137	.0020*	.030
Conflict with other Nurses	.664	.211	.174	3.149	.0020*	.030
Lack of Support	.500	.237	.116	2.108	.0360*	.013
Uncertainty concerning Treatment	-.494	.259	-.123	-1.909	.0570	-.015
Conflict with Physicians	.439	.256	.108	1.715	.0870	.012
Inadequate Preparation	.384	.307	.065	1.252	.2110	.004

Note. * Statistically significant levels of standardized coefficients at 95.0% (ρ <.05) confidence interval for beta (β)
sr^2 = squared semi-partial correlation coefficient

Workload is the stressor that makes the most significant unique contribution to explaining psychological stress in critical care nurses at the workplace, with the largest beta coefficient of .24, a high level of significance $\rho < .0005$, and $sr^2 = .059$ (5.9%). The stressor with the least significant contribution to psychological stress in critical care nurses at the workplace is Inadequate Preparation with a beta coefficient of .07, contributing less than 1%.

Research Question 2

RQ2: What is the amount of stress (DV) perceived by nurses in critical care?

Ho2: Nurses in critical care do not perceive any amount of stress as measured by the PSM-9.

Ha2: Nurses in critical care perceive amounts of stress as measured by the PSM-9.

Results from the descriptive statistics of the standard multiple regression analysis show that stress levels range from a minimum score of 9 to a maximum score of 72 with the mean of 41.84, SD = 10.89. Therefore, the null hypothesis is rejected in favor of the alternative hypothesis.

Research Question 3

RQ3: What is the strength and direction for the relationship between perceived stressors (IVs) and the amount of perceived stress (DV) in CCNs?

Ho3: There is no relationship between the kinds of stressors (IVs) perceived by CCNs as measured by the NSS and the amount of psychological stress (DV) perceived by CCNs as measured by the PSM-9.

Ha3: There is a relationship between the kinds of stressors (IVs) perceived by CCNs) as measured by NSS and the amount of psychological stress (DV) perceived by CCNs as measured by PSM-9.

Analysis of the relationship between the kinds of stressors perceived by CCNs as measured by NSS and the amount of psychological stress perceived by CCNs as measured by PSM-9 show a strong positive relationship. The overall result from the multiple linear regression was significant, $F(7, 368) = 23.31$, $\rho < .0005$, $R^2 = .31$. Thirty-one percent of the amount of variance in the perceived psychological stress (DV) in critical care nurses at the

workplace is explained by this model that includes all the seven stressors (IVs). Therefore, the null hypothesis is rejected in favor of the alternative hypothesis.

Summary

In this chapter, I used multiple regression analyses on data from seven independent stressor variables to predict one dependent psychological stress variable on critical care nurses at the workplace. The seven independent variables included Death and Dying, Conflict with Physicians, Inadequate Preparation, Lack of Support, Conflict with other Nurses, Workload, and Uncertainty concerning Treatment. Four hundred and forty-nine critical care nurses responded to the questionnaires and the data was cleaned and screened for final analysis, using four hundred participants. Hypothesis testing showed four out of the seven stressors were significant to the model, including Workload, Death and Dying, Conflict with other Nurses, and Lack of Support. Workload was the most significant, with Death and Dying and Conflict with other Nurses as joint second most significant. Chapter 5 will discuss the summary with interpretation of these findings, including the implications for social change and recommendations for future studies.

Chapter 5: Discussion, Conclusions, and Recommendations

The purpose of this study was to examine the relationship between the stressors and psychological stress perceived by critical care nurses, and to identify significant stressors in the workplace that need to be reduced or eliminated for mitigating workplace stress. The quantitative part of the study included three research questions and hypotheses:

Quantitative Research Questions

RQ1: What are the kinds of perceived stressors (IVs) encountered by CCNs? The perceived stressors were measured with the NSS.

RQ2: What is the amount of psychological stress (DV) perceived by nurses in critical care? The PSM-9 was used to determine the amount of psychological stress.

RQ3: What is the strength and direction of the relationship between perceived stressors (IVs) and the amount of perceived stress (DV) in CCNs? The strength and direction of the relationship between the perceived stressors and the perceived stress was determined, using the regression function of the IBM SPSS Statistics 21 (Laureate Education Inc., 2013) for statistical analysis.

Quantitative Hypotheses

Ho1: Nurses in critical care do not perceive any type of stressors as measured by the NSS.

Ha1: Nurses in critical care perceive types of stressors as measured by the NSS.

Ho2: Nurses in critical care do not perceive any amount of stress as measured by the PSM-9.

Ha2: Nurses in critical care perceive amounts of stress as measured by the PSM-9.

Ho3: There is no relationship between the types of stressors (IVs) perceived by CCNs as measured by the NSS and the amount of psychological stress (DV) perceived by CCNs as measured by PSM-9.

Ha3: There is a relationship between the types of stressors (IVs) perceived by CCNs as measured by the NSS and the amount of psychological stress (DV) perceived by CCNs as measured by PSM-9.

The qualitative part of the study included three other research questions:

Qualitative Research Questions

RQ4: How do you, as a critical care nurse, see yourself as experiencing stress differently from other nurses in this hospital?

RQ5: How is your health affected differently by stress when compared to other nurses who do not work in critical care?

RQ6: How do you cope with stress and what would you teach a new nurse about the stress level in critical care?

However, the qualitative data were not included in the final analysis due to an inadequate number of participants for saturation. Previous studies addressed the stressors and stress of nurses in general (Bailey, 1980; Brunero et al., 2008; Colligan & Higgins, 2005; Gray-Toft & Anderson, 1981; Lambert et al., 2007; Lemyre & Tessier, 2003; McGrath et al., 2003) and in critical care nurses in particular (Bailey et al., 1980; Moola et al., 2008; Mrayyan, 2009). Bailey et al. (1980) applied the stress audit, a research strategy including questionnaire survey, to elicit intensive care nurses' perceptions of

stressful events in the workplace. The types and nature of the stressors were not quantifiable for correlation with amounts of stress perceived. Subsequently, Gray-Toft and Anderson (1981) developed and established the Nursing Stress Scale (NSS) for quantifying, on a Likert scale, the frequency of perceived stressors in nurses in the workplace. Lambert et al. (2007) and Mrayyan (2009) applied the NSS in modified forms to determine the frequency of workplace stressors of intensive care unit nurses.

Lemyre and Tessier (2003) developed the Psychological Stress Measure (PSM) to assess the amount of stress in social settings, including research at health care workplaces. Most of the relevant literature on stressors and stress so far either addressed differences in the sources of stressors by comparing settings in nursing care (Bailey et al., 1980; Mrayyan, 2009) or the most common stressors in nurses in general (Lambert et al., 2007; Brunero et al., 2008; Opie et al., 2011). Some researchers explored coping strategies (Bailey, 1980; Moola et al, 2008) and related the stressors to coping strategies, health (Lambert et al, 2007), and social support behaviors (Moola et al., 2008; Mrayyan, 2009). Other researchers reviewed the literature for nurses' perceptions of workplace stress with strategies in place to reduce stress (McVicar, 2003), and described the negative effect of workplace stressors on the health of workers (Colligan & Higgins, 2005; Lambert et al, 2007; McGrath et al, 2003). Brunero et al. (2008) examined the use of cognitive behavioral therapy to reduce the effect of perceived stressors on critical care nurses. A paucity of research existed on stress measurement and the relationship between perceived stressors and the amount of stress experienced by nurses in general and tical care nurses in particular. This study addressed gaps in the literature through examination

of the relationship between frequencies of perceived stressors at the hospital workplace and the amount of psychological stress perceived by critical care nurses.

