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Integration and Impact of Stress Management and Resiliency Training (Smart) in a Nurse Residency Program: A Feasibility Study

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INTEGRATION AND IMPACT OF STRESS MANAGEMENT AND RESILIENCY TRAINING (SMART) IN A NURSE RESIDENCY PROGRAM: A FEASIBILITY STUDY

by

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ABSTRACT

INTEGRATION AND IMPACT OF STRESS MANAGEMENT AND RESILIENCY TRAINING (SMART) IN A NURSE RESIDENCY PROGRAM:
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Under the Supervision of Professor Dr. Karen Morin

Nursing is recognized widely as a highly stressful profession, and the time of orientation is identified as the most stressful time in a nurse's career. Innovative strategies are needed to assist new registered nurses in the management and prevention of stress as a result of transitioning into the complex and challenging healthcare environment. The purpose of this study was to assess the feasibility and impact of integrating a Stress Management and Resiliency Training (SMART) program within a nurse residency program for new nurses at an academic medical center. Additional aims were to assess the effects of the program on participants' levels of stress, anxiety, mindfulness and resilience in relationship to a comparison group. Focus group interviews were conducted at 12 weeks post the initial intervention to identify the impact of the program on participants. Quantitative outcome measures were taken at baseline and 4 and 12 weeks post the initial intervention and included: Perceived Stress Scale (PSS), Generalized Anxiety Disorder (GAD-7), Mindful Attention Awareness Scale (MAAS), and Connor-Davidson Resilience Scale (CD-RISC). The convenience sample consisted of $n = 27$ for the intervention group and $n = 39$ for the comparison group. The nurse residents

exhibited compliance with the SMART program as demonstrated by high recruitment and attendance levels; however, they were not adherent to the intervention according to the pre-determined parameters for percentage of days practicing the principles of the program (>60% of study days). A mixed model analysis of the instrument scores revealed a decrease in stress for both groups over time with no significant group by time interaction ($F = 1.19$, $p = .19$); a decrease in anxiety for both groups over time with no significant group by time interaction ($F = .17$, $p = .68$); an improvement in resilience for the intervention group and decline for the comparison group with no significant group by time interaction ($F = .37$, $p = .55$); and an improvement in mindfulness for both groups with no significant group by time interaction ($F = .07$, $p = .79$). Focus group interviews revealed the impact of the program and aspects of the program that were the most and least helpful to participants. Themes that emerged included: 1) Enhanced Personal and Professional Development, 2) Sensitivity to Learner Needs, and 3) Fostering the Principles of Mindfulness. The outcomes provide tentative support of integration of the SMART program within a nurse residency program. It is recommended that such a program continue to be implemented for nurse residents and a wider audience of nurses. Future studies are needed with larger numbers to further explore the efficacy of the SMART program and to determine an adequate level of adherence to the intervention.

DEDICATION

With gratitude to my husband Andy;

My children Ava, Andrew, and Anika

My sisters Luanne, Sandy, and Katy

And my parents Greg and Nadeen

You always supported me, believed in me and encouraged me. I could not have completed this without you. You stood by me in the good times and the challenging times. I am forever grateful for you.

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CHAPTER 1: INTRODUCTION

The National Institute for Occupational Safety and Health (2008) noted that healthcare workers are exposed to a number of stressors that lead to higher rates of distress than many other occupations. Historically, nursing has been recognized as a highly stressful career (Milliken, Clements, & Tillman, 2007). In a large survey of nurses within the United States (N = 4,826), the American Nurses Association (ANA) (2001) found that 70.5% of the nurses surveyed identified the effects of acute and chronic stress as one of their top three concerns. In addition, in a more recent study funded by the National Institutes of Health (Mealer, Burnham, Goode, Rothbaum, & Moss, 2009), psychological symptoms related to stress, including burnout syndrome, post-traumatic stress disorder, anxiety, and depression were common in nurses and had a dramatic impact on both work and non-work related activities.

In a review of literature, McVicar (2003) identified six main themes reported consistently by nurses over the years as causes of occupational stress: 1) workload, inadequate staff cover, time pressure; 2) relationship with other clinical staff; 3) leadership and management style, poor locus of control, poor group cohesion, lack of adequate supervisory support; 4) coping with emotional needs of patients and their families, poor patient diagnosis, death and dying; 5) shift working; and 6) lack of reward. Such stress can have multiple negative effects on nurses, as well as their patients. Moustaka and Constantinidis (2010) found that nurse stress can affect the ability to concentrate and make appropriate decisions, which can lead to errors in patient care. In addition, stress can affect both the physical and mental health of nurses, which can have

deleterious effects on their ability to provide high quality care (Moustaka & Constantinidis, 2010). Furthermore, nurse stress leads to organizational consequences, such as absenteeism, tardiness, and job turnover, all of which also ultimately jeopardize safe patient care (Miliken, Clements, & Tillman, 2007).

Various characteristics of nurses can influence their probability of experiencing high levels of stress. A key characteristic is the nurse's level of experience. Novice nurses tend to experience difficulties with learning new skills and procedures; role change challenges; lack of confidence; overwhelming workload; difficulty integrating into the unit; and fears of making errors, harming patients, losing their license, and their ability to meet others' expectations (Fink, Krugman, Casey, & Goode, 2008). Each of these issues has the potential to lead to significant job stress and job dissatisfaction – two factors that have been found to be major contributors to nurse turnover (Hayes et al., 2006). This may explain the high voluntary turnover rate for first year nurses, which Pricewaterhouse Coopers Health Research Institute (2007) reports as 27.1%.

Innovative and creative strategies are needed to assist new registered nurses in the management and prevention of feelings of stress as a result of transitioning into working within the complex and challenging healthcare environment. The authors of the Institute of Medicine (IOM) report (2010), *The Future of Nursing: Leading Change, Advancing Health* highlight that the high turnover rate of new nurses indicates a need for programs that assist with the transition from school to work. In addition, as stated by Jennings (2008), healthcare organizations can no longer ignore the pervasiveness of stress in nursing and its negative impact on nurses and patients. Rather, they must take action to

improve and change an unhealthy situation. Brit Pipe et al. (2011) also noted that the solution to addressing stressors in the healthcare environment is not to continue to focus on the problem, but to shift efforts toward identifying positive ways of coping which lead to the development of resiliency in providers of patient care.

The purpose of this chapter is to explicate the problem studied, including the investigation of the use of a Stress Management and Resiliency Training (SMART) program within a pilot nurse residency program. The investigator will determine the feasibility of integrating the stress management program within a nurse residency program as well as whether the program has an impact on stress, anxiety, mindfulness and resilience in nurse participants in the program. Lazarus and Folkman's Transactional Model of Stress is identified as a framework in the guidance of this study. Lastly, the significance of the study to nursing is highlighted.

Statement of the Problem

Stress has been associated with the clinical practice of nursing in multiple studies (Clegg, 2001, McVicar, 2003; Mealer et al., 2009; Motowidlo, Packard & Manning, 1986; Phillips, 1996; Riahi, 2011). According to Jennings (2008), nurse occupational stress was first assessed in the literature in 1960 by Menzies who identified anxiety as an outcome of stress and documented four sources of anxiety among nurses: patient care, decision making, taking responsibility, and change. Subsequently, Motowidlo et al. (1986) identified that events associated with stress for nurses included those that involve work overload, uncooperative patients, criticism, negligent co-workers, lack of support from supervisors, and difficulties with physicians. Dolan, Van Ameringen, and Corbin

(1992) supported many of the previous findings by identifying the following factors associated with nurse stress: workload, patient care, and interpersonal relationships; and also included bureaucratic political constraints. More recently, researchers have recognized additional factors associated with the contemporary healthcare setting that contribute to nurse stress, such as increased complexity of patients' conditions, decrease in control, role ambiguity, and staffing shortages (Riahi, 2011); as well as an increased use of sophisticated technologies and competition among hospitals (Moustaka & Constantinidis, 2010).

Other than organizational factors, individual dynamics have been found to predispose nurses to stress as well. For example, a decreased sense of meaningfulness and self-efficacy have been associated with a higher risk of nurse burnout – a severe form of stress that is characterized by emotional exhaustion, depersonalization, and lack of a sense of personal accomplishment (Mealer et al., 2009). Burgess, Irvine and Wallymahmed (2010), in a descriptive exploratory study, identified that certain personality traits of intensive care nurses were associated with less perceived stress and better ability to cope, such as openness, extraversion, agreeableness, and conscientiousness.

Stress has been found to negatively impact the well-being and mental and physical health of nurses (Gelsema, Van Der Doef, Maes, Akerboom, & Verhoeven, 2006). The Centers for Disease Control and Prevention (CDC) (National Institute for Occupational Safety and Health, 2008) has identified that nurse stress has been linked to exposure to infectious disease, needle stick injuries, exposure to work-related violence or

threats, sleep deprivation, and difficulties in dealing with seriously ill patients. The CDC also found that stress in healthcare workers is associated with psychological reactions, behavioral problems and negative physical symptoms. Mealer et al. (2009) reviewed an extensive amount of literature and found that burnout syndrome is very prevalent amongst nurses. In addition, Mealer et al. (2009) identified that symptoms of post-traumatic stress disorder (PTSD), a psychiatric disorder resulting from exposure to a traumatic event or extreme stressor, are prevalent among inpatient nurses; however, the actual incidence of PTSD amongst nurses has not yet been determined. Other authors have identified additional outcomes of stress among nurses and other healthcare professionals, including musculoskeletal injuries (O'Brien-Pallas et al., 2004) psychosomatic disorders (Kane, 2009), poor mental health (Greenglass & Burke, 2000), alcoholism (Greenglass & Burke, 2000), drug abuse (Greenglass &Burke, 2000), absenteeism (O'Brien-Pallas et al., 2004), turnover (Dugan et al. 1996), on-the-job injury (Dugan et al. 1996), exhaustion (Demerouti, Bakker, Nachreiner, & Schaufeli, 2001), disengagement (Demerouti et al., 2001), diminished life satisfaction (Demerouti et al., 2001), and a decreased ability to provide quality care (Dugan, et al., 1996; O'Brien-Pallas et al., 2004). High perceived stress levels in nurses are also associated with lower health-promoting behavior scores (Tucker, Weymiller, Cutshall, Rhudy, & Lohse, 2012).

The time of orientation has been identified as the most stressful time in a registered nurse's career (Delany, 2003; Oermann & Moffitt-Wolf, 2009). Newly licensed registered nurses encounter several challenges as they transition into the hospital environment. They face complex settings with multiple stimuli and sources of

information. In addition, they are confronted with time pressures in the care of patients with complex healthcare needs, while often lacking adequate preparation, knowledge, time management, and critical thinking ability (Fero, Witsberger, Wesmiller, Zullo & Hoffman, 2008; Oermann & Garvin, 2002). Not only is the time of orientation stressful, it is well documented that the transition period for the graduate nurse from orientation to staff nurse is highly stressful as well (Delany, 2003; Godinez, Schweiger, Gruyer, & Ryan, 1999; Oermann & Garvin, 2002; Strachota, Normandin, O'Brien, Clary, & Krukow, 2003). In addition, the stressful transition from school to work is a major factor that influences the significant turnover rate of new nurses (Duvall & Andrews, 2010).

As noted earlier, stress can also lead to more severe conditions including burnout and PTSD. Burnout is a chronic form of stress caused specifically by role conflict, role ambiguity, and the emotional demands of caring for patients (Garrosa, Moreno-Jimenez, Liang, & Gonzalez, 2008). It is characterized by emotional exhaustion, depersonalization, and lack of a sense of personal accomplishment (Demerouti et al., 2001; Maslach & Jackson, 1981). Additionally, stressful events can lead to symptoms associated with PTSD which is "a psychiatric disorder caused by exposure to a traumatic event or extreme stressor that is responded to with fear, helplessness, or horror" (Mealer et al., 2009, p. 1119). Both of these disorders have a dramatic effect on nurses' work activities and interactions with their patients (Mealer et al., 2009)

Nurses' stress can be significant enough that it puts patients at risk (Berland, Natvig, & Gundersen, 2008), and has been linked to patient care errors (O'Brien-Pallas et al., 2004; Dugan et al., 1996). Safety issues that have been associated with job stressors

include incorrect documentation, medication errors or near misses, delays in patient care delivery, and violence among patients or towards nurses (Elfering, Semmer, & Grebner, 2006). Nurse absenteeism and turnover related to stress can lead to inadequate staffing levels, which also place patients at risk.

There are a growing number of investigations that examine the effectiveness of interventions aimed at mitigating nurses' and other healthcare workers' occupational stress (Van Wyk & Pillay-Van Wyk, 2010). A wide range of approaches has been implemented that can be divided into two main categories: those that are aimed at environmental management, and those that are targeted at supporting personnel to effectively deal with stress (Mimura & Griffiths, 2003). Riahi (2011) categorized nurse role stress preventive measures according to primary, secondary, and tertiary prevention. Primary prevention measures include those that involve fostering a healthy work environment in which there are the fewest number of possible stressors, such as introducing more efficient nursing care models, managing nurse workload, and addressing leadership issues (McVicar, 2003; Mimura & Griffiths, 2003). Secondary prevention involves identifying the presence of nurse stress and taking measures to manage the stress. Such measures often involve education and training (Riahi, 2011). Finally, tertiary preventative measures are those that focus on treatment, rehabilitation, and recovery for the severe health issues that have been associated with stress (Riahi, 2011).

Despite the growing number of studies regarding stress management for nurses and healthcare workers, literature review results have identified that there is not sufficient

evidence to support which measures are the most effective (Awa, Plaumann, & Walter, 2010; Clegg, 2001; McVicar, 2003; Mimura & Griffiths, 2003; Ruotsalainen, Serra, Marine, & Verbeek, 2008). Many of the associated investigations are plagued by methodological weaknesses such as small sample size, lack of power analysis, high attrition rates, and uncontrolled observations (Awa et al., 2010; Clegg, 2001; McVicar, 2003; Mimura & Griffiths, 2003; Ruotsalaine et al., 2008). There is, however, limited evidence that suggests that stress management interventions that are aimed at the person tend to be more effective than those aimed at environmental management (Mimura & Griffiths, 2003). In addition, Ruotsalainen et al. (2008) identified, in a systematic review of literature, that person-directed interventions for reducing occupational stress in health care workers can significantly reduce stress, burnout, lack of personal accomplishment, and anxiety. In a study involving nurses (N = 2,247) that was implemented at the same institution in which the present study occurred, Tucker et al. (2012) identified that "the degree to which nurses practice health-promoting behaviors in the areas of health responsibility, spiritual growth, and stress management" (p. 289) accounted for the majority of the variance in perceived stress scores.

Therefore, it is of great importance to identify strategies that reduce occupational stress and help nurses cope with stress in an effort to improve the quality of life of nurses and their patients, and to prevent the economic loss associated with injuries, absenteeism and job turnover. As noted above, studies are emerging in the literature regarding interventions aimed at helping the nurse cope with stress; yet, insufficient evidence is available as to the effectiveness of preventive strategies. In addition, due to the high rate

of stress experienced by the new nurse, substantiation of efforts to reduce the stress of nurses who are transitioning into the hospital setting is imperative.

A person-directed intervention that has shown promise for reducing stress and improving resiliency in a variety of populations is the Stress Management and Resiliency Training (SMART) program. The SMART program was developed by Dr. Amit Sood, Director of Research and Practice of the Complementary and Integrative Medicine Program at Mayo Clinic Rochester. It is designed to train participants to enhance present moment awareness through the practice of mindfulness, and cultivation of the higher principles of gratitude, compassion, acceptance, forgiveness and higher meaning and purpose (Sood, 2010).

A key component of the program is the integration of mindfulness practices into everyday life (Sood, 2010). Mindfulness permits one to "be present to reality as it is rather than to react to it or habitually process it through conceptual filters" (Brown, Ryan, & Creswell, 2007). Many physical and health-related benefits have been associated with the practice of mindfulness (Grossman, Niemann, Schmidt, & Walach, 2003), including a reduction of stress and stress-related symptoms (Brown et al., 2007). The program is also designed to promote resilience which allows one to move on from stressful experiences (Jackson, Firtko, & Edenborough, 2007), and to possibly emerge stronger in one's ability to face adversity (Gillespie, Chaboyer, & Wallis, 2007).

Purpose of the Study

The purpose of this study was to determine the feasibility of integrating the SMART intervention within a nurse residency program. In addition, the investigator

determined the impact of the SMART program on participants and assessed which aspects of the program were most beneficial. A third purpose was to assess the effect of the intervention on stress, anxiety, resilience, and mindfulness in relationship to a comparison group among nurse residents employed at a large Midwestern academic medical center.

Theoretical Framework

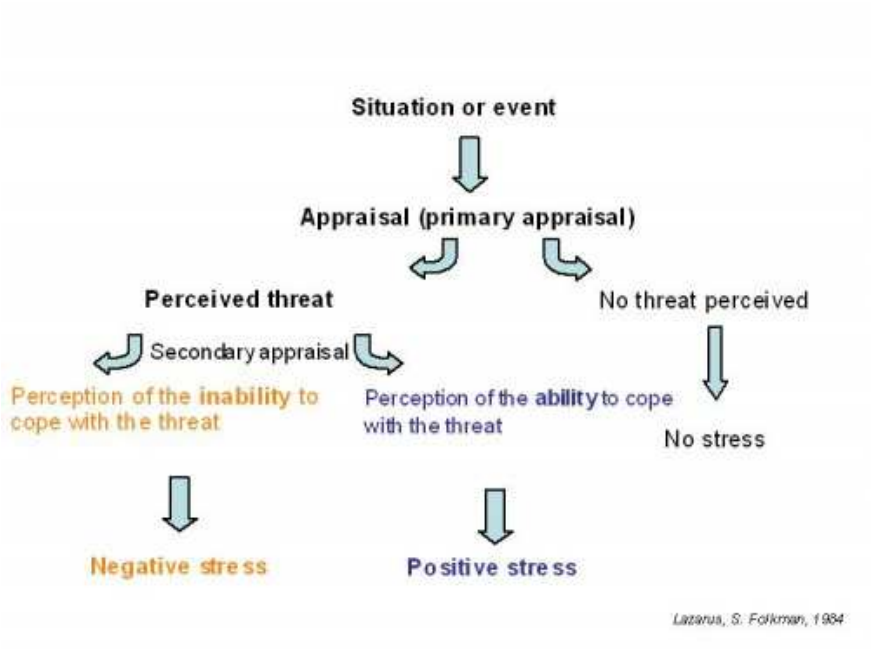
Stress-coping theoretical frameworks for nursing were developed by Goosen and Bush (1979) and Roy (1976). However, as indicated by Scott, Oberst, and Dropkin (1982), framework development was incomplete up to that point due to the lack of consistency of basic theoretical and operational constructs. In addition, these authors indicated that there was a need for a dynamic model that mapped the entire process of adjustment, as well as the interaction between individual and environment. The authors proposed a Helical Process of Coping model that included concepts of cognitive appraisal and physiologic response adapted from multiple authors, including Lazarus (1978). This model was developed in an attempt to provide a clear theoretical direction for department of nursing research and as a basis for generating research proposals (Scott et al., 1982). More recently, Lazarus and Folkman's theory of stress (1984), from the discipline of psychology, has become the most extensively applied theory in the study of stress management across disciplines (Lehrer & Woolfolk, 1993; Rick & Perrewe, 1995).

For the purposes of this study, *Lazarus and Folkman's Transactional Model of Stress* (1984) was employed in an effort to explain the process of the stress response. The Transactional Model of Stress offers a framework for understanding how a mindfulness-

based program can positively affect the stress appraisal of new nurses. According to Houser (2012), nursing practice is enhanced through knowledge obtained from other disciplines, such as psychology. Houser (2012) identifies Lazarus and Folkman's Transactional Model of Stress as an example of a theory that has been "borrowed, tested, and found to be empirically adequate in more than one discipline" (p. 137). According to this model, stress response involves a personal-environment transaction based on two primary variables: demand placed plus ability to meet that demand. The primary appraisal consists of assessment of the demand placed on the system, while the secondary appraisal comprises the assessment of resources available to meet this demand. Lazarus and Folkman's model is depicted in Figure 1.

Figure 1

Lazaraus and Folkman Transactional Model of Stress



Source: SKYbrary.com, permission for use granted (Appendix A)

Lazarus (2000) hypothesized that during the primary appraisal, one determines whether the situation he/she is facing is relevant to his/her values, beliefs, and goals and if so, in what way. If one believes the event or situation is not relevant to his/her well-being, then nothing further is considered. However, if it is determined that it is relevant, then the secondary appraisal occurs. In the secondary appraisal, one evaluates coping options, decides which ones to choose, and how to employ them (Lazarus, 2000). Coping is defined as "constantly changing cognitive and behavioral efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person" (Lazarus & Folkman, 1984, p. 141).

According to Lazarus and Folkman (1986) coping methods are assessed and selected during the secondary appraisal process. Coping is defined as "cognitive and behavioral efforts to manage (reduce, minimize, master, or tolerate) the internal and external demands of the person-environment transaction that is appraised as taxing or exceeding the person's resources" (Lazarus & Folkman, 1986). According to Cox, Griggiths, and Rial-Gonzalez (2000), if one is not able to cope effectively (due to either excessive demands or lack of resources), stress and negative health outcomes are likely to occur, and this would likely lead to negative organizational outcomes in the workplace as well.

Review of Theory

Confidence in Lazarus and Folkman's Transactional Model of Stress has been supported by research aimed at testing the model for empirical value. Folkman, Lazarus, Gruen, and DeLongis (1986) tested the relationship between personality factors, primary

appraisal, secondary appraisal, eight forms of problem- and emotion-focused coping, somatic health status and psychological symptoms in 150 community-residing adults in stressful situations. They found that “the variables did not explain a significant amount of the variance in somatic health status, but they did explain a significant amount of the variance in psychological symptoms” (p. 571); thus lending support for the prediction of psychological symptoms within the model. In addition, Penley, Tomaka, and Wiebe (2002) performed a meta-analytic review of the association of coping to physical and psychological health outcomes. Results indicated that problem-focused coping was positively correlated with overall health outcomes. These findings support the link between perception of the ability to cope with the threat and positive stress in the Transactional Model of Stress.

The model has also been tested in studies that occurred in workplace settings. Dewe (1991) tested the model with employees of a large insurance company. Significance was established between primary appraisal, coping and emotional discomfort, which “tends to support the growing recognition that measuring how a person thinks in a particular encounter is the key to determining how one copes” (p. 347). The model was also tested in a study with a sample of 190 nurses at a Veterans Affairs Medical Center (Welbourne, Eggerth, Hartley, Andrew, & Sanchez, 2006). The authors tested the relationships among workplace coping strategies, occupational attributional style (optimistic versus pessimistic), and job satisfaction and found that problem-solving coping mediated the relationship between attributional style and job satisfaction. The authors indicated that the findings “underscore the importance of understanding effective

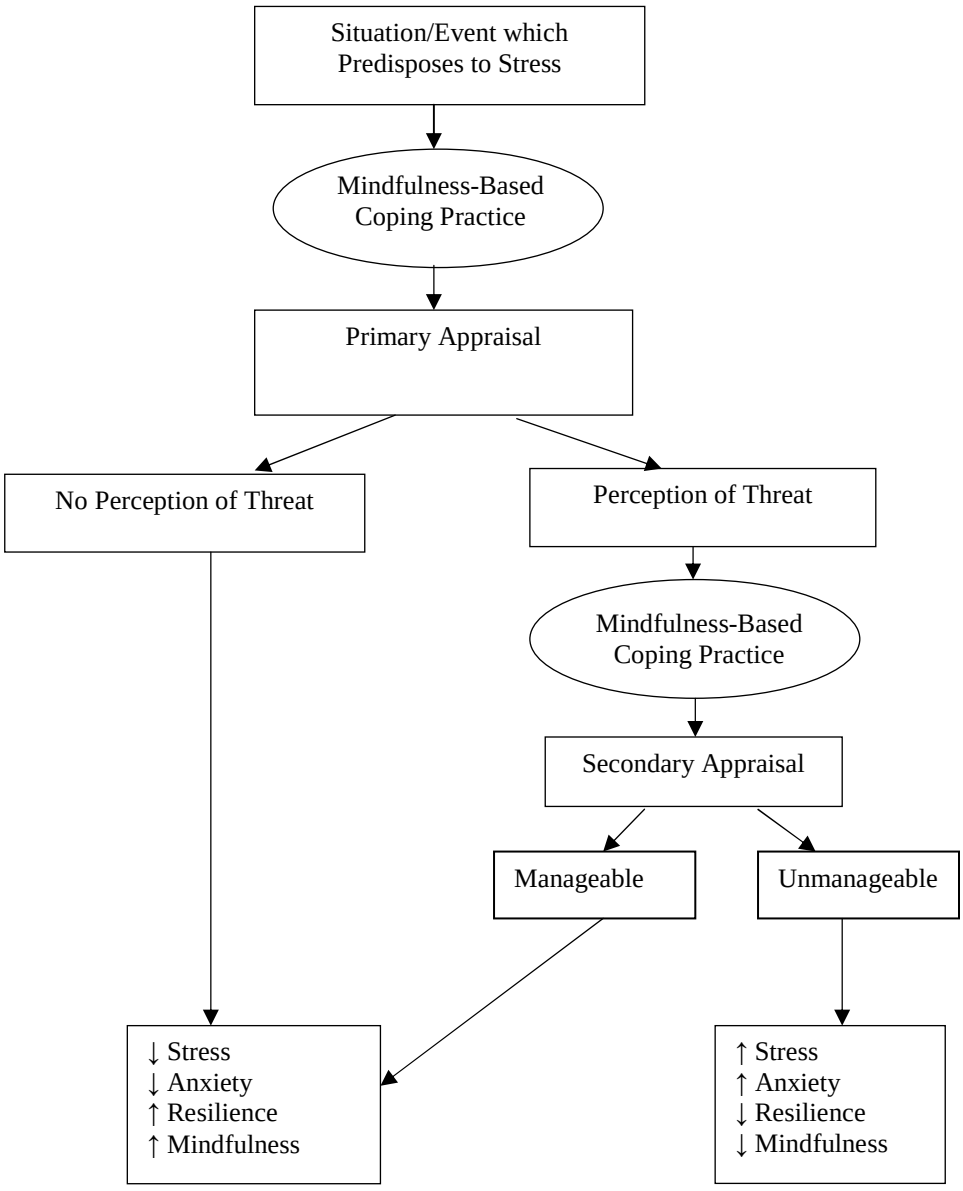
coping strategies for the workplace, and highlight the role that coping plays in linking individual differences among workers to job-related outcomes" (p. 322-323).

Application of Theory to Study

Expanding upon Lazarus and Folkman's stress and coping transactional model, it is hypothesized that the SMART program intervention will provide skills for meaning-based coping by including methods to enhance mindfulness and cultivate greater gratitude, compassion, acceptance, forgiveness and higher meaning and purpose (Figure 2). These skills provide coping strategies, and thus it is surmised the program will positively influence both primary and secondary stress appraisal by cultivating inner resources. At the point of primary appraisal, where one assesses whether an event or situation is perceived as a threat, mindfulness-based coping can assist with allowing one to observe the situation objectively and to more effectively identify those situations that are truly threatening, versus those that are merely threatening on the surface. At the secondary appraisal level, mindfulness based coping can assist one with developing new strategies to manage threatening situations. By impacting both levels of appraisal, mindfulness based coping has the potential to decrease stress and anxiety and increase resilience to prevent future stress. The use of this theory from psychology will add to the knowledge base of nursing by allowing us to identify how to prevent the negative outcomes of stress for the nurse, as well as the subsequent impact on the patient.

Figure 2

Theoretical Model: Mindfulness-Based Coping as an Intermediary in the Stress-Illness Link within Lazarus and Folkman's Transactional Model of Stress



Research Aims and Questions

To achieve the purpose of this feasibility study, the following aims were tested. Those aims that have research questions associated with them are followed by the associated question.

Aim I. Assess the feasibility of integrating a stress management and resiliency training program within a nurse residency program for nurse residents at a large Midwestern academic medical center. Feasibility was operationalized through evaluation of participant intervention compliance and adherence rates.

Research question: What are the levels of participant intervention compliance and adherence rates among nurse residents at a large Midwestern academic medical center who participate in the SMART program?

Aim II. Determine the impact of the SMART program on participants and assess which aspects of the program were most beneficial.

Aim III. Assess the effect of a program of stress management and resiliency training on participant stress at baseline and 4 and 12 weeks following the initial intervention among nurse residents at a large Midwestern academic medical center.

Research question: What is the difference in stress between those who attend the SMART program and a comparison group at baseline and 4 and 12 weeks following the initial intervention among nurse residents at a large Midwestern academic medical center?

Aim IV. Assess the effect of a program of stress management and resiliency training on participant anxiety at baseline and 4 and 12 weeks following the initial

intervention among nurse residents at a large Midwestern academic medical center.

Research question: What is the difference in anxiety between those who attend the SMART program and a comparison group at baseline and 4 and 12 weeks following the initial intervention among nurse residents at a large Midwestern academic medical center?

Aim V. Assess the effect of a program of stress management and resiliency training on participant mindfulness at baseline and 4 and 12 weeks following the initial intervention among nurse residents at a large Midwestern academic medical center.

Research question: What is the difference in mindfulness between those who attend the SMART program and a comparison group at baseline and 4 and 12 weeks following the initial intervention among nurse residents at a large Midwestern academic medical center?

Aim VI. Assess the effect of a program of stress management and resiliency training on participant resilience at baseline and 4 and 12 weeks following the initial intervention among nurse residents at a large Midwestern academic medical center.

Research question: What is the difference in resilience between those who attend the SMART program and a comparison group at baseline and 4 and 12 weeks following the initial intervention among nurse residents at a large Midwestern academic medical center?

Conceptual and Operational Definitions of Concepts

Select terms related to this study are defined for clarity:

Adherence. The World Health Organization (2003) has defined adherence to

health-related behaviors as “the extent to which a person’s behavior – taking medication, following a diet, and/or executing lifestyle changes - corresponds with agreed recommendations from a health care provider” (p. 17). For the purposes of this study, adherence was made operational by participant self-report of practice of the principles associated with the intervention at least 60% of the study days. The self-report item that measures this concept is item number three in the End of Study Questionnaire (Appendix B).

Anxiety. Anxiety is defined as “a heightened state of uneasiness to a potential nonspecific threat that is inconsistent with the expected event and results when there is a mismatch between the next likely event and the actual event” (Bay & Algase, 1999, p. 105). The concept was operationally defined as the total score on the Generalized Anxiety Disorder 7-item (GAD-7) scale (Spitzer, Kroenks, & Williams, 2006) (Appendix C).

Mindfulness. The term mindfulness is typically used to signify presence of mind and is defined by Kabat-Zinn as “Paying attention in a particular way: on purpose, in the present moment, and non-judgmentally” (1994, p. 4). It is rooted in Buddhist psychology and consists of two fundamental activities of consciousness: attention and awareness (Brown, Ryan, & Creswell, 2007). For the purposes of this study, mindfulness was made operational by means of the total score on the Mindfulness Attention Awareness Scale (MAAS) (Brown & Ryan, 2003) (Appendix D).

Resilience. Jackson et al. (2007) summarized the common characteristics and themes traditionally used to describe resilience and provided the following definition:

"the ability of an individual to adjust to adversity, maintain equilibrium, retain some sense of control over their environment, and continue to move on in a positive manner" (p. 3). Resilience was operationally defined in this study as the total score on the Connor-Davidson Resilience Scale (CD-RISC) (Connor & Davidson, 2003) (Appendix E). This is conceptually congruent with Lazarus and Folkman's (1984) description of the stress response. Lazarus and Folkman (1984) indicate that within both primary and secondary stress appraisals, stressors can be viewed as challenges rather than threats; furthermore, challenges provide an opportunity for growth and gain and can lead to positive emotions.

Stress. Lazarus and Folkman's (1984) definition of psychological stress was employed as a basis for the concept of stress in this study. The authors conceptualize stress as "a relationship between the person and the environment that is appraised by the person as taxing or exceeding his or her resources and endangering his or her well-being" (p. 21). The term stress can refer to multiple features; however, for the purposes of this study stress referred to the reaction of an individual to stressors. The term was operationally defined in this study by the total score on the Perceived Stress Scale (PSS) (Cohen, Kamarck, & Mermelstein, 1983) (Appendix F).

Significance of Study

Practice

This study is prescriptive in nature and attempts to add to the knowledge base of evidence-based nursing practice. The investigator's endeavor is to determine the feasibility of implementing a stress management program within a nurse residency program, and its effect on decreasing nurses' stress and anxiety and increasing their

mindfulness and resilience. As a result, this research has the potential to lead to the enhancement of the nursing discipline's current understanding of interventions which may lead to a reduction in stress for new nurses. A reduction in nurse stress, in turn, has the potential to develop new nurses' ability to provide high-level, safe, and effective patient care.