The findings showed that after screening participants' responses for excessive missing data and assessing for outliers, 400 participants were included in the data analysis. Demographic data from these participants showed that the mean age of the critical care nurses was 42 years (*SD* = 12; Range = 22-69) with a majority (323, 84%) White European, and married (271, 69%). All participants were licensed registered nurses (RNs) including nine (2%) with the advanced nurse practitioner license. More than four fifths (348, 86%) of the critical care nurses (CCNs) had attained a bachelor's degree, including 74 (19%) with an additional master's degree and two (1%) having a doctorate. More than half of the participants were certified in critical care (227, 57%). The average level of experience in the critical care workplace was 12 years (*SD* = 12; Range 0-47). Hypothesis testing using a multiple regression model showed that Workload was the most common and most significant stressor followed by Death and Dying and Conflict with other Nurses. In the third place was Lack of Support.

Interpretation of the Findings

The study was not similar in design, setting, and methods to previous peer-reviewed studies. However, the findings in the characteristics of participant critical care nurses showed that the average age of nurses working in critical care units was higher than an earlier stress study on critical care nurses in the United States. Bailey et al. (1980) found that most of the nurses were younger and single in contrast to the participants in this study who were older and married. In addition, critical care nurses in this study had

more experience working in critical care. The role of age and experience in stress perception was unclear. It appeared that older and more experienced nurses could perceive stressors and stress more than younger nurses. Lambert et al. (2007) found a positive correlation between workload and demographics of age and years of experience. The explanation given was that the older the age of the nurse, the more likely the nurse perceived an increase in workload. Lambert et al. also argued that as the nurse became more experienced, she or he was given more responsibilities that increased work demands. The levels of education and certification of the critical care nurses in this study were notable compared to those reported in previous studies. Bailey et al. reported 40% had a bachelor's degree, while 86% had a bachelor's in this study, and some had graduate degrees. There is no comparable level of critical care certification in previous research of CCNs in the United States. The increase in level of education would have improved the nurses' competence, experience in critical care, and possibly confidence in their nursing roles.

Types of Perceived Stressors as Predictors of Psychological Stress

Workload. I found that Workload was the most significant predictor of psychological stress, which was consistent with previous studies that indicated that nurses perceived workload as the most stressful factor in the workplace. Studies with which direct comparison could be made using the same instrument to measure the frequency of workplace stressors support this finding (Chang et al., 2006; Lambert et al., 2007). Bailey et al. (1980), who used another instrument (Stress Audit), reported the factors that caused critical care nurses the most stress were Conflict with other Health

Care Providers, Inadequate Staffing Patterns, Lack of Support in Dealing with Death and Dying, Inadequate Workspace and other Inefficient Factors in the Physical Work Environment, and Unresponsive Nursing Leadership. In the NSS instrument, Workload comprised six items (Breakdown of Computer, Unpredictable Staffing and Scheduling, Too Many Non-Nursing Tasks Required such as Clerical Work, Not Enough Time to Provide Emotional Support to a Patient, Not Enough Time to Complete All of My Nursing Tasks, and Not Enough Staff to Adequately Cover the Unit) that might be similar to Bailey et al.'s study. According to Bailey et al., Workload might also include issues like patient's acuity including care needs for determining a patient-nurse ratio. These were implicit in the items and scores of the NSS instrument of stressor measurement. A desirable ratio implied that at least one nurse was available for each unit room of two patients.

Death and conflict. After Workload, Death and Dying and Conflict with other Nurses were the next most frequently encountered stressors by critical care nurses. Death and Dying as a factor consisted of seven stressors as its components (Performing Procedures that Patients Experience as Painful, Feeling Helpless in the Case of a Patient, who Fails to Improve, Listening or Talking to a Patient about His/Her Approaching Death, The Death of a Patient, The Death of a Patient with whom You Developed a Close Relationship, Physician not being Present when Patient Dies, and Watching a Patient Suffer). Conflict with other Nurses comprised five stressors (Conflict with a Supervisor, Floating to other Units that are Short-staffed, Difficulty in Working with a Particular Nurse or Nurses outside the Unit, Criticism by a Supervisor, and Difficulty in Working

with a Particular Nurse or Nurses on the Unit). It was significant that the NSS stressor items in Workload, Death and Dying, and Conflict with other Nurses were similar to the stressors reported more than three decades ago using the Stress Audit (Bailey et al., 1980). The results from Mrayyan's (2009) research on intensive care units with the NSS also supported this finding. These three stressors in the NSS that were highly significant in this study were also found to be significant in Mrayyan's study.

Support. Also significant was the perceived stressor of Lack of Support, consisting of three stressors (Lack of an Opportunity to Talk Openly with other Unit Personnel about Problems on the Unit, Lack of an Opportunity to Share Experiences and Feelings with other Personnel on the Unit, and Lack of an Opportunity to Express to other Personnel on the Unit my Negative Feelings toward Patients). The finding was consistent with Mrayyan's (2009) study that social support was occasionally provided to ICU nurses suggesting that more work needed to be done in this area to reduce stress in critical care nurses.

Other three stressor categories. The finding that the remaining three stressor categories did not significantly predict stress in critical care nurses was encouraging. These stressors, ranked in decreasing order of significance, included Uncertainty concerning Treatment (Inadequate Information from a Physician regarding the Medical Condition of a Patient, A Physician Ordering What Appears to be Inappropriate for a Patient, A Physician not being Present in a Medical Emergency, Not Knowing what a Patient or a Patient's Family Ought to be Told about the Patient's Condition and its Treatment, and Uncertainty regarding the Operation and Functioning of Specialized

Equipment). Next was Conflict with Physicians (Criticism by a Physician, Conflict with a Physician, Fear of Making a Mistake in Treating a Patient, Disagreement concerning the Treatment of a Patient, and Making a Decision concerning a Patient when the Physician is Unavailable). Next was Inadequate Preparation (Feeling inadequately prepared to Help with Emotional Needs of a Patient's Family, Being Asked a Question by a Patient for which I do not Have a Satisfactory Answer, and Feeling Inadequately Prepared to Help with the Emotional Needs of a Patient). The nonsignificance of the stressor category of Uncertainty concerning Treatment was borderline, approaching significance. This stressor group was ranked one of the factors that caused ICU nurses the most stress by Bailey et al. (1980) and Mrayyan (2009). Efforts directed at improving communication and transparency between the nurse and the physician before communication with patients might continue to make Uncertainty concerning Treatment less important as a predictor of stress in critical care nurses. Improvement in the educational attainment and increased certification in critical care nursing, as found in this study, might explain the reason for the near elimination of Inadequate Preparation as a predictor of stress and the reduction of Conflict with Physicians to a level not significant a predictor of stress in critical care nurses. Higher educational attainment and certification would provide nurses more training on information and skills to be confident and comfortable with less stress in critical nursing. Better understanding would arise from communication at the same specialty level between critical care nurses and physicians. A better understanding would lead to less disagreement and conflict as well as being well prepared to cope with the needs of the patient and family.

Perceived stressors in the context of the concept of stress. The four significant stressors (Workload, Death and Dying, Conflict with other Nurses, and Lack of Support) in the study findings supported the first element in the concept of stress that identified the existence of an external environment as the stressor (Selye, 1973), acting on the individual to initiate the stress reaction. Findings supported the second element of the cognitive theory (Lazarus, 1966; Lazarus & Folkman, 1984) by which the individual (the critical care nurse) appraised the external environment and perceived it as a stressor. In this study the critical care nurses perceived these four stressors as the most significant stressors contributing to the amounts of psychological stress perceived at the workplace.

Amount of Stress Perceived by Critical Care Nurses

The findings showed the total amounts of psychological stress perceived by individual critical care nurse participants as well as the mean total of psychological stress perceived by all CCNs in the sample. These amounts of stress were significant enough for the third element of the stress concept that described an internal phenomenon of allostasis (Sterling & Eyer, 1988), measurable as the levels of stress or allostatic load in the individual. Chrousos and Gold (1992) described this stress response (Lazarus & Folkman, 1984; Selye, 1973) or allostasis as the internal process or phenomenon that would take place in the individual to maintain homeostasis against the exposure to or experience with the stressor. The findings also suggested measurement of the psychosocial component of a biopsychosocial model of the stress concept, described by Lemyre and Tissier (2003). Measurement of the biological component was beyond the scope of this study.

Strength and Direction of the Relationship Between Perceived Stressors and Amount of Perceived Stress

The literature showed a paucity of empirical studies on the relationship between perceived stressors and the amount of perceived stress. Researchers who used the NSS to assess the frequencies of perceived stressors misinterpreted the frequencies as equivalent to the levels of stress. For example, Mrayyan (2009) compared the frequencies of stressors measured with the NSS between ICUs and general hospital wards while Bailey (1980) compared the stressors among two ICUs and a regional hospital, using a different instrument (Stress Audit). I measured the stressor frequencies in CCNs with the NSS and amounts of stress with the PSM-9 in the same population and examined the relationship between the two variables. The findings showed a strong positive relationship between the predictor variable (stressor) and the criterion variable (stress). The result was consistent with the three elements of the stress concept of the perceived existence of external environmental stressors as the source of perceived product level of psychological stress reaction or allostasis in the individual (Chrousos & Gold, 1992; Lazarus & Folkman, 1984; Selye, 1973). Critical care nurses identified a strong positive association between the four workplace stressors (Workload, Death and Dying, Conflict with other Nurses, and Lack of Support) as the source of the high levels of psychological stress experienced at the workplace.

Limitations of the Study

The initial plan to limit participants to a regional hospital was abandoned, a situation that would have created serious limitations to generalizability of the findings in

this study. In addition to the use of a power analysis for quantitative sample size, the research setting included a national critical nurses' association and a statewide nurses' association. The American Association of Critical-Care Nurses (AACN) has a membership of more than 100,000 critical care nurses (CCNs) with 240 chapters located in all states of the USA (except two, Kansas and Wyoming); in addition, internationally in three other countries of China, Japan, and Germany (AACN, 2016). The Tennessee Nurses' Association (TNA) is a constituent of the American Nurses Association representing American registered nurses (TNA, 2016). The change in procedure, did not only facilitate an increase in the number of responses obtained in a limited time period (six weeks) to nearly fourfold of the minimum sample size, but also provided some diversity of the study population nationally and internationally. In addition, the normality tests provided the near perfect normal sample population distribution, taken in numerical sequence of response. Consequently, the first limitation would exist in generalization of the findings from this study. Generalization might be limited to the population of CCNs registered and working in geographical locations in the United States, China, Japan, and Germany only. Moreover, due to the online methods chosen in order to protect participants' confidentiality and personal information, it was not possible to identify the locations of the participating CCNs or the response rates from the different geographic locations in the setting. Future studies may seek to randomize sampling of CCNs nationally and internationally.

The second limitation on sampling may be due to selection bias that might affect the internal validity of the sample. Selection bias would exist due to the possibility that

the CCNs that responded to the questionnaire were motivated and self-selective; the others might not have shown any interest to address the issues of stress at the workplace, despite being stressed. Moreover, the participants might have given answers that were socially desirable, given the possibility of doubt in confidentiality that was assured in the study.

The third limitation pertained to the period for sampling. This study was designed as a mixed method of an online questionnaire and a simultaneous email interview. However, due to time constraints for sample collection, the number of email participants did not reach saturation for analysis. Subsequently, findings discussed were limited to the quantitative component of the study and the remaining three qualitative research questions about coping were neither analyzed nor discussed in depth. Further studies may wish to lift the lid on time limitation for the qualitative data collection to increase participation to saturation.

The fourth limitation could involve the possibility of confounding independent variables. It is conceivable that the measured high levels of psychological stress at the workplace might have been contaminated by intrinsic and other extrinsic stressors existing in the life of participating CCNs, as varied as the individual critical care nurse in this study. These stressors, and by implication levels of stress, might turn out to be confounding variables in the overall levels of perceived stress by CCNs at the workplace. Pallant (2013) suggested that contaminating or confounding variables could artificially inflate the size of the correlation between the independent and dependent variables. Such

confounding stressors that would need to be controlled for might be the subject of future research, in the attempt to completely eliminate stress at the workplace in CCNs.

Recommendations

This study has shown that stressors in the workplace predicted significant amounts of stress in critical care nurses, particularly in the United States. While the overall amount of stress due to the combination of these stressors might have seen a decline as a result of improvements in some of the stressors, significant types of stressors that predict the high level of stress in CCNs persisted at the critical care workplace. These stressors included Workload; Death and Dying; Conflict with Nurses; and Lack of Support. Uncertainty concerning Treatment and Conflict with Physicians were marginally important while Inadequate Preparation has been substantially reduced. Therefore, efforts would be directed at all areas of critical care unit stressors, without relenting on the achievements on continued education, training and development for critical care nurses. Further research in the following areas is recommended, starting with research in regular assessment of stressors and amounts of stress in critical care nurses and units. The American Psychological Association (APA, 2016) commissioned an annual nationwide survey to examine the state of stress across the United States. This regular survey has helped to monitor, on a yearly basis, positive social changes that might occur nationally on the issue of stress. Similarly, the survey could be translated to a regular survey of the sources of stress at the workplace for CCNs. Research in regular assessment of stressors and amounts of stress in critical care nurses and units would be recommended; and for

practical purposes at least every 3-5 years, in order to monitor progress or changes in eliminating the workplace stressors for CCNs.

Research on coping strategies by CCNs at the workplace could be done either separately or with the assessments of stressors and evaluation of stress levels, using appropriately validated instruments. Quantitative methods, qualitative methods or both might also be used in the design. Lambert et al. (2004; 2007) identified positive appraisals as the most frequently used coping strategy in a quantitative survey of hospital nurses in China and South Korea, while hospital nurses in Japan and Thailand (Lambert et al, 2004) utilized self-control. In a national or international investigation, other cultures might also present a variety of coping strategies to mitigate perceived stressors at the workplace, particularly in CCNs. Brunero, Cowan, and Fairbrother (2008) utilized cognitive behavioral therapy (CBT) as an interventional method to improve the ratings of stress in Australian hospital nurses. Other methods might be more appropriate for use by different hospitals in the U.S.A for coping with the frequency of workplace stressors and reduce the levels of stress in CCNs. This study attempted a qualitative method by using email interviews to explore the coping methods utilized by CCNs, with fewer than saturation samples responding to analyze and develop particular themes for coping. It was intriguing that two of the three interview responses discussed the coping strategy of social support at work by talking about the stressors with other personnel at work, as a form of an outlet to seek help when needed. The third participant indicated the use of cognition from personal life experiences as a reminder for internal resilience and hardiness (Moola et al., 2008) in order to cope with and enjoy caring for patients and

lower perceived stress level. Further studies on these coping strategies would be useful for the goal of eliminating stress in CCNs.