If this research should advance beyond the feasibility phase, further studies are incorporated, and the intervention is found to be successful, it has the potential to contribute to nursing knowledge surrounding the client-nurse interaction. Kim (1987) identified that the client-nurse interaction is one of the four essential components of nursing knowledge. Kim (1987) conceptualized the linkage of variables in the client-nurse interaction, and identified that psychological elements of the nurse are one of the factors that influence the client-nurse interaction, which can, in turn, impact the client's health and behavior. The nurse's attributes are considered the "predisposing, enabling, and hindering factors for the process and property of interaction" (p. 138) with the client. This investigator's research will help to identify whether a stress management program can be effective in improving the psychological elements of the nurse. It is hypothesized that by positively impacting the nurse's ability to cope with stress, that he/she will be better poised to meet his/her patient's needs and will be more likely to affect positive health and behavior outcomes. Future research based on this feasibility study could address this hypothesis. Secondary economic gains may also result, through decreased absenteeism and an improved retention rate of new nurses.

Theory

According to Fawcett (1999), science is generally considered "the systematic, controlled, empirical, and critical activities undertaken to generate and test theories" (p. 311). For the purposes of this study, the transactional model of stress (Lazarus & Folkman, 1984) offers a theoretical framework for understanding how a mindfulness-based program can positively affect the stress appraisal of new nurses. As noted earlier, Houser (2012) identified Lazarus and Folkman's transactional model of stress as an example of a theory that has been "borrowed, tested, and found to be empirically adequate in more than one discipline" (p. 137). According to this model, stress response involves a personal-environment transaction based on two primary variables: demand placed plus ability to meet that demand. The primary appraisal consists of assessment of the demand placed on the system, while the secondary appraisal comprises the assessment of resources available to meet this demand. Lazarus and Folkman's model is depicted in Figure 1. This study will allow for a better understanding as to whether a mind-body intervention can impact the nurse's primary and/or secondary appraisal of stress, and therefore act as an intermediary in the stress-illness link. This information will lend further support to Lazarus and Folkman's transactional model of stress.

Research

Multiple stress management interventions have been implemented with nurses, and have been placed in the categories of cognitive-behavioral, relaxation, organizational, multimodal, or alternative (Richardson & Rothstein, 2008). Awa et al. (2010) also report the use of professional skill training, clinical supervision, counseling, and psycho-social

skill training for healthcare professionals as strategies to reduce stress. However, job-related stress continues to be a significant issue for new nurses, lending support for the continued need for identifying effective interventions and the optimal time to employ them. In addition, there is a need for an intervention that is feasible for busy healthcare practitioners.

In a review of the state of the science of the benefits of mindfulness, Brown et al. (2007) identified that current literature supports the fact that the cultivation of mindfulness promotes healthy, adaptive human functioning. However, they also recognized that the field of mindfulness studies is in its early stages and the current literature lacks methodological rigor. This study will lay the foundation for more studies which have the potential to identify an intervention that can effectively assist new nurses in managing the high stress associated with the profession. It entails a rigorously-designed protocol with a relatively large sample size and a comparison group, thus providing reliable results regarding the benefits of mindfulness practice and stress management for nurses.

The intervention is unique in that it aims to not only decrease stress, but to increase resilience which can lead to prevention of future stress. This will add to the limited body of knowledge related to resiliency training, and resiliency training for nurses in particular. In addition, this study will assist in identifying whether a relatively brief mind-body intervention can add to the feasibility of the program for nurses who tend to lead busy lives. This research also provides the opportunity to test the effectiveness of the program with a unique population not previously studied in relation to this intervention.

Policy

A key issue that has been identified as contributing to new nurse stress is that new graduates are not adequately prepared to provide safe patient care. A survey of employers by the National Council of State Boards of Nursing (NCSBN, 2002, 2004) found that less than 50 percent answered “Yes definitely” when asked if new graduates are ready to provide safe, effective care. In addition, The Nursing Executive Center survey of frontline nurse leaders found that improvement of nurse preparedness is needed across levels of nursing education (Berkow, Virkstis, Stewart, & Conway, 2008). Therefore, transition to work programs with a stress management component have been developed as a method to prepare more competent providers, decrease nurse turnover rates, and improve patient safety.

Dracup and Morris (2007) predict a 50% turnover in the nursing profession in just over 10 years, based on the number of nurses reporting they plan to retire between 2011 and 2020. As nurses retire, the ratio of new graduates to experienced nurses will increase, creating an expertise gap in nursing. In addition, according to the American Association of Colleges of Nursing (2012), despite the recently reported easing of the nursing shortage due to the recession, it is expected that there will be a 26% growth in need for nurses by 2020 – an increase of 712,000 nurses. A shortage of nurses could lead to new nurses caring for more patients under increasingly difficult working conditions (Hassmiller & Cozine, 2006). Novice nurses tend to struggle with detecting subtle changes in patient conditions (Orsolini-Hain & Malone, 2007) and may omit necessary care (Kalisch, 2006). They also tend to be concrete thinkers who focus on technology

(Benner, 2004; Ebright, Urden, Patterson, & Chalko, 2004) who then miss the bigger picture, adversely affecting patient outcomes (Del Bueno, 2005; Orsolini-Hain & Malone, 2007).

The NCSBN has recently developed a Transition-to-Practice regulatory model (Spector & Echternacht, 2010). The council's goal is to gain support for a federally funded residency program for nursing, implemented through regulation. It is currently conducting a longitudinal, multi-institutional, randomized study to investigate the effect of the Transition-to-Practice Model. The study is expected to be completed in 2013 and results will provide evidence to boards of nursing on whether to implement the regulatory model.

This study will contribute to the current knowledge base on the effectiveness of a stress management component within a nurse transition to work program in reducing nurse stress. There is some evidence to support the hypothesis that transition programs contribute to reduced stress in new nurses and promote factors which would be beneficial in reducing stress. Multiple studies identified a reduction of stress as a positive outcome of nurse transition programs (Beyea, von Reyn, & Slattery, 2007; Scott & Smith, 2008; Fink et al., 2008; Goode, Lynn, Krsek, & Bednash, 2009). Others identified a reduced turnover rate of new nurses (Cantrell & Browne, 2006, Schoessler & Waldo, 2006; Goode et al., 2009; Meyers-Bratt, 2009; Morris et al., 2009) and decreased nurse vacancy rates (Morris et al., 2009). This study will assist with identifying the feasibility of incorporating a stress management curriculum component within a nurse residency program, and analyze the potential benefits of the stress management program.

If the SMART program is found to be feasible within a nurse residency program, and if it demonstrates a positive impact on nurse residents' stress, anxiety, mindfulness, and resilience, significant support will be gained for implementation of the program on a wider scale within the institution. Recommendations would be made to incorporate the program into the next phase of implementation of the nurse residency program, beyond the pilot phase. In addition, support would be extended for wide-spread implementation of the program, making it available to a broader audience of nurses within the institution, as well as other members of the healthcare team. This study also has the potential to support the inclusion of a stress management component within the NCSBN Transition-to-Practice regulatory model.

Chapter Summary

Nursing has been identified as a highly stressful career. Nurses face a complex work environment and encounter time pressures and safety issues in the care of patients with multifaceted needs. Nurse stress can negatively impact the well-being and mental health of nurses, and can be significant enough that it places patients at risk and reduces their quality of care. New nurses tend to experience the greatest degree of stress due to the difficult transition from school to work. A wide range of approaches to assist nurses in managing or preventing stress have been investigated; however, there is not enough evidence to support which measures are the most effective. Identification of effective strategies are needed to reduce nurse stress, thus improving their physical and mental health and positively impacting their ability to provide safe, effective patient care. Therefore, the purposes of this study were to determine the feasibility of integrating a

Stress Management and Resiliency Training program into a nurse residency program; assess the impact of the program on the participants and identify the components of the program that were most beneficial to them; and measure its effect on nurse residents' stress, anxiety, resilience and mindfulness in relationship to a comparison group. A theoretical model based on Lazarus and Folkman's (1984) Transactional Model of Stress was used as a theoretical framework to guide the study.

Format of Subsequent Chapters

The following chapters provide a review of literature regarding stress management interventions for nurses, a description of the methodology employed for this study, a report of quantitative and qualitative outcomes of the investigation, and a synthesis of the findings. Included in the chapters are three manuscripts written in a format to be submitted to scholarly journals for consideration. Chapter 2 includes two sections. Section one contains manuscript 1 titled "Stress Management Interventions for Nurses: A Systematic Review of Literature". Section two of chapter 2 includes a review of literature on mindfulness, mindfulness based coping intervention approaches, and resilience. The study methodology is presented in Chapter 3. The outcomes of the study are included in Chapter 4, which includes the remaining two manuscripts. Manuscript 2 is titled "Integration and Impact of Stress Management and Resiliency Training (SMART) in a Nurse Residency Program: Part I, Quantitative Outcomes". Manuscript 3 is titled "Integration and Impact of Stress Management and Resiliency Training (SMART) in a Nurse Residency Program: Part II, Qualitative Outcomes". Finally, a synthesis of the studies is provided in chapter 5.

CHAPTER 2: REVIEW OF LITERATURE

Chapter Introduction

The purpose of this chapter is to provide a review of literature related to stress management and stress management interventions for nurses. Particular attention is paid to mindfulness-based interventions that allow for enhanced coping in the workplace. Four mindfulness-based treatment approaches that are most commonly found in the literature are described. The Stress Management and Resiliency Training Program (SMART), the effects of which were investigated in this study, is presented and the findings of previous studies associated with the program are reported. This chapter is organized in two sections. Section one entails a systematic review of literature related to stress management interventions for nurses in the format of a manuscript to be submitted to the Western Journal of Nursing Research for consideration. The literature on mindfulness, mindfulness-based coping intervention approaches, and resilience is reviewed in section two.

Section One: Manuscript 1: Stress Management Interventions for Nurses: A Systematic Review of Literature

Abstract

Nursing literature contains numerous studies on the effect of stress management interventions for nurses; however, the body of evidence is not clear. The purpose of this review of literature was to identify the state of the science of stress management interventions for nurses. Twenty-seven articles met the inclusion criteria for this study and were categorized and analyzed for scientific rigor. The results indicate that there are

a variety of interventions that have been investigated, the majority of which are aimed at treatment of the individual and are at the secondary level of prevention. Contemporary studies are only moderately meeting the identified gold standards of research design. Issues identified include lack of randomized controlled trials (RCTs); small sample sizes; barriers to generalizability, such as lack of heterogeneous samples; absence of theoretical frameworks to guide the studies; inadequate control of confounding variables; and limited statistical analysis. Recommendations for future research include: implementing studies that include a randomized, controlled design; employment of a large sample size with an adequate statistical power analysis; studies designed and interventions selected in accordance with a theoretical model that will inform the reader of how concepts were applied in the study and will allow for future studies to be based on past work; methods of assessment which include both self-report and objective techniques; long-term assessment of outcomes in an effort to assess the sustainability of the interventions over time; and a clear description of interventions and dosage of the interventions to allow for replication of study designs and for readers to determine applicability of the study to their environment.

Introduction

Stress is defined in many different ways due to the numerous diverse aspects related to the phenomenon. The Biopsychosocial Model of Stress by Bernard and Krupat (1994) states that stress involves three components: external, internal, and the interaction between the external and internal components. Although stress is commonly thought of in negative terms, stress can also have positive effects and outcomes. Eustress is a term used

for positive responses, while distress refers to responses with negative connotations (Le Fevre, Matheny, & Kolt, 2003). As noted by McVikar (2003), “Stress, therefore, should be viewed as a continuum along which an individual may pass, from feelings of eustress to those of mild/moderate distress, to those of severe distress” (p. 634). Lazarus and Folkman (1984) identified that stress is experienced as a result of one’s appraisal that an event or situation is taxing and exceeding his/her resources and endangering his/her well-being.

A review of literature identified that workplace stress has been associated with the clinical practice of nursing in multiple studies (McVicar, 2003). Nurses encounter several challenges in the work environment. They face complex settings with multiple stimuli and sources of information (Burgess, Irvine, & Wallymahmed, 2010), and are confronted with heavy workloads, rotating shifts, and time pressures in the care of patients with complex healthcare needs (Gershon et al., 2000). In addition, nurses work in an environment with multiple safety concerns, including possible needle stick injuries and exposure to blood and body fluids (Gershon et al., 2000).

Workplace stress has been found to have a negative impact on the health and well-being of nurses (Gelsema, Van Der Doef, Maes, Akerboom, & Verhoeven, 2006). Among nurses and other healthcare professionals, outcomes of stress have been identified as psychosomatic disorders, poor mental health, alcoholism, drug abuse, absenteeism, tardiness, turnover, on-the-job injury, and a decreased ability to provide quality care (Dugan, et al., 1996; O’Brien-Pallas et al., 2004). In addition, stress can also lead to the severe condition of “burnout”, a chronic form of stress caused specifically by role

conflict, role ambiguity, and the emotional demands of caring for patients (Garrosa, Moreno-Jimenez, Liang, & Gonzalez, 2008). Burnout is characterized by emotional exhaustion, depersonalization, and lack of a sense of personal accomplishment (Maslach & Jackson, 1981)

Nurses' occupational stress can be significant enough that it puts patients at risk (Berland, Natvig, & Gundersen, 2008), and has been linked to patient errors (O'Brien-Pallas et al., 2004; Dugan et al., 1996). Safety issues that have been associated with job stressors include incorrect documentation, medication errors or near misses, delays in patient care delivery, and violence among patients or towards nurses (Elfering, Semmer, & Grebner, 2006). Nurse absenteeism and turnover related to stress can lead to inadequate staffing levels, which also place patients at risk.

Therefore, initial determinations support preventing and reducing work-related stress in an effort to improve the quality of life of nurses and their patients, and to prevent the economic loss associated with injuries, absenteeism and job turnover. However, these issues have not yet been adequately addressed. The purpose of this paper is to synthesize the current state of the science regarding stress management interventions for nurses. The questions proposed include: 1) What types of stress management interventions have been investigated for their ability to reduce stress and/or burnout in nurses? and 2) What is the level of rigor and empirical validity related to studies which have investigated stress management interventions for nurses? A systematic review of the literature was used to synthesize the recent research on the topic, identify gaps in the literature, and recommend directions for future research and practice.

Methodology

A literature search was performed using the key terms ‘nurse’, ‘nurses’, ‘nursing’, ‘stress’, ‘distress’, ‘burnout’, and ‘intervention’, in various combinations. Databases searched include CINAHL, Medline, and PsycINFO. Articles were also obtained from reference lists of studies identified in the original search. Eligibility criteria included: evaluation of a stress management intervention, stress or burnout measured as an outcome, licensed nurses comprised the majority of the sample, quantitative measures used, and published in English. Articles from January 2000 – March 2012 were included in order to ensure recency of the data.

In an effort to delineate the various types of stress interventions that are present in the literature, a complete list of all interventions employed in the studies was compiled. Next, the studies were categorized by types of interventions. According to Mimura and Griffiths (2003), stress management interventions for nurses tend to fall into two categories: 1) those that impact the individual, and 2) those that impact the workplace environment. Therefore, these criteria were employed as a method to categorize the interventions. As a second method, the studies were categorized by level of prevention of the interventions, which can be regarded as either: 1) primary (removes or reduces the stressors), 2) secondary (modifies an individual’s response to stress), or 3) tertiary (assists those who are already experiencing severe stress) (Cooper, Dewe, & O’Driscoll, 2001; Galbraith & Brown, 2011; Murphy, 1988).

Finally, articles were analyzed for rigor and empirical validity. Study components that were analyzed include those based on standards well-established in the literature for

analyzing the effectiveness of interventional studies: 1) design, 2) sample size, 3) factors affecting generalizability, 4) interventions employed, 5) description of the interventions, 6) confounders, 7) statistical reporting, and 8) recommendations for practice (Pennington & Spurlock, 2010). The studies examined were analyzed against the gold standard for interventional study designs, which is considered to be experimental with randomization to groups (Evans, 2003; Pennington & Spurlock, 2010). According to Shadish, Cook, and Campbell (2002), random assignment "reduces the plausibility of threats to validity" and "allows for the computation of a valid estimate of error variance that is also orthogonal to treatment" (p. 248). While there is evidence to support that both randomized controlled trials (RCT) and observational studies can contribute to the validity of the effectiveness of an intervention, only RCTs can determine if factors other than the intervention may be responsible for differences in findings (Evans, 2003).

A sample size was ascertained to be valid if the size was determined by power analysis; and if not, then at least 80 participants, with 40 in each group, of a two-group study (Kellar & Kelvin, 2013). Factors regarding generalizability were considered to be addressed appropriately if threats to external validity were minimized, significant ones were addressed, demographic and geographic information was reported, multiple sites were used, or long-term outcomes were used to avoid focused variability in the data (Pennington & Spurlock, 2010). The intervention employed was determined to be valid if either a single intervention was employed or, if more than one intervention was employed, they were theoretically bundled appropriately (dealing in only one domain) (Pennington & Spurlock, 2010). In addition, criteria for an adequate description of the

intervention included a clear enough description of the intervention so that it could be replicated (Brandt, Kirsch, Lewis, & Casey, 2004; Pennington & Spurlock, 2010). Confounders were found to be adequately addressed if those that could not be controlled were addressed and accounted for (Pennington & Spurlock, 2010). In regard to statistical reporting, criteria included that the correct tests were performed, statistical significance and means and standard deviations were reported, and confidence intervals were provided if p values were not stated (Pennington & Spurlock, 2010). Finally, criteria for an ideal report of recommendations included reporting implications for practice, recommendations which were based on data from the study and did not overreach the data analyzed, and study limitations (Pennington & Spurlock, 2010).

Each component of the study was scored as 1 = criterion met or 0 = criterion not met. This allowed for an investigation into the rigor of the studies, their validity, and their capability to identify the effectiveness of the interventions tested (Pennington & Spurlock, 2010).

Results

The search originally produced 314 studies. Each study was analyzed according to the inclusion criteria. Twenty-nine articles remained after excluding those that did not meet the criteria. After further analysis, two articles were omitted which were too brief to be analyzed for adequate rigor. This left a final count of 27 articles included in the review. A flowchart depicting the literature search process is depicted in Figure 1.

INSERT FIGURE 1 HERE

Research Question 1: Types of Stress Management Interventions for Nurses

In an effort to determine what types of stress management interventions have been investigated regarding their effect on stress and/or burnout in nurses, a compilation of all interventions employed in the studies was created. Each of the studies fell into one of the two categories previously mentioned regarding the impact of the intervention: those in which interventions were aimed at treatment of the individual (*n*=20), and those in which interventions were aimed at treatment of the workplace environment (*n*=7). Another classification of articles was identified according to the level of prevention of the interventions studied. As noted earlier, interventions can be categorized as either primary, secondary, or tertiary. The majority of the interventions in the studies analyzed in this review were secondary (*n*=18), followed by primary (*n*=7), and tertiary (*n*=2). A compilation of the strategies used for stress management in all reviewed studies, as well as their classifications, is included in Table 1.

INSERT TABLE 1 HERE

Research Question 2: Rigor and Empirical Validity of Studies

The studies were then judged for rigor and empirical validity according to the eight components listed earlier. Each component of the study was scored as 1 if the ideal criterion was met, and 0 if it wasn't; therefore, the highest score possible for each study was 8 and the lowest score 0. The overall scores for the 27 articles were: mean = 4, median = 4, mode = 4. This denotes a moderate rating in comparison to a gold standard of 8, indicating that there were some issues with the majority of the studies regarding

validity and generalizability of the results. The findings for each component from the analysis of the literature are discussed in the following sections.

Design

Eight of the 27 articles examined for this study employed a randomized, controlled design. The majority (*n*=7) used self-report measures to assess stress or stress-related symptoms. Bost and Wallis (2006) performed an RCT and were the only authors who included physiological measures related to stress (urinary cortisol and blood pressure readings) in addition to a self-report measure (State-Trait Anxiety Inventory). The majority of studies (*n*=12) that did not employ a randomized control design implemented a single group pre-test, post-test design. A common structure barrier reported that prevented the implementation of a randomized, controlled design was the difficulty of working with nurse participants with varied schedules, or from a number of units of a hospital, and scheduling them for interventions and control group activities. The authors of one study (Pemberton & Turpin, 2008) had the participants each serve as his or her own control in the testing of different combinations of essential oils to determine which formulation was more successful at reducing stress. Cooke, Holzhauser, Jones, Davies and Finucane (2007) did not employ a control group; however, the nurses who were invited to participate in the study were randomly selected from all the nurses in the emergency department of a hospital. Walker (2006) studied nurses from 6 different hospitals and randomly assigned the participants by institution in an effort to avoid cross-contamination among the experimental and control groups. Chang, Kicis, and Sangha (2007) studied the effect of the Clinical Support Nurse (CSN) role on stress and used a

one-group design with a post-test only. Dodd-McCue, Tartaglia, Myer, Kuthy, and Faulkner (2004) were the only investigators to employ a retrospective design to examine the effects of a protocol change on nurses' perception of stress five years after the protocol was implemented. Kravits, McAllister-Black, Grant, and Kirk (2010) were the only authors who included an assessment technique (Draw-a-Person-in-the-Rain) which required evaluation and scoring by the investigators.

Few studies (5/27) stipulated a theoretical framework as a basis for their investigation. Sherwood and Tagar (2002) identified that the attributes of Rudolf Steiners's (1981) psychological model were incorporated into the stress management intervention of philophonetics counseling examined in their study. Two studies drew from multiple models: Judkins and Ingram (2002) identified frameworks of stress and coping by Lazarus (1966), Kobasa's (1979) hardiness, and Roy's (1974) Adaptation Model; while Kravits, McAllister-Black, Grant, and Kirk (2010) employed the frameworks of Lazarus and Folkman's (1984) Cognitive Model of Stress and Coping to identify their curriculum and the Transtheoretical Model of Change (Prochaska & Norcross, 2001) to guide their instructional methods. The remaining studies did not include a theoretical model as a basis for their study. For those that did include a theoretical model, only two included a conceptual model specific to the study, and which was based on the theories they employed: Günüşen and Üstün (2010) and Kravits et al. (2010).

Sample Size

A specific sample size was provided in each study. The majority of the sample sizes were relatively small (meaning a sample size of 50 or less). The largest sample size reported was by Kravits, McAllister-Black, Grant, and Kirk (2010) who reported a sample of 248 nurses from a cancer center; however, the participants were not followed for any long-term outcomes. Sherwood and Tagar (2002) reported the smallest sample size of 5 nurses who were studied in an effort to determine the effects of philophonetics counseling sessions. Those studies in which an experimental randomized, controlled design was used had an average sample size of 54. In only one study (Brit Pipe, Bortz, & Dueck, 2009) was an a priori power analysis reported for the sample size.

Generalizability

Both demographic and geographic information were identified in the majority of the studies. Only 4 studies (Jelonek Walker, 2006; Judkins & Ingram, 2002; Walker, 2008; Yamagishi, Kobayashi, & Nakamura, 2008) used multiple sites. Jelonek Walker (2006) employed the largest number of sites, recruiting nurses from 6 different hospitals within a hospital network. Due to the large number of studies only using one site, it is difficult to determine if the results could be replicated in a system with a heterogeneous sample in comparison to those of the studies. As stated earlier, only 5 of the 27 studies explicitly stated a conceptual framework that was utilized as a guide for research. Without the ability to clearly identify and evaluate the framework of a study, it is difficult to determine how the findings can be integrated into practice. The use of theoretical frameworks allows the reader to fully grasp the concepts and the relationship of concepts

included in the study and to determine how the concepts have been applied within the study design (Polit & Beck, 2012).

Intervention Quality

A single, discrete intervention was used in the majority of the studies (*n*=25). Those investigators who used multiple interventions (Cooke et al., 2007; Kravits, McAllister-Black, Grant, & Kirk, 2010; Repar & Patton, 2007), used a combination of interventions that were bundled appropriately, such as aromatherapy and music together with chair massage. Few identified a theoretical framework that was used to guide the selection of the intervention.

Description of Interventions

A thorough enough explanation of the interventions employed was provided in 20 studies, such that they could be replicated. However, some of the reports were missing key data which would be necessary to identify if the study could be replicated. For example, two studies (Cooke et al., 2007; Cuneo et al., 2011) did not adequately identify the "dose" of the interventions employed. Also, 6 of the studies did not clearly specify the length of time over which the study occurred. In one of these studies (Judkins & Ingram, 2002) the use of a self-paced learning module was investigated and the authors failed to identify the intended or actual length of time to complete the module. This would be particularly important information for researchers planning interventions for nurses who tend to be too busy to invest large amounts of time in a learning module.

Confounding Variables

Because the majority of the studies did not include a control group, it is difficult

to determine if the effects of the intervention were due to confounding variables, such as passage of time, time off the unit for the intervention, or socialization aspects of the interventions. For those that did use an experimental design with a control group, only two (Britt Pipe, Bortz, & Dueck, 2009; Brennan & DeBate, 2006) employed an alternative treatment for the control group to control for the placebo effect and other possible confounding variables. Most utilized a wait list control group instead. Also, the majority of the studies in which a pre-test, post-test design was used did not perform an assessment of long-term outcomes, making it difficult to determine if the intervention had any lasting effects. Finally, Dodd-McCue et al. (2004), who used a retrospective design, collected data 5 years after the implementation of the intervention and relied on the participants' ability to recall their stress level prior to the start of the intervention. It would be extremely difficult to control for confounding variables with a retrospective design which spans over such a long period of time. No attempts to control for such variables were addressed by the authors.

Statistical Reporting

The majority of the studies employed the correct tests and reported adequate statistics, including statistical significance, means and standard deviations, and confidence intervals if appropriate. Some authors, however, provided limited statistical analyses of the data. For example, both Pemberton and Turpin (2008) and Repar and Patton (2010) failed to provide standard deviations and did not report statistical significance. In addition, Bright and Crockett (2011) used an experimental randomized, controlled design; however, they did not report a between group analysis of the data and

only provided limited statistical analysis. Few studies reported effect sizes. Tran B.Med et al. (2010) reported a small sample size of matched pair data for the 6-month follow-up data, limiting the reliability of the statistical analysis, which the authors acknowledged as a limitation of the study.

Recommendations

All studies included recommendations for implementing stress management interventions in the workplace for nurses. The majority (*n*=22) also addressed limitations of the studies. Themes identified in the studies regarding recommendations include:

- Greater emphasis needs to be placed on self-management of stressors by institutions that employ nurses (Bright & Crockett, 2011; Brit Pipe et al., 2009; Dodd-McCue et al., 2004; Kravits et al., 2010; Sherwood & Tagar, 2002).
- Stress management interventions should be employed in order to decrease the psychological stress of nurses and decrease sick leave and improve retention rates (Brennan & DeBate, 2006; Chang et al., 2007; Judkins & Ingram, 2002; Repar & Patton, 2010).
- Future studies regarding stress management intervention for nurses need to be employed with larger samples sizes; long-term outcomes; and randomized, controlled designs (Bost & Wallis, 2006; Bright & Crockett, 2011; Cooke et al., 2007; Chang et al., 2007; Cuneo et al., 2011; Ewers, Bradshaw, McGovern, & Ewers, 2002; Isaksson Rø, Gude, Tyssen, & Aasland, 2010; Jelonek Walker, 2006; Pemberton & Turpin, 2008; Poulin, Mackenzie, Soloway, & Karayolas, 2008; Sherwood & Tagar, 2002; Shimizu, Mizoue, Kubota, Mishima, & Nagata, 2003; Yamagishi, Kobayashi, & Nadamura, 2008).

▪ Feasible ways of implementing stress management techniques into the work setting, and promoting long-term use of the strategies are needed (Brit Pipe et al., 2009; Brennan & DeBate, 2006; Mackenzie et al., 2006; Repar & Patton, 2010).

▪ Nursing leadership needs to support healthy stress management (Bright & Crockett, 2011; Brit Pipe et al., 2009; Chang et al., 2007; Judkins & Ingram, 2002; Poulin et al., 2008; Wallbank & Hatton, 2011).

Discussion

This review of studies investigating stress management interventions for nurses revealed that the majority of reported interventions are aimed at treatment of the individual versus treatment of the workplace environment. In addition, the preponderance of interventions are at the secondary level of prevention - those that are aimed at modifying an individual's response to stress (versus those that are intended to remove or reduce stressors or assist those who are already experiencing severe stress). A wide variety of types of interventions are reported including education, counseling, relaxation techniques such as massage and mindfulness based coping strategies, aromatherapy, support groups, introduction of new employee roles and models of nursing, and adoption of a computerized order system.

Very few RCTs are present in the literature, which greatly limits the ability to determine if the interventions employed are primarily responsible for the findings of the studies (Evans, 2003; Shadish et al., 2002). In addition, an extremely small number of physiological, objective measures of stress were employed in the studies, with the large majority including self-report measures. This also limits the ability to determine whether

factors other than the intervention influenced the results of the study (Cohen, Kamarck, & Mermelstein, 1983). Sample sizes in the studies on a whole were small without a priori power analyses performed. Generalizability of the studies is hampered by lack of multiple site study designs and largely absent conceptual frameworks as a guide for the study or intervention design. Intervention quality and descriptions of interventions tend to rate high; however, the absence of accounting for confounding variables jeopardized the results of the studies. For example, very few studies reported long-term outcome measures. The majority of the studies included appropriate statistical reporting; however, few reported an effect size when appropriate. Several recommendations were reported in the studies analyzed; however a large degree of confidence cannot be placed on the recommendations due to the many methodological challenges identified in this systematic review of literature. While many studies have indicated the benefits of stress management for nurses, more rigorous studies are needed that can more reliably demonstrate the extent of their effect.

There is a need for more studies employing experimental randomized, controlled designs. Including a control group is critical for this type of study to account for the many confounding variables that are likely to impact results, such as passage of time, effects of taking a break from the unit, socialization aspects of interventions, other variables within the hospital or unit that may impact stress levels, taking time to focus on self, and the placebo effect can be taken into account. In addition, larger sample sizes are needed in order to produce an adequate statistical power. Utilization of an alternate treatment for control groups can also assist in avoidance of confounding factors. Measures of stress

that are more objective than self-report measures, such as physiological markers, would provide more reliable data regarding the effect of the interventions. Barriers to the use of physiological measures are most likely related to the greater ease of use of self-report measures.

The issues identified in this review lend support to the need for studies with more robust designs. Long term outcomes need to be measured in order to determine the lasting effects of the interventions. The multiple barriers to implementing stress management interventions for nurses identified in the studies reviewed demonstrate the importance of identifying the long-term effects of the techniques in order to gain administrative support for the cost and effort of implementation. The identification of multiple barriers to implementation also supports the fact that more studies are needed which will address the feasibility of stress management interventions. Before large-scale studies are implemented, pilot studies assessing the feasibility of the intervention should be executed first.

Recommendations for Future Research

As a result of this analysis of the literature, several recommendations emerged regarding the study of stress management interventions for nurses. Future research should employ randomized, controlled designs with a sample size that has been analyzed for adequate power. Statistical power calculations should be performed prior to data collection. Control groups should receive an alternate, comparable treatment in an effort to account for possible confounding variables. Studies should be designed and interventions selected in accordance with a theoretical model which will inform the

reader of how concepts were applied in the study and will allow for future studies to be based on past work. Methods of assessment should include both self-report and objective techniques, and should be selected based on literature reviews of stress for nurses.

The majority of the articles in this review applied appropriate statistical methods; however, few reported effect sizes when appropriate, which indicate the magnitude of a relationship between two groups (Shadish, Cook, & Campbell, 2002). In addition, most of the articles did not employ long-term assessment of outcomes. This would be important to include in order to assess the sustainability of the interventions over time. Interventions need to be clearly described and the dosage of the interventions indicated to allow for replication of study designs and for readers to determine applicability of the study to their environment. Finally, pilot studies should be conducted to determine the feasibility of interventions prior to large-scale studies, given the many obstacles to implementation of interventions identified in the literature.

Conclusion

There are a number of issues that arose from this systematic review of the literature that demonstrate the need for improved rigor in the design of research for stress management interventions for nurses. The majority of the current studies in the literature are only moderately meeting the identified gold standards of research design. Studies with a more robust design, such as randomized controlled trials, would provide stronger evidence for or against the efficacy of such interventions. This information is vital to the practice of nursing, in that decreasing nurse stress has the potential to improve the psychological health of nurses and allow them to provide more effective, safe patient

care.

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Figure 1 (Dissertation Figure 3)

Literature Search Process for Stress Management Interventions for Nurses

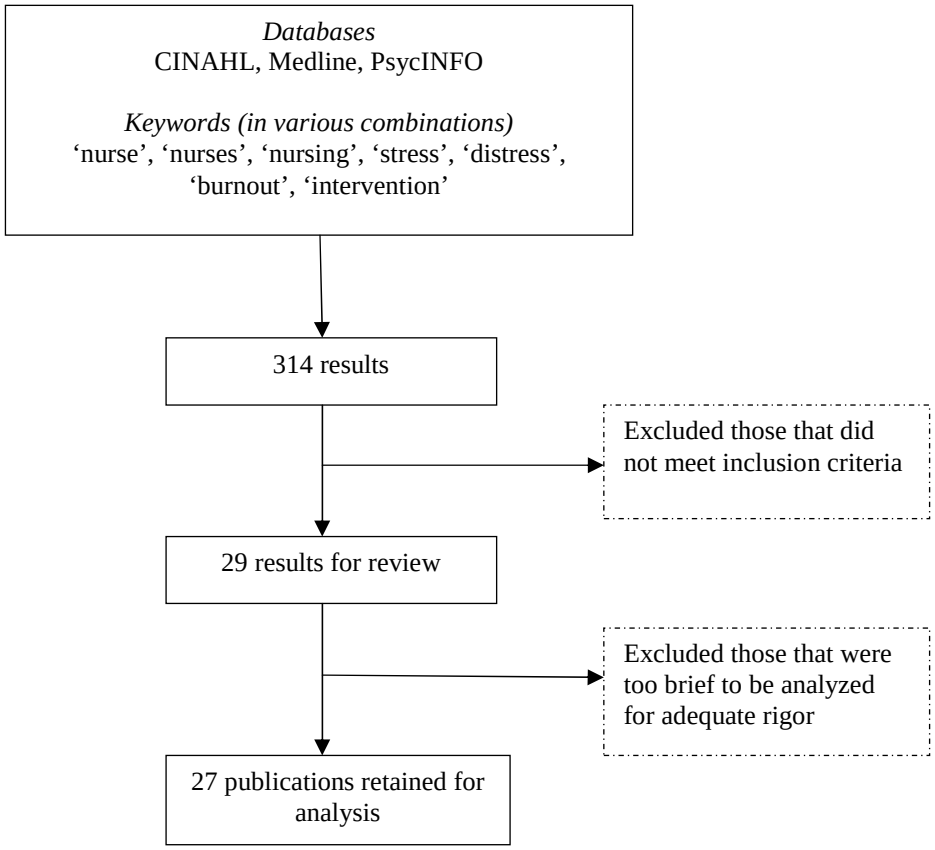


Table 1

Stress Management Interventions for Nurses Identified in a Systematic Literature Review

Author(s)	Intervention	Aim of Treatment	Level of Prevention
Poulin et al. (2008)	Brief Mindfulness Based Stress Reduction course	Individual	Secondary
Britt Pipe et al. (2009)	Brief Mindfulness Based Stress Reduction course	Individual	Secondary
Mackenzie et al. (2006)	Brief Mindfulness Based Stress Reduction course	Individual	Secondary
Pemberton and Turpin (2008)	Aromatherapy	Individual	Secondary
Kravits et al. (2010)	Psycho-educational program (relaxation, guided imagery training, art exploration, personalized wellness plan)	Individual	Secondary
Repar and Patton (2007)	Chair massage with imaginative and creative activities	Individual	Secondary
Bost and Wallis (2006)	Back massage	Individual	Secondary
Cooke et al. (2007)	Chair massage with aromatherapy and music	Individual	Secondary
Brennan and DeBate (2006)	Chair massage	Individual	Secondary
Isaksson Rø et al. (2010)	Self-referral counseling intervention	Individual	Secondary
Jelonek Walker (2006)	HeartTouch technique	Individual	Secondary
Cutshall et al. (2011)	Computer-guided meditation program	Individual	Secondary
Cuneo et al. (2011)	Reiki I classes	Individual	Secondary
Günüş and Üstün (2010)	Coping and support group intervention	Individual	Tertiary
Yamagishi et al. (2008)	Career Identity Training	Individual	Secondary
Ewers et al. (2002)	Psychosocial intervention training	Individual	Secondary
Sherwood and Tagar (2002)	Philophonetics counseling	Individual	Tertiary
Judkins and Ingram (2002)	Self-paced learning module on stress, adaptation, and hardiness	Individual	Secondary
Shimizu et al. (2003)	Communication skill training	Individual	Secondary
Bright and Crockett (2011)	Strategies for Enhancing Performance (SfEP) program	Individual	Secondary
Chang et al. (2007)	Introduction of Clinical Support Nurse role	Environment	Primary
Tran B.Med et al. (2010)	Shared Care in Nursing (SCN) care model vs. Patient Allocation (PA) care model	Environment	Primary
Dodd-McCue et al. (2005)	Protocol directed at increasing organ donation	Environment	Primary
Walker (2008)	Introduction of Medication Nursing Assistant (MNA) role	Environment	Primary
Dodd-McCue et al. (2004)	Family Communication Coordinator (FCC) protocol	Environment	Primary
Jhun et al. (2003)	Adoption of a computerized Order Communication System (OCS)	Environment	Primary
Wallbank and Hatton (2011)	Introduction of a model of clinical supervision	Environment	Primary

Section 2: Review of Literature on Mindfulness, Mindfulness Based Coping Intervention Approaches and Resilience

This section provides a review of the literature on mindfulness, mindfulness based coping interventions, and resilience. The concept of mindfulness is explored and its benefits are presented. The four most commonly reported mindfulness based coping intervention approaches reported in the literature are described and compared and contrasted with one another. In addition, a description of the SMART program is provided, including a synthesis of reported findings regarding the effects associated with the intervention. Finally, the concept of resilience is explored and the benefits of resilience in relation to nurses are reported.

Mindfulness

The concept of mindfulness has been defined in various ways in the literature across multiple disciplines, with a range of emphases including cognition, awareness, and emotion (Irving, Dobkin, & Park, 2009). Jon Kabat-Zinn (2003) provides the following commonly referenced operational definition of the term: “the awareness that emerges through paying attention, on purpose, in the present moment, and non-judgmentally to the unfolding of experience moment by moment” (p. 145). The term is typically used to signify presence of mind and is defined by Brown, Ryan, and Creswell (2007) as “a receptive attention to an awareness of present events and experience” (p. 212). According to Sood (2010) a definition of the term is difficult to comprehend due to its simplicity; for the simplest of entities are sometimes the most difficult to grasp. Sood elucidates that it is difficult to find words to describe a concept that “has no specific reference to anything

that can be perceived by our senses" (p. 112). The term is rooted in Buddhist psychology and originated from Vipassana, a form of Buddhist meditation that can be translated as "insight - a clear awareness of exactly what is happening as it happens" (Gunaratana, 2002, p. 3).

According to Brown et al. (2007), mindfulness consists of two fundamental activities of consciousness: attention and awareness. Brown et al. (2007) define awareness as "the conscious registration of stimuli, including the five physical senses, the kinesthetic senses, and the activities of the mind" (p. 212). Attention is considered to be engaged when a stimulus is sufficiently strong and is manifested as a taking notice of the object (Brown et al., 2007). Mindfulness has also been related to the concept of memory, associating it with a clear and accurate recall (Hirst, 2003). Hirst also reports that mindfulness has been associated with seeing things for the first time, and as they really are. In a conceptual overview of the term, Brown et al. (2007) identified the core concepts appearing in the literature of several Buddhist traditions regarding mindfulness: clarity of awareness; non-conceptual, nondiscriminatory awareness; flexibility of awareness and attention; empirical stance toward reality; present-oriented consciousness; and stability or continuity of attention and awareness.

Mindfulness differs from meditation in that meditation is a technique used to practice the state or skill of mindfulness (Bishop et al., 2004). Therefore, mindfulness is not limited to meditation; however, the primary method for cultivating mindfulness is meditation (Irving et al., 2009). There are other forms of meditation, such as transcendental or object focused that are distinguished from mindfulness meditation in

terms of: “the type of attention garnered, the actions taken upon cognitive processes, and the underlying goals of the practice” (Irving et al., 2009, p. 62). Mindfulness does not entail a focus on a particular object or sound as with some types of meditation, rather thoughts are observed and accepted as they are with the goal of letting go of expectations and avoiding automaticity of thinking (Irving et al., 2009). In addition, meditation is typically practiced in a specific place for a particular period of time, while the ultimate goal of mindfulness is to practice it throughout the day (Brown & Ryan, 2003).

Several benefits that support healthy, adaptive human functioning have been related to the practice of mindfulness (Brown et al., 2007). Brown et al. (2007) reviewed the literature and identified benefits that were acknowledged. Reported benefits included improved mental health and psychological well-being, specifically a positive impact on well-being; emotional disturbance (depression, anxiety, and stress); various indicators of psychopathology, including dissociation, alexithymia, and general psychological distress; neuroticism; and extroversion. Mindfulness practice has also been found to be associated with improved physical health, including an alleviation of physical discomfort, reduction in medical symptoms associated with stress-related diseases, and improved immune system functioning (Brown et al., 2007). Behavioral regulation also appears to benefit through mindfulness practices, for example, self-control enhancement, decreased preoccupation with concerns, and improved goal attainment (Brown et al., 2007). The final category of benefits reported by Brown et al. (2007) was relationship and social interaction quality. The authors state that mindfulness has been found to promote attunement, connection, and closeness in relationships; however, they also reported that

the evidence in this area was still new. More recently, Eberth and Sedlmeier (2012) performed a meta-analysis of the effects of mindfulness meditation in non-clinical settings and identified strong effects related to stress reduction, experiencing less negative emotions, greater well-being, and improved mindfulness.

Mindfulness Based Coping Intervention Approaches

There are a number of mindfulness based coping intervention strategies that employ a variety of approaches toward enhancing the quality of consciousness (Brown et al., 2007). The four most common treatment approaches mentioned in the literature include: 1) Mindfulness-Based Stress Reduction (MBSR) (Kabat-Zinn, 1982), 2) Mindfulness-Based Cognitive Therapy (MBCT) (Segal, Williams, & Teasdale, 2002), 3) Acceptance and Commitment Therapy (ACT) (Hayes, Strosahl, & Wilson, 1999), and 4) Dialectical Behavior Therapy (DBT) (Linehan, 1993), all of which are supported by evidence of efficacy (Brown et al., 2007).

According to Brown et al. (2007), the four interventions can be categorized in respect to four dimensions: 1) their philosophical underpinnings, 2) the centrality of mindfulness in the treatment plan, 3) their format, and 4) their population focus. The authors identified the following specifics in respect to the differences in dimensions between the treatment plans. All of the interventions are secular in nature; however, MBSR is more closely tied to eastern philosophy, while MBCT, ACT, and DBT have both eastern and western philosophical approaches. Mindfulness is the central element in both MBSR and MBCT therapies, while it is one of many treatment elements in ACT and DBT. In regard to variation in format, MBSR and MBCT are group-based therapies that

are prescribed to run over 8-10 weeks. DBT and ACT are provided both individually and in a group-based context. DBT is implemented in stages, with the first stage occurring over 1 year, while ACT has been identified to occur over a time period varying from 1 day to 16 weeks. MBSR and ACT are applied to both clinical and healthy populations, while DBT and MBCT are concentrated on psychiatric populations, such as "chronic depression (MBCT), and borderline personality disorder and impulse control conditions, including eating disorders (DBT)" (p. 219).

Stress Management and Resiliency Training (SMART)

As mentioned earlier, the SMART program was developed by Dr. Amit Sood, Director of Research and Practice Complementary and Integrative Medicine Program at Mayo Clinic Rochester. It was adapted from Sood's (2010) Attention and Interpretation Therapy (AIT) which is a structured program designed to assist learners in improving their ability to train their attention and refine interpretations. The AIT course was modified in an effort to shorten the amount of in-person training time and therefore allow more people access to obtaining the content of the course. The skills employed in the program guide learners to "delay judgment and pay greater attention to the novelty of the world" (Sood, Prasad, Schroeder, & Varkey, 2011, p. 2). The goal of the program is to enhance peace, joy, resilience, and altruism, thus reducing stress and improving resiliency (Sood, 2010).

The SMART program includes both components that comprise AIT training: attention training and interpretation refinement (Sood, 2010). Attention training is fostered through the practice of two mindful attention practices: joyful attention and kind

attention. Joyful attention entails delaying judgment and paying attention to novelty. The exercises that are taught to enhance joyful attention include paying attention to novelty, using one sensory system at a time, finding one new detail in a familiar object, anchoring on to movement, and contemplating on a story (Sood, 2010). Attention training also includes exercises that augment kind attention, such as sending a silent greeting of compassion and acceptance to others who are encountered throughout the day (Sood, 2010). Finally, interpretation refinement is taught through the practice of higher principles including gratitude, compassion, acceptance, meaning, forgiveness, celebration, and reflection and prayer (Sood, 2010). The principles are incorporated into a structured program in which the participants are encouraged to follow a daily theme assigning one value for each day of the week (Monday – gratitude, Tuesday – compassion, Wednesday – acceptance, Thursday – meaning and purpose, Friday – Forgiveness, Saturday – celebration, and Sunday – reflection/prayer) (Sood, 2010). Each day, a participant is to set the intention to incorporate the associated principle as a central theme for the day (Sood, 2010).

The SMART program is applicable to both healthy and clinical populations (Sood et al., 2011). It is typically delivered in an initial 90 minute training session, with optional 30-60 minute follow-up sessions depending on individual need (Sood et al., 2011). Similar to MBSR and MBCT, mindfulness is the central element of the SMART program. The program is unique to other mindfulness based treatment strategies in that, while it incorporates the practice of higher principles, it remains secular in nature with no culturally-based or ritualized practices involved (Sood, 2010). In addition, it incorporates

subject matter related to the neurobiological connection between mindfulness and living from higher principles (Sood, 2010). Finally, a unique aspect of the SMART program is that the exercises associated with the program can be incorporated into one's daily routine without having to find a particular time and place to practice them, as is the case with other mindfulness based interventions (Sood, 2010).

The SMART program has been implemented with a variety of both clinical and non-clinical populations. Many studies related to the SMART program are currently in progress. The results of a completed study were published in a peer reviewed journal (Sood et al., 2011). This study was a pilot, randomized controlled trial in which the effects of the SMART program were investigated with 40 physician participants. The intervention included an initial individual 90 minute training session, followed by one optional 30-60 minute follow-up session based on individual need. Outcomes were measured at baseline and week 8 and included the Connor Davidson Resilience Scale (CD-RISC) (Connor & Davidson, 2003), Perceived Stress Scale (PSS) (Cohen, Kamarck, & Mermelstein, 1983), Smith Anxiety Scale (SAS) (Smith, Hancock, Blake-Mortimer, & Eckert, 2007) and Linear Analog Self-Assessment Scale (LASA) (Sloan, Loprinzi, & Kuross, 1998).

> *Results indicated "a statistically significant improvement in resiliency, perceived stress, anxiety, and overall quality of life at 8 weeks was observed in the study arm compared to the wait-list control arm: CDRS: mean±SD change from baseline +9.8±9.6 vs. -0.8±8.2, t(30)=3.18, p= 0.003; PSS: -5.4±8.1 vs. +2.2±6.1, t(30)= -2.76, p=0.010; SAS: -11.8±12.3 vs .+ 2.9±8.9, t(30)= -3.62,*

> *p=0.001; and LASA: +0.4±1.4 vs. -0.6±1.0, t(30)=2.2 9, p=0.029" (Sood et al., 2011, p. 1). Based on the results, the authors concluded: "A brief training to enhance resilience and decrease stress among physicians using the SMART program was feasible. Further, the intervention provided statistically significant improvement in resilience, stress, anxiety, and overall quality of life. In the future, larger clinical trials with longer follow-up and possibly wider dissemination of this intervention are warranted." (p. 1).*

Sood et al. (2011) noted the following limitations related to the study: 1) small sample size, 2) enrollment of participants who were likely highly motivated to practice the skills, and 3) short duration of follow-up.

In addition, Loprinzi, Prasad, Schroeder, and Sood (2011) investigated the effects of the SMART program intervention with 25 breast cancer survivors in a randomized, wait-list controlled, pilot clinical trial. The intervention varied from the previously described study, in that it consisted of 2 small-group, 90-minute sessions, a brief individual session, and 3 follow-up telephone calls. Outcome measurements included the Connor-Davidson Resilience Scale (CD-RISC) (Connor & Davidson, 2003), PSS (Cohen, Kamarck, & Mermelstein, 1983), SAS (Cohen, Kamarck, & Mermelstein, 1983), LASA (Sloan, Loprinzi, & Kuross, 1998), and Visual Analog Scale-Fatigue (VAS-Fatigue) (Lee, Hicks, & Nino-Murcis, 1991), and were completed at baseline and 12 weeks following the intervention. Outcomes revealed the following:

> *Measure of resilience (CD-RISC) increased from 73.6 ±10.1 at baseline to 81.3 ±9.1 at the end of the 12-week period in the active arm (P= .010). PSS score*

> *(measure of stress) decreased from 22.1 ±5.9 initially to 12.8 ±6.6 in the active arm (P = .003). Measure of anxiety (SAS) decreased from 49.4 ±18.2 at baseline to 33.3 ±11.7 in the active arm (P = .002). No significant difference in any of these measures was noted in the control group. Overall QOL (LASA) also improved in the active group compared with the control group, from 38.4 ±6.1 to 44.5 ±3.5 (P = .002). VAS-Fatigue did not show a statistically significant change. No adverse effects were reported. (p. 366)*

The author was the primary investigator in an additional randomized controlled pilot trial examining the outcomes of the SMART program with 55 orienting nurses at the same institution this study occurred. The aims of the study were to 1) assess the feasibility of the program with a group of orienting nurses, 2) assess the nurses' treatment adherence with the program, and 3) obtain initial efficacy estimates of the program for reducing symptoms of stress and anxiety, and improving mindfulness and resilience among orienting nurses. The intervention was implemented as an initial 90 minute large group (*n*=25) session, followed by one optional small group session. Outcome measures included the following: Perceived Stress Scale (PSS) (Cohen, Kamarck, & Mermelstein, 1983), Generalized Anxiety Disorder (GAD-7) (Spitzer, Kroenks, & Williams, 2006), Mindful Attention Awareness Scale (MAAS) (Brown & Ryan, 2003), and Connor-Davidson Resilience Scale (CD-RISC) (Connor & Davidson, 2003). Outcomes were measured by self-report at baseline and 12 weeks post the initial intervention. The results of the study have not yet been published; however, they are included here for the purposes of this literature review in Table 2.

Table 2

Outcomes of A Stress Management and Resiliency Training (SMART) Program for Newly Hired Nurses

Scale	SMART	Control	p†
Perceived Stress (PSS)	N=19‡	N=20‡	
Baseline	20.16±5.54	22.30±5.14	
Follow-up	20.11±6.79	25.50±6.44	
Delta	-0.05±6.36	+3.20±7.08	0.140
Mindful Attention Awareness (MAAS)	N=18‡	N=20‡	
Baseline	4.42±0.77	3.85±0.52	
Follow-up	4.57±0.81	3.80±0.60	
Delta	+0.15±0.69	-0.05±0.65	0.367
Generalized Anxiety Disorder (GAD-7)	N=18‡	N=20‡	
Baseline	3.11±2.76	4.25±2.77	
Follow-up	2.22±2.67	5.10±4.14	
Delta	-0.89±3.45	0.85±5.25	0.241
Connor Davidson Resilience Scale (CDRS)	N=19‡	N=21‡	
Baseline	79.68±9.59	74.76±10.19	
Follow-up	79.74±11.82	72.52±8.83	
Delta	+0.05±7.04	-2.24±6.81	0.302

† Two-sample t-test comparing change from baseline between groups.
‡ There were 40 participants (19 SMART, 21 Control) who completed both the baseline and follow-up assessments. Some participants did not complete all scales at both time points. In all cases, data are presented only for those who completed the given scale at both baseline and follow-up.

Participants in the intervention arm of the study tended to demonstrate decreases in stress and anxiety and increases in resilience and mindfulness, while those in the control arm tended to demonstrate increases in stress and anxiety and decreases in resilience and mindfulness; however, the changes in the scores between the two groups were not statistically significant. In regard to measure of treatment compliance, 4 (2%) of the participants in the active arm participated in the optional follow-up session. Participants were considered to be adherent to the treatment if they indicated by self-report that they practiced the mind/body principles associated with the intervention >60%

of the days over the 12 weeks of the study. This criterion was met by 4 (16%) of the participants in the active arm of the study. Feasibility was evaluated through attrition rates. No predetermined rate of attrition was identified as indicating an accepted level of feasibility. Fifty-five nurses consented to participate in the study and were randomized into two groups, 27 in the active arm and 28 in the control arm. After randomization, 2 from the active arm, and 2 from the control arm declined to participate without explanation. Twenty-five from the active arm participated in the initial intervention, and 4 participated in the follow-up session. The low rate of participants in the follow-up session was largely attributed to scheduling issues. Nineteen in the active arm and 21 in the control arm completed both the baseline and follow-up assessments.

Because the participants in the intervention group tended to move in a positive direction on all measurement scales between baseline and 12 weeks post-intervention, and the control group tended to move in a negative direction, this investigator determined that the SMART program has the potential for efficacy among newly hired nurses. However, because the results were not statistically significant, future research is warranted. The low rate of attendance at the follow-up session may have negatively impacted outcome measures and adherence to the intervention; therefore, it was determined that future studies should include more streamlined scheduling for any planned follow-up sessions.

The current study differs from the above study in that the nurse participants are past the orientation period and are enrolled in a pilot nurse residency program. The orientation program spans 10-12 weeks, depending on the patient care area, and the nurse

residency program begins approximately 1 month after orientation. The nurse residency program has scheduled group seminars one day/month for 9 months, and the SMART program is incorporated into 8 of those seminars. This allows for SMART program follow-up sessions that 1) occur more frequently than in the previous study, 2) span across a greater length of time, and 3) are more likely to be attended due to protected time in nurses' schedules. In addition, this study examined outcomes at two points in time following the initial intervention rather than one, in an effort to investigate the impact of time on changes in the measures.

The results of this study, with a larger dose of the intervention, have the potential to assist in determining criteria for optimal implementation of the program for future offerings with a similar population. In addition, this study will provide the opportunity to determine if the program can be integrated within a standardized curriculum for nurses, rather than offered as a stand-alone course. It is anticipated that if offered within a standardized curriculum, it will enable the program to be extended to a wider audience of nurses. Finally, this study collected qualitative data in addition to the quantitative measurements in order to gather more in-depth information from the participants regarding the impact of the SMART program on their personal and professional lives, suggestions for changes to the program, and what parts of the program were most beneficial to them. This information will also aid in optimal development of the program for future offerings.

Resilience

Resilience is defined in many different ways in the literature. In an attempt to summarize the common characteristics and themes that have traditionally been used to describe the term, Jackson, Firtko, and Edenborough (2007) provided the following definition: "the ability of an individual to adjust to adversity, maintain equilibrium, retain some sense of control over their environment, and continue to move on in a positive manner" (p. 3). The authors identify two key concepts identified in the literature related to resiliency: vulnerability and adversity. Resilience and vulnerability are sometimes considered as being on opposite ends of a spectrum (Jackson et al., 2007). "If equilibrium is maintained, an individual can theoretically manage any situation that comes along" (Jackson et al., 2007). A key point identified by Richardson (2002) is that the term resilience refers to "growth or adaptation through disruption, rather than to just recover or bounce back" (p. 313). Experience and learning can help people develop qualities to cope, adapt and recover better from stress, and thus develop resilience (Luthans, Vogelgesand, & Lester, 2006; Maddi & Khoshaba, 2005).

Multiple variables have been identified as predictors of resilience: genetic, neurobiologic, developmental, psychologic, and social (Haglund, Nestadt, Cooper, Southwick, & Charney, 2007). These variables interact; however, one or another variable may be important at a particular stage (Haglund, Nestadt, Cooper, Southwick, & Charney, 2007). Some of the variables studied include: self-efficacy (Zimmerman, Ramirez-Valles, & Maton, 1999); coping ability (Zimmerman, Ramirez-Valles, & Maton, 1999); ability to control stressors (Chorpita & Barlow, 1998); faith (Kaplan, Matar,

Kamin, Sadan, & Cohen, 2005); and sociopolitical effectiveness (Yi, Smith, & Vitaliano, 2005). Earvolino-Ramirez (2007) performed a concept analysis of the term and identified that the main antecedent associated with resilience is adversity. Consequences were also identified and include effective coping, mastery, and positive adaptation. Finally, defining attributes included rebounding/reintegration, high expectancy/self-determination, positive relationships/social support, flexibility, sense of humor, and self-esteem/self-efficacy.

A term that has been used interchangeably with resilience in the literature is hardiness (Earvolino-Ramirez, 2007). According to Kobasa (1979), hardiness has three elements: 1) commitment – the ability to turn events into something meaningful, 2) control – belief that with effort events can be changed, and 3) challenge – attitude that taking challenges results in fulfillment in life. Hardiness has been investigated in a number of studies in adults and is positively associated with lower psychological distress and well-being. (Bartone, Ursano, Wright, & Ingraham, 1989; Farber, Schwartz, Schaper, Moonen, & McDaniel, 2000; Ford, Eklund, & Gordon, 2000).

Only a few studies have been undertaken to assess the efficacy of resilience training (Bradshaw, Richardson, & Kumpfer, 2007; Ruini, Belaise, Brombin, Caffo, & Fava, 2006; Steinhardt & Dolbier, 2008; Waite & Richardson, 2004). Inspection of study findings indicated that resilience training is associated with higher resilience scores (Bradshaw et al., 2007; Steinhardt & Dolbier, 2008; Waite & Richardson, 2004). Steinhardt and Dolbier (2008) identified additional positive outcomes including more effective coping strategies, higher scores on protective factors, and lower scores on

symptomatology. In addition, Oman et al. (2008) identified that resilience increases through the development of mindfulness and acceptance when working through stressors.

Hodges, Keeley, and Grier (2005) identified that resilience can be developed in nurses and would benefit the profession by assisting in the retention of nurses rather than leaving the profession when they are overwhelmed by stress and adversity in the workplace. In a review of literature, Jackson et al. (2007) concluded that hardiness (as noted earlier, a term often used interchangeably with resilience) helps to buffer stressful events or extreme adversity, and the notion of hardiness can be learned. The authors also identified five strategies that can help nurses build resilience to workplace adversity: 1) building positive nurturing professional relationships and networks, 2) maintaining positivity, 3) developing emotional insight, 4) achieving life balance and spirituality, and 4) becoming more reflective.

Gaps in the Literature This Study Addressed

This investigation involved a pilot study that examined the feasibility of the intervention, participant adherence to the intervention, and allowed for an effect size estimate prior to carrying out future larger studies. As indicated by Barton and Pachman (2012), for mind-body interventions in particular, pilot studies should be conducted first, which then inform phase II trials with *apriori* primary endpoints, feasibility and verification of measures. This practice results in a more efficient and well-informed program of research. This study employed a co comparison group which provided data on intervention effects and time effects (Barton & Pachman, 2012). Barton and Pachman (2012) indicate that even for pilot trials that include a mind-body intervention,

incorporating a comparison group is appropriate in that it provides valuable information regarding effects of the intervention. In addition, this investigation employed a long-term measurement outcome at 12 weeks post the initial intervention. This contributed to evidence regarding sustainability of the intervention over time. Finally, this study utilized a theoretical framework that allowed for a description of how the concepts were applied to the study, and the expected relationships between the concepts.

Study Summary

Recent studies regarding stress management interventions for nurses incorporate a number of different strategies, the majority of which are aimed at the individual (versus the work environment) and are at the secondary level of prevention. When examining current literature regarding stress management interventions for nurses, it was noted that the studies are only moderately meeting gold standards of research design. Some of the recommendations for future research include incorporation of RCTs, inclusion of a theoretical framework which guides the study, and employment of a large sample size with adequate statistical power analysis when attempting to determine the effectiveness of the interventions.

Chapter Summary

The concept of mindfulness has been defined in a number of ways; however, a commonly referenced definition is “the awareness that emerges through paying attention, on purpose, in the present moment, and non-judgmentally to the unfolding of experience moment by moment” (Kabat-Zinn, 2003, p. 145). The study of mindfulness-based coping interventions has the potential to provide valuable information regarding its effect on

reducing nurse stress and anxiety and improving mindfulness and resilience. Mindfulness-based interventions employ a variety of approaches toward enhancing attention and awareness, paying attention non-judgmentally, and decreasing preoccupation with concerns, thus reducing stress and anxiety.

The SMART program is a mindfulness-based intervention which provides participants with exercises they can incorporate into their everyday lives which assist with stress reduction. The program has been tested with other groups including healthcare providers and patients and was found to be beneficial. This study allowed the program to be tested with a new population of nurse residents, examined the effects of the program, and assessed the feasibility of implementing it within a nurse residency program.

CHAPTER 3 - METHODOLOGY

The purpose of this study was to determine the feasibility of integrating the SMART intervention within a nurse residency program. In addition, the investigator determined the impact of the SMART program and assessed which aspects of the program were most beneficial. A third purpose was to assess the effect of the intervention on stress, anxiety, resilience, and mindfulness in relationship to a comparison group among nurse residents employed at a large Midwestern academic medical center. The research design, process and procedures, outcome measures, and statistical data analysis are described in this chapter. Human research study considerations are also addressed.

Research Design

This study was designed as a quasi-experimental pilot study enrolling a convenience sample of 66 (27 in the intervention group, 39 in the comparison group) newly hired nurses at a large Midwestern academic medical center. It is part of a larger study examining the outcomes of a pilot nurse residency program. A comparison group was employed to allow the investigator to determine if factors other than the intervention may be responsible for differences in findings (Shadish, Cook, & Campbell, 2002). Barton and Pachman (2012) identify that when a mind-body intervention is investigated, even pilot trials should incorporate a comparison group in that it provides valuable information regarding effects of the intervention.

A mixed method approach (Johnson & Turner, 2003) to data collection was implemented for this study, incorporating both quantitative and qualitative research techniques. Quantitative data assisted in investigating the effects of the program, as well

as its feasibility, through the use of objective and self-report measures. Qualitative data were obtained to provide additional information from the participants regarding the program, in an effort to obtain a holistic view of evidence, such as whether or not participants found the program beneficial, and if so, what parts of it had the greatest impact. According to Janesick (2000), qualitative methods are appropriate when an investigator aims to identify a person's lived experience with a phenomenon in question, interpret meanings of the participant's statements, and inspect the meanings for recurring features related to the phenomenon. Focus group interviews were conducted, which are appropriate to employ when one is trying to uncover opinions, behavior, or motivation (Krueger & Casey, 2009). In addition, group interviews allowed for new thoughts to emerge, and for a synergy of ideas to develop from the group that became more than the sum of its parts (Krueger & Casey, 2009). Qualitative data generated by the focus group interviews were analyzed and interpreted using a narrative analysis approach (Patton, 2002).

Setting

The setting for this study was a large Midwestern academic medical center. The nurses who were invited to participate in this study were part of a pilot nurse residency program study. This study is part of an effort to improve the quality of the institution's nurse orientation program, and involves the incorporation of a nine month nurse residency program which occurs beyond the current 10-12 week nurse orientation program. The pilot nurse residency program is designed to provide new nurses with experiences that will assist them in transitioning from the role of nursing student to

professional nurse. Topics incorporated within the program include safety, quality care, evidence based practice, critical thinking, professionalism, communication, peer support, and networking.

Inclusion criteria for the participants in the intervention group of the pilot nurse residency program included: 1) registered nurses with a July 18, 2012 or August 1, 2012 start date at the institution, 2) prepared at a minimum of a baccalaureate degree in nursing, 3) assigned to one out of a possible thirteen general care inpatient units, and 3) less than one year of experience as a registered nurse. Inclusion criteria for the participants in the comparison group of the program were similar, with the exception criterion number 3; those in the comparison group could be assigned to any inpatient unit, including general care, intensive care, and progressive care units. Twenty-seven nurses met the inclusion criteria for the intervention group, and all 27 were assigned to the intervention group of the pilot nurse residency program. Likewise, 79 nurses who met the criteria for the comparison group were all assigned to the comparison group.

Sample

A convenience sample was obtained for this study through invitation of the 106 registered nurses who were included in the nurse residency quality improvement project. After IRB approval was obtained, the 27 nurses who were selected to participate in the residency program arm were invited to participate in the intervention group of this study. Likewise, the 79 who were selected to participate in the comparison group arm of the nurse residency program were invited to participate in the comparison group for this study. All 27 nurses in the intervention group and 41/79 from the comparison group

agreed to participate; however, only 39 from the comparison group completed the instruments at all three time points.

Given a moderate effect size of .50 (Cohen, 1987) and a power of .80, 64 subjects would be needed in each group for a fully powered study employing a two-tailed test at the .05 level of significance (Keller & Kelvin, 2013). Due to resource constraints, this sample size could not be attained; however, results of this feasibility study will be used to inform power analysis in order to determine necessary sample sizes for a larger study. In addition, the sample size attained for this study more than adequately meets the recommendation of 10% of the larger study sample size (Lackey & Wingate, 1998), provided the larger study includes 64 subjects in each group as indicated earlier as an adequately powered sample size.

Inclusion criteria for the sample were: 1) already recruited to be a participant in the nurse residency pilot program; and 2) willing and able to participate in all aspects of the study. All participants met the inclusion criteria associated with the nurse residency pilot program, as listed in the setting section. Exclusion criteria were: 1) had currently or recently (past 6 months) experienced a psychotic episode per participant self-report; and 2) had clinically significant acute unstable neurological, psychiatric, hepatic, renal, cardiovascular or respiratory disease that will prevent participation in the study per participant self-report.

Intervention

The SMART program was implemented as the intervention for this study. As noted earlier, the SMART program was developed by Dr. Amit Sood, Director of

Research and Practice, Complementary and Integrative Medicine Program at Mayo Clinic Rochester. It was adapted from Sood's (2010) Attention and Interpretation Therapy (AIT), a structured program designed to assist learners in improving their ability to train their attention and refine interpretations. The skills employed in the program guide learners to "delay judgment and pay greater attention to the novelty of the world" (Sood, Prasad, Schroeder, & Varkey, 2011, p. 2). The goal of the course is to enhance peace, joy, resilience, and altruism, thus reducing stress and improving resiliency (Sood, 2010).