Research efforts in nursing and hospital administrations would focus on reducing and eliminating the frequency of stressors at the critical care work environment, particularly in the areas of Workload, support in Death and Dying; Conflict with other Nurses; Lack of Support; Uncertainty concerning Treatment; and Conflict with Physicians. Mryyan (2009) suggested assessing nurses' stressors and managing them with various social support behaviors. Moola et al. (2008) recommended implementing and evaluating stress management programs for CCNs, including debriefing and education programs to raise awareness and improve resilience and addressing staff and equipment shortages by managers. Based on the Stress Audit survey, Bailey, Walker and Madsen (1980b), developed self-management procedures for the training and implementing a stress reduction program, including running (Zindler-Wernet & Bailey, 1980) for intensive care nurses at Stanford, U.S.A. Bailey et al. (1980a) concluded that the results of their stress research had special implications for nursing administrators in particular, being a reflection of the impact the organization, its leadership and the nature of the tasks on the employees. The nursing administrators might be obligated to retain CCNs that play a vital role in health care delivery by addressing perceived stressors and meeting the psychological needs of CCNs at the workplace.

Additional research might explore the intrinsic stressors and other extrinsic stressors that CCNs could take to the workplace, personal life stressors outside work. These stressors might complement the extrinsic workplace stressors and confound the

levels of stress perceived. Pollock (1984) had suggested that demographic variables, including age, education, and nursing experience could contribute to external mediating factors in stress. Similarly, Pollock also suggested hardiness (Kobasa, 1979) as a possible internal mediating factor in perception and coping. Lee's (1987) review of the stressors in medical professional groups (including nurses) noted that personal characteristics mediated the relationship between stressors and stress. Specter (1998) proposed the possibility that individual's perception of control, like Bandura's (1982) locus of control and self-efficacy, could be a moderating factor over stressors and stress. Garrrosa and colleagues (2010; 2011) also studied intrinsic factors that affected job stressors, like personal resources of optimism, emotional competence and hardy personality in coping with job stressors and stress in nurses. The study by Brunero et al. (2008) was consistent with the existence of other extrinsic stressors outside of the workplace that showed significant improvement after CBT intervention. Such studies might help to understand better the role of other stressors in the workplace stress experience of CCNs and further reduce their effect in critical care nursing.

The implications for practice at hospital critical care units depend on the culture in the specific environment. The culture is varied at personal, unit management, and corporate levels. One of the participants in the email interview suggested discussing stress perception experiences with someone at the workplace on a regular basis, indicating a lack of social support from, and conflict with, other nurses at the workplace. Conflict with other Nurses and Lack of Support were found joint second and third most significant stressors for CCNs in the quantitative questionnaire. Working at a very high

intensity, fast-paced, and awareness at a critical care unit for long hours (8-12 hours) requires intermittent breaks to refresh and tone down the effects of stressors for a while, before resuming work. It is imperative that CCNs are able to talk and discuss issues with buddies at work during these short breaks to relieve psychological stress. Critical care unit managers may authorize a minimum of fifteen minutes of such breaks, after every 4 hours of working. Written procedures at the workplace, backed by employer policies, would also make it mandatory to take a 30-minute meal break, after working for 8 hours during a shift. Individual and personal changes can occur with more self-care by healthy eating, having adequate physical activity for cardiovascular fitness outside work (like fast walking or running; jogging; bicycling; swimming or a workout at the gym or any other commonly practiced aerobic exercises). In the stress management program for ICU nurses at Stanford University Hospital, California in the United States, Zindler-Wernet and Bailey (1980) had used running or fast walking for 30 minutes, at the speed of one mile in 12 minutes, four times a week for nurses to be physically fit and cope with the workplace stress. In addition, the program promoted increased interpersonal social skills and counseling problem-solving skills with increase in physical fitness (Collingwood & Holder, 1973).

Another interview participant pointed to the role of inequity in the allocation of patients to CCNs by the management, as a recurrent stressor in critical care. There have been reports of some critical care units having one RN per five patient beds and even a 12-hour regular shift with only one RN in a unit of six patient beds. The issue would indicate the need to reduce the workload, the number one stressor in critical care nursing,

in order to mitigate the impact of stress on CCNs. Choi, Choi, and Fucile (2011) underscored the use of patient acuity, workload index, hours per workload index (HPWI), hours per patient day (HPPD), and length of stay (LOS) to estimate the nurse-patient ratio for nurse staffing models. In the Stanford stress management study, Bailey et al. (1980) had advocated a nurse-patient ratio of 1:2 for patient's acuity in the ICUs. The models may also consider using a staff mix model (ratio of RNs and non-RNs, including patient care technicians) with patient acuity data for regular staffing (Choi et al., 2011). It is recommended that nursing administration and management consider using the evidence provided on nursing workload, not only to reduce hospital expenses and provide quality nursing care but also, an equitable staffing model to reduce workload stressor and levels of stress in CCNs.

Implications for Social Change

In the health care industry, critical care nurses play a vital role to look after the most life-threatening conditions in patients and experience the highest amount of stress at the workplace. Few studies have used appropriate instruments to determine frequency of stressors in nurses, and even less so, to measure the amount of stress in nurses at the workplace. The gap exists in the literature regarding the relationship between measured perceived stressors and perceived psychological stress. This study assessed the types and frequency of stressors perceived by CCNs as significant predictors of amounts of stress at the workplace, predominantly in the United States. The stressors included Workload for nurses; patients' Death and Dying; Conflict with Nurses as coworkers; and Lack of Support for nurses in the workplace. The stressors of Uncertainty concerning Treatment

of Patients; and nurses' Conflict with Physicians were also assessed and found to be on the borderline of significantly predicting stress. Nurses' Inadequate Preparation for their role in critical care was found not to predict stress. The implications from these results would impact on social change at individual, organizational, community, national, international and global levels.

Individual nurses could obtain information from the outcome of this research, disseminated in publications or through professional associations, and be empowered to develop coping strategies that would reduce or eliminate stress at work. Some of these coping strategies may include individual peer or group physical activities outside work, like running or fast walking for 30 minutes at least four times in a week. Other physical activities may also include swimming, jogging, gym exercises or some other aerobic exercises (including dances) appropriate for different cultures. At the organizational level, the administration and management team within the hospital organization would benefit from the findings to develop policies and procedures for critical care units that would reduce or eliminate the stressors and stress at the workplace and make working in critical care more attractive to nurses, reducing absenteeism and attrition to improve productivity and mitigate economic loss for the organization. Such policies may include a mandatory minimum 30-minute meal and break period during a shift to provide the opportunity for interacting informally at work with other peers and coworkers for support and discussions about stressors and stress on a shift. Procedures may include establishing the policy of patient allocation that is grounded on the use of patient's acuity, workload index, length of stay, and the staff mix model to attain the goal of one RN to two patients

at a time in a critical care unit. Administration and management may also provide relief of stress during work with short sessions of professional massage or counselling to staff willing to utilize these options for coping at the workplace.

The local community of professional nurses, business and governments would consider putting these recommendations into sourcing the local health industry. The research community could depend on appropriate background instruments at its disposal and methods for assessing the frequency of stressors in critical care nurses. These instruments could be used to evaluate the amount of psychological stress perceived by critical care nurses at the workplace to develop deeper research and management programs for reducing and eliminating stress in hospital employees.

At the national level, this study would translate into advising policies and funding for health care providers, the health insurance business, and the legal controls in United States. Internationally, the findings would remain at the cutting edge of evidence-based research that could advise individual nurse and nursing professions; national, international and global regional governments; and global health care agencies and organizations in developing policies toward reducing and eliminating psychological stress in critical care nurses at the workplace.

Conclusion

The evidence in literature has shown that stress in populations increased and turned into nearly an epidemic. Critical care nurses have been at the forefront of emergent and critical care in health care services locally, nationally, and globally. The critical care nurse, undeniably, would continue to play a vital role in the health care

industry, bearing the brunt of a palpable wave of psychological stress and its consequences to health care providers at the workplace. Evidence-based research into the types of workplace stressors and their relationship to stress at the workplace would become the foundation for developing policies and procedures that could mitigate stress and its consequences to health care workers at the workplace.