The portion of the program included in this investigation spanned 12 weeks and consisted of an initial 90 minute session and 2, one-hour group follow-up sessions at 4 and 8 weeks after the initial session. The follow-up sessions were designed as group sessions in an effort to allow nurses to share and learn from one another methods used to implement the principles of the program, as well as identified benefits. During the initial session, Dr. Amit Sood discussed with the participants the psychology, neurobiology, and neuropsychology of stress and resilience in an easy to understand format. Specific modalities to manage stress and improve resilience, primarily mindfulness-based approaches, were discussed. The format was participatory and informal in order to adapt to the individual group's needs and preferences. The skills discussed during this session addressed the issues of attention, gratitude, acceptance, meaning and purpose, forgiveness, and relationships. The emphasis was on mind-body medicine approaches toward resilience including skills in attention training to enhance present moment

awareness, and cultivate greater gratitude, compassion, acceptance, forgiveness, and higher meaning and purpose.

At the first session, the participants in the intervention group received a 152-page workbook related to the SMART program titled “Attention & Interpretation Therapy (AIT): A Personal Workbook”. Participants were asked to review a select number of pages from the workbook related to the topics that would be discussed prior to each follow-up session. The workbook provides activities which allow the reader to understand and embody the concepts and skills related to the SMART program. There are spaces provided throughout the workbook for readers to write in their responses to questions, plan for implementing the principles, and journal the results of the activities. The workbook was for the participant’s personal use, and no information was gathered from it for this study.

Follow-up sessions occurred at 4 and 8 weeks following the initial intervention. These sessions were provided during the participants’ monthly scheduled residency program seminars and were led by the author and a Clinical Nurse Specialist. Both of these facilitators attended a 6 month training course preparing them as instructors for the program. At the follow-up sessions, the facilitators reviewed the skills associated with the intervention, facilitated discussion on how the participants were implementing the skills in their work and personal lives, and answered any questions the participants had. The sessions were each 60 minutes in length. A teaching plan for the program is included in Appendix G.

Instruments

Five self-report outcome instruments were employed for both study groups, with one additional instrument administered with the intervention group only (End of Study Questionnaire). The instruments included measurements of resilience, stress, anxiety, and mindfulness. In addition, a Demographic Questionnaire was employed to assess the characteristics of the participants. The End of Study Questionnaire, administered to the intervention group only, was used to collect information related to participant adherence to the treatment, as well as opinions regarding the SMART program. The scales were selected based on instruments employed in previous studies regarding the SMART program and determined to be responsive to the intervention (Sood, Prasad, Schroeder, & Varkey, 2011). In addition, the instruments have been found to be valid and reliable, as indicated below. A list of all instruments that were used in the study and corresponding number of items for each are included in Table 3.

Following is a description of each of the instruments that was employed, as well as information regarding validity, reliability, and scoring.

Connor-Davidson Resilience Scale (CD-RISC) (Connor & Davidson, 2003) (Appendix E)

Description. CD-RISC is a 10-item scale, each of which has a 5-point range of responses (0-4) with higher scores reflecting more resilience (Connor & Davidson, 2003). The numbered responses are labeled with the following: not true at all (0), rarely true (1), sometimes true (2), often true (3), and true nearly all of the time (4) (Connor & Davidson, 2003). Instructions are provided for the participants to rate how they felt over the last

Table 3

Study Variables and Outcome Instruments

Study Variable	Outcome Instrument	Number of Items in Instrument
Resilience	10-Item Connor-Davidson Resilience Scale (CD-RISC)	10
Anxiety	Generalized Anxiety Disorder 7-item (GAD-7)	7
Mindfulness	Mindfulness Attention Awareness Scale (MAAS)	15
Stress	Perceived Stress Scale (PSS)	14
Participant Demographics	Demographic Questionnaire	9
Treatment Adherence/Opinions Regarding the SMART Program	End-of-Study Questionnaire	9

month. Examples of items included in the scale include: “I am able to adapt when changes occur”, “I can deal with whatever comes my way”, and “Past successes give me confidence in dealing with new challenges and difficulties”.

The 10-item CD-RISC was derived from the original CD-RISC scale that included 25 items. Campbell-Sills and Stein (2007) performed a psychometric analysis of the 25-item scale, and empirically driven revisions were made that resulted in the 10-item scale.

Validity. Campbell-Sills and Stein (2007) tested the newly developed 10-item scale with a group of undergraduate college students (*N*=537) and inspection of the scores revealed that the 10-item CD-RISC moderated the correlations between childhood

maltreatment and current psychiatric status. In addition, Davidson et al. (2008) found that PTSD patients' scores on the 10-item CD-RISC increased significantly in those who were treated with an antidepressant versus a placebo control group with moderate effect sizes (0.36 for 12 weeks, 0.34 for 24 weeks). The CD-RISC has been tested for convergent validity and has demonstrated positive relationships with multiple related measures, including the Kobasa hardiness measure, with ability to distinguish between participants with lesser and greater resilience (Ahern, Kiehl, Sole, & Byers, 2006). When compared to the PSS, the CD-RISC showed a significant negative correlation (Pearson r = -0.76, p<.001), "indicating that higher levels of resilience corresponded with less perceived stress" (Connor & Davidson, 2003, p. 79).

Reliability. The CD-RISC was tested with undergraduate college students (n=537), and found to have good internal consistency (α = .85) (Campbell-Sills & Stein, 2007). Cronbach's alpha internal consistency reliabilities for the current study were obtained for the instrument at each measurement point: baseline, 4 weeks post intervention, and 12 weeks post intervention. The results, in respective order, were .84, .86, and .84.

Scoring. The scores for each item are added for a total possible score range of 0-40. A higher score indicates greater resilience (Connor & Davidson, 2003).

Perceived Stress Scale (PSS) (Cohen, Kamarck & Mermelstein, 1983) (Appendix F)

Description. PSS is a 14-item self-report instrument that provides a global measure of perceived stress (Cohen, Kamarck & Mermelstein, 1983). The instrument consists of 7 positively stated items and 7 negatively stated items. Responses range on a

5-point Likert response scale (0 = “never” to 4 = “very often”) (Cohen et al., 1983). Examples of items include: “In the last month, how often have you been upset because of something that happened unexpectedly?”, and “In the last month, how often have you felt that you were effectively coping with important changes that were occurring in your life?”.

Validity. The PSS was tested for concurrent validity and was found to relate well with Number of Life Events ($\alpha = 0.20$, $p<.01$; 0.17, $p<.05$) and Impact of Life Events ($\alpha = 0.35$, $p<.01$; 0.24, $p<.01$) in two separate samples of college students (Cohen et al., 1983).

Reliability. The scale has been determined to have adequate reliability ($\alpha= .84$, .85, .86) in three different samples which included 1) college students, 2) a separate sample of college students, and 3) participants in a smoking cessation study, respectively (Cohen et al., 1983). Cronbach’s alpha internal consistency reliabilities for the current study were conducted for the instrument at each measurement point: baseline, 4 weeks post intervention, and 12 weeks post intervention. The results, in respective order, were .89, .90, and .87.

Scoring. The positively stated items are reversed scored and all items’ scores are summed. Total scores range from 0 to 56 and a higher score indicates a greater stress level.

Generalized Anxiety Disorder 7-item (GAD-7) scale (Spitzer, Kroenks, & Williams, 2006) (Appendix C)

Description. The GAD-7 is a 7-item questionnaire which asks how often, during the last 2 weeks, the participant was bothered by each symptom (Spitzer, Kroenks, & Williams, 2006). Examples of symptoms include: “feeling nervous, anxious, or on edge”; “not being able to stop or control worrying”; and “becoming easily annoyed or irritable”. Response options are “not at all”, “several days”, “more than half the days”, and “nearly every day”, scored as 0, 1, 2, and 3 respectively.

Validity. The instrument has been found to have strong criterion validity for identifying probable cases of GAD, as well as good construct, factorial and procedural validity (Spitzer et al., 2006).

Reliability. The GAD-7 has been found to have excellent internal consistency ($\alpha = .92$), and good test-retest reliability (intraclass correlation = 0.83) among a sample of outpatient clients with anxiety issues (N=965) (Spitzer et al., 2006). Cronbach’s alpha internal consistency reliabilities for the current study were obtained for the instrument at each measurement point: baseline, 4 weeks post intervention, and 12 weeks post intervention. The results, in respective order, were .84, .85, and .73.

Scoring. All scores are summed with a possible range of 0-21. A score of 0-4 indicates minimal anxiety, 5-9 mild anxiety, 10-14 moderate anxiety, and 15-21 severe anxiety (Spitzer et al., 2006).

Mindful Attention Awareness Scale (MAAS) (Brown & Ryan, 2003) (Appendix D)

Description. The Mindful Attention Awareness Scale is a 15-item measure assessing mindfulness of moment to moment experience (Brown & Ryan, 2003). The scale measures the frequency of mindful states in day-to-day life, using both general and situation-specific statements. Sample statements include: "I could be experiencing some emotion and not be conscious of it until some time later"; "I find it difficult to stay focused on what's happing in the present", and "I rush through activities without being really attentive to them.". The items are answered on a Likert scale from 0 (almost always) to 6 (almost never).

Validity. Brown and Ryan (2003) indicated that across multiple studies, the MAAS has been found to "discriminate between groups expected to differ in degree of mindfulness" (p. 843) and to "predict a variety of indicators of psychological well-being" (p. 844).

Reliability. The MAAS has demonstrated adequate reliability (α = .80 - .87) when used with a general adult populations (N = 74-327) (Brown & Ryan, 2003). Cronbach's alpha internal consistency reliabilities for the current study were conducted for the instrument at each measurement point: baseline, 4 weeks post intervention, and 12 weeks post intervention. The results, in respective order, were .91, .93, and .91.

Scoring. Based on a mean of all items, MAAS scores can range from 1 to 6. Higher scores indicate greater mindfulness.

The preceding questionnaires together took approximately 20 minutes to complete. In addition to the above outcome scales, participants completed the following questionnaires

at the end of the study:

End-of-Study Questionnaire (Appendix B)

The End-of –Study Questionnaire is an investigator-developed 9-item questionnaire to evaluate various aspects of the program. Participants were asked how the program had impacted their lives and what they found most and least helpful about the program. In addition, one of the items requested information regarding the percentage of days the participants practiced the skills that were taught in the program. Participants were also provided space to add in their comments and suggestions related to the program. This information was used to determine participants' adherence to the intervention and to elicit information regarding program improvement.

Demographic Questionnaire (Appendix H)

This is a 9-item investigator-developed questionnaire that includes questions regarding gender, race, and previous nursing experience, if applicable. This information was used to provide a descriptive profile of the participants, and to determine if the groups are similar in characteristics.

Participant Recruitment

Following IRB approval by the medical center's Foundation Institutional Review Board (IRB), recruitment of the participants occurred by email one week prior to the initial study intervention. Email recruitment was selected because not all members of the nurse residency comparison group could be gathered together in one location, as all had completed orientation and were working on different units and varying shifts. Therefore, in an effort to treat both the intervention and comparison groups equally, the intervention

group was recruited by email as well. The investigator introduced the study to the potential participants by email using the scripts provided in Appendices H and I (Appendix I – comparison group script; Appendix J – intervention group script. The study was presented to the participants by this investigator who has no supervisory responsibilities for the potential participants. The potential participants were informed in the email that declining to participate in the study, or withdrawing from the study, would in no way impact their employment at the institution or their participation in the residency program. They were also invited to ask any questions of the investigator either by email or phone.

Because mindfulness-based interventions are not recommended to be practiced independently by those with a history of a psychotic episode, or an unstable physical illness, potential participants in the intervention group were notified that a history of such a disorder excluded them from participating in this study. Therefore, they were informed that if this was the case, they should not agree to participate in the study. The primary investigator was not notified by any potential participants that they did not agree to participate for this reason. Racial and ethnic characteristics were not exclusionary for this trial. Pregnant women were eligible to participate.

Prior to the initial intervention, the participants of both groups were provided with the questionnaires via an electronic database (REDCap) used at the institution. The follow-up questionnaires at 4 and 12 weeks were also administered electronically via REDCap. Participants received an initial email through REDCap containing a link to the questionnaires. Two reminder emails were sent at 3 and 6 days following the initial one

for those who did not complete the questionnaires prior to those time points.

Data Collection Procedures

After IRB approval was obtained from the medical center (the educational institution's IRB deferred to the medical center's IRB), participants in the intervention and comparison groups who consented to participate completed the following instruments at baseline, and at 4 and 12 weeks following baseline: Connor-Davidson Resilience Scale (CD-RISC) (Connor & Davidson, 2003), Perceived Stress Scale (PSS) (Cohen, Kamarck, & Mermelstein, 1983), Generalized Anxiety Scale (GAD-7) (Spitzer, Kroenks, & Williams, 2006), and the Mindful Attention Awareness Scale (MAAS) (Brown & Ryan, 2003). The outcome instruments were completed in an online format and took approximately 20 minutes to complete at each time point. In addition, the participants in the intervention group completed the End of Study Questionnaire (Appendix B) at 12 weeks following the initial intervention. Both groups completed the Demographic Questionnaire (Appendix H) at the end of the study.

At the conclusion of the study (12 weeks after the initial intervention), qualitative focus group interviews were conducted with the intervention group to assess the impact of the training on participants and to determine what elements of the program were most effective. The interviews were conducted by a PhD prepared Licensed Psychologist and a Research Analyst, both of whom have significant qualitative research experience. Also present at the interview were an Administrative Assistant and Patient Education Specialist who assisted with note taking. Neither this author nor the Clinical Nurse Specialist who assisted in facilitating the follow-up interventions participated in the

interviews in an effort to prevent the potential of biased results related to the interventionists eliciting opinions from the participants. A script of interview questions (Appendix K) was developed according to guidelines for minimizing bias and increasing the reliability and validity of interview data (Denzin & Lincoln, 2002; Kirk & Miller, 1986). Also contained in the script (Appendix K) is an opening statement that introduced the ground rules to the participants, including a request that they keep all information shared during the discussion confidential. The participants in the intervention group were divided into 3 groups of 9 for the qualitative interviews, and each group was interviewed separately by the same facilitators. This group size was determined based on the recommendations of Krueger and Casey (2009) who state that non-commercial focus groups should not exceed 10 participants per group, as large groups are difficult to control, and not all participants tend to have the opportunity to provide their insights. The interviews were videotaped for purposes of data analysis.

Feasibility was evaluated by participant recruitment, intervention compliance, and attrition. Adherence was assessed through use of a self-report measure of percentage of study days the principles of the intervention were practiced.

A depiction of the flow of the study procedures is provided in Figure 4.

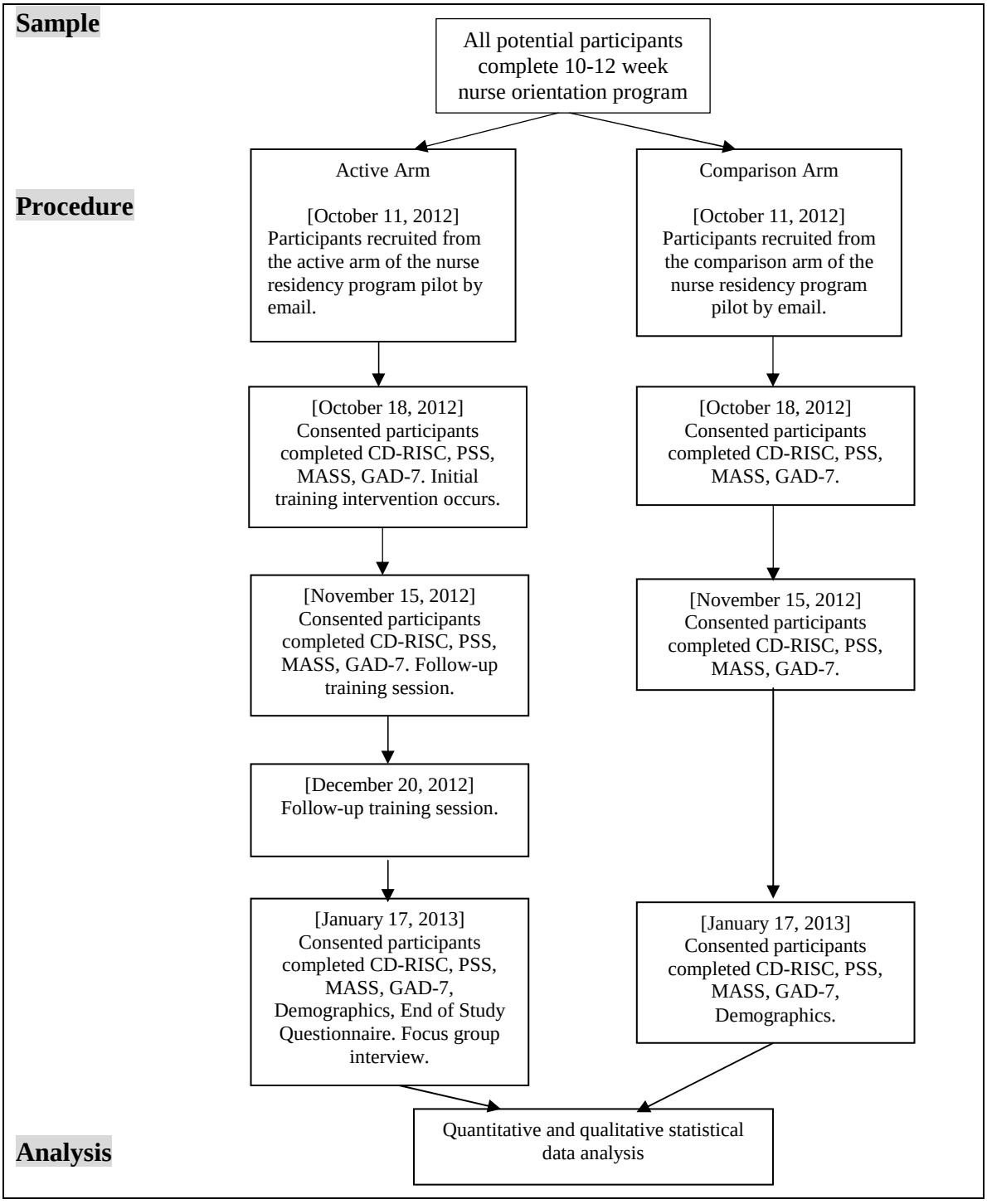
Data Analysis

Descriptive Analysis

A descriptive analysis was performed to summarize baseline characteristics of the participants. The information summarized in this descriptive analysis included participant demographics (e.g. age, gender). Baseline demographics and characteristics

Figure 4

Flowchart of Study



were summarized using mean, standard deviation, median, and select percentiles for continuous variables, and frequency and percentages for categorical variables. Data for each scale were inspected for normalcy and all demonstrated normal distributions.

Inferential Analysis

The data were analyzed as follows for each research aim:

Aim I: Assess the feasibility of integrating a stress management and resiliency training program within a nurse residency program for nurse residents at a large Midwestern academic medical center.

Research question: What is the association between participant characteristics and intervention adherence among nurse residents at a large Midwestern academic medical center who participate in the SMART program?

Feasibility was determined by evaluating participant compliance with the intervention and adherence to the intervention. Compliance was measured by participant recruitment, attrition rates, and attendance rates. Adherence was made operational by percentage of days the participants practiced the principles related to the program. Data related to participant recruitment, including the total number of potential participants who participated in the first session, the number excluded for each of the specific inclusion and exclusion criteria, and the number of eligible participants were summarized. The percentages of participants who chose not to enroll (opt-out group) and discontinued study participation after the start of the study were summarized. This was critical information for the planning and conduct of a larger study.

Treatment adherence was assessed using a self-report end-of-study treatment adherence measure (End of Study Questionnaire). Participants were considered adherent if they practiced the principles of the intervention for >60% of the study days, or 50 of the 84 study days. This adherence standard was based on parameters used in previous investigations of the SMART intervention.

Aim II: Assess the impact of the program on participants and determine their personal opinions regarding which components of the training were beneficial.

Qualitative content analysis as described by Patton (2002) was performed on the interviews conducted with the participants in the intervention group at week 12 of the study. Data generated by the focus group interviews were analyzed and interpreted using a narrative analysis approach (Patton, 2002). This approach was selected, as it is the most appropriate method for the research question. Narrative inquiry involves "retrospective meaning making" (Denzin & Lincoln, 2005, p. 656) and the shaping of past experience (Denzin & Lincoln, 2005). It is useful in situations in which one aims to understand others' actions and organize them into a meaningful whole in order to see the consequence of actions over time (Denzin & Lincoln, 2005). With narrative analysis, the researcher attempts to identify meaning-making events as they are interpreted by the participant and then understand the reconstruction of meaning, not truth, and reinterpret it theoretically (Hill Bailey, 1996). Preventing investigator bias is particularly important for this study since the primary investigator was involved in administering the intervention that is under investigation.

Initial data analysis was performed independently by this investigator and the Research Analyst who was present for the interviews. The investigators began by reading the transcripts to become familiar with the data and to begin to identify meaning and initial impressions. Codes, or topics that represent the meaning in them, were identified. As described by Morse and Richards (2002), coding "entails creating a category or recognizing one from earlier, reflecting on where it belongs among your growing ideas, and reflecting on the data you are referring to and on how they fit with the other data coded there" (p. 117). These topics became the coding framework and the three transcripts were reviewed once again to identify passages in the transcripts by code. The framework was modified as new meaning arose during the coding process.

After careful review of indexed data by representative passages, the codes were grouped as themes emerged (Patton, 2002). The amount of emphasis given to coded data in developing themes was determined in part by the factors recommended by Krueger and Casey (2009) for analyzing focus group results. These factors include frequency, specificity (giving more emphasis to those comments that provide detail), amount of emotion, and extensiveness (how many different people made a similar comment). Videotaped data from focus groups were reviewed to confirm these factors as needed. Following individual analysis, the two investigators met and reviewed each other's findings. The coding frameworks and identified themes were compared and contrasted and integrated into one structure collaboratively.

Measures were taken during the data analysis phase to ensure trustworthiness of the results. As described by Lincoln and Guba (1985), there are four criteria for

determining the soundness of qualitative research: credibility, transferability, dependability, and confirmability. Credibility can usually be enhanced through the triangulation of data (Patton, 1990). For this study, the investigators accomplished this through the use of multiple data analysts who analyzed the data separately prior to synthesizing their outcomes. Transferability refers to the extent which the findings can be generalized to other settings (Merriam, 1998). According to Lincoln and Guba (1985), with qualitative research, it is up to the reader to determine whether the findings are applicable to another setting; however, the investigator has the responsibility to provide sufficient information for the reader to determine transferability. In this study, broad descriptions of the results were provided to allow the reader to have a comprehensive understanding of the lived experience of the participants from their unique perspectives.

Lincoln and Guba (1985) identify that dependability of qualitative research can be enhanced through examination of both the process and the product of the investigation for consistency. Dependability was established in this study through provision of a rationale for the selection of the methodology of data analysis, a detailed description of the participants and the selection criteria employed, as well as a thorough explanation of the environment in which data were collected and the processes used. Finally, confirmability of data is accomplished through demonstration of neutrality of the research interpretations (Lincoln & Guba, 1985). This was accomplished in this study through collaboration of multiple investigators in the review of interview transcripts and interpretation of themes and subthemes that emerged from the data.

For the following four aims, a description of the data analysis that was conducted follows the list of all three aims and associated research questions as they called for similar analyses.

Aim III: Assess the effect of a program of stress management and resiliency training on symptoms of stress at baseline and 4 and 12 weeks following the intervention among nurse residents at a large Midwestern academic medical center.

Research question: What is the difference in stress between those who attend the SMART program and a comparison group at baseline and 4 and 12 weeks following the intervention among nurse residents at a large Midwestern academic medical center?

Aim IV: Assess the effect of a program of stress management and resiliency training on symptoms of anxiety at baseline and 4 and 12 weeks following the intervention among nurse residents at a large Midwestern academic medical center.

Research question: What is the difference in anxiety between those who attend the SMART program and a comparison group at baseline and 4 and 12 weeks following the intervention among nurse residents at a large Midwestern academic medical center?

Aim V: Assess the effect of a program of stress management and resiliency training on mindfulness at baseline and 4 and 12 weeks following the intervention among nurse residents at a large Midwestern academic medical center.

Research question: What is the difference in mindfulness between those who attend the SMART program and a comparison group at baseline and 4 and 12 weeks following the intervention among nurse residents at a large Midwestern academic medical center?

Aim VI: Assess the effect of a program of stress management and resiliency training on participant resilience at baseline and 4 and 12 weeks following the intervention among nurse residents at a large Midwestern academic medical center.

Research question: What is the difference in resilience between those who attend the SMART program and a comparison group at baseline and 4 and 12 weeks following the intervention among nurse residents at a large Midwestern academic medical center?

Study endpoints include resilience (CD-RISC), stress (PSS), anxiety (GAD-7), and mindfulness (MAAS) scores. These assessments were evaluated at baseline, 4 weeks, and 12 weeks post-intervention for each group. The follow-up assessment time periods were based on previous research regarding the SMART program, as well as time periods typically used with psychosocial treatment studies to study both short-term and sustained effects (Shapiro, Brown, Thoresen, & Plante, 2011). Data were summarized as both raw scores, change from baseline, and between group changes.

Results were analyzed using a mixed model design. The mixed model design is useful for investigations that include both between-subjects and repeated measures factors (Lehman, O'Rourke, Hatcher, & Stepanski, 2005). This method of analysis was appropriate for this investigation in that it accounts for correlations among groups of observations and provides convenient modeling for repeated covariates and heterogeneity between groups (Cheng, Edwards, Maldonado-Molina, Komro, & Muller, 2010). This statistical design was selected over repeated measures ANOVA as it takes into account differences between groups, a likely occurrence when the intervention and control groups are not randomly assigned (Meyers, Gamst, & Guarino, 2006). In addition, the mixed

model design takes into account differences between group mean scores at baseline levels of measurement (Meyers, Gamst, & Guarino, 2006).

Missing Data

For the purposes of this study, the technique of multiple imputation was used to replace the values of missing data. This procedure uses available data from the participant's observed values in order to predict a missing value (McCleary, 2002). According to McCleary (2002), the benefits of multiple imputation are it "(a) results in unbiased estimates, providing more validity than ad hoc approaches to missing data; (b) uses all available data, preserving sample size and statistical power; (c) may be used with standard statistical software; and, (d) results are readily interpreted" (p. 339).

Limitations

Limitations of this study were: 1) lack of cultural diversity due to local area demographics; 2) open-label study intervention, thereby limiting the ability to control for the placebo effect; 3) cross-contamination of intervention and comparison group participants could occur as nurses from each group may work closely with one another; and 4) potential that positive outcomes are related to other aspects of the residency program, such as socialization, supportive environment, and time away from the unit.

Human Subject Research Considerations

The participants were compensated $10.00 for each set of questionnaires they completed, funded by a $5,000.00 grant provided by the institution's Sponsorship Board Research Committee. The payment was added to the employees' payroll checks at the

end of the study. The number of questionnaires completed was identified through REDCap.

Each participant was assigned a study ID, the code for which was maintained by the study PI and not available to other study investigators. No other participant identifiers were included on the study forms.

The sources of material included data obtained from questionnaires. Data collected from the participants included contact information, demographics, and standardized questionnaires. Data were obtained for research purposes only. All assessments were kept confidential, without impact on institutional personnel documentation. All participant information was kept in a locked file in the PI's office. A list of names and corresponding ID's was kept locked in a separate file cabinet.

The principal risks to human subjects in this study were: 1) inconvenience of questionnaires, intervention session, and follow-up interviews, and 2) potential adverse effects of the mindfulness-based training program, which are highly unlikely.

Chapter Summary

The aims of this study were to identify the feasibility of integrating the SMART program into a pilot nurse residency program, as well as assess the effects of the program on the nurse participants' stress, anxiety, resilience, and mindfulness. An additional purpose of the study was to determine the impact of the program on the nurse residents, and what elements impacted their experiences. This provided information regarding what portions of the program were most effective, and which needed improvement, allowing

the researcher to make recommendations for elements that should be considered for inclusion in stress management programs for nurses.

The study design was quasi-experimental with a convenience sample of 66 nurse residents, 27 in the intervention group and 39 in the comparison group. A comparison group was employed in an attempt to control for confounding variables. Both quantitative and qualitative methods were used to investigate the aims of the study. The SMART intervention was administered in three sessions over a 12 week period. Quantitative assessment measures were employed to measure the participants' stress, anxiety, mindfulness, and resilience and were conducted at baseline, and at 4 weeks and 12 weeks following the initial intervention. Qualitative data collection occurred at 12 weeks following the initial intervention.

Quantitative analysis included employment of a mixed model statistical technique. In addition, feasibility of the program was assessed through measurement of participant adherence and compliance with the intervention. A narrative analysis approach was used for the qualitative analysis. Steps were taken throughout the research process to ensure adequate considerations regarding human subject research.

CHAPTER 4: RESULTS - QUANTITATIVE AND QUALITATIVE MANUSCRIPTS

Introduction to Chapter

This chapter contains two manuscripts reporting the outcomes of the study, written in a format for submission to the Journal for Nurses in Professional Development. The first manuscript comprises the quantitative results, while the second manuscript includes the qualitative outcomes. Incorporated within the quantitative manuscript are a review of literature related to stress management for nurses, the purpose of the quantitative portion of the study, the theoretical framework used as a model for the investigation, research methods, statistical results, a discussion of the findings, a statement of the limitations of the study, and a summary of the manuscript. Reported in the qualitative manuscript are an introduction to the problem, the purpose of the qualitative portion of the study, research methods, results of analysis of focus group interviews, and a discussion of the findings.

Manuscript 2: Integration and Impact of Stress Management and Resiliency Training (SMART) in a Nurse Residency Program: Part I, Quantitative Outcomes

Abstract

Innovative strategies are needed to assist new registered nurses in the management and prevention of stress as a result of transitioning into the complex and challenging healthcare environment. The purpose of this quasi-experimental study was to assess the feasibility of integrating a Stress Management and Resiliency Training (SMART) program within a pilot nurse residency program with a convenience sample of new nurses

(*n* = 27 intervention group; *n* = 39 control group). Additional aims were to assess the effects of the program on participants' levels of stress, anxiety, mindfulness and resilience in relationship to a comparison group. Each outcome was measured with self-report instruments at baseline and 4 and 12 weeks after the initial intervention. The nurse residents exhibited compliance with the SMART program; however, they were not adherent to the intervention according to the pre-determined parameters. A mixed model analysis of instrument scores revealed no significant group*time interactions for any of the outcomes: (stress: $F = 1.19$, $p = .19$), (anxiety: $F = .17$, $p = .68$), (resilience: $F = .37$, $p = .55$), and (mindfulness: $F = .07$, $p = .79$). The results provide a preliminary indication that the SMART program could be successfully integrated within a nurse residency program. Trends indicated that those who participated in the program tended to have more positive outcomes. Further research is recommended with larger sample sizes and randomized control groups to further explore the efficacy of the SMART program.

Introduction and Statement of the Problem

Nursing has been recognized historically as a highly stressful career (Milliken, Clements, & Tillman, 2007). In a large survey of nurses within the United States (*N*=4,826), the American Nurses Association (ANA) (2001) found that 70.5% of the nurses surveyed identified the effects of acute and chronic stress as one of their top three concerns. In addition, in a more recent study that was funded by the National Institutes of Health (Mealer, Burnham, Goode, Rothbaum, & Moss, 2009), psychological symptoms related to stress, including burnout syndrome, post-traumatic stress disorder, anxiety, and depression were reported as common in nurses and had a dramatic impact on both work

and non-work related activities. In addition, nurse stress can negatively impact patients and the quality of care they receive (Moustaka and Constantinidis, 2010; Miliken, Clements, & Tillman, 2007).

Due to the high rate of stress experienced by nurses and the subsequent negative outcomes for both them and their patients, substantiation of efforts to reduce their stress is imperative. New nurses tend to experience the greatest degree of stress (Delany, 2003; Oermann & Moffitt-Wolf, 2009); therefore, stress reduction efforts should be directed toward assisting new nurses who are transitioning into the healthcare setting. Studies are emerging in the literature regarding interventions aimed at helping the nurse cope with stress; yet, insufficient evidence is available as to the effectiveness of such strategies.

Review of Literature

In a review of literature, McVicar (2003) identified six main themes reported consistently by nurses over the years as causes of occupational stress: 1) workload, inadequate staff cover, time pressure; 2) relationships with other clinical staff; 3) leadership and management style, poor locus of control, poor group cohesion, lack of adequate supervisory support; 4) coping with emotional needs of patients and their families, poor patient diagnosis, death and dying; 5) shift working; and 6) lack of reward. Such stress can have multiple negative effects on nurses, as well as their patients. Moustaka and Constantinidis (2010) found that nurse stress can affect the ability to concentrate and make appropriate decisions, which can lead to errors in patient care. In addition, stress can affect both the physical and mental health of nurses, which can also have deleterious effects on their ability to provide high quality care (Moustaka &

Constantinidis, 2010). Furthermore, nurse stress leads to organizational consequences, such as absenteeism, tardiness, and job turnover, all of which also ultimately jeopardize safe patient care (Miliken, Clements, & Tillman, 2007).

The time of orientation has been identified as the most stressful time in a registered nurse's career (Delany, 2003; Oermann & Moffitt-Wolf, 2009). Newly licensed registered nurses encounter several challenges as they transition into the hospital environment. They face complex settings with multiple stimuli and sources of information. In addition, they are confronted with time pressures in the care of patients with complex healthcare needs, while often lacking adequate preparation, knowledge, time management, and critical thinking ability (Fero, Witsberger, Wesmiller, Zullo, & Hoffman, 2008; Oermann & Garvin, 2002). Not only is the time of orientation stressful, it is well documented that the transition period for the graduate nurse from orientation to staff nurse is highly stressful as well (Delany, 2003; Godinez, Schweiger, Gruyer, & Ryan, 1999; Oermann & Garvin, 2002; Strachota, Normandin, O'Brien, Clary, & Krukow, 2003).

Despite the growing number of studies regarding stress management for nurses and healthcare workers, literature review results have identified that there is not sufficient evidence to definitively support which measures are the most effective (Awa, Plaumann, & Walter, 2010; Clegg, 2001; McVicar, 2003; Mimura & Griffiths, 2003; Ruotsalainen, Serra, Marine, & Verbeek, 2008). Many of the associated investigations are plagued by methodological weaknesses such as small sample size, lack of power analysis, high attrition rates, and uncontrolled observations (Awa et al., 2010; Clegg, 2001; McVicar,

2003; Mimura & Griffiths, 2003; Ruotsalaine et al., 2008). There is some evidence that suggests that stress management interventions that are aimed at the person tend to be more effective than those aimed at environmental management (Mimura & Griffiths, 2003). In addition, Ruotsalainen et al. (2008) identified, in a systematic review of literature, that person-directed interventions for reducing occupational stress in health care workers can significantly reduce stress, burnout, lack of personal accomplishment, and anxiety. In a study involving nurses (N=2,247) at the same institution in which this study was implemented, Tucker et al. (2012) identified that "the degree to which nurses practice health-promoting behaviors in the areas of health responsibility, spiritual growth, and stress management" (p. 289) accounted for the majority of the variance in perceived stress scores.

A person-directed intervention that has shown promise for reducing stress and improving resiliency in a variety of populations is the Stress Management and Resiliency Training (SMART) program (Sood, 2010). It is designed to train participants to enhance present moment awareness through the practice of mindfulness, and cultivation of the higher principles of gratitude, compassion, acceptance, forgiveness and higher meaning and purpose (Sood, 2010).

Purpose of the Study

The purpose of this study was to investigate the outcomes of integrating the SMART program within a pilot nurse residency program at a large Midwestern academic medical center. The specific aims were to 1) determine the feasibility of incorporating the SMART program within the nurse residency program, and 2) assess the effect of the

training on symptoms of stress, anxiety, mindfulness and resiliency at baseline, 4 weeks, and 12 weeks following the intervention among nurse residents in relationship to a comparison group.

Theoretical Framework

Lazarus and Folkman's Transactional Model of Stress (1984) was employed in an effort to explain the process of the stress response. The model offers a framework for understanding how a mindfulness-based program can positively affect the stress appraisal of new nurses. According to the theory, stress response involves a personal-environment transaction based on two primary variables: demand placed plus ability to meet that demand. The primary appraisal consists of assessment of the demand placed on the system, while the secondary appraisal comprises the assessment of resources available to meet this demand. Lazarus (2000) hypothesized that during the primary appraisal, one determines whether the situation he/she is facing is relevant to his/her values, beliefs, and goals and if so, in what way. If one believes the event or situation is not relevant to his/her well-being, then nothing further is considered. However, if it is determined that it is relevant, then the secondary appraisal occurs. In the secondary appraisal, one evaluates coping options, decides which ones to choose, and how to employ them (Lazarus, 2000). Coping is defined as "constantly changing cognitive and behavioral efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person" (Lazarus & Folkman, 1984, p. 141).

Expanding upon Lazarus and Folkman's stress and coping transactional model, we hypothesized that the SMART program intervention would provide skills for

meaning-based coping by including methods to enhance mindfulness and cultivate greater gratitude, compassion, acceptance, forgiveness and higher meaning and purpose. These skills will provide coping strategies, and thus it is surmised the program would positively influence both primary and secondary stress appraisal by cultivating inner resources. By impacting both levels of appraisal, mindfulness-based coping has the potential to decrease stress and anxiety and increase resilience to prevent future stress (Figure 1). We presumed that a mindfulness-based coping practice would act as a moderator to the stress-illness link.

INSERT FIGURE 1 HERE

Methods

Design

This 12 week study was designed as a quasi-experimental investigation, enrolling a convenience sample of 66 (*n*=27 for treatment group, *n*=39 for comparison group) nurse residents at a large Midwestern tertiary academic medical center. The study was approved by the healthcare institution's IRB and was part of a larger study investigating outcomes of a nine-month pilot nurse residency program.

Sample

The pilot nurse residency program enrolled 106 registered nurses who were assigned into two groups: one group of 27 who participated in the residency program, and a comparison group of 79 who participated in the usual orientation program only. This investigator used those two groups to recruit participants for this study. All 106 registered nurses who were included in the pilot nurse residency program were invited to participate

in this study. The 27 nurses who were selected to participate in the residency program arm were invited to participate in the intervention group of this study; all 27 agreed to participate. Likewise, the 79 who were selected to participate in the comparison group arm of the nurse residency program were invited to participate in the comparison group for this study; 41 agreed to participate. Two participants in the comparison group only completed the instruments at baseline and were therefore excluded from the study. Thus, the final sample size was $n = 27$ for the intervention group, and $n = 39$ for the comparison group.

Inclusion criteria for the participants in the intervention group of the pilot nurse residency program included: 1) registered nurses with a July 18, 2012 or August 1, 2012 start date at the institution, 2) prepared at a minimum of a baccalaureate degree in nursing, 3) assigned to one out of a possible thirteen general care inpatient units, and 3) less than one year of experience as a registered nurse. Inclusion criteria for the participants in the comparison group of the program were similar, with the exception criterion number 3; those in the comparison group could be assigned to any inpatient unit, including general care, intensive care, and progressive care units. Twenty-seven nurses met the inclusion criteria for the intervention group, and all 27 were assigned to the intervention group of the pilot nurse residency program. Likewise, 79 nurses who met the criteria for the comparison group were all assigned to the comparison group.

Inclusion criteria for the sample for this study included that the participants were 1) already recruited to be a participant in the pilot nurse residency program; and 2) willing and able to participate in all aspects of the study. Exclusion criteria for this study

included: 1) have currently or recently (past 6 months) experienced a psychotic episode per participant self-report; and 2) have clinically significant acute unstable neurological, psychiatric, hepatic, renal, cardiovascular or respiratory disease.

Intervention

The SMART program was developed by Dr. Amit Sood, and was adapted from Sood's (2010) Attention and Interpretation Therapy (AIT), which is a structured six month program designed to assist healthcare providers in improving their ability to train their attention and refine interpretations, as well as teach others these skills. The skills employed in the program guide learners to "delay judgment and pay greater attention to the novelty of the world" (Sood, Prasad, Schroeder, & Varkey, 2011, p. 2). The goal of the program is to enhance peace, joy, resilience, and altruism, thus reducing stress and improving resiliency (Sood, 2010). The SMART program was adapted from the AIT program in an attempt to offer the training to a wider audience. In comparison to the AIT program, the SMART program is in a condensed format with a reduced amount of in-person training time. At the time of print, the SMART program is the only program adapted from the AIT program.

The SMART program is implemented in various formats depending on the type and number of participants. Variances include the length of the sessions, the number of follow-up sessions, and the number of participants in each session. For this study, the program was integrated in a nine-month pilot nurse residency program that held monthly meetings. It consisted of an initial 90 minute intervention and two 60 minute follow-up sessions at four and eight weeks following the initial intervention. These time periods

were selected to coincide with the monthly meetings of the pilot nurse residency program. All three interventions were presented in a group setting including all 27 participants. Future follow-up sessions were planned to occur at each of the remaining pilot nurse residency meetings and end of program and long-term outcomes will be measured. Results will be reported in a future manuscript.

An outline of the SMART curriculum for this study is provided in Table 1. The initial intervention was comprised of a discussion facilitated by Dr. Sood regarding the psychology, neurobiology, and neuropsychology of stress and resilience. Specific modalities to manage stress and improve resilience, primarily mindfulness-based approaches, were discussed. The skills discussed during this session addressed the issues of attention, gratitude, acceptance, meaning and purpose, forgiveness, and relationships.

In addition, the participants in the intervention group received a 152-page workbook related to the SMART program. The nurses were asked to review a select number of pages from the workbook related to the topics that would be discussed prior to each follow-up session. The workbook provides activities which allow the reader to understand and embody the concepts and skills related to the SMART program. There are spaces provided throughout the workbook for readers to write in their responses to questions, plan for implementing the principles, and journal the results of the activities. The workbooks were for the participants' personal use, and no information was gathered from it for this study.

Small group follow-up sessions occurred at 4 and 8 weeks following the initial intervention. These sessions were provided during the participants' monthly scheduled

residency program classes and were led by this author and a Clinical Nurse Specialist. Both facilitators completed the six-month AIT training course that prepared them as instructors for the program. At the follow-up sessions, the facilitators reviewed the skills associated with the intervention, facilitated discussion on how the participants were implementing the skills in their work and personal lives, and answered any questions the participants had. The sessions were each 60 minutes in length. An outline of the curriculum for the timeframe of this study is provided in Table 1.

INSERT TABLE 1 HERE

Measurement

Participants in both the intervention and comparison groups completed the following instruments at three points: 1) baseline, 2) 4 weeks post baseline, and 3) 12 weeks post baseline: Perceived Stress Scale (PSS) (Cohen, Kamarck, & Mermelstein, 1983), Generalized Anxiety Disorder 7-Item Scale (GAD-7) (Spitzer, Kroenks, & Williams, 2006), Connor-Davidson Resilience Scale (CD-RISC) (Connor & Davidson, 2003), and the Mindful Attention Awareness Scale (MAAS) (Brown & Ryan, 2003). An outline of the study measurement points is included in Figure 2. The participants in the intervention group completed the scales prior to the scheduled interventions to avoid bias induced by a mindful state. Demographic data were collected from both groups at the end of the study. In addition, the intervention group completed an End of Study Questionnaire to evaluate various aspects of the program. Participants were asked questions regarding how they implemented the program into their lives and what they found most and least helpful about the program. These data were used to determine participants' adherence to

the intervention and to elicit information regarding program improvement.

INSERT FIGURE 2 HERE

At week 12 of the study, qualitative focus group interviews were conducted with the intervention group to assess the impact of the program on the nurse residents and gather their opinions regarding the aspects of the program that were most beneficial. Methods and results related to the qualitative research are addressed elsewhere.

Following is a description, as well as a summary of validity and reliability findings for each of the instruments employed for the study.

Perceived Stress Scale. The PSS is a 14-item self-report tool that provides a global measure of perceived stress (Cohen et al., 1983). The instrument consists of 7 positively stated items and 7 negatively stated items. Responses range on a 5-point Likert response scale from “never” to “very often” (Cohen et al., 1983). A higher score indicates a greater stress level. The scale was tested for concurrent validity and was found to correlate well with Number of Life Events (correlations = 0.20, p <.01, 0.17) and Impact of Life Events (correlations = 0.35, p <.01, 0.24, p <.01) in two separate samples of college students (Cohen et al., 1983). The scale has also been determined to have adequate reliability (α= .84, .85, .86) in three different samples which included college students and participants in a smoking cessation study (Cohen et al., 1983). Cronbach’s alpha internal consistency reliabilities were computed for the PSS at each measurement point in this study: baseline, 4 weeks post intervention, and 12 weeks post intervention. The results, in respective order, were .89, .90, and .87.

Generalized Anxiety Disorder 7-Item Scale. The GAD-7 is a 7-item questionnaire that asks how often, during the last 2 weeks, the participant was bothered by each symptom (Spitzer et al., 2006). Examples of symptoms include: “felling nervous, anxious, or on edge”; “not being able to stop or control worrying”; and “becoming easily annoyed or irritable”. Response options are “not at all”, “several days”, “more than half the days”, and “nearly every day”, scored as 0, 1, 2, and 3 respectively. Higher scores indicate higher anxiety levels. The instrument has been found to have strong criterion validity for identifying probable cases of GAD, as well as good construct, factorial and procedural validity (Spitzer et al., 2006). The instrument has also been found to have excellent internal consistency ($\alpha = .92$), and good test-retest reliability (intraclass correlation = 0.83) among a sample of outpatient clients with anxiety issues (Spitzer et al., 2006). Cronbach’s alpha internal consistency reliabilities were computed for the GAD-7 at each measurement point in this study: baseline, 4 weeks post intervention, and 12 weeks post intervention. The results, in respective order, were .84, .85, and .73.

Connor-Davidson Resilience Scale. The CD-RISC has 10 items, each of which has a 5-point range of responses (0-4) with higher scores reflecting more resilience (Connor & Davidson, 2003). The numbered responses are labeled with the following: not true at all (0), rarely true (1), sometimes true (2), often true (3), and true nearly all of the time (4) (Connor & Davidson, 2003). The scale has been tested for convergent validity and has demonstrated positive correlation with multiple related measures, including the Kobasa hardiness measure, with ability to distinguish between participants with lesser and greater resilience (Ahern, Kiehl, Sole, & Byers, 2006). The CD-RISC was tested with

undergraduate college students (n=537), and found to have good internal consistency (α = .85) (Campbell-Sills & Stein, 2007). Cronbach's alpha internal consistency reliabilities were computed for the CD-RISC at each measurement point in this study: baseline, 4 weeks post intervention, and 12 weeks post intervention. The results, in respective order, were .84, .86, and .84.

Mindful Attention Awareness Scale. The MAAS is a 15-item measure assessing mindfulness of moment to moment experience (Brown & Ryan, 2003). The scale measures the frequency of mindful states in day-to-day life, using both general and situation-specific statements. The items are answered on a Likert scale from 0 (almost always) to 6 (almost never). Higher scores indicate greater mindfulness. The scale has been found valid across multiple studies and has demonstrated adequate reliability (α = .80 - .87) when used with general adult populations (Brown & Ryan, 2003). Cronbach's alpha internal consistency reliabilities were computed for the MAAS at each measurement point in this study: baseline, 4 weeks post intervention, and 12 weeks post intervention. The results, in respective order, were .91, .93, and .91.

Results

Demographics

Participants in the intervention group were predominately female (93%) between the ages of 21 and 25 years (100%), and mostly white/Caucasian (94%), which is consistent with the cultural makeup of the geographic area. The mean age was 22 (± .64). All participants held a bachelor's degree in nursing as their highest level of nursing education, and all had less than one year of experience as a nurse (which was an inclusion

criterion for participation in the residency program). Participants in the comparison group were predominately female (88%) and selected white/Caucasian as their ethnicity (93%). The mean age was 24 (±2.82 years). Although the mean age was similar for both groups, the comparison group had a wider age range than the intervention group. All participants indicated that their highest level of education in nursing was a baccalaureate degree, and length of experience in nursing was less than 1 year (which was an inclusion criterion for participation in the comparison group). These findings are summarized in Table 2.

INSERT TABLE 2 HERE

Descriptive Statistics

Descriptive statistics (means and standard deviations) for each of the dependent variables are presented in Table 3. Mean scores are reported for each of the four scales at baseline, four week follow-up, and twelve week follow-up for the intervention group and comparison group.

INSERT TABLE 3 HERE

Study Aims

Prior to addressing the aims of the study, four independent t-tests were conducted to determine if there were significant differences between the measures reported by the intervention and comparison groups at baseline for each of the scales. No significant differences (p <.05) were found between the groups, with the exception of measures of stress. The intervention group reported significantly higher stress levels on the PSS than the comparison group at baseline (t = 2.79, p = < .007).

Aim 1: Feasibility

The first aim of the study was to assess the feasibility of integrating a stress management and resiliency training program (SMART) within a pilot nurse residency program. Feasibility was evaluated by participant compliance with the intervention and adherence to the intervention. Compliance was measured by participant recruitment, attrition rates, and attendance rates. Adherence was made operational by percentage of days the participants practiced the principles related to the program.

Compliance. All compliance rates measured favorably in relation to recruitment and attendance levels. There were 27 nurses enrolled in the nurse residency program and all 27 agreed to participate in the study. No nurses met the exclusion criteria, and no participants elected to drop out of the study at any point. Attendance levels were high with 27 (100%) attending the first session, 26 (96%) attending the second session, and 25 (93%) attending the third session.

Adherence. Participants were considered to be adherent to the SMART program if they identified by self-report that they practiced the principles related to the intervention at least 60% of the study days. This benchmark was based on standards used for prior research related to the SMART program. Adherence rates for this study were poor, based on the parameters that were set. Twenty-five nurse residents responded to the question, and 3 (12%) participants reported they had practiced the principles at least 60% of the days. A little more than 1/3 of the nurse residents (n = 9) responded that they practiced the principles 20-39% of the study days. All responses regarding report of percentage of days the principles were practiced are provided in Table 4.

INSERT TABLE 4 HERE

Aims 2-5: Differences in Stress, Anxiety, Resilience, and Mindfulness between Groups Over Time

The remaining aims of this study were to assess the differences in measures of stress, anxiety, resilience, and mindfulness between those who participated in the SMART program and a comparison group at baseline, 4 weeks, and 12 weeks following the intervention. These aims were addressed using a mixed model statistical analysis to examine differences in each of the dependent variables (stress, anxiety, resilience, and mindfulness) over the three time points: baseline, four weeks, and twelve weeks (Table 5). Analysis was performed for each dependent variable separately rather than as a composite of the variables as the creator of the intervention has historically investigated outcomes from an individual perspective. For each analysis, the dependent variables were measured by the instrument scores and the model effects were time, group, time*group, and age (to account for the differences in age between the intervention and comparison groups). Each measure was tested at the .05 level of significance. The results for each variable are included in Table 5 and are described below.

INSERT TABLE 5 HERE

Aim 2: Analysis of Perceived Stress

Inspection of findings indicated a decrease in stress over the length of the study for the intervention group (-5.88) and the comparison group (-2.05) (Table 3, Figure 3). A mixed model analysis revealed the group by time interaction was not significant (F = 1.19, p = .19) (Table 5), therefore it was removed from the model for interpretation. In

addition, the main effect of group was not significant (F = 1.61, p = .21) (Table 5). However, the analysis did reveal a significant effect for time (F = 6.33, p = .01) (Table 5). Therefore, the comparison and intervention groups responded the same over time; there was not an overall difference between groups with respect to their mean perceived stress scores; and time was a significant effect for both groups.

Aim 3: Analysis of Anxiety

Inspection of findings indicated a decrease in anxiety from baseline to 12 weeks for the intervention group (-2.59) and the comparison group (-1.88) (Table 3, Figure 3). The mixed model analysis indicated the group by time interaction was not significant (F = .17, p = .68) (Table 5), therefore it was removed from the model for interpretation. In addition, the main effect of group was not significant (F = .14, p = .71) (Table 5). There was a significant effect for time (F = 4.06, p = .05) (Table 5). These findings indicate that both groups responded similarly over time; there was not an overall difference between groups with respect to their mean anxiety scores; however, time is a significant effect for both groups.

Aim 4: Analysis of Resilience

Resilience scores for the intervention group improved (+1.44) from baseline to the study endpoint, and declined (-0.90) for the comparison group (Table 3, Figure 3). The mixed model analysis revealed the group by time interaction was not significant (F = .37, p = .55) (Table 5), therefore it was removed from the model for interpretation. However, the analysis did reveal a significant effect for group (F = 48.13, p = < .0001) (Table 5). There was not a significant effect for time (F = 2.40, p = .13) (Table 5). Thus, the

intervention and comparison groups responded similarly to resilience over time. Initially, there was an overall difference between groups in regard to their mean resilience scores; however, over time the difference was no longer present.

Aim 5: Analysis of Mindfulness

The mindfulness scores improved for the intervention group (+0.30) and the comparison group (+0.05) (Table 3, Figure 3). The mixed model analysis revealed the group by time interaction was not significant (F = .07, p = .79), therefore it was removed from the model for interpretation. The main effect of group was also not significant (F = 1.91, p = .17), as well as the effect for time (F = 3.71, p = .06) (Table 5). These findings indicate the intervention and comparison groups responded similarly to mindfulness over time; there was not an overall difference between groups with respect to their mean anxiety scores; and time did not have a significant effect for both groups.

INSERT FIGURE 3 HERE

Analysis of Differences Between Groups by Adherence Level

Post-hoc analysis was conducted to determine whether the level of participant adherence for those in the intervention group influenced the dependent outcomes of the study. For this analysis, the intervention group was divided into 3 groups: 1) those who practiced the skills 0-19% of the study days (n = 7), 2) those who practiced the skills 20-39% of the study days (n = 9), and 3) those who practiced the skills 40-100% of the study days (n = 9). One-way ANOVAs were conducted to assess for differences in mean scores for each scale, comparing each group to the other two groups. No statistically significant differences were noted in the outcomes between any of the paired groups.

Discussion

The nurse residents were compliant with the SMART program, reflected by high recruitment and attendance levels; however, they were not adherent to the intervention based on the pre-determined parameters regarding percentage of practice days. There is no single measure of adherence that is applicable to all interventions, neither is there a gold standard for satisfactory adherence across health behaviors (Vitolins, Rand, Rapp, Ribisl & Sevick, 2000); therefore it is difficult to compare adherence levels across studies. However, results for this study were compared to an unpublished pilot study that employed the same intervention and it was identified that attendance rates at the follow-up sessions for this investigation were much higher than those for the pilot study. Participants in the pilot study included orienting nurses who were not part of a residency program. The high compliance rate for this study could be related to the SMART program's integration with the pilot nurse residency program, in that it likely allowed for fewer scheduling issues and therefore higher attendance at the follow-up sessions.

The percent of participants who met the criterion for adherence to the intervention (practicing the principles of the SMART program at least 60% of the study days) (12%) was found to be similar to the previous pilot study with a group of orienting nurses (16%) (unpublished data). It is possible that this low adherence rate negatively impacted the dependent factor outcomes for this study.

The criterion for intervention adherence may need to be reassessed in future studies through the use of a larger sample size, providing adequate power to determine differences between groups who practiced at different levels of adherence. An additional

question that needs to be addressed is whether it is feasible or reasonable to expect the nurses to practice the principles of the program >60% of the time. As noted by Vitolins, et al. (2000), an adherence level should be identified that is explicitly delineated and appropriate for the intervention and expected behavior under investigation. Therefore, future studies are warranted in an effort to determine the most effective dose of treatment specific to the SMART program. In addition, modifications to the intervention could be considered for future studies to determine if additions, such as regularly scheduled reminders to practice the principles of the SMART program, could positively impact the participants' adherence levels.

The intervention group's significantly higher stress levels at baseline in relationship to the comparison group could be related to the nurses' awareness that they were participating in a new program and were involved in an intervention group associated with a study. In addition, the participants may have been unsure of the expectations and responsibilities associated with the program. As noted by Michael, Garry, and Kirsch (2012), such suggestions could influence one's cognitions and behavior in ways that are unpredictable. Baseline data were collected prior to the first intervention (which includes discussions regarding stress), therefore the nurse residents' higher level of stress was unlikely related to talking about stress, which could bring the topic to the forefront of their mind and increase their perceived stress. However, it is possible that the residents had spontaneous discussions regarding stress or stressful events with each other prior to the first intervention.

Statistical analysis revealed that the intervention group did not differ in their response to perceived stress, anxiety, resilience, or mindfulness in relationship to the comparison group over the length of the study. These findings are similar to the previously mentioned unpublished pilot study with orienting nurses, in which the same outcome measures were obtained at baseline and 12 weeks post the initial intervention. Findings from that study demonstrated no statistically significant differences in scores between an intervention and control group for all four measures. However, for both studies, it is likely that the sample size did not allow for enough power to detect significant differences. Data patterns did indicate that the intervention group had a larger decrease in both stress and anxiety in relationship to the comparison group from baseline to the end of the study. In addition, resilience scores improved for the intervention group while they decreased for the comparison group; and mindfulness scores improved to a greater extent for the intervention group in relationship to the comparison group. These findings provide very tentative indications that the SMART program has the potential for reducing symptoms of stress and anxiety and improving symptoms of mindfulness and resilience in new nurses and therefore should continue to be integrated within the nurse residency program. Additional investigations are warranted to further explore the effects of the intervention on the dependent variables in relationship to a comparison group with greater power. In addition, employment of a randomized control group is recommended in order to control for alternative explanations for study results.

The theoretical model (Figure 1) employed for this study proved to be a useful organizing framework for the investigation of a mindfulness-based coping strategy for new nurses. When placed in the context of the framework, the findings lend support to the hypothesis that a mindfulness-based coping strategy has the potential to positively influence one's stress appraisal at both the primary and secondary levels. At the primary appraisal level, the coping practice can assist one in more accurately identifying whether a situation or event is an actual threat. At the secondary level, the coping practice can potentially positively influence one's ability to manage the stressful event or situation. These findings are congruent with other research regarding the ability of the variables within the theoretical model to predict psychological symptoms (Gilbar, Ben-Zur, & Lubin, 2010), and the findings of Dewe (1991) who identified that how one perceives a situation is key to determining how he/she copes with the situation.

Future research should measure participant coping levels in an effort to enhance an understanding of the study's theoretical model. This would allow for improved discernment of whether the intervention had an influence on coping, which according to the theoretical model is a construct that has the potential to contribute to positive stress rather than negative stress. Studying coping levels in relation to the intervention would also contribute to previous research that indicated problem-focused coping was positively correlated with psychological health outcomes (Penley, Tomaka, & Wiebe, 2002).

Limitations

Limitations of this study include the following: 1) relatively small sample size, 2) lack of cultural diversity due to local area demographics; 3) open-label study intervention, thereby limiting the ability to control for the placebo effect; 4) cross-contamination of intervention and comparison group participants may have occurred as nurses from each group may have worked closely with one another; and 5) potential that positive outcomes were related to other aspects of the residency program, such as socialization, supportive environment, and time away from the unit.

Summary

The results of this study provide a preliminary indication that the SMART program could be successfully integrated within a nurse residency program. Although significant differences in stress, anxiety, mindfulness, and resilience were not noted between groups, trends indicated that those who participated in the program tended to have more positive outcomes. Further research is needed with larger sample sizes to increase power to detect potential statistically significant differences between groups, and to determine adequate dosage of the intervention. In addition, a randomized control group should be employed in future studies in an effort to discount alternative explanations for the outcomes.

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Figure 1 (Dissertation Figure 5)

Theoretical Model: Mindfulness-Based Coping as a Moderator of the Stress-Illness Link within Lazarus and Folkman's Transactional Model of Stress

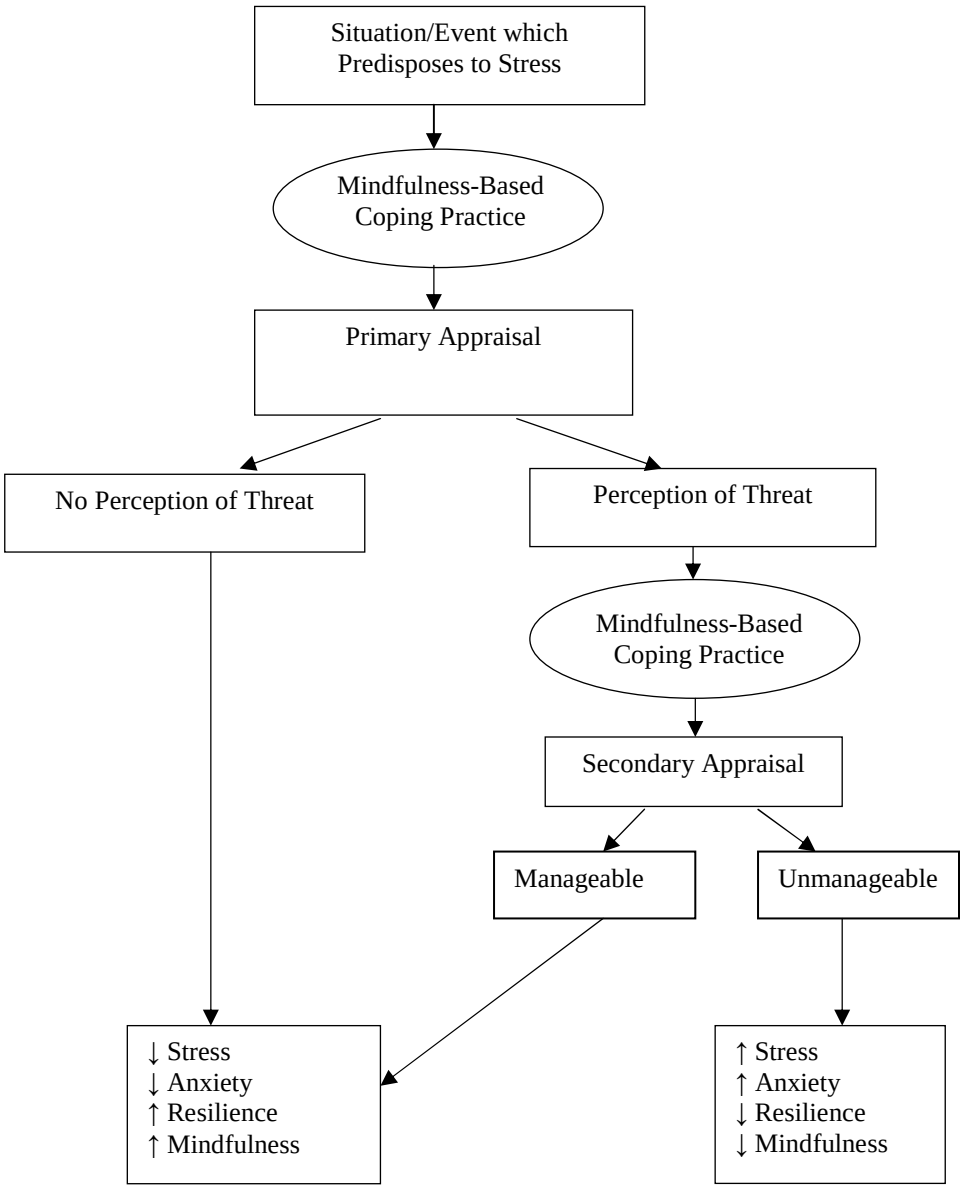


Table 1 (Dissertation Table 4)

SMART Program for Nurse Residents Curriculum: Months 1-3

SMART Program Session	Time Frame	Content	Presenter(s)
Initial Session	90 Minutes	The psychology and neurobiology of stress and resilience. The SMART principles: Gratitude, Compassion, Acceptance, Forgiveness, Meaning and Purpose.	Dr. Amit Sood
4 Week Follow-up Session	60 Minutes	Discussion of Integration of SMART principles Theme: Gratitude	Nursing Education Specialist (NES) Clinical Nurse Specialist (CNS)
8 Week Follow-up Session	60 Minutes	Discussion of Integration of SMART principles Theme: Compassion	NES CNS

Figure 2 (Dissertation Figure 6)

Flowchart of Study

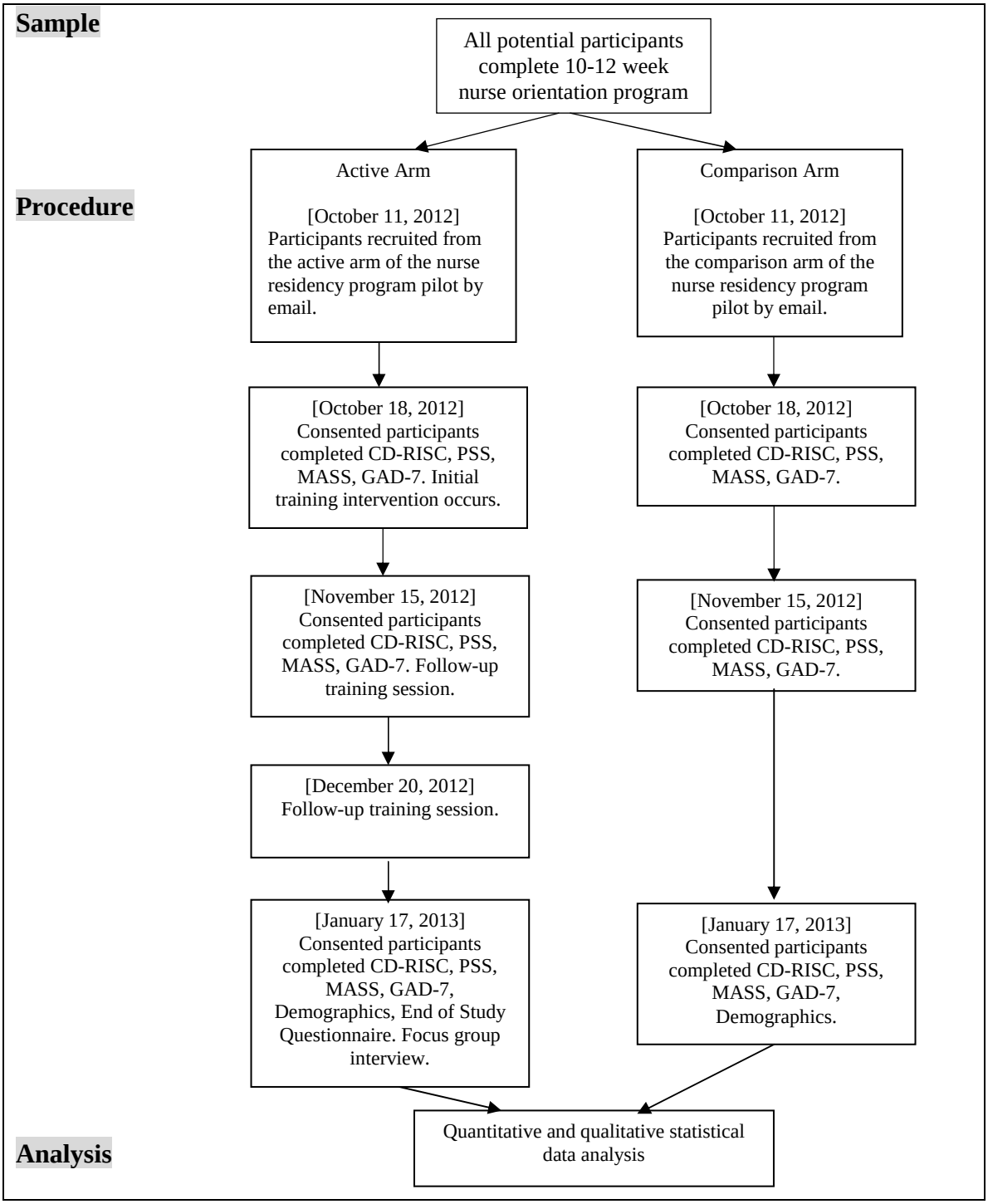


Table 2 (Dissertation Table 5)

Demographic Characteristics of Study Participants

Characteristic	Intervention Group *n=27*	%	Comparison Group *n=39*	%
Gender				
Female	25	93	36	92
Male	2	7	3	8
Age				
21-25	27	100	33	85
26-30			4	10
31-35			2	5
Ethnicity				
White/Caucasian	26	96	38	97
Asian	1	4	1	3
Level nursing education				
Bachelor's degree	27	100	39	100
Experience in nursing				
<1 year	27	100	39	100

Table 3 (Dissertation Table 6)

Mean and Standard Deviations for PSS, GAD7, CDRS, and MAAS Scores

Scale	Intervention Group *n*=27†		Comparison Group *n*=39†	
	M	*SD*	M	*SD*
Perceived Stress Scale (PSS)				
Baseline	24.07	7.07	19.08	7.46
Week 4 Follow-up	21.85	7.04	18.74	8.42
Week 12 Follow-up	18.19	6.79	17.03	6.79
Change from Baseline to Week 12	-5.88		-2.05	
Generalized Anxiety Disorder (GAD-7)				
Baseline	6.48	4.28	5.22	3.41
Week 4 Follow-up	4.70	3.44	3.98	3.34
Week 12 Follow-up	3.89	2.65	3.34	2.34
Change from Baseline to Week 12	-2.59		-1.88	
10-Item Connor Davidson Resilience Scale (CDRS)				
Baseline	26.89	4.99	30.05	4.06
Week 4 Follow-up	27.67	4.95	28.16	6.52
Week 12 Follow-up	28.33	4.33	29.15	6.34
Change from Baseline to Week 12	+1.44		-0.90	
Mindful Attention Awareness Scale (MAAS)				
Baseline	3.57	0.75	4.12	0.81
Week 4 Follow-up	3.68	0.82	3.99	0.85
Week 12 Follow-up	3.87	0.75	4.17	0.80
Change from Baseline to Week 12	+0.30		+0.05	

† There were 68 participants (27 Intervention, 41 comparison) who completed all scales at baseline. At 4 and 12 weeks, 66 participants (27 Intervention, 39 comparison) completed all scales.