This study was designed and carried out with the main purpose of providing the scientific evidence from the population of critical care nurses in the United States in order to measure the frequency of their perception of stressors at their workplace and evaluate their relationship to the individual's perceived psychological stress at work. The findings showed that by using the appropriately validated instruments for measurement, seven potential categories of stressors were perceived. These included, patient's condition of Death and Dying; nurse's Conflict with Physicians; nurse's Inadequate Preparation; Lack of Support for nurses; nurse's Conflict with other Nurses; nurse's Workload; and nurse's Uncertainty concerning Treatment for patients. In a decreasing order of significance as a predictor of the amount of psychological stress in critical care nurses, nurses' Workload was the most significant, followed jointly by patients' conditions of Death and Dying; and nurse's Conflict with other Nurses. Lack of support for the nurse was also a significant perceived stressor, while improvement in significance has occurred over the last decade in nurse's Uncertainty concerning Treatment; and nurse's Conflict with Physicians. Inadequate Preparation in nurses was no more a significant predictor of psychological stress in critical care nurses due to educational attainment, certification and training.

It would be desirable that efforts directed into continued research and evaluation; awareness at individual micro-level; policy and procedures at the health care provider organization at the meso-level; and regulation and control at national and international macro-levels, could bring the social change to stem the tide and eliminate psychological stress at the workplace in critical care nurses in particular and in nurses in general.

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Appendix A: Demographic Background Information

(This section is optional and does not form a part of the measure; however, it may help to interpret the results)

Educational Attainments (please check all that apply)

❑ Some high school or equivalent (please specify_____)
❑ High school diploma, GED, or equivalent (e.g. secondary, please specify_____)
❑ Some post-secondary, or professional school diploma(s) (please specify_____)
❑ Associate's degree
❑ Bachelor's degree (please specify_____)
❑ Professional degree (please specify _____)
❑ Graduate degree(s) (please specify_____)

Nursing Licensure(s)

❑ RN
❑ ARNP

Critical Care Certification(s)

❑ CCRN
❑ PCCN

Experience working in critical care nursing _____ Years

Work Shifts

❑ Day (12-hour)
❑ Night (12-hour)
❑ Other (Please specify time and hours_____)

*Age*_____ Years
Gender ❑ Male ❑ Female

Marital status

❑ Married/Partner/Cohabiting
❑ Unmarried/No Partner/Single

Heritage

❑ American Indian/Alaska Native
❑ Asian (includes Chinese, Japanese, Indian, and Filipino)
❑ Black (includes African, African-American, African-Caribbean Islander)
❑ Hawaiian/Other Pacific Islander
❑ Hispanic/Latino
❑ White European
❑ Mixed (please specify _____)
❑ Other (please specify _____)

THANK YOU!!

Appendix B: Items and Scoring for the Nursing Stress Scale (NSS)

Below is a list of situations that commonly occur on a hospital unit. For each item mark how often on your present unit you have found the situations to be stressful. Your responses are strictly confidential.

	Items	Frequency (0 1 2 3)*
	Factor I: Death and dying	
1.	Performing procedures that patients experience as painful	0 1 2 3
2.	Feeling helpless in the case of a patient who fails to improve	0 1 2 3
3.	Listening or talking to a patient about his/her approaching death	0 1 2 3
4.	The death of a patient	0 1 2 3
5.	The death of a patient with whom you developed a close relationship	0 1 2 3
6.	Physician not being present when a patient dies	0 1 2 3
7.	Watching a patient suffer	0 1 2 3
	Factor II: Conflict with physicians	
8.	Criticism by a physician	0 1 2 3
9.	Conflict with a physician	0 1 2 3
10.	Fear of making a mistake in treating a patient	0 1 2 3
11.	Disagreement concerning the treatment of a patient	0 1 2 3
12.	Making a decision concerning a patient when the physician is unavailable	0 1 2 3
	Factor III: Inadequate preparation	
13.	Feeling inadequately prepared to help with the emotional needs of a patient's family	0 1 2 3
14.	Being asked a question by a patient for which I do not have a satisfactory answer	0 1 2 3
15.	Feeling inadequately prepared to help with the emotional needs of a patient	0 1 2 3
	Factor IV: Lack of support	
16.	Lack of an opportunity to talk openly with other unit personnel about problems on the unit	0 1 2 3
17.	Lack of an opportunity to share experiences and feelings with other personnel on the unit	0 1 2 3
18.	Lack of an opportunity to express to other personnel on the unit my negative feelings toward patients	0 1 2 3
	Factor V: Conflict with other nurses	
19.	Conflict with a supervisor	0 1 2 3
20.	Floating to other units that are short-staffed	0 1 2 3
21.	Difficulty in working with a particular nurse (or nurses) outside the unit	0 1 2 3
22.	Criticism by a supervisor	0 1 2 3
23.	Difficulty in working with a particular nurse (or nurses) on the unit	0 1 2 3
	Factor VI: Workload	
24.	Breakdown of computer	0 1 2 3
25.	Unpredictable staffing and scheduling	0 1 2 3
26.	Too many nonnursing tasks required, such as clerical work	0 1 2 3
27.	Not enough time to provide emotional support to a patient	0 1 2 3
28.	Not enough time to complete all of my nursing tasks	0 1 2 3
29.	Not enough staff to adequately cover the unit	0 1 2 3
	Factor VII: Uncertainty concerning treatment	
30.	Inadequate information from a physician regarding the medical condition of a patient	0 1 2 3
31.	A physician ordering what appears to be inappropriate treatment for a patient	0 1 2 3
32.	A physician not being present in a medical emergency	0 1 2 3
33.	Not knowing what a patient or a patient's family ought to be told about the patient's condition and its treatment	0 1 2 3
34.	Uncertainty regarding the operation and functioning of specialized equipment	0 1 2 3

*Frequency: never (0); occasionally (1); frequently (2); very frequently (3)

Appendix C: The Psychological Stress Measure, PSM-9 (Lemyre and Tessier, 1988, 2003; Lemyre and Lalande-Markon, 2009)

Mark the number that best indicates the degree to which each statement applies to you recently, that is within the last 4-5 days

Not at all 1 | Not really 2 | Very little 3 | A bit 4 | Somewhat 5 | Quite a bit 6 | Very much 7 | Extremely 8

1.	I feel calm.	1 2 3 4 5 6 7 8
2.	I feel rushed; I do not seem to have enough time	1 2 3 4 5 6 7 8
3.	I suffer from physical aches and pains: sore back, headaches, stiff neck, stomach aches	1 2 3 4 5 6 7 8
4.	I feel preoccupied, tormented or worried.	1 2 3 4 5 6 7 8
5.	I feel confused; my thoughts are muddled; I lack concentration and I cannot focus my attention.	1 2 3 4 5 6 7 8
6.	I feel full of energy and keen.	1 2 3 4 5 6 7 8
7.	I feel great weight on my shoulders.	1 2 3 4 5 6 7 8
8.	I have difficulty controlling my reactions, emotions, moods or gestures	1 2 3 4 5 6 7 8
9.	I feel stressed.	1 2 3 4 5 6 7 8

Appendix D: Walden University Institutional Review Board Approval

Conditional IRB Approval - Oladele Akinwolere

Inbox x

IRB <IRB@waldenu.edu> 1/7/15

to me, Amy

Dear Mr. Akinwolere,

This email is to notify you that the Institutional Review Board (IRB) has approved your application for the study entitled, "Psychological Stress in Critical Care Nurses: A Mixed Method Study at the Workplace," conditional upon the approval of the community research partner, which will need to be documented in a signed notification of the community partner IRB's approval or exemption (depending on their policies). Walden's IRB approval only goes into effect once the Walden IRB confirms receipt of that notification of IRB approval or exemption.