Table 4 (Dissertation Table 7)

Percentage of Study Days [3 months] Participants Reported Practicing Principles of SMART Program

Percentage of Study Days	*n* (25/27)	Percentage
0	1	4%
1-19%	6	24%
20-39%	9	36%
40-59%	6	24%
60-79%	1	4%
80-100%	2	8%
Missing data	2	

Table 5 (Dissertation Table 8)

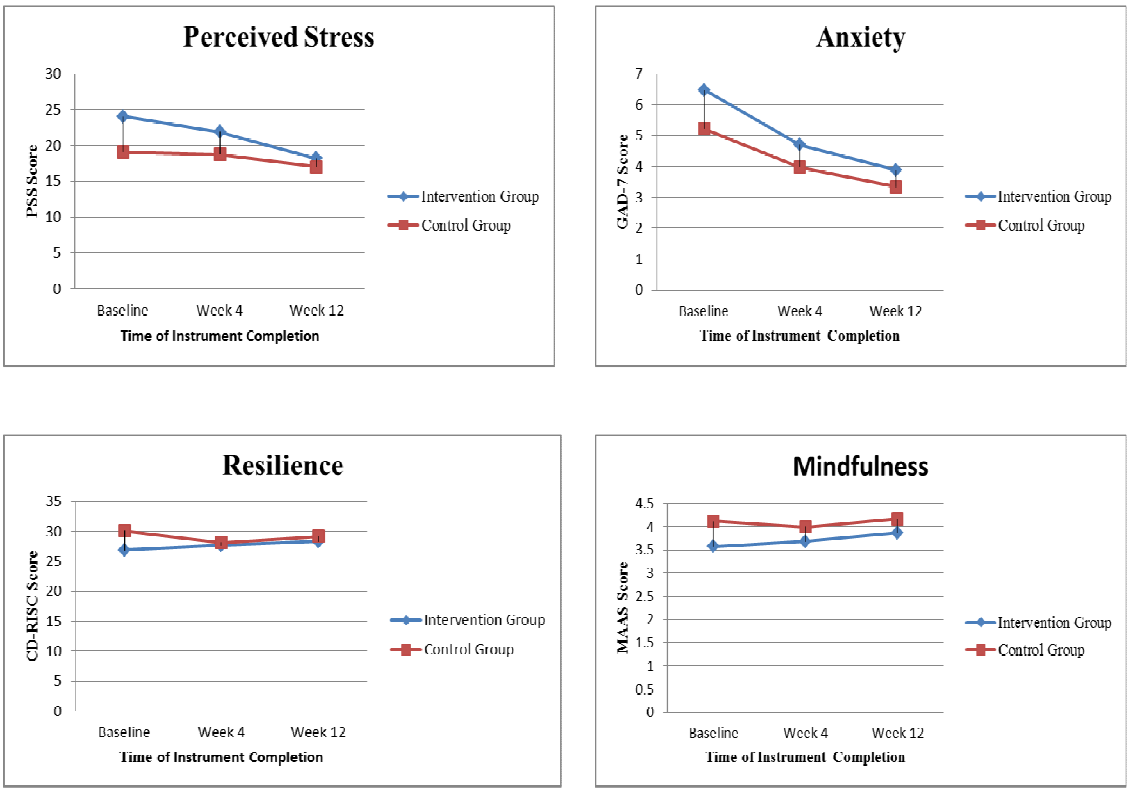
Mixed Model Analysis of Differences in Mean Scores for Stress, Anxiety, Resilience and Mindfulness over Time

Scale/Source of Variation	Slope	Std Error	F	P
Perceived Stress				
Group	-1.50	1.19	1.61	.21
Time	-2.24	.89	6.33	.01
Time*Group†	-2.41	1.80	1.79	.19
Anxiety				
Group	-.18	.47	.14	.71
Time	-.65	.32	4.06	.05
Time*Group†	-.28	.66	.17	.68
Resilience				
Group	1.40	.90	48.13	<.0001
Time	1.23	.76	2.40	.13
Time*Group†	-.95	1.56	.37	.55
Mindfulness				
Group	.19	.13	1.91	.17
Time	.16	.08	3.71	.06
Time*Group†	.05	.17	.07	.79

†Time*Group interaction was not significant, and was therefore removed from the model for analysis

Figure 3 (Dissertation Figure 7)

Changes in Mean Scores over Time for Each Outcome Measure



Manuscript 3: Integration and Impact of Stress Management and Resiliency Training (SMART) in a Nurse Residency Program: Part II, Qualitative Outcomes

Abstract

Stress has been found to negatively impact the well-being and mental and physical health of nurses, and when nurses' stress is high enough it can put patients at risk for health-threatening errors. The purpose of this study was to assess the impact of a Stress Management and Resilience Training (SMART) program on nurse residents, as well as determine which aspects of the program were most beneficial. Focus group interviews were conducted with a convenience sample of 27 (3 groups of 9) nurse residents at a large academic medical center 12 weeks after the initial intervention. A narrative analysis of the interview data revealed specific aspects of the program that were the most and least helpful to participants. Findings indicate that the SMART program 1) enhanced the personal and professional development of nurse residents, 2) was sensitive to learner needs, and 3) fostered the principles of mindfulness. As a result of the positive outcomes, it is recommended that a stress management intervention be incorporated within a nurse residency program. Future studies are needed with larger numbers to further explore the efficacy of the SMART program.

Introduction

Occupational stress is an increasingly important topic in the clinical practice of nursing (Clegg, 2001, McVicar, 2003; Mealer et al., 2009; Motowidlo, Packard, & Manning, 1986; Phillips, 1996; Riahi, 2011). Stress has been found to negatively impact

the well-being and mental and physical health of nurses (Gelsema, Van Der Doef, Maes, Akerboom, & Verhoeven, 2006), and when nurses' stress is high enough it can put patients at risk of errors such as incorrect documentation, medication errors or near misses, delays in patient care delivery, and violence among patients or towards nurses (Berland, Natvig, & Gundersen, 2008; Dugan et al., 1996; Elfering, Semmer, & Grebner, 2006; O'Brien-Pallas et al., 2004;). Nurse absenteeism and turnover related to stress can lead to inadequate staffing levels, which also place patients at risk.

Purpose of the Study

The purpose of this study was to assess the impact of a Stress Management and Resilience Training (SMART) program on nurse residents, as well as determine the aspects of the program that were most beneficial.

Statement of the Problem

Sources of nurse stress include organizational and personal factors such as patient care, decision making, taking responsibility, and change (Riahi, 2011). Individual dynamics have also been found to predispose nurses to stress. For example, a decreased sense of meaningfulness and self-efficacy have been associated with a higher risk of nurse burnout - a severe form of stress which is characterized by emotional exhaustion, depersonalization, and lack of personal accomplishment (Mealer et al., 2009). Burgess, Irvine and Wallymahmed (2010), in a descriptive exploratory study, identified that certain personality traits of intensive care nurses were associated with less perceived stress and better ability to cope, such as openness, extraversion, agreeableness, and conscientiousness.

Healthcare organizations can no longer ignore the pervasiveness of stress in nursing and its negative impact on nurses and patients (Jennings, 2008). The solution to addressing stressors in the healthcare environment is to shift institutional efforts toward identifying positive ways of coping that lead to the development of resiliency (Brit Pipe et al., 2011). The authors of the Institute of Medicine (IOM) report (2010), *The Future of Nursing: Leading Change, Advancing Health* highlight that the high turnover rate of new nurses indicates a particular need for support during the school to work transition.

There are a growing number of investigations which have examined the effectiveness of interventions aimed at mitigating nurses' and other healthcare workers' occupational stress. A wide range of approaches have been implemented which can be divided into two main categories: those that are aimed at environmental management, and those that are targeted at supporting personnel to effectively deal with stress (Mimura & Griffiths, 2003). Ruotsalainen et al. (2008) identified, in a systematic review of literature, that person-directed interventions for reducing occupational stress in health care workers can significantly reduce stress, burnout, lack of personal accomplishment, and anxiety.

A person-directed intervention which has shown promise for reducing stress and improving resiliency in a variety of populations is the Stress Management and Resiliency Training (SMART) program. The Stress Management and Resiliency Training (SMART) program is a mindfulness-based program aimed at reducing stress and improving resiliency. Many physical and health-related benefits have been associated with the practice of mindfulness (Grossman, Niemann, Schmidt, & Walach, 2003), including a reduction of stress and stress-related symptoms (Brown, Ryan, & Creswell, 2007). The

program is also designed to promote resilience which allows one to move on from stressful experiences (Jackson, Firtko, & Edenborough, 2007), and to possibly emerge stronger in one's ability to face adversity (Gillespie, Chaboyer, & Wallis, 2007). The program has been employed with a variety of audiences, including patients and healthcare professionals; however its implementation has not yet been studied among new career nurses.

This article is the second of two documenting the outcomes of the integration of the SMART program within a pilot nurse residency program at a large Midwestern academic medical center. In the first article, we reviewed the literature, identified a theoretical framework for the study, described the intervention, and reported the quantitative outcomes of the program. In this article we describe the qualitative methods employed to evaluate the program and report the outcomes of focus group interviews implemented for the study.

Methods

Design

This 12-week, IRB approved study employed a qualitative design in order to address essential aspects of program evaluation. An effective program evaluation not only measures the impact of a program by drawing inferences from statistical relations between the intervention and other covariates, but also assists in understanding the process by which the program instigates an observed impact, and this information is most effectively gathered with qualitative methods (Rao & Woolcock, 2003). In addition, qualitative methods are employed for program evaluation when "information needs

comprise multiple perspectives, contextualized meanings, or the experience of program participation" (Greene, 1994, p. 539).

Participants

The larger study enrolled 106 registered nurses, 27 of which were assigned to participate in the residency program and 79 who were assigned to the comparison group. Intervention group participants met the following inclusion criteria: 1) registered nurses with a start date of July 18, 2012 or August 1, 2012; 2) a baccalaureate degree in nursing, or higher degree; 3) employed to work on a medical or surgical floor; and 4) employed as a registered nurse for less than one year; 5) selected as a participant in the pilot nurse residency program; and 6) willing and capable of participating in all facets of the study. All 27 nurses in the intervention group for the pilot nurse residency program agreed to participate in this portion of the study.

Training

The SMART program is a mindfulness-based program that trains participants to enhance present moment awareness through the development of skills which enhance attention and interpretation. Attention training allows one to choose the direction, depth, and duration of attention which leads to a deeper engagement with life (Sood, 2010). Through cultivation of this skill, one can become less dependent on stressful thoughts, and instead be guided by purposeful effort, while finding novelty within the ordinary (Sood, 2010). In addition, by refining interpretations, one can act with an increased awareness, regulate his/her reactions to thoughts and events, and improve his/her ability

to become nonjudgmental and accepting. Through the practice of these skills, one can "journey away from stress toward resilience" (Sood, 2010, p. 55).

For this study, the SMART program was integrated in a 9-month nurse residency program that holds monthly meetings. The initial intervention was a 90 minute discussion facilitated by Dr. Sood regarding the psychology, neurobiology, and neuropsychology of stress and resilience. Specific modalities to manage stress and improve resilience, primarily mindfulness-based approaches, were discussed. The format was participatory and informal in order to adapt to the individual group's needs and preferences.

Monthly follow-up sessions were incorporated at each of the nurse residency meetings. These 1-hour sessions were facilitated by the primary investigator and a Clinical Nurse Specialist who were trained in facilitation of the SMART program. Follow-up sessions focused on one of the 5 higher principles and included a presentation on the definition and purpose of each principle, followed by a discussion among the nurses regarding how they were integrating the principle into their lives. Time was also provided for answering any questions the nurses had regarding the program.

Data Collection

Three focus groups of nine individuals each were conducted 12 weeks following the initial intervention. At this point in time, the nurses had also participated in 2 follow-up sessions that focused on the topics of gratitude and compassion. The one-hour focus group interviews were all conducted on one day by a PhD prepared Licensed Psychologist and a Research Analyst, both of whom have significant qualitative research experience and were unaffiliated with the pilot residency program so as to encourage

feedback and reduce bias in results. Also present at the interview were an Administrative Assistant and Patient Education Specialist who assisted with note taking. A script of interview questions (Table 1) was developed according to guidelines for minimizing bias and increasing the reliability and validity of interview data (Denzin & Lincoln, 2002; Kirk & Miller, 1986). The interviews were videotaped for purpose of data analysis.

INSERT TABLE 1 HERE

Data Analysis

The interviews were transcribed verbatim. The primary investigator subsequently viewed the video recordings and read the transcripts. Data were analyzed and interpreted using a narrative analysis approach, the goal of which is to interpret the text of stories through the lens of individuals' experiences (Patton, 1990). Analysis was performed independently by the investigator and the Research Analyst who was present during the interviews. Both analysts began by reading the transcripts separately to become familiar with the data and to begin to identify meaning and initial impressions. The focus group moderator reviewed the collaborative analysis and provided input. Codes, or topics that represent the meaning in them, were identified. As described by Morse and Richards (2002), coding "entails creating a category or recognizing one from earlier, reflecting on where it belongs among your growing ideas, and reflecting on the data you are referring to and on how they fit with the other data coded there" (p. 117). These topics became the coding framework and the three transcripts were reviewed once again to identify passages in the transcripts by code. The framework was modified as new meaning arose during the coding process.

After careful review of indexed data by representative passages, the codes were grouped as themes emerged (Patton, 2002). The amount of emphasis given to coded data in developing themes was determined in part by the factors recommended by Krueger and Casey (2009) for analyzing focus group results. These factors include frequency, specificity (giving more emphasis to those comments that provide detail), amount of emotion, and extensiveness (how many different people made a similar comment). Following individual analysis, the two investigators met and reviewed each other's findings. The coding frameworks and identified themes were compared and contrasted and collaboratively integrated into one structure, and they were shared with the research team for feedback. Examples of quotes from the interview and the related initial coding frameworks and final coding frameworks after collaboration between investigators are provided in Table 2.

INSERT TABLE 2 HERE

Trustworthiness of Data

Measures were taken during the data analysis phase to ensure trustworthiness of the results. As described by Lincoln and Guba (1985), there are four criteria for determining the soundness of qualitative research: credibility, transferability, dependability, and confirmability. Credibility can be enhanced through the triangulation of data (Patton, 1990). For this study, the investigators accomplished this through the use of multiple data analysts. Transferability refers to the extent which the findings can be generalized to other settings (Merriam, 1998). According to Lincoln and Guba (1985), with qualitative research, it is up to the reader to determine whether the findings are

applicable to another setting; however, the investigator has the responsibility to provide sufficient information for the reader to determine transferability. In this study, broad descriptions of the results were provided to allow the reader to have a comprehensive understanding of the participants' experience with the program from their unique perspectives.

Lincoln and Guba (1985) identify that dependability of qualitative research can be enhanced through examination of both the process and the product of the investigation for consistency. This was established in this study through provision of a rationale for the selection of the methodology of data analysis, a detailed description of the participants and the selection criteria employed, as well as a thorough explanation of the environment in which data were collected and the processes used. Finally, confirmability of data is accomplished through demonstration of neutrality of the research interpretations (Lincoln & Guba, 1985). This was accomplished in this study through peer review of interview transcripts and collaboration of multiple investigators in the interpretation of themes and subthemes that emerged from the data.

Results

Three main themes emerged from the focus group data, as shown in Figure 1: 1) Enhanced Personal and Professional Development, 2) Sensitivity to Learner Needs, and 3) Fostering the Principles of Mindfulness. For each theme, sub-themes were identified as illustrated in Figure 1. Under the theme of Enhanced Personal and Professional Development, three subthemes emerged: 1) Self (Personal Perspective), 2) Nurse Role/Transition from School to Nurse, and 3) Relationships. As noted in Figure 1,

two of the themes (Sensitivity to Learner Needs and Fostering the Principles of Mindfulness) influenced the subthemes associated with the Enhanced Personal and Professional Development theme.

INSERT FIGURE 1 HERE

The second main theme of Sensitivity to Learner Needs had four sub-themes: 1) Relevance of Content, 2) Novelty of Content, 3) Timing of Program, and 4) Content Delivery. The third theme – Fostering the Principles of Mindfulness - had two subthemes: 1) Factors that Help Practice, and 2) Factors that Hinder Practice. The investigators identified that both of these main themes had an effect on the influence of the program. Each of the themes and subthemes is further explored in the following description of the nurses' experience with the SMART program. Quotes representing each theme and subthemes under the Enhanced Personal and Professional Development theme are included in Table 2.

Enhanced Personal and Professional Development

The nurses identified that, for the most part, the program positively impacted their personal perspective through improving their ability to practice mindfulness; demonstrate positive principles, such as gratitude and compassion; and focus on positive aspects of their life. It also tended to positively influence their relationships with family, friends and patients. Finally, the program allowed them to more effectively transition into their role as a nurse.

Self (Personal Perspective). The practice of mindfulness and presence was a common theme that emerged from the data across the three interviews. The nurses

expressed that as a result of their experience with the program, they found themselves living more in the present moment, slowing down, and paying attention to details. They began paying more attention to the novelty in "day to day things," and specifically referred to elements of nature as the focus of their attention. They also became more aware of their thoughts, and as a result, identified negative ruminations and 'black holes' earlier. 'Black holes' is a term Dr. Sood used in his discussion with the nurses which refers to spiraling negative thoughts. They mentioned that practicing the principles was a good start to the day and helped to set a positive tone for their interactions throughout the day.

The nurses frequently mentioned that their practice of gratitude improved throughout the program and that this had a positive impact on their general life perspective. They were more appreciative of the here and now and were better able to focus on what is truly important in life. Many stated that by practicing gratitude first thing in the morning, as instructed in the program, it positively influenced their mood throughout the day and allowed for a more positive perspective. Also, if they found themselves in a negative thought pattern during the day, thinking of things they were grateful for helped to change their perspective and improve their mood.

In addition, the nurses shared that their improved practice of compassion during the program tended to decrease their stress and anxiety. However, responses related to stress, worry and anxiety tended to be more varied amongst participants. There were many replies that indicated the program was helpful in regard to these variables, yet others didn't consider themselves as under significant stress, or already considered

themselves as able to handle stress well, and therefore did not think the program was lessening stress. A couple nurses mentioned that simply by talking about stress, their stress increased. One stated that her stress increased when she didn't feel able to practice the principles of the program.

A very common sentiment was that the program was more beneficial in improving the positives (resilience, mindfulness, gratitude, and compassion) rather than decreasing the negatives (stress and anxiety). For those who did find the program beneficial in reducing stress, worry, and anxiety, they stated it did so because it improved their mood and gave them a more positive outlook on life. They found their thoughts to be more positive and considered themselves more resilient. They also stated they tended to look at "the big picture" rather than worrying about the little details. One commented that practicing the SMART principles helped to "regenerate" her and lessen the impact of stress in her life.

Relationships. Many nurses stated that the program had a strong positive impact on their relationships. They were more appreciative of family and friends and noted that their time spent with them was more meaningful. One nurse stated that she found herself sharing more with her family regarding her life, rather than expecting them to discern what she was going through. Many noted that the program had a positive impact on their relationships with their patients, and this is described further in the Nurse Role/Transition from School to Work section.

Another common sentiment was that the nurses found themselves greeting their friends and family more warmly. They recalled what they had learned in the initial

session regarding considering how finite their time is with their loved ones. It was recommended in one of the program sessions that each time they greet those that they are close to, they do so as if they hadn't seen them in a long time.

The nurses stated that practicing gratitude positively impacted their relationships. They provided many examples of how they became more grateful for others in their lives, including friends, family, coworkers, and patients throughout the course of the program. As a result, they found themselves less likely to try to change others, rather be more accepting of who they are and have more appreciation for their unique qualities.

The nurses described that the program influenced their frequency of showing compassion, as well as the methods used to demonstrate the concept. Some stated that they now take more time and make more of an effort to show compassion to themselves, family, friends, loved ones, and even strangers. They talked about practicing the 'silently wishing others well' exercise they learned from the program, which involves giving others a silent blessing as you pass them throughout the day. One stated that through this practice, she found herself feeling more kindheartedness for others. For example, she wondered how they're day was going, realized that they most likely had a to-do list for the day, just like her, and that "they are a person with brothers and sisters." As a result, she became "less focused on me and my agenda and more focused on the people around me."

Nurse Role/Transition from School to Work. A commonly stated sentiment that emerged from the interviews is that nursing is an emotionally draining profession. Two aspects of the profession that were commonly mentioned as the cause for that are 1)

it tends to be a task-oriented role, and 2) it requires you to deal with patients on a very emotional level. Many noted that the program tended to help with both of these characteristics of the profession. They identified that as a result of the program, they are more mindful of the task at hand and paying attention to the details of it, rather than allowing other thoughts to distract them. Some stated this lead to them providing a higher quality of nursing care.

The nurses stated that the program helped them to form deeper relationships with their patients, and thus tended to lessen the impact of the emotionally tasking aspect of the job. Specific activities that helped with this included showing more compassion for their patients, changing their perspective toward the patient, and being more aware of their patients' individual needs. The nurses also stated that the program also assisted with creating a better work/life balance and allowed them to worry less about work.

Many nurses stated that an aspect of the program that they found most helpful was discussing stressful situations with other nurses who have been in similar situations, and identifying how they dealt with those scenarios. This allowed them to feel a sense of validation for their feelings, and empowered them to more effectively deal with stressful situations.

Many stated that they tended to find the principles of the program less helpful in the midst of a stressful situation; however, it assisted in decreasing the worrying about it afterward. Many found it helpful in decreasing stress at the end of a work day.

Some stated that, although they did find their stress decreasing, they weren't certain if was because of the SMART program, or if was related to other factors in their

life. Other possible influences they discussed included the passage of time, improved comfort level with their role as a nurse, and increased familiarity with their work setting.

The topic of resilience was frequently mentioned when the nurses discussed their transition from school to work, integration into their new role, and entering a new chapter in their lives. They shared that this was a very stressful period for them and the program assisted them with this transition and allowed them to feel "equipped" to navigate this new path in their life. From their perspective, practicing the principles of the program allowed them to reflect on a stressful situation, examine how they dealt with it, ruminate less on the situation, and deal more effectively with similar situations in the future. They also noted a difference in how they dealt with stressful situations in comparison to other new nurses who did not participate in the program.

Sensitivity to Learner Needs

The participants identified specific areas in which the program demonstrated sensitivity to learner needs, including relevance of the program content, novelty of the content, timing of the program, and method of content delivery.

Relevance of Content. There was a general consensus among the nurses that the content of the SMART program was appropriate for inclusion in the nurse residency program. They shared that it was helpful information to have as they were transitioning into a new role, which some identified as a new chapter in their lives. As noted earlier, they thought it was helpful to be able to discuss stress management with other nurses who could relate to each other's experiences, and to be able to learn from each other how to manage the stressful situations they were mutually experiencing. It was interesting to

note that they believed the content added value beyond the other information they received in the nurse residency program that may help to reduce stress, such as communication techniques. In addition, it was apparent from the nurses' responses included in the section on Nurse Role/Transition from School to Work section that the principles that were introduced to them as part of the SMART program were relevant to their role as a nurse and had a positive impact on it.

One nurse shared that she felt it was important that some type of stress management program be integrated in a nurse residency program, even if it isn't the SMART program. She specifically mentioned useful topics for such a program would include stress management, attention training, and resiliency training. Another nurse stated that even if she doesn't use all the tools she learned from the SMART program right away, she will most likely go back to them later as a resource.

Novelty of Content. There was agreement across the three interviews that about half of the content in the program was new to them. Many stated that the principles themselves weren't new information, but the practical examples on how to apply the principles was what made the program novel. They appreciated the new strategies they had gained for managing stress and increasing resilience, and believed that those strategies made them more likely to practice the principles on a regular basis. One nurse stated it provided her with an easy way to adjust the principles within her lifestyle. Another stated the program brought all the principles together for her and provided her with an "organized" method to practice them. Finally, a nurse commented that it provided

her with a “new way of living” in that it allows one to “focus on the positive things in your life” and “keep bringing yourself up on an everyday basis.”

Some stated that they had a religious background, or were raised with the principles of the program reinforced to them, and therefore, the topics were not new to them, yet the reinforcement and practical applications provided were still very relevant. One nurse stated, “I think that being grateful, and things like that, you’ve heard that in your life, but you have never really been given ways to be grateful”. Another stated that she had never considered how practicing the principles could benefit her, for example she hadn’t realized how wishing others well could make her feel better.

Timing of Program. There were varied opinions regarding the timing of the SMART program within the residency program. Some believed the placement near the start of the residency program was appropriate in that it was introduced at a time when they are starting “a whole new life” and it provided them with tools on “what path to go down” at a crucial point in time when they would be “receptive to applying it”. Others stated that they would recommend a revision to the timing and their suggestions included: 1) meet more frequently in the beginning, then once a month at a later point, 2) introduce the program 6 months into the nurse residency program after they have had a chance to take in other content first, or 3) introduce the SMART program early in the residency, but not in-depth, then provide more comprehensive details at 6 months after the start of the residency. A couple of nurses mentioned it should be introduced even before they enter the nurse residency program, such as in nursing school, or when they first start on the unit without the assistance of their preceptor.

Although some nurses indicated that more frequent meetings would be beneficial, the majority agreed that meeting once a month was an appropriate span between meetings; however, some thought reminders to practice the principles of the program in between sessions would be beneficial. Many stated that they were more likely to practice the principles right after a meeting when it was fresh in their minds; however, their practice would dwindle as time went on. There was not a consensus regarding what type of reminders, or the method of delivery of the reminders, they would prefer. While some wanted email reminders, others were strongly against this method of communication. Some stated they would prefer an online discussion format, such as a blog, to connect with others throughout the program, while others did not think they would be likely to participate in them.

Content Delivery. There was strong agreement that the portions of the program that the nurses found most useful were those that were delivered in an engaging format. The delivery methods that they found most engaging were those that involved being active, such as exercises which allowed them to put the principles into practice, or small group discussions related to the principles. They found the initial presentation by Dr. Sood very appealing, particularly since they sensed his passion for the topic and appreciated the wide variety of specific examples he provided on how to integrate the principles into their personal and professional lives. They added that it was particularly helpful to hear how he personally was practicing the principles. One stated, “He worked to formulate it, so it was good to hear from him.” They also noted that he was “credible” because he was “living it out.”

Regarding the follow-up sessions, they had a definite aversion to the use of PowerPoint and any portions of the sessions that they perceived as lecture. Some stated these portions reminded them of classroom learning and they felt they were beyond that phase. They had become use to being active in their job and therefore were more motivated by hands-on, specific applications. The portions of the content that they perceived as lecture that they stated were the least useful were those that covered definitions of terms or why the principles were important to practice. They perceived these as “surfacey” and redundant in nature, as this was content they were already familiar with. They wanted to get to what one referred to as “deep” content at a faster pace. Interestingly, they perceived the length of the “lecture” portion as much longer than it actually was. When asked, they estimated the lecture portion was anywhere from 50% to 80% of the 1 hour follow-up session, when in reality it was approximately 25%.

Most tended to like the format of small group discussions during the follow-up sessions. Some did state it was redundant to share what they discussed in their small group with the large group. When asked how an ideal follow-up session should be formatted, there was a general consensus that the introduction should be 5-10 minutes and consist of a brief overview of the definitions of the concepts being discussed, and the rest of the time should be spent on discussions and activities which allowed them to apply the principles. The recommended small group size ranged from 4-10. They would prefer a facilitator for their group discussion, but wanted the majority of the contribution toward the discussion to come from them rather than the facilitator.

When discussing the value of the workbook they were provided at the first session, there were mixed opinions. Most did find value in the workbook and appreciated the portions that were interactive. However, some found it burdensome, as it "was just like homework." Most agreed that they appreciated having the workbook and it will most likely be a resource for the future, but they did not want to be given assignments associated with it, rather thought it should be an optional resource.

Fostering the Principles of Mindfulness

The nurses identified which factors helped them practice the principles of mindfulness introduced in the program, and which factors hindered their practice. They also relayed recommendations for enhancing the positive influences of the program.

Factors that Help Practice. Many nurses stated that they are, or would be, more likely to practice the principles when others around them are practicing them. They stated it was helpful when others understood the "language" and exercises associated with the program, and it served as a reminder to practice it as well. Specific individuals they mentioned included family members and other nurses on their unit, including their preceptors. One nurse who works on the same unit as another nurse in the program stated, "…that really helps having her there, just because we're doing exactly the same things, but with other new hires, they have no idea what I'm talking about…if part of my email says 'practice compassion', they are like, 'What on earth is that?'" Many stated they had shared the program with others in their lives in an effort to teach them how to apply it. The nurses recommended incorporating a method to encourage a community of nurses practicing it on a unit, such as a buddy system where two nurses would hold each other

accountable, or a unit champion who would identify a focus for the unit for each month related to the principles of the program.

As noted earlier, some of the nurses stated they would be more likely to practice the principles if they received email reminders or had an online discussion forum they could participate in, yet opinions varied on this. Those that thought the online discussions would be helpful stated it would give them the opportunity to learn from others, which they found very effective. This would not only provide them with new ideas, but would give them a sense of validation that other nurses are experiencing stress in the same ways they are. One stated that the most beneficial part of the entire residency program for her was discussing stressful events with other nurses and seeing the growth in each other each month regarding how they were able to handle them.

An attribute of the program that they found contributed to the ease of practicing it was the practicality of it; they stated it was easy to adjust to their life. Some found themselves practicing it without thinking about it, or specifically relating it to the program. They also stated that it became easier to practice the principles with the passage of time.

Factors that Hinder Practice. As noted earlier, the nurses found it more difficult to practice the principles in the moment of a stressful event; rather they were more likely to implement the program as an aid after the event. Also, some stated it was difficult to fully engage in the program at this time of transition in their lives. One stated it was hard to practice because she was “consistently in the shock phase.” Others stated they found it

difficult to “take in” because they were learning so many new things at once during that phase of their lives. Quotes related to this theme are enumerated in Table 2.