Your approval # is 01-07-15-0126454. You will need to reference this number in your dissertation and in any future funding or publication submissions. Also attached to this e-mail is the IRB approved consent form. Please note, if this is already in an on-line format, you will need to update that consent document to include the IRB approval number and expiration date.

Your IRB approval expires on January 6, 2016. One month before this expiration date, you will be sent a Continuing Review Form, which must be submitted if you wish to collect data beyond the approval expiration date. Please note that this letter indicates that the IRB has approved your research. You may **NOT** begin the research phase of your doctoral study, however, until you have received official notification from the IRB to do so. Once you have received this notification by email, you may begin your data collection. Your IRB approval is contingent upon your adherence to the exact procedures described in the final version of the IRB application materials that have been submitted as of this date. This includes maintaining your current status with the university. Your IRB approval is only valid while you are an actively enrolled student at Walden University. If you need to take a leave of absence or are otherwise unable to remain actively enrolled, your IRB approval is suspended. Absolutely NO participant recruitment or data collection may occur while a student is not actively enrolled.

If you need to make any changes to your research staff or procedures, you must obtain IRB approval by submitting the IRB Request for Change in Procedures Form. You will receive confirmation with a status update of the request within 1 week of submitting the change request form and are not permitted to implement changes prior to receiving approval. Please note that Walden University does not accept responsibility or liability for research activities conducted

without the IRB's approval, and the University will not accept or grant credit for student work that fails to comply with the policies and procedures related to ethical standards in research.

When you submitted your IRB application, you a made commitment to communicate both discrete adverse events and general problems to the IRB within 1 week of their occurrence/realization. Failure to do so may result in invalidation of data, loss of academic credit, and/or loss of legal protections otherwise available to the researcher.

Both the Adverse Event Reporting form and Request for Change in Procedures form can be obtained at the IRB section of the Walden website:
http://academicguides.waldenu.edu/researchcenter/orec

Researchers are expected to keep detailed records of their research activities (i.e., participant log sheets, completed consent forms, etc.) for the same period of time they retain the original data. If, in the future, you require copies of the originally submitted IRB materials, you may request them from Institutional Review Board.

Both students and faculty are invited to provide feedback on this IRB experience at the link below:

http://www.surveymonkey.com/s.aspx?sm=qHBJzkJMUx43pZegKlmdiQ_3d_3d

Sincerely,

Libby Munson

Research Ethics Support Specialist

Office of Research Ethics and Compliance

irb@waldenu.edu

Fax: 626-605-0472

Phone: 612-312-1283

Office address for Walden University:

100 Washington Avenue South, Suite 900

Minneapolis, MN 55401

Information about the Walden University Institutional Review Board, including instructions for application, may be found at this link: http://academicguides.waldenu.edu/researchcenter/orec

Attachments area

Request for Change in Procedures - Approved

Inbox x

IRB <irb@waldenu.edu> 12/3/15

to me, Amy

Dear Mr. Akinwolere,

This e-mail serves to inform you that your request for a change in procedures, submitted on 11/17/15 has been approved. You may implement the requested changes effective immediately. The approval number for this study will remain the same.

Both students and faculty are invited to provide feedback on this IRB experience at the link below:

http://www.surveymonkey.com/s.aspx?sm=qHBJzkJMUx43pZegKlmdiQ_3d_3d

Sincerely,

Libby Munson

Research Ethics Support Specialist

Office of Research Ethics and Compliance

irb@waldenu.edu

Fax: 626-605-0472

Phone: 612-312-1283

Office address for Walden University:

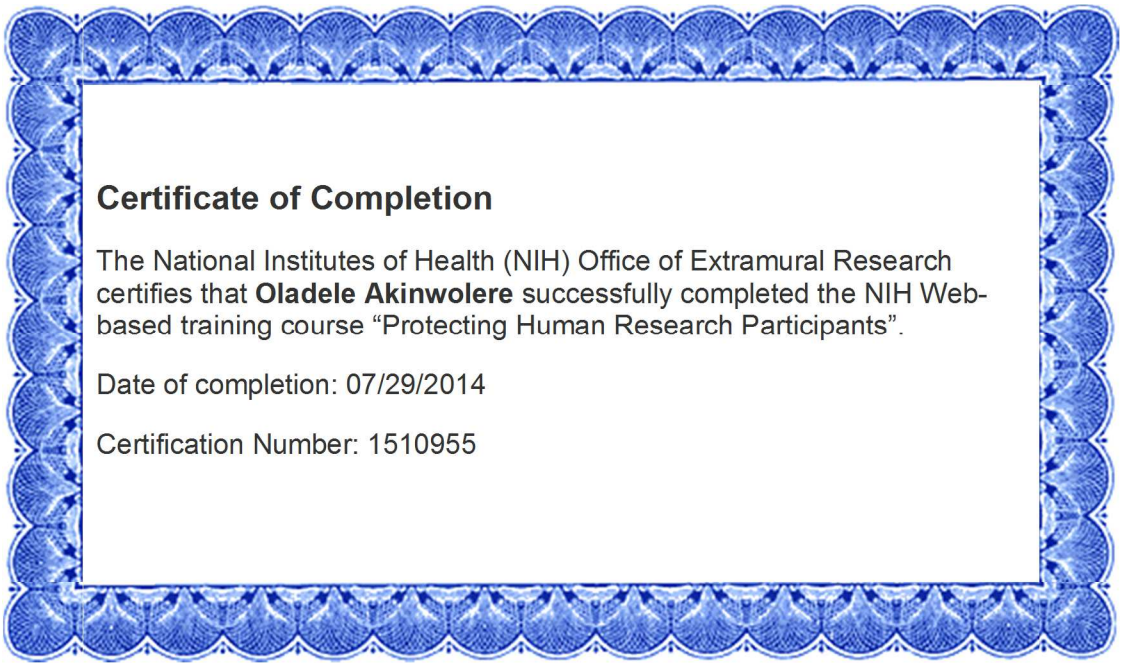
100 Washington Avenue South, Suite 900

Minneapolis, MN 55401

Information about the Walden University Institutional Review Board, including instructions for application, may be found at this link: http://academicguides.waldenu.edu/researchcenter/orec

Appendix E: National Institute of Health (NIH) Certificate of Completion in Training"

for "Protecting Human Research Participants"



Certificate of Completion

The National Institutes of Health (NIH) Office of Extramural Research certifies that **Oladele Akinwolere** successfully completed the NIH Web-based training course "Protecting Human Research Participants".

Date of completion: 07/29/2014

Certification Number: 1510955

Appendix F: Curriculum Vitae

Oladele Augustine Odunayo Akinwolere
MA, MBBS, MSc, MMedSc, DPHE

Contact Address
4430 Yachtman's Court
Orlando FL 32812
407-249-3965; 407-962-9688 (Cell)
deleaoak@outlook.com
oladele.akinwolere@waldenu.edu

Background

I have worked continuously abroad and in the United States in health and education. In health care and social care services, I taught health professionals and carried out medical research in physical health, mental health, and social care, using both quantitative and qualitative research methods. I am strongly motivated to teach social science and medical subjects to mature undergraduate and graduate students training at college level. Behind me is a rich background of training and academic work in medicine, health and social care plus more than ten years management experience.