INSERT TABLE 2 HERE

Discussion

The results of this study lend tentative support to the value of integration of a stress management program within a nurse residency program. The major impact of the program was related to its influence on the nurses’ personal and professional lives in respect to their role as a nurse and transition from school to work, personal perspective, and relationships with family, friends, and patients. Specific aspects of the nurse role that were strongly influenced through the practice of mindfulness principles included their ability to manage emotionally taxing and task-oriented aspects of the role more effectively. These findings support previous findings indicating that interventions aimed as supporting personnel to effectively deal with stress can be effectual in mitigating nurses’ stress levels (Mimura & Griffiths, 2003).

The principles of mindfulness, resilience, gratitude and compassion also positively influenced the participants’ relationships with friends and family, as they found themselves valuing these relationships to a greater degree. By turning their attention and acts of compassion toward others, they tended to feel better about themselves and to have a greater sense of calm. The nurse residents also noted that the program assisted in decreasing their stress, worry, and anxiety related to work, as well as other aspects of their lives. They identified that their general mood improved and they were able to more effectively change their negative thoughts to positive ones. These findings are consistent

with those of Ruotsalainen et al. (2008) who indicated that person-directed interventions can reduce stress and anxiety in healthcare workers.

Information gathered regarding the structure and content of the program, and how these aspects influenced the impact of the program, will assist in future planning for implementation of the program with this and other groups. The content that had the greatest influence was that which was delivered in an engaging format, such as the practice of active exercises related to the principles of the program, rather than a lecture format. The nurses found it beneficial to learn from each other in that it was validating to hear of others' experiences with stress and to identify how they were handling similar stressful situations. This supports continued inclusion of the small group discussion element of the follow-up sessions. It was also interesting to note that of the five key principles included in the program (gratitude, compassion, acceptance, forgiveness and meaning and purpose), each of which was a focus of the follow-up sessions, the two topics which were included in the follow-up sessions prior to the focus group interviews - gratitude and compassion – were the only two that were discussed by the nurses in the interviews. This suggests that the follow-up sessions positively impacted their practice of the program principles, and further supports continued inclusion of these sessions in the program.

The nurses indicated that the content of the program was relevant to the nurse residency program and they believed it was beneficial to have some type of stress management program integrated within a nurse residency program. In addition, the nurses' comments regarding what was most beneficial to them support inclusion of

content that is applicable to their every-day lives and provides them with the opportunity to practice the skills and discuss with others how they are practicing them. The differing opinions as to appropriate timing for introduction of the program and the frequency of meetings suggest that a variety of options may need to be tested and further researched.

The indication by the participants that having others around them practicing the principles of the program would encourage them to practice, suggests that it would be beneficial to provide the program to a wider audience of nurses and to develop ways to encourage nurses in the same unit to support each other in their practice. The nurses were most likely to practice the program when it was fresh in their minds. Therefore, reminders to practice in-between meetings may be beneficial; however, there was a lack of consensus on the appropriate method for this, such as emails or electronic blogs. Further research should be conducted to identify what method would be most effective at engaging the nurses. Alternatively, a variety of methods could be implemented allowing for nurses to choose the option that they most prefer.

The nurses were less likely to practice the principles when they were in the midst of a stressful event, rather would implement them after the event as a method to cope more effectively with it. However, they did feel that with the passage of time and practice, they would be more likely to employ it as a coping mechanism in the moment of the event. This emphasizes the importance of long-term follow-up with the nurses to encourage continued growth in practice. It is hypothesized that this could be accomplished by wide-spread introduction of the program to a greater audience of nurses,

including nurse leaders who could model the practice of the principles and encourage other nurses to grow their practice.

Finally, some of the nurses found it difficult to take in the information related to the SMART program as it was presented during a time of a stressful transition in their lives; however, others thought the timing was appropriate. This further supports the previous conclusion that additional research is needed to assist in identifying the optimal time to introduce the program and to offer follow-up sessions. Furthermore, the implementation aspects of the intervention may need to be modified to allow for ease of assimilation of the information and improved application of the principles by the nurses despite participation in the program during a stressful transition period.

Conclusion

The results of this study indicate that the SMART program was an efficacious component of a nurse residency program. It positively impacted the participants' personal perspective; nurse role and transition from school to work; and relationships with their patients, family and friends. As a result of this study, it is recommended that a stress management component is integrated within the curriculum of a nurse residency program. In addition, this content would benefit a wider audience of nurses. Further research with larger numbers of participants is compulsory to investigate the structure and content of the SMART program in an effort to identify components that will optimally benefit nurse participants and the patients they care for.

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Table 1 (Dissertation Table 9)

Focus Group Interview Questions

What impact did the SMART program have on you, if any?
When you think back on the training, what stands out to you most?
What impact has this program had on your stress?
What impact has this program had on your anxiety?
How much of the content of the program was new to you?
What do you think is most relevant to you about the program as a nurse?
When was the last time you practiced something that you learned from the program?
Would you recommend this program to other nurses, and why or why not?
What would help you apply the program in your life?
What did you like least about the program?
Was there anything about the content of the program that you didn't like?

Table 2 (Dissertation Table 10)

Examples of Quotes and Related Coding Frameworks

Interview Quote	Selected Phrases	Initial Coding Framework	Final Coding Framework
"I feel like I'm a pretty resilient person, but this [program] impacted my personal relationships. I like how [Dr. Sood] talked about being grateful and your relationships…He mentioned, if you think about it, you're only going to see your parents this many times for the rest of your life and I try to think of that a lot more often now."	"impacted my personal relationships"	Relationships	Relationships
	"being grateful"	Gratitude	Self (Personal Perspective)
"I think [the program] helps us balance, too. Instead of letting the stress of the job and new career and everything else that comes ahead of us, and getting overwhelmed with those. It helps us balance everything out."	"the stress of the job and new career"	Transition from School to Work	Nurse Role/Transition from School to Work
	"stress…helps us balance" everything out"	Stress	Self (Personal Perspective)

Figure 1 (Dissertation Figure 8)

Qualitative Theme and Sub-theme Relationships

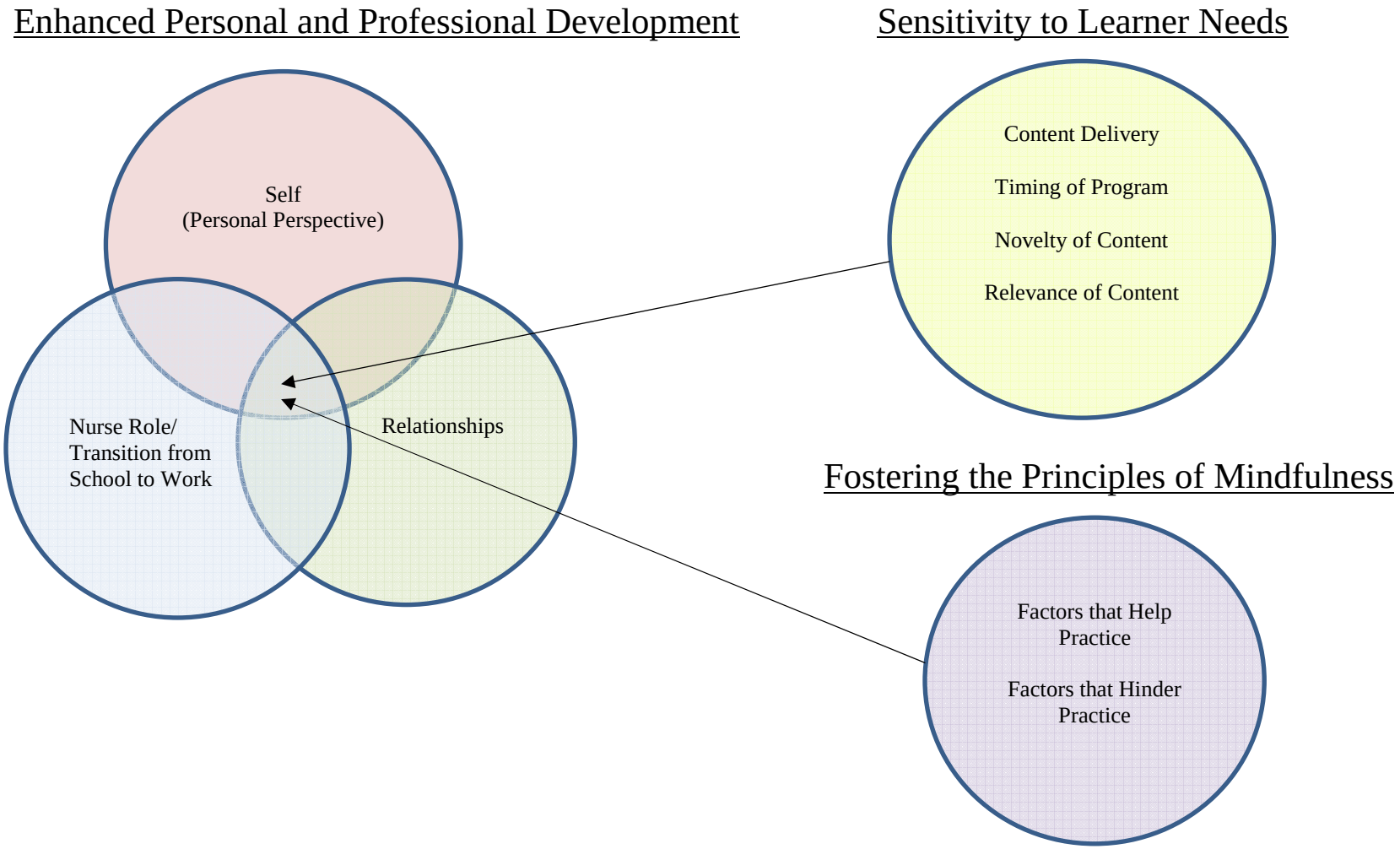

Table 2 (Dissertation Table 11)

Nurse Resident Focus Group Interview Quotes by Theme and Subtheme

Theme: Enhanced Personal and Professional Development.
Subtheme: Self (Personal Perspective)
[On when was the last time they practiced something they learned from the program.]Last night for me. When Dr. Sood was talking about in the morning how he showers, he really smells the soap or feels the hot water on his skin – last night I was nervous about class and we were supposed to have our PICO questions done, and just all of my to-do list, and I was just standing in the shower and I was like, "I'm not going to worry about that right now. I'm just going to enjoy that I have running water and feel the sensation on my skin."
I have my own way of dealing with things, but I think the program has helped me with different alternatives on how to do it, things that I may not have considered before, like even to stop in the hallway and notice little details of colors or pictures, or if I'm walking outside, to notice things like that. Because otherwise, I was always that person that got to where I was going and didn't remember exactly how I got there or what I saw on the way there. Now, just stopping and slowing down, I think I've been more apt to realize or do that.
I think I am more apt to think about [the principles of the program] right after we have had a session. Like this morning, I was not happy with how cold it was as I was walking. I was like, "This is freezing." And then I started to think that I have a nice warm coat and I have these warm mittens that are soft and took in all the things that I'm grateful for that were around my body to keep me warm.
I'm a natural worrier. When we had the lecture on compassion, I think the program taught me to be compassionate toward myself too…I think the program has helped me to accept [who I am]. I think compassion was a big one to help me decrease the worrying.

Subtheme: Relationships

It's helped me connect with people. I moved from [state] so I'm pretty far from home and [Dr. Sood] brought up in his first session how you think about how you might only see your parents a limited amount of times. Especially as you get older, it's less and less, so you really need to enjoy the times and pick out details and be excited for seeing that specific person. So each time that I've been able to go home, I've really treasured specific details and things to bring me through until next time.

I feel like I'm a pretty resilient person, but this impacted my personal relationships. I like how he talked about being grateful for your relationships. When I talk to my mom on the phone, instead of getting annoyed, I thought, "Okay, I only get to talk to her about every so often." [Dr. Sood] mentioned, you know, if you think about it, you're only going to see your parents this many times for the rest of your life and I try to think of that a lot more often now.

[On the finite number of interactions you have left with those close to you in your lifetime] Once you realize that number, you stop trying to change that person or pick out the flaws, and you appreciate them more. I remember [Dr. Sood] saying that every time I see my parents, I don't try to change something about them. Whatever it is… you just appreciate their whole self.

Subtheme: Nurse Role/Transition from School to Work.

It's just like hanging that IV fluid, we do it so many times that we are like, "Yeah, I'll do it." We'll multi-task things like that. Stopping to really think about what you are doing will prevent a lot of harm or errors.

I think for me it's like the slowing down aspect and paying attention to details, because as nurses, we need to see all those little details. Even if they all of a sudden have a little rash here, or breathing faster or whatever, but just slowing down and actually looking. Not being in such a rush. I think that is where it's had the most impact on me.

I think it's really helped me see my patients because starting out, I'd be like, "Oh, the patient with chest tubes…" or something that really intimidated me, and now I can understand, "Okay, this is a person before their condition, and I really am able to practice that now."

I've started thinking about all the times during this program, how these patients, some of them go through treacherous stories. This guy died with cancer that I just [took care of]. He went through surgery, and while you are their nurse, you get to the level of like it almost happened to you. But then at the end of the day, you can walk away and you don't have cancer anymore. You don't have the abdominal incision anymore. But you look back and you are like, "Oh, but they still do." And then you think about them and their family and it makes you more compassionate while you are at the bedside.

I think [the program] helps us balance, too. Instead of letting the stress of the job and new career and everything else that comes ahead of us, and getting overwhelmed with those. It helps us balance everything out.

I think the discussions that we've had related to the SMART program has been good at realizing, "Oh, I'm not the only one, other people are in the same boat." Other people are going through this and this is what they are doing. It's like it allows you to have that community, because you are not alone.

I think that's the ultimate goal is to try to get to that spot where you can catch yourself in that moment, and maybe it's not necessarily saying five things that I'm grateful for in the middle of a code, but it's figuring out how to deal with the situation and not be panicked or stressed as much…Afterwards, that's when we can think back and reflect on how things go and I think in certain cases, eventually, if you keep doing that, you will be able to stop yourself in that moment and say, "Wait, I'm being way too stressed, I'm not thinking clearly. Let me back up two seconds and restart."

I think the biggest [impact of the program] that I've seen is people that I have these conversations with within the program and talking about other new nurses that started at the same time that I did, I graduated with, and the major stress that they are going through and how they are dealing with it, or are not dealing with it. I think that is where the resiliency part is key because it's like, "Oh, I'm feeling like I'm being equipped, I'm having time to talk to other people about what's going on." So, I feel like I'm moving along at a good pace, where others aren't…So, there must be something there, something is going well because everyone in our program is still here.

Theme: Sensitivity to Learner Needs

This is my first job as a new nurse, and everything was new, things to remember…different processes to learn…it is very function-related work. I was very overwhelmed. And then the program opened me up to there is more than just the function part of nursing. It taught me…compassion, gratitude, helped me see that it's not a function-related job…It's been helpful.

I'd agree [that 50% of the content was new to me]. I think so many times you hear "Be grateful for what you have" or "Count your blessings," but without really specific ways to do that, it's just kind of hard to incorporate that into your life. By having strategies, like waking up and thinking of five people you're grateful for, or wishing three people well on your way to work, it's easier to incorporate into your lifestyle.

Being introduced to it at the very beginning [of the nurse residency program] was nice because it's such a stressful time, just starting out as a nurse, it was good to learn different ways to cope with everything we were going through.

Theme: Fostering the Principles of Mindfulness

I think it is just helpful to know how other people [in small group discussions] are dealing with certain things…it's just really helpful to go back to work after the session and know what things worked for other people if your way didn't work.

If some of the other nurses on the floor went through this training and there was more continuity and people more aware of these types of things, the awareness, the gratitude…then that could assist [with practicing the principles of the program].

I think eventually the goal is to try to get to that spot where you can catch yourself in that [stressful] moment, and maybe it's not necessarily saying five things that I'm grateful for in the middle of a code, …But I think it starts first with being able to reflect back and see how you did react and then you can…move on to either managing in the moment or not getting to that [stressful] point in the first place.

CHAPTER 5 – ANALYSIS OF THE MANUSCRIPTS

The purpose of this compilation of investigations was to examine 1) a review of literature on stress management interventions for nurses; 2) the feasibility of integrating a Stress Management and Resiliency Training (SMART) program in a pilot nurse residency program, and the effects of the program on the participants' levels of self-reported stress, anxiety, mindfulness, and resilience; and 3) the participants' personal opinions regarding the impact of the SMART program and which aspects of the program were most beneficial. A total of 68 registered nurses at a large Midwestern tertiary academic medical center participated in the study. This chapter begins with a summary and synthesis of the manuscripts and proceeds with an interpretation of the implications for practice, policy, and research.

Synthesis of the Manuscripts

Manuscript one provided an examination of recent studies investigating stress management interventions for nurses. This review of literature revealed that a wide variety of types of interventions have been investigated, including education, counseling, relaxation techniques, mindfulness based coping strategies, aromatherapy, support groups, introduction of new employee roles and models of nursing, and adoption of a computerized order system. The majority of interventions in the literature are directed toward treatment of the individual versus treatment of the workplace environment. Although there is not sufficient evidence to support which types of interventions are the most effective at reducing stress in nurses, there is limited support for the hypothesis that

interventions aimed at the person are more effective than those aimed at environmental management (Mimura & Griffiths, 2003).

As a result of the review of literature, it was identified that current studies regarding stress management interventions for nurses were plagued by methodological weaknesses. The majority of current studies are only moderately meeting the gold standards of research design. Specific design issues include lack of studies with a randomized controlled design, small sample sizes, insufficient use of alternative treatments for the control group to control for confounding factors, lack of use of objective measures of stress, and insufficient use of long-term outcome measures.

A study was conducted by this investigator to research the use of a Stress Management and Resiliency Training (SMART) program with nurse residents at a large Midwestern academic medical center. Both quantitative and qualitative methods were employed and measures were taken to address some of the gaps identified in the literature review.

Manuscript two outlined the quantitative portion of the study. The investigator employed a quasi-experimental design with a convenience sample and use of a comparison group to investigate the feasibility of integrating the SMART program into a pilot nurse residency program. In addition, outcome variables of stress, anxiety, mindfulness and resilience were assessed in an effort to provide information regarding efficacy of the program. The sample consisted of 66 new registered nurses at a large Midwestern tertiary academic medical center; 27 were in the intervention group, and 39 were in the comparison group. Those in the intervention group participated in a new

nurse orientation program and a nine month pilot nurse residency program, while those in the comparison group participated in the new nurse orientation program only. The SMART program was integrated within the nurse residency program.

The 12 week study measured outcomes from both groups at baseline, 4 weeks post the initial intervention and 12 weeks post the initial intervention. The Perceived Stress Scale (PSS) (Cohen, Kamarck, & Mermelstein, 1983) was used to measure stress. Anxiety was measured with the Generalized Anxiety Disorder scale (GAD-7) Spitzer, Kroenks, & Williams, 2006). The Mindful Attention Awareness Scale (MAAS) (Brown & Ryan, 2003) was employed to measure mindfulness. Resilience was measured with the 10-Item Connor-Davidson Resilience Scale (CDRS) (Connor & Davidson, 2003). Finally, a demographic questionnaire developed by the researcher was used to assess characteristics of the participants at the end of the study.

Feasibility of the integration of the program was measured by participant recruitment and attrition rates, adherence to the intervention, and compliance rates. Adherence was determined by the number of study days the participants practiced the principles of the program by self-report. Compliance was measured according to participant attendance rates.

The SMART program interventions were implemented at baseline, 4 weeks, 8 weeks and 12 weeks in conjunction with the monthly pilot nurse residency program meetings. Outcomes from the additional interventions administered post this investigation in conjunction with the remaining pilot nurse residency program meetings will be reported in the future. The program teaches mind-body approaches toward resilience and

introduces specific strategies for attention and interpretation training, including practicing the principles of gratitude, compassion, acceptance, forgiveness, and meaning and purpose. The initial 90-minue intervention consisted of a discussion of the psychology, neurobiology, and neuropsychology of stress and resilience, and a description of various modalities for practicing the skills. The 60-minute follow-up sessions each focused on one of the principles introduced in the initial session and allowed the participants to discuss how they implemented the principles. In addition, questions the participants had regarding the program were discussed.

Mixed model statistical analysis identified stress levels decreased for both groups over time. Repeated measures ANOVA analysis identified a statistically significant decrease in stress over time for the intervention group in relationship to the comparison group. Anxiety decreased for both groups over time as well and no statistically significant difference between groups was noted. Resilience scores improved over time for the intervention group, and decreased over time for the comparison group; however, the two groups did not differ significantly over time. Mindfulness scores improved for both groups over the course of the study; the intervention group's mindfulness scores improved statistically significantly more than the comparison group over time.

Manuscript three addressed the qualitative outcomes of the study. For this portion of the study, focus group interviews were conducted with the 27 nurses who were included in the intervention group. The purpose was to elicit the participants' personal opinions regarding the SMART program, including the impact the program had on them, recommendations they had regarding what parts of the program were the most and least

helpful, and suggestions they had for changes to the program. A narrative analysis approach was employed for data analysis.

The results of the analysis indicated that the program impacted the nurses positively in areas related to enhanced personal and professional development, some of which differed from the outcomes selected to be measured quantitatively. The three subthemes included: their personal perspective (for example, mindfulness; resilience; gratitude; compassion; and stress, worry and anxiety), their nurse role and transition from school to work; and their relationships. The participants expressed their opinions regarding sensitivity to learner needs in four areas: content delivery, timing of the program, novelty of the content, and relevance of content. Overall, comments regarding the structure and content were favorable; however, the nurses overwhelmingly agreed that the portions of the program of the content that were most helpful were those that were delivered in an interactive format and which provided practical examples of how to apply the principles of the program to their lives. Finally, the nurses shared factors that both helped and hindered their practice of the principles. They found it helpful when others around them were practicing the principles and could relate to terms discussed in the program, and when they received reminders to practice in between sessions. They also found that the ease of applying the program to their lives was a helpful aspect of the program. Their practice was hindered when they were in the midst of a stressful event; rather they were more able to apply the principles after the event. Another hindrance was the timing of the program; some found it difficult to take in the content because of the number of new things they were learning during their transition from school to work.

Discussion

Both quantitative and qualitative methods were employed in this study in an effort to allow for one method to explain and to extend the other (Andrew & Halcomb, 2009). Quantitative methods were used to measure selected outcomes of the program, while qualitative methods were employed to help understand processes that could affect the outcomes (Andrew & Halcomb, 2009). The qualitative data allowed the researcher to determine not only if the intervention was effective, but also to evaluate the program in terms of what made it effective and what alterations to the program could be implemented to make it more effective. In addition, the qualitative data provided information regarding concepts that may have been influenced by the intervention, but were not measured quantitatively. This information will contribute to the design of future quantitative research regarding the program.

Although the participants tended to state in the focus group interviews that the program positively impacted their stress and anxiety levels, the quantitative results did not reveal a significant decrease in mean scores for either of the measures in relationship to the comparison group. However, anxiety scores did tend to decrease to a greater degree for the intervention group (-2.59) versus the comparison group (-1.88) from baseline to the end of the study. In addition, stress scores decreased to a greater degree for the intervention group (-5.88) in relationship to the comparison group (-2.05). It is likely that the sample size was not large enough and thus there was not enough power to detect a significant decrease in stress and anxiety in relationship to the comparison group.

In addition, the participants in the intervention group noted the SMART program positively impacted their resilience and mindfulness, yet the quantitative outcomes did not indicate a significant improvement in relationship to the comparison group for either of the measures. However, it is also important to note that while the intervention group's resilience scores improved over the length of the study (+1.44), the comparison group's decreased (-1.35). Also, the intervention group's mindfulness scores improved to a greater extent for the intervention group (+0.30) than the comparison group (+0.05). Again, this may be attributable to the fact that there was inadequate power due to the small sample size to detect a significant difference.

Another possible explanation for the discrepancy in stress and anxiety findings between the quantitative and qualitative results is that the participants were aware that they were part of an intervention group for a study regarding a new stress management program for nurses. The novelty of the program may have contributed to a sense of excitement and motivated them to focus more on their stress and anxiety levels and how they were changing over time. This could lead to an inflated view of their decrease in anxiety, which would have been more likely expressed verbally in an interview and less likely expressed in a survey where specific markers for stress and anxiety are measured.

The analysis of the quantitative data identified that the nurses in the intervention group had a significantly higher level of stress than the comparison group at baseline and four weeks post baseline. It is plausible that the nurses in the intervention group experienced a higher level of stress because they were aware they were part of a new pilot residency program and were unsure of the expectations that would be associated

with the program. If this was the case, the intervention group's significantly higher drop in stress level in relationship to the comparison group could have been related to their familiarity with the program rather than the impact of the SMART program.

As noted in the discussion of findings in the quantitative manuscript, it is possible that the positive outcomes of the study were a result of aspects of the pilot nurse residency program other than the SMART program. Possible aspects include socialization, instruction on communication skills, and time away from the unit. These factors could have potentially led to a decrease in stress and improvement in mindfulness. Other authors have reported decreased stress as an outcome of nurse transition programs (Fink, Krugman, Casey, & Goode, 2008; Goode, Lynn, Krsek, & Bednach, 2009; Scott & Smith, 2008). However, when triangulated with the qualitative data, there is more support for the premise that the positive outcomes for this study were at least partially related to the SMART program. The participants were able to identify specific aspects of the program that decreased their stress and were able to articulate how that process occurred. For example, by practicing the principles of the program, they stated that they were able to deal more effectively with the task-oriented and emotional aspects of their new role, and this in turn decreased their experience of stress during the transition into their new role. In addition, when specifically asked, the nurses stated that the SMART program provided benefits above and beyond the pilot nurse residency program in relation to decreasing stress and anxiety.

The qualitative outcomes revealed four main principles that the nurses stated positively impacted the effects of the program: mindfulness, resilience, gratitude, and

compassion. Of these, only mindfulness and resilience were measured quantitatively. This suggests that it may be helpful to measure gratitude and compassion in future quantitative research regarding the SMART program in an effort to identify if the impact of the two concepts could be supported quantitatively as well. Another consideration for future studies is to measure the quantitative measures with different instruments in an attempt to determine if other forms of measurement would be more sensitive to the intervention.

The qualitative data added to the findings by indicating what aspects of the program were helpful and what aspects could be improved. It was helpful to note that the nurses found they were more effectively benefited by practical applications of how to practice the principles of the program, rather than discussions regarding the definition of the concepts and why it was important to practice them. It was also valuable to note that the majority of the nurses found reminders between sessions to be beneficial in that it helped them to practice the principles more frequently. These data would be unlikely ascertained through quantitative research methods and will be beneficial when planning future implementation of the program.

Another item that was made evident by the qualitative data, and would not have been necessarily captured by quantitative data, is the relevancy of the content of the program to the nurses. There was a strong consensus that the program was appropriate for the nurses and that it assisted them in their transition to their new role. Although there were discrepancies amongst the participants regarding the timing of the program, they overwhelmingly agreed that the program positively impacted their role; their transition

into their new role; the care they gave to their patients; and their relationships with friends, family and patients and family members. This evidence lends support to inclusion of a stress management program within a nurse transition to practice program.

Implications

Practice

The findings of this study have implications for nursing practice. It has been well-documented that stress has been associated with the clinical practice of nursing (Clegg, 2001, McVicar, 2003; Mealer et al., 2009; Motowidlo, Packard, & Manning, 1986; Phillips, 1996; Riahi, 2011). In addition, the time of orientation is the most stressful time in a nurse's career (Delany, 2003; Oermann & Moffitt-Wolf, 2009). Although a wide range of approaches have been attempted, there is not currently definitive evidence as to the most effective method to reduce nurse stress (Awa, Plaumann, & Walter, 2010; Clegg, 2001; McVicar, 2003; Mimura & Griffiths, 2003; Ruotsalainen, Serra, Marine, & Verbeek, 2008). However, there is limited evidence that suggests person-centered interventions tend to be more effective than those aimed at environmental management (Mimura & Griffiths, 2003). The findings of this study provide some empirical support for the value of a person-centered approach to stress management for nurses.

The outcomes of this study suggest that the integration of a mindfulness-based stress management program in a nurse residency program may facilitate a reduction in nurse stress and anxiety and improvement in mindfulness and resilience. Inspection of the qualitative data revealed that the SMART program positively impacted the nurses' transition into the workplace and allowed them to manage their role as a nurse more

effectively. They also stated it positively impacted their relationships with their patients, and in so doing, allowed them to provide more compassionate care. While it is difficult to determine the actual impact of the program on the provision of compassionate care, these data lend some support to the hypothesis that by improving nurses' stress levels, their ability to provide high quality care increases. This lends credence to the assertion presented by Kim (1987) that the psychological elements of the nurse can influence the client-nurse interaction, and impact the care the client receives.

This study also allowed for insight into what factors of the program had the greatest impact on the nurses. The qualitative analysis provided evidence to support that by positively impacting nurses' mindfulness, resilience, and practices of gratitude and compassion, their ability to manage stress, worry, and anxiety can improve. In addition, they can work more effectively as a new nurse and have a greater positive impact on their patients. The nurses in the intervention group noted their increased ability to cope with the stressful aspects of the job in relation to other nurses on the unit who did not participated in the SMART program. They attributed this to the skills they learned in the program and stated they felt more "equipped" to handle the stressful transition from school to work.

Because of the identified outcomes of this program, it is recommended that such a program be offered to nurses in an effort to positively influence nurse stress, mindfulness, resilience, and practices of gratitude and compassion. According to the results of this study, when those factors are improved, they have the potential to positively impact the care the nurses provide to their patients.

Policy

A review of literature identifies that there is a need for nursing leadership to support stress management interventions for nurses (Bright & Crockett, 2011; Brit Pipe et al., 2009; Chang et al., 2007; Judkins & Ingram, 2002; Poulin et al., 2008; Wallbank & Hatton, 2011). In addition, feasible methods for implementing stress management interventions into the workplace need to be identified (Brit Pipe et al., 2009; Brennan & DeBate, 2006; Mackenzie et al., 2006; Repar & Patton, 2010).

This study lends support to a program that can be feasibly integrated within a nurse residency program. It also provides insight into what aspects of the program were most beneficial and clarifies the most effective components related to the content and structure of a stress management program for nurses. It supports the fact that stress management programs should provide information on how to practically implement the skills into the nurses' lives. Learning activities that are interactive in nature need to be emphasized rather than content that is delivered in a lecture style. It would therefore be important to design the program in a manner which provides the participants the ability to put the skills into practice and discuss with other nurses how they are implementing the principles of the program. Thus, this study provides valuable data for nurse leadership in support of offering such a program for new nurses and the components that should be included in order for it to be most effective.

The evidence also suggests that attendance rates would be higher for a stress management program when offered in conjunction with another program, versus presented as a stand-alone program. Attendance rates were much higher for the two

follow-up sessions in this study (93%-96%) in comparison to one offered in a pilot study (2%) at the same institution in which the session was not offered in conjunction with another program. This information holds promise to provide nurse leaders with a blueprint for a practical and feasible way to integrate a stress management program within their staff development curriculum for nurses.

Research

As identified in nursing literature, there is a need for research related to stress management for nurses that employ larger sample sizes; long-term outcomes; and randomized, controlled designs (Bost & Wallis, 2006; Bright & Crockett, 2011; Cooke et al., 2007; Chang et al., 2007; Cuneo et al., 2011; Ewers, Bradshaw, McGovern, & Ewers, 2002; Isaksson Rø, Gude, Tyssen, & Aasland, 2010; Jelonek Walker, 2006; Pemberton & Turpin, 2008; Poulin, Mackenzie, Soloway, & Karayolas, 2008; Sherwood & Tagar, 2002; Shimizu, Mizoue, Kubota, Mishima, & Nagata, 2003; Yamagishi, Kobayashi, & Nadamura, 2008). It has also been recommended that pilot studies are conducted prior to phase II trials in order to identify feasibility of interventions and verification of measures for future investigations (Barton & Pachman, 2012). This researcher conducted a feasibility study to investigate the integration of a stress management program within a pilot nurse residency program and to partially address the gaps identified in the literature.

A comparison group was used in order to ascertain the efficacy of the intervention (Barton & Pachman, 2012) and to control for confounding variables that may have contributed to changes identified in the outcomes of the study (Evans, 2003). In addition, the sample size was relatively large considering related studies identified in the literature,

as noted in the review of literature in Chapter 2 of this report. Also noted in the review of literature, many of the reported investigations regarding stress management interventions for nurses assessed outcomes only shortly after the intervention was implemented. This study assessed outcomes 12 weeks post the initial intervention. This allowed for evidence that supports sustainability of the intervention over time. Finally, the review of literature identified that few researchers have employed a theoretical framework as a basis for their research regarding stress management for nurses. This researcher employed Lazarus and Folkman's Transactional Model of Stress (1984) as a framework for the development of the theoretical model for the investigation. The use of the theoretical framework allowed for an explanation of the process of the stress response and how a mind-body stress management intervention can impact that response.

The results of this study indicate that a mindfulness-based intervention for nurses may have a positive impact on their practice of mindfulness and management of stress, which in turn may lead to improved personal perspectives, relationships, and their nurse role as they transition from school to work. Thus, it adds to the limited body of knowledge related to outcomes of stress management and resiliency training for new nurses. In addition, the study findings indicate that it is feasible to integrate the program into a nurse residency program for new nurses. Qualitative data provided additional information regarding what parts of the program were most and least effective, and specified how the program explicitly impacted their lives and their nursing roles.

Outcomes of this investigation provided valuable information for future trials. Two additional concepts emerged as themes in the qualitative analysis that were impacted

by the program and were not measured quantitatively: compassion and gratitude. Thus, assessments regarding these two concepts could be added to future studies. In addition, future research could employ fully powered sample sizes to identify if the results could be replicated and if new findings emerge. Analysis of outcomes, including effect sizes and attrition rates can inform power analysis for future studies. In addition, because there were discrepancies in opinions regarding the timing of the initial interventions and follow-up sessions, as well as the frequency and method of reminders to practice the principles of the program, future research could attempt to explicate the most effective format of the program. Also requiring further investigation is establishment of a standard for adherence to the program. As noted earlier, for the purposes of this study, participants were considered to be adherent to the intervention if they stated they practiced the principles of the program for >60% of the study days. However, few (12%) met this standard, yet the nurses still reported positive benefits from the program.

Theory

This study also provided further insight into the use of Lazarus and Folkman's (1986) Transactional Model of Stress as a basis for the theoretical framework for investigations assessing the effectiveness of stress management interventions for nurses. The results tentatively support the theorized framework which asserted that a mindfulness-based coping practice can impact one's primary appraisal and secondary appraisal of stress, thus positively impacting their ability to perceive threats aptly and to determine their ability to effectively manage stress. In regard to primary appraisal, the participants indicated that by employing the skills learned through the study intervention,

they were better able to perceive whether an event or situation should aptly be considered a stressor or not. They stated that as a result, they felt more “balanced” and better able to provide effective care to patients. This lends support to similar findings by Dewe (1991) who tested Lazarus and Folkman’s model in a workplace setting and identified that how a person views an event is key to determining how one copes.

In regard to secondary appraisal of stress, the participants were able to identify specific coping mechanisms they learned through the study intervention which allowed them to more effectively manage the stressors associated with the challenging transition from school to professional role of a nurse. Thus, they were able to better focus on attention to important details, such as preparing medications or developing stronger relationships with their patients. This further supports the findings of Welbourne et al. (2006) who found that effective coping strategies for the workplace can positively impact job-related outcomes.

However, this investigation also identified further work that can be done in relation to Lazarus and Folkman’s (1986) Transactional Model of Stress. While the nurses in this study identified that they were learning coping mechanisms which allowed them to handle stress more effectively, coping was not measured objectively. It would be beneficial in future studies to measure coping quantitatively in an effort to lend further support to whether or not the intervention impacted the participants’ coping levels. Measuring coping in addition to perceived stress, and analyzing the correlation between the two constructs would allow for further testing of the model to determine whether coping can be correlated with health outcomes, as was found to be positively correlated

by Penlye, Tomaka, and Wiebe (2002) in a meta-analytic review of literature.

In addition, although it was implied by the participants that the intervention positively impacted both their primary and secondary levels of appraisal of stress, this could be supported by stronger evidence in future studies. It is recommended that qualitative interview questions be included which tease out whether the intervention truly impacted both the participant's ability to appropriately determine whether a situation was a threat or not, as well as whether or not practicing the principles of the SMART program positively impacted their ability to perceive a threat as manageable. This would lend further support to Lazarus and Folkman's (1986) Transactional Model of Stress.

Study Summary

This researcher performed a systematic review of literature regarding stress management interventions for nurses, resulting in a manuscript evaluating current interventions. This information served as the basis for this study which also included analysis of the feasibility of integrating a stress management and resiliency training program for nurses within a nurse residency program. Quantitative and qualitative methods were employed in this quasi-experimental study. A comparison group was employed in an attempt to account for confounding variables. Sixty-seven nurses were enrolled in the study, 27 in the intervention group, and 39 in the comparison group. The setting for the study was a large Midwestern academic medical center.

Findings indicate that nurses were compliant with the program, however not adherent according to the pre-determined criteria. Quantitative analysis revealed that both study groups' stress and anxiety levels decreased over time, and the intervention group's

decreased to a greater extent than the comparison group's. However, there was not a statistically significant difference between groups over time for either of the measures. Mindfulness levels improved for both groups over time; however, those for the intervention group improved to a greater extent than the comparison group's. Once again, no statistically significant differences between groups were identified. Resilience improved for the intervention group and decreased for the comparison group, yet as with the other measures, no statistically significant differences were identified between groups over time.

Qualitative analysis identified that the nurse participants found the program to be beneficial in many aspects, some of which were not measured quantitatively. The main themes that emerged from the data include: Enhanced Personal and Professional Development (included sub-themes of Self [Personal Perspective], Nurse Role/Transition from School to Work, and Relationships), Sensitivity to Learner Needs (included sub-themes of Content Delivery, Timing of Program, Novelty of Content, and Relevance of Content), and Fostering the Principles of Mindfulness (included subthemes of Factors that Help Practice and Factors that Hinder Practice). It was noted that the elements related to the Sensitivity to Learner Needs and Fostering the Principles of Mindfulness had an influence on Enhanced Personal and Professional Development.

As a result of this study it was determined that there is a need for increased rigor in the design of studies aimed at stress management interventions for nurses. Randomized controlled trials should be implemented in order to provide stronger evidence for or against the efficacy of such interventions and to discount alternative explanations for the

outcomes. The findings also suggest that a stress management program is a beneficial addition to the curriculum of a nurse residency program, and should be provided to other nurse audiences as well. Further research is needed to further explore the efficacy of the SMART program and to determine an adequate dosage of the intervention.

Chapter Summary

A wide variety of stress management interventions for nurses have been reported in the literature; however, many of the studies associated with these interventions are plagued by methodological weaknesses. The purpose of this study was to assess the outcomes of a stress management program among nurse residents at a large academic medical center while partially addressing the current gaps in the literature. The quantitative and qualitative outcomes of this study collectively provide valuable information regarding the feasibility of integrating a stress management program into a nurse residency program. The potential positive effects of the program have implications for nursing practice, nursing research, and policy. All concepts measured quantitatively (stress, anxiety, mindfulness and resilience) improved from baseline to 12 weeks for the interventions group. These changes in scores were not significant in comparison to the comparison group; however the sample size was likely too small to detect significant differences between groups. Outcomes of the qualitative study indicate that the SMART program positively impacted the nurses in regard to their self-perspective; their role as a nurse; and their relationships with their friends, family, and patient. As a result of these positive outcomes, it is recommended that such a program be implemented for new nurses and future research conducted in an attempt to further support the efficacy of this

type of intervention. Those elements of the program that were found to be most beneficial to the nurses should be incorporated into future stress management interventions for nurses.

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APPENDICES

Appendix A

Permission for Use of Image

From: KRASTEV Alexander <alexander.krastev@eurocontrol.int>
Sent: Wednesday, February 13, 2013 3:47 AM
To: Chesak, Sherry S., R.N.
Subject: RE: Request for use of image

Dear Sherry,

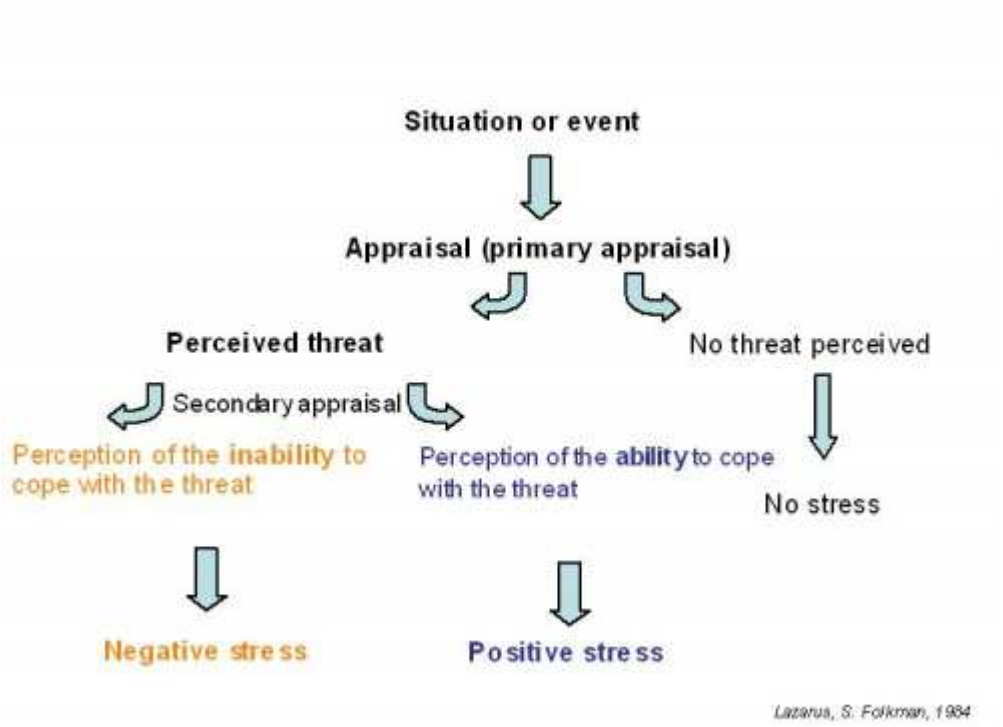
Thank you for contacting me.
You can use the image by referring to SKYbrary as a source.

Best regards,
Alexander Krastev
SKYbrary content manager

From: Chesak, Sherry S., R.N. [mailto:Chesak.Sherry@mayo.edu]
Sent: Tuesday 12 February 2013 16:19
To: KRASTEV Alexander
Subject: Request for use of image

Hello – I am interested in using the image below which is located at the link below it on your website. I referred to the text that is referenced for the image (*Stress, Appraisal, and Coping* by Lazarus and Folkman, 1984), however that exact image is not in the text, only the concepts and description of the theory. Therefore, can I get permission from you to use this image? This will be for my dissertation toward a PhD in Nursing. Please let me know if there is someone else I should contact regarding this.

Thanks,
Sherry



Sherry

http://www.skybrary.aero/index.php/Stress_and_Stress_Management_(OGHFA_BN)

Appendix B

End of Study Questionnaire

First, we request that you provide us feedback on whether the program helped decrease your stress and/or anxiety.

1. Do you think the skills you learned helped decrease your stress level?

1 ……2…….3……4……5
Not at all Very much so

2. Do you think the skills you learned helped decrease your anxiety level?

1 ……2…….3……4……5
Not at all Very much so

3. What percentage of days over the last 3 months did you practice the principles associated with the Stress Management and Resiliency Training program?

1. 0 ☐
2. 1-19% ☐
3. 20-39% ☐
4. 40-59% ☐
5. 60-79% ☐
6. 80-100% ☐

Next we request you to provide general feedback about the program.

4. Would you recommend the program we shared with you to your friends and loved ones to help decrease their stress and/or anxiety?

1 ……2…….3……4……5
Not at all Very much so

5. Have the skills you learned positively impacted the care you provide to patients?

1 ……2…….3……4……5
Not at all Very much so

6. Have the skills you learned positively impacted how you interact with your coworkers?

1 ……2…….3……4……5
Not at all Very much so

7. What aspects of the program did you like the most?

8. What aspects of the program need improvement?

9. Any other suggestions / feedback?

Appendix C

Generalized Anxiety Disorder 7-Item (GAD-7) Scale

Over the last 2 weeks, how often have you been bothered by the following problems?	Not at all sure	Several days	Over half the days	Nearly every day
1. Feeling nervous, anxious, or on edge	0	1	2	3
2. Not being able to stop or control worrying	0	1	2	3
3. Worrying too much about different things	0	1	2	3
4. Trouble relaxing	0	1	2	3
5. Being so restless that it's hard to sit still	0	1	2	3
6. Becoming easily annoyed or irritable	0	1	2	3
7. Feeling afraid as if something awful might happen	0	1	2	3
Add the score for each column				
Total Score *(add your column scores)* =				

If you checked off any problems, how difficult have these made it for you to do your work, take care of things at home, or get along with other people?

Not difficult at all _____
Somewhat difficult _____
Very difficult _____
Extremely difficult _____

Appendix D

Mindful Attention Awareness Scale

Instructions: Below is a collection of statements about your everyday experience. Using the 1-6 scale below, please indicate how frequently or infrequently you currently have each experience. Please answer according to what ***really reflects*** your experience rather than what you think your experience should be. Please treat each item separately from every other item.

1 = Almost Always
2 = Very Frequently
3 = Somewhat Frequently
4 = Somewhat Infrequently
5 = Very Infrequently
6 = Almost Never

1. I could be experiencing some emotion and not be conscious of it until some time later.

1 2 3 4 5 6

2. I break or spill things because of carelessness, not paying attention, or thinking of something else.

1 2 3 4 5 6

3. I find it difficult to stay focused on what's happening in the present.

1 2 3 4 5 6

4. I tend to walk quickly to get where I'm going without paying attention to what I experience along the way.

1 2 3 4 5 6

5. I tend not to notice feelings of physical tension or discomfort until they really grab my attention.

1 2 3 4 5 6

6. I forget a person's name almost as soon as I've been told it for the first time.

1 2 3 4 5 6

7. It seems I am "running on automatic," without much awareness of what I'm doing.

1 2 3 4 5 6

8. I rush through activities without being really attentive to them.

1 2 3 4 5 6

9. I get so focused on the goal I want to achieve that I lose touch with what I'm doing right now to get there.

1 2 3 4 5 6

10. I do jobs or tasks automatically, without being aware of what I'm doing.

1 2 3 4 5 6

11. I find myself listening to someone with one ear, doing something else at the same time.

1 2 3 4 5 6

12. I drive places on 'automatic pilot' and then wonder why I went there.

1 2 3 4 5 6

13. I find myself preoccupied with the future or the past.

1 2 3 4 5 6

14. I find myself doing things without paying attention.

1 2 3 4 5 6

15. I snack without being aware that I'm eating.

1 2 3 4 5 6

Appendix E

Connor-Davidson Resilience Scale

Please respond to the following 25 questions with one of the five choices:

	Not true at all (0)	Rarely true (1)	Sometimes true (2)	Often true (3)	True nearly all of the time (4)
1. I am able to adapt when changes occur.					
2. I have at least one close and secure relationship that helps me when I am stressed.					
3. When there are no clear solutions to my problems, sometimes fate or God can help.					
4. I can deal with whatever comes my way.					
5. Past successes give me confidence in dealing with new challenges and difficulties.					
6. I try to see the humorous side of things when I am faced with problems.					

7. Having to cope with stress can make me stronger.					
8. I tend to bounce back after illness, injury, or other hardships.					
9. Good or bad, I believe that most things happen for a reason.					
10. I give my best effort no matter what the outcome may be.					
11. I believe I can achieve my goals, even if there are obstacles.					
12. Even when things look hopeless, I don't give up.					
13. During times of stress/crisis, I know where to turn for help.					
14. Under pressure, I stay focused and think clearly.					
15. I prefer to take the lead in solving problems rather than letting others make all the decisions.					
16. I am not easily discouraged by failure.					

17. I think of myself as a strong person when dealing with life's challenges and difficulties.					
18. I can make unpopular or difficult decisions that affect other people, if it is necessary.					
19. I am able to handle unpleasant or painful feelings like sadness, fear, and anger.					
20. In dealing with life's problems, sometimes you have to act on a hunch without knowing why.					
21. I have a strong sense of purpose in life.					
22. I feel in control of my life.					
23. I like challenges.					
24. I work to attain my goals no matter what roadblocks I encounter along the way.					
25. I take pride in my achievements.					

Appendix F

Perceived Stress Scale

INSTRUCTIONS:

The questions in this scale ask you about your feelings and thoughts during THE LAST MONTH. In each case, you will be asked to indicate your response by placing an "X" over the circle representing HOW OFTEN you felt or thought a certain way. Although some of the questions are similar, there are differences between them and you should treat each one as a separate question. The best approach is to answer fairly quickly. That is, don't try to count up the number of times you felt a particular way, but rather indicate the alternative that seems like a reasonable estimate.

1. In the last month, how often have you been upset because of something that happened unexpectedly?

Never	Almost Never	Sometimes	Fairly Often	Very Often
0	1	2	3	4
○	○	○	○	○

2. In the last month, how often have you felt that you were unable to control the important things in your life?

Never	Almost Never	Sometimes	Fairly Often	Very Often
0	1	2	3	4
○	○	○	○	○

3. In the last month, how often have you felt nervous and "stressed"?

Never	Almost Never	Sometimes	Fairly Often	Very Often
0	1	2	3	4
○	○	○	○	○

4. In the last month, how often have you dealt successfully with day to day problems and annoyances?

Never	Almost Never	Sometimes	Fairly Often	Very Often
0	1	2	3	4
○	○	○	○	○

5. In the last month, how often have you felt that you were effectively coping with important changes that were occurring in your life?

Never	Almost Never	Sometimes	Fairly Often	Very Often
0	1	2	3	4
○	○	○	○	○

6. In the last month, how often have you felt confident about your ability to handle your personal problems?

Never	Almost Never	Sometimes	Fairly Often	Very Often
0	1	2	3	4
○	○	○	○	○

7. In the last month, how often have you felt that things were going your way?

Never	Almost Never	Sometimes	Fairly Often	Very Often
0	1	2	3	4
○	○	○	○	○

8. In the last month, how often have you found that you could not cope with all the things that you had to do?

Never	Almost Never	Sometimes	Fairly Often	Very Often
0	1	2	3	4
○	○	○	○	○

9. In the last month, how often have you been able to control irritations in your life?

Never	Almost Never	Sometimes	Fairly Often	Very Often
0	1	2	3	4
○	○	○	○	○

10. In the last month, how often have you felt that you were on top of things?

Never	Almost Never	Sometimes	Fairly Often	Very Often
0	1	2	3	4
○	○	○	○	○

11. In the last month, how often have you been angered because of things that happened that were outside of your control?

Never	Almost Never	Sometimes	Fairly Often	Very Often
0	1	2	3	4
○	○	○	○	○

12. In the last month, how often have you found yourself thinking about things that you have to accomplish?

Never	Almost Never	Sometimes	Fairly Often	Very Often
0	1	2	3	4
○	○	○	○	○

13. In the last month, how often have you been able to control the way you spend your time?

Never	Almost Never	Sometimes	Fairly Often	Very Often
0	1	2	3	4
○	○	○	○	○

14. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?

Never	Almost Never	Sometimes	Fairly Often	Very Often
0	1	2	3	4
○	○	○	○	○

Appendix G

Stress Management and Resiliency Training (SMART) for Nurse Residents

Teaching Plan

Date/ Time	Content	Speakers	Resources
10/18/2012 ½ hour	• Study Recruitment • Completion of Baseline Assessments	Nursing Education Specialist	Consent Forms Computers
10/18/2012 1 ½ hours	• Initial Training	Dr. Amit Sood	"Train Your Brain…" Workbook PowerPoint Presentation
11/15/2012 1 hour	• Follow-up Session – Review SMART principle: Gratitude • Completion of Assessments	Nursing Education Specialist Clinical Nurse Specialist	Computers PowerPoint Presentation
12/20/2012 1 hour	• Follow-up Session – Review SMART principle: Compassion	Nursing Education Specialist Clinical Nurse Specialist	PowerPoint Presentation
1/17/2013 1 ½ hours	• Focus Group Interview – Assess SMART Program • Completion of Assessments • Completion of End of Study Questionnaire • Completion of Demographic Questionnaire	Licensed Psychologist Research Analyst	Computers

Appendix H

Demographic Questionnaire

_____Age

Select your gender:

_____M _____F

Select your race:
____ White
____ Black or African American
____ Hispanic or Latino
____ Asian
____ Native Hawaiian or Other Pacific Islander
____ American Indian, Alaska Native
____ Other (specify)_____

Select your highest level of education in nursing:
____ Associate degree
____ Bachelor's degree
____ Master's degree
____ PhD
____ Other (describe) _____

Select your highest level of education in a field other than nursing, if applicable:
____ Associate degree
____ Bachelor's degree
____ Master's degree
____ PhD
____ Other (describe) _____

Do you have previous experience as a licensed nurse?

_____Yes _____ No

If yes, how long?

_____

If yes, was your previous experience at [institution]?

_____Yes _____No

Do you have previous experience as an employee at [institution] in a role other than a licensed nurse?

_____Yes _____No

If yes, how long? _____

Appendix I

Recruitment Script: Comparison Group

[Institution] Office for Human Research Protection

Protocol Title: Integration of a Stress Management and Resiliency Training (SMART) Program in a Nurse Residency Program: A Feasibility Study
IRB #: 12-007914
Principal Investigator: Sherry S. Chesak

You are being asked to participate in a research study related to my dissertation project in which I will evaluate nurse stress, anxiety, resilience and mindfulness over time. You are being invited to participate since you have been selected as a member of the comparison group for the nurse residency program pilot. You have not been singled out as a potential participant in this study; e-mails are being sent individually to all who are invited to participate.

If you agree to participate you will be asked to allow me to use information from surveys regarding your stress, anxiety, mindfulness, and resilience for research purposes. Your survey results will be kept confidential and your name will not be associated with any reports of findings. The surveys will be offered now, and at 1 month, 3 months, 8 months, and 1 year after the start of the study. One set of surveys (4 surveys) takes approximately 20 minutes to complete. In addition, you will complete one short demographic survey which will be included in the set of surveys you complete 3 months after the start of the study.

You will receive $10.00 for each set of surveys you complete (up to $50) as payment for your participation. You will be paid at 2 points in time if you participate: 1) At the end of the first three months of the study - the number of sets of surveys you have taken up to that point (up to 3 possible sets) will be tallied, and you will receive $10.00 if you completed one set, $20.00 if you completed two sets, and $30.00 if you completed 3 sets. 2) At one year after the start of the study - it will be assessed if you took the 8 month and 1 year surveys, and again you will be paid $10.00 for one survey and $20 for two surveys. These payments will be added to your payroll check.

The risks associated with the research study are very minimal. Some questions you will be asked to answer in the study surveys may make you feel uncomfortable. You may choose not to answer any questions that make you feel uncomfortable.

[institution] is committed to protecting the confidentiality of information obtained about you in connection with this research study. Your information related to this study will be

kept anonymous through the use of ID codes, and will be stored in a locked file in the primary investigator's office. Information saved on the investigator's computer will be password protected. During this research, information about your health will be collected. Under Federal law called the Privacy Rule, health information is private. However, there are exceptions to this rule, and you should know who may be able to see, use and share your health information for research and why they may need to do so. Information about you and your health cannot be used in this research study without your written permission. If you agree to participate in this study, it will provide that permission. Only the primary investigator will have access to the study ID associated with your name, all other study personnel will receive your information anonymously.
A federal regulation called the Health Insurance Portability and Accountability Act (HIPAA) protects your privacy further. The HIPAA form that is attached to this email provides additional information about how we will use your personal information for conducting this study. Signing the HIPAA form allows us to collect and use only the minimum information we need to conduct this study; we are not allowed to use your medical information unless we have received your signed copy of this form. **Please read and sign and return the HIPAA form in a confidential intra-office envelope to: Sherry Chesak, [location].**

This study may not make your health better. It is for the benefit of research. However, reflecting on your levels of stress, anxiety, mindfulness, and resilience may encourage you to take steps to positively impact each of them.

Please understand your participation is voluntary and you have the right to withdraw your consent or discontinue participation at any time without penalty. Specifically, your employment at [institution] will not be jeopardized if you choose not to participate in the study.

If you have any questions about this research study you can email me at [PI's email] or call me at [PI's phone number]. If you have any concerns, complaints, or general questions about research or your rights as a participant, please contact the [institution] Institutional Review Board (IRB) to speak to someone independent of the research team at [phone numbers].

By completing the surveys included in the link below, you are indicating your consent to participate in this study.

Appendix J

Recruitment Script: Intervention Group

[Institution]: Office for Human Research Protection

Protocol Title: Integration of a Stress Management and Resiliency Training (SMART) Program in a Nurse Residency Program: A Feasibility Study
IRB #: 12-007914
Principal Investigator: Sherry S. Chesak

You are being asked to participate in a research study related to my dissertation project. Realizing that your transition to a new job as an RN may be contributing to stress, we would like to evaluate the effects of a stress management and resiliency training program as part of the nurse residency program. You are being invited to participate since you have been selected as a participant for the nurse residency program pilot. You have not been singled out as a potential participant in this study, e-mails are being sent individually to all who are invited to participate.

If you agree to participate you will be asked to allow me to use information from surveys regarding stress, anxiety, mindfulness, and resilience for research purposes. Your survey results will be kept confidential and your name will not be associated with any reports of findings. The surveys will be offered now, and at 1 month, 3 months, 8 months, and 1 year after the start of the study. One set of surveys (4 surveys) takes approximately 20 minutes to complete. In addition, you will complete one short demographic survey which will be included in the set of surveys you take at 3 months after the start of the study.

You will receive $10.00 for each set of surveys you complete (up to $50) as payment for your participation. You will be paid at 2 points in time if you participate: 1) At the end of the first three months of the study - the number of sets of surveys you have taken up to that point (up to 3 possible sets) will be tallied, and you will receive $10.00 if you completed one set, $20.00 if you completed two sets, and $30.00 if you completed 3 sets. 2) At one year after the start of the study - it will be assessed if you took the 8 month and 1 year surveys, and again you will be paid $10.00 for one survey and $20 for two surveys. These payments will be added to your payroll check.

In addition, you will be asked to participate in a 1 hour small group interview regarding your opinion of the stress management program. This will take place during one of your regularly scheduled nurse residency class days.

The risks associated with the research study are very minimal. Listening to educational sessions regarding the psychology, neurobiology, and neuropsychology of stress and

resilience in an informal setting is not likely to be associated with any risk. Some questions you will be asked to answer in the study surveys may make you feel uncomfortable. You may choose not to answer any questions that make you feel uncomfortable. If you have a history of a psychotic episode, or an unstable physical illness, this will exclude you from participating in this study.

[Institution] is committed to protecting the confidentiality of information obtained about you in connection with this research study. Your information related to this study will be kept anonymous through the use of ID codes, and will be stored in a locked file in the primary investigator's office. Information saved on the investigator's computer will be password protected. During this research, information about your health will be collected. Under Federal law called the Privacy Rule, health information is private. However, there are exceptions to this rule, and you should know who may be able to see, use and share your health information for research and why they may need to do so. Information about you and your health cannot be used in this research study without your written permission. If you agree to participate in this study, it will provide that permission. Only the primary investigator will have access to the study ID associated with your name, all other study personnel will receive your information anonymously.

A federal regulation called the Health Insurance Portability and Accountability Act (HIPAA) protects your privacy further. The HIPAA form provides additional information about how we will use your personal information for conducting this study. Signing the HIPAA form allows us to collect and use only the minimum information we need to conduct this study; we are not allowed to use your medical information unless we have received your signed copy of this form. Please read and sign this form which will be given to you by the study investigator.

This study may not make your health better. It is for the benefit of research. However it may help you with improved resilience and mindfulness, decreased stress and anxiety, and improved overall quality of life.

Please understand your participation is voluntary and you have the right to withdraw your consent or discontinue participation at any time without penalty. Specifically, your participation in the nurse residency program and your employment at [institution] will not be jeopardized if you choose not to participate in the study.

If you have any questions about this research study you can email me at [PI's email address] or contact me at [PI's phone number]. If you have any concerns, complaints, or general questions about research or your rights as a participant, please contact the [institution] Institutional Review Board (IRB) to speak to someone independent of the research team at [phone numbers].

By completing the surveys included in the link below, you are indicating your consent to participate in this study.

Appendix K

Stress Management and Resiliency Training (SMART) Program for Nurse Residents

Focus Group Interview Script

Introduction statement: I would like to ask you questions related to the Stress Management and Resiliency Training Program study. This is the interview portion of the study which was introduced to you at the first meeting. I would like to ask you to keep all information which is shared during this discussion confidential, as some may share personal information. There are no right or wrong answers, we expect that you may have different points of view. Feel free to share your point of view even if it differs from others. We are recording this session because we don't want to miss anything you have to say. No names will be included in any reports, your comments are confidential. I would like to hear from all of you, so if you are talking a lot, I may ask you to give others a chance, and if you are quiet, I may ask you your opinion. If you have a cell phone or pager please put them on silent mode, and if you need to answer them, please step out to do so.

1. What impact did the SMART program have on you, if any? (please be specific)
2. When you think back on the training, what stands out to you most?
3. What impact has this program had on your stress?
4. What impact has this program had on your anxiety?
5. How much of the content of the program was new to you?
6. What do you think is most relevant to you about the program as a nurse?
7. When was the last time you practiced something that you learned from the program?
8. Would you recommend this program to other nurses, and why or why not?
9. What would help you to apply the SMART program in your life?
10. What do you like least about the SMART program?
11. Was there anything about the content of the program that you didn't like?
12. Any other comments?

Curriculum Vitae and Bibliography
Sherry S. Chesak

1. PRESENT ACADEMIC RANK AND POSITION

Nursing Education Specialist - Mayo Clinic Multidisciplinary Simulation Center - Department of Nursing, Mayo Clinic, Rochester, Minnesota Identify and collaborate with content experts to develop simulation activities which facilitate learner achievement of educational objectives Supervise the implementation of planned educational activities and conduct a comprehensive evaluation Participate in evidence-based research to identify strategies for improving professional development activities, nursing practice, and patient outcomes	2008 - Present
Instructor of Nursing - Mayo Clinic College of Medicine	11/01/2012 - Present

2. EDUCATION

Austin Community College, Austin, Minnesota AS, Nursing	06/1993 - 05/1996
Winona State University, Rochester, Minnesota BS, Nursing	09/1996 - 05/1998
Winona State University, Rochester, Minnesota MS, Nursing (Nurse Educator)	09/1998 - 12/2001
University of Wisconsin, Milwaukee, Milwaukee, Wisconsin Nursing -PhD	06/2009 – 12/2013

3. CERTIFICATION(S)

Board Certification(s)

American Heart Association (AHA)

Basic Life Support (BLS)	1994 - present

Mayo Clinic Certification(s)

Mayo Clinic Quality Academy

Mayo Clinic Quality Fellow: Bronze Level Certification	12/15/2010
Mayo Clinic Quality Fellow: Silver Level Certification	03/28/2012

4. LICENSURE

Minnesota	R1353235	09/30/2014

5. PREVIOUS PROFESSIONAL POSITIONS AND MAJOR APPOINTMENTS

Nursing Assistant/Home Health Aide, Medical/Surgical/Pediatrics - Mayo Clinic Health System in Austin, Mayo Clinic Health System, Austin, Minnesota — 1994 - 1996
Assisted clients with personal cares, ambulating, transferring, and feeding
Managed and evaluated home health maintenance of elderly and disabled clients

Registered Nurse, Obstetrics/Newborn Nursery/Gynecological Surgery - Mayo Clinic Health System in Austin, Mayo Clinic Health System, Austin, Minnesota — 1996 - 1999
Managed care of labor, postpartum, and neonatal clients
Analyzed fetal monitoring strips of the laboring client
Administered intravenous, catheter, dressing change, and medication therapies
Managed care of postoperative and medical clients
Provided health education to postpartum and postoperative clients
Provided home maintenance education

Registered Nurse - Obstetrics (ISCN Nursery) - Department of Nursing, Mayo Clinic, Rochester, Minnesota — 1999 - 2002
Planned, implemented, and evaluated care for postpartum clients, premature neonates, and neonates requiring special care
Assisted in resuscitation and stabilization of neonates
Administered intravenous, oxygen, medication, and nutritional therapies
Provided education and support to families of special care babies

Graduate Assistant - Winona State University, Winona, Minnesota — 2000 - 2001
Coordinated data entry for research projects
Associate Professor of Nursing J. Hatlevig at Winona State University

Nursing Instructor - Riverland Community College, Austin, Minnesota — 2001 - 2007
Instructed students in the second year of the associate degree program in the following content areas: medical, surgical, neurologic, pediatric, and obstetric nursing
Developed and implemented simulation curriculum
Utilized online educational methods
Supervised students in the medical/surgical/pediatric clinical settings
Developed and employed student evaluation methods
Mentored students through the academic system

Director of Nursing - Riverland Community College, Austin, Minnesota — 2007 - 2008

Coordinated instructional functions of the practical and associate degree nursing programs at the state and national level with the Minnesota Board of Nursing, Minnesota Department of Health, National League for Nursing, and Minnesota State College and University board and staff
Directed the Health Science Simulation Lab
Articulated instructional plans related to nursing with other MNSCU post-secondary institutions
Initiated clinical site contracts and educational articulation agreements for the nursing program
Collaborated with clinical sites for coordination of clinical activities
Coordinated and chaired advisory board meetings
Represented Riverland Community College on appropriate nursing, allied health and educational working groups
Maintained an ongoing relationship with the community to ensure responsiveness to community needs
Mentored by Julia Bronner, Dean of Health Sciences at Riverland Community College, on leadership responsibilities related to the nursing program 2006-2008. Topics included curriculum development, grant writing, articulation agreements, accreditation activities, supervisory responsibilities, and facility development

Nursing Instructor - Riverland Community College, Austin, Minnesota — 2008 - 2009

Performed research on best practices regarding assessment of nursing abilities
Advised and assisted nursing program director with the Minnesota Board of Nursing approval report process

6. PROFESSIONAL & COMMUNITY MEMBERSHIPS, SOCIETIES AND SERVICES

Professional Memberships & Services

Minnesota American Holistic Nurses Association
Member — 2012 - Present

Sigma Theta Tau International, Honor Society of Nursing
Member — 2010 - 2011

Society for Simulation in Healthcare
Member — 2009 - Present

7. EDUCATIONAL ACTIVITIES

A. Curriculum/Course Development

Pathway Nursing Program Curriculum — 09/2006 - 09/2007
Program: LPN