Employment

My role as a medical research fellow in teaching hospitals (University College Hospital Ibadan and City Hospital Birmingham) and universities (Institute of Child Health University of Ibadan and University of Birmingham) included teaching undergraduate and graduate students and carrying out research, preparation of and submission of abstracts and manuscripts. As an experienced researcher, I published more than twenty original data in peer reviewed professional and academic journals internationally, including a book (Annex 1) and I made presentations and audits at training meetings, workshops and conferences (Annex 2). I was appointed the Managing Editor of the Nigerian Journal of Immunology on a volunteer basis. My role also included seeking extramural grant funding.

Managerial experience included preparation of regular reviews and reports on services. As the Senior Scheme Manager at Home-Start Selly Oak, UK, I performed the role of the strategic manager to senior management (board), service, staff and volunteers. I was the senior support coordinator in a service, which supported families that included persons with disabilities (physical and mental). Home-Start, in the UK, is a not-for-profit organization at local, regional, national and international level that supports families with pre-school children (under-fives), both physically and emotionally.

My role at the Midland Refugee Council (MRC), a UK registered charity and voluntary organisation advising, advocating, counselling on, and managing refugees' health and social care included that of a chief executive officer (CEO) and Refugees' Health Manager, counselling refugees from around the world living in the Midlands of United Kingdom, managing physical and mental health service at MRC with counsellors, health administrators and volunteers. Additional role included supervision of MRC staff and senior managers as well as overall service and strategic management, including networking, partnerships and grant applications.

I have continued learning, research, and teaching with professional development through my working career. The titles of my graduate theses were Talking Treatment and Social Support for

Refugees and Asylum Seekers: A Service Evaluation; Standardization of ELISA for Detecting Human Antibodies against Meningococcal Capsular Polysaccharides; and Humoral and Cellular Immunity in Nigerian Children Naturally Infected with *Plasmodium Falciparum* Malaria.

Employment History

May 2008 – Present	Cardiac Telemetry Monitoring, Cardiovascular Observation Unit (CVOU), formerly Chest Pain Observation Unit, Cardiovascular Institute, Florida Hospital, Orlando, U.S.A.
Jan 2007 - Apr 2008	Relocation and training in Health Unit Coordinating and Telemetry Monitoring, Orange County Public Schools, Orlando, Florida, U.S.
Nov 2004 - Dec 2006	Senior Scheme Manager, Home-Start Selly Oak, Birmingham, U.K.
Aug 1995 - Oct 2004	Health Manager and later combined with CEO role, Midland Refugee Council, Birmingham, U.K.
Aug 1980 - Apr 1995	Clinical Research Fellow/Senior Research Fellow in Child Health/Community Pediatrics, College of Medicine, University of Ibadan, Nigeria and Honorary Registrar in Immunology, Dudley Road Hospital, Birmingham, U.K (1991-1992).
July 1978 - Jul 1980	Senior House Officer and Registrar in Pediatrics, University College Hospital (UCH), Ibadan, Nigeria.
Jul 1977 - Jul 1978	National Youth Service Corps (NYSC) Medical Officer of Health, NYSC, Imo State, Nigeria.
Jul 1976 - Jul 1977	Intern (Housemanship) at University College Hospital, Ibadan, Nigeria.

Education & Training

Sep 2008 - Present	PhD Candidate in General Educational Psychology, Walden University, U.S.A.
Dec 2007 - Apr 2008	Relocation and training in Health Unit Coordinating and Telemetry Monitoring, Orange County Public Schools, Orlando, Florida. Certified trainings at the Agency for Persons with Disabilities (APD), Orlando, Florida, U.S.A.
Nov 2003	Master of Arts in Migration, Mental Health and Social Care (MA), European Center for Migration, University of Kent, U.K.
Sep 1997	Postgraduate Diploma in Public Health and Epidemiology (DPHE), Birmingham Medical School, University of Birmingham, U.K.
Jul 1995	Master of Medical Science (MMedSc) in Immunology, Birmingham Medical School, University of Birmingham, U.K.
Sep 1982	Master of Science (MSc) in Chemical Pathology, University of Ibadan, Nigeria.
Jun 1976	Bachelor of Medicine & Bachelor of Surgery (MBBS), University of Ibadan, Nigeria.

Additional Personal Information

Marital Status: Married *Gender:* Male *Immigration Status:* Permanent Legal Resident in Orlando, Florida State, US

Honors: Member, Golden Key International Honor Society; Member, Walden Psi Chi Society; Student Affiliate Member, American Psychological Association; Formerly Managing Editor,

Nigerian Journal of Immunology; World Health Organization Fellowship Award; Foreign and Commonwealth Office Fellowship Award; French Government Scholarship Award.
Others: Open-minded and strong team player; self-motivated with excellent self and time management; researcher with ability to take responsibility with little or no supervision; believer in continuing personal and professional development as a second nature; interests in sports; multi-lingual in English, French, Yoruba and more.

Annex 1: Research and Publications

1. Akinwolere, OAO (2003). Talking Treatment and Social Support for Refugees and Asylum Seekers: A Service Evaluation. MA dissertation, University of Kent, UK.

2. Johnson, MRD and Akinwolere OAO (1997). Refugees and Primary Health Care in the West Midlands (Review & Report. Center for Research in Ethnic Relations (CRER), Warwick. 42pp.

3. Akinwolere OAO (1997). Midlands Health Project for Refugees (Report). Global Security. Summer 1997 Number 17:16.

4. Akinbami, FO, Erinoso, O, Akinwolere, OA (1996). Defaecation pattern and intestinal transit in Nigerian children. African Journal of Medicine and Medical Sciences, 24(4), 337-341.

5. Akinwolere OAO (1995). Standardization of ELISA for detecting human antibodies against meningococcal capsular polysaccharides. MMedSc thesis, University of Birmingham, U.K.

6. Akinwolere OAO, Kumararatne DS, Bartlett R, Goodall DM and Catty D (1994). Two enzyme-linked immunosorbent assays (ELISA) for detecting antibodies against meningococcal capsular polysaccharides A and C. Journal of Clinical Pathology, 47: 405-410.

7. Adu FD, Akinwolere OAO, Tomori O and Uche LN (1992). Low seroconversion rates to measles vaccine among children in Nigeria. Bulletin of the World Health Organization, 70(41): 457-460.

8. Akinkugbe FM, Akinwolere OAO and Oyewole AIM (1990). Blood pressure in three socio-economic groups of black children in Nigeria. Cardiologie Tropicale, 16: 7-16.

9. Osinusi K, Akinkugbe FM, Akinwolere OAO and Fabiyi A (1990). Safety and efficacy of yellow fever vaccine in children less than one year old. West African Journal of Medicine, 9: 200-203.

10. Akinwolere OAO, Akinkugbe FM, Oyewole AI and Salimonu LS (1989). Serum immunoglobins in Nigerian neonates. West African Journal of Medicine, 8: 150-154.

11. Akinkugbe FM, Akinwolere OAO and Oyewole AI (1989). Serum immunoglobulin concentration in Nigerian infants. African Journal of Medicine and medical Sciences, 18: 169-175.

12. Akinwolere OAO and Williams AIO (1989). Immunity in malaria: heterophile and malarial antibodies in acute Plasmodium falciparum infection. African Journal of Medicine and medical Sciences, 18: 235-24.

13. Akinwolere OAO (1989). Effectiveness of BCG vaccination in infants. Nigerian Journal of Immunology, 2: 68 (Abstract).

14. Akinwolere OAO, Williams AIO, Akinkugbe FM and Laditan AAO (1988). Immunity in malaria: depression of delayed hypersensitivity reaction in acute Plasmodium falciparum infection. African Journal of Medicine and medical Sciences, 17: 47-52.

15. Akinwolere OAO, Williams AIO, Okerengwo AA and Salimonu LS (1988). Heterophile antibodies in malarious children: effect of cell tanning and absorption of serum. Nigerian Journal of Immunology, 1: 15-18.

16. Akinkugbe FM, Akinwolere OAO and Oyewole AIM 1988). Asymptomatic bacteriuria and other urinary abnormalities in children in Ibadan. Nigerian Journal of Pediatrics, 15: 11-18.

17. Osinusi K, Ette SI and Akinwolere OAO (1988). Plasma ascorbic acid levels in children with measles. Nigerian Journal of Pediatrics, 15: 15-19.

18. Akinwolere OAO (1988). Editorial. Nigerian Journal of Immunology, 1:1

19. Oyewole AI, Akinwolere OAO and Akinkugbe FM (1987). Use and misuse of drugs in Nigerian infants. Nigerian Medical Journal, 17: 21-29.

20. Williams A, Drager-Dayal R, Engers H, Akinwolere O and Lambert PH (1987). Dissociated antibody response to defined Plasmodium falciparum antigens in man. International Archives of Allergy & Applied Immunology, 83: 13 (Abstract).

21. Akinwolere OAO, Jambon B and Duheille J (1986). Functional lymphocytes of mesenteric lymph nodes of malnourished children. Sixth International Congress of Immunology, Toronto Canada, p.88 (Abstract).

22. Akinwolere OAO and Williams AIO (1983). Transient depression of delayed hypersensitivity in acute Plasmodium falciparum infection. Immunology Seminars, 2: 45-50.

23. Salimonu LS, Ojo-Amaize E, Johnson AOK, Laditan AAO, Akinwolere OAO and Wigzell H (1983). Depressed natural killer cell activity in children with protein-calorie malnutrition. II. Correction of impaired activity after recovery. Cellular Immunology, 82: 210-215.

24. Akinwolere OAO (1982). Humoral and cellular immunity in Nigerian children naturally infected with P.falciparum malaria. MSc thesis. University of Ibadan, Nigeria.

25. Ojo-Amaize EA, Salimonu LS, Williams AIO, Akinwolere OAO, Shabo R, Gunnar VA and Wigzell H (1981). Positive correlation between degree of parasitaemia, interferon titers and natural killer cell activity in Plasmodium falciparum-infected children. Journal of Immunology, 127: 2296-2300.

Annex 2: Conferences, Presentations, Training and Audits

- Presentation and defense of Dissertation Proposal titled "Psychological Stress in Critical Care Nurses: A Mixed Method Study at the Workplace - Walden University, July 23, 2014.

- Participant at four Walden PhD academic residencies at Liverpool (Aug 2009), Jacksonville (Sep 2010) and Orlando (Aug 2011; Sep 2013)

- Participant and presenter at the International Workshop on Refugees' Mental Health - University of Kent, Canterbury, UK (27-29 June 2003)

- Participant at the First Annual Student Conference on Forced Migration - St. Anne's College, University of Oxford (24 February 2003)

- Participant and presenter at the International Workshop and Conference on Migrants and Refugees - University of Utrecht, Netherlands (17-19 January 2003)

- Participant and presenter at the International Workshop on Immigrants, Refugees and their Needs - Orebro Universitet, Sweden (30 August – 1 September 2002)

- Participant, Barnsley Health Authority's Public Health Medicine Open Day - Holiday Inn Royal Victoria, Sheffield (24 May 2000)

- Participant, Continuous training in the implementation of Practical Quality Assurance System for Small Organizations (PQASSO) - The British Refugee Council, London, U.K (January '99 – December 2000)

- Facilitator, Midlands Refugee Council's FGM Project Study Day - Birmingham Voluntary Service Council, Birmingham, U.K (27 March 2000)

- Facilitator, Study Day on "Finding Our Ground – a Networking and Study Day with The Medical Foundation on Working with Survivors of Torture and Organized Violence" - Medical School, University of Birmingham, Birmingham, U.K (July 1999)

- Birmingham City Council Economic Development's Management and Staff Development for Voluntary Organizations Seminar: Negotiation Skills - Fircroft College, Birmingham, U.K (18 November 1998)

- Birmingham City Council Economic Development's Management and Staff Development for Voluntary Organizations Seminar: Presentation Skills - Fircroft College, Birmingham, U.K (6/7 October 1998)

- Participant, Workshop on "S.A.H.E.T. Alliance Launch-A Partnership for Improving the Health of Black & Ethnic Minority Communities" - Birmingham Health Authority, Birmingham, U.K (27 April 1998)

- Participant, Seminar on "Employment, Economics & Health Study Group and the Cities Network – Sustainability, Economy & Health" - Hennessy Lecture Theatre, Sandwell Health Authority, Sandwell, U.K (1 October 1997)

- Guest speaker, Regional Conference on Refugees' Health, Housing and Education, including Seminars and Workshops. Oral OHP presentation on "Improving Refugees' Access to Health Care in the Midlands" - Westhill College, Birmingham, U.K (16 & 17 September 1997)

- East Birmingham Community Health Council Representative and auditor. Conference on "The Future of Local Health Services" - National Motorcycle Museum, Birmingham, U.K (27 June 1997)

- Participant, Consultation on "Community Care Policy Consultation Series-Listening to Experience: The Mental Health and Social Care Needs of Asylum Seekers and Refugees - Cumberland Lodge, Windsor, U.K (20-22 June 1997)

- Participant, Conference on "Refugees' Rights and Realities", including Workshops on Health, Education, Employment, Immigration, Repatriation, Racism …" - University of Nottingham, Nottingham, U.K (30 November 1996)

- Participant, National Conference on "Developing Primary Care for Black and Minority Ethnic People" - Hotel St. George, Harrogate, U.K (20 June 1996)

- Auditor, "Regional Refugee Community Development Conference", including Workshops on Health, Education & Housing" - Central Hall, Coventry, U.K (12 March 1996)

- Participant at West Midlands Counseling Association Workshop on "Mental Health Day: Helping People with Mental Health Problems" – Norfolk Hotel, Birmingham, U.K (19 April 1996)

- Poster presentation at the Spring Meeting of the British Society for Immunology. "ELISA for Human Anti-tetanus and anti-pneumococcal antibodies: Performance of Anti-IgG Subclass Reagents Produced by Hollow Fiber Hybridoma Culture" - University of Sheffield, Sheffield, U.K (1-3 April 1992)

- National Co-coordinator and auditor at three International Congresses: "Family & Leisure" - London, U.K (5-7 November 1993); "Towards Ensuring Unity in the Family" - Ibadan, Nigeria (9-11 November 1990); "Family & Work" - Barcelona, Spain (1-3 November 1985)

- Oral OHP presentations and abstracts at Annual Scientific Conferences of the Nigerian Society for Immunology: Ten papers on the Immunology of Communicable Disease – Ibadan, Ilorin, Lagos (1983-1990)
- Auditor at Training Workshop: Research Methodology in Biomedical Sciences - College of Medicine, University of Ibadan, Nigeria (22 November 1987)

- Poster presentation at the 6th International Congress of Immunology: "Functional Lymphocytes of Mesenteric Lymph Nodes in Malnourished Children" - Toronto, Canada (6-11 July 1986)

- Oral OHP presentation at the International Seminar: "Transient Depression of Delayed Hypersensitivity Reaction in Acute P. falciparum Malaria" - W.H.O Immunology Research & Training Center, Lausanne, Switzerland (17 October 1984)

- Participant at the W.H.O. Advanced Training Course: "Immunology and Immunopathology of Infectious Diseases" - Lausanne Section of the W.H.O. Immunology Research & Training Center, Geneva/Lausanne, Switzerland (11 September – 18 October 1984)

- Trainee, Community Pediatrics (Pediatrie Preventive et Sociale),
  Centre Hospitalier Regional de Nancy, Nancy, France (December 1982 – November 1983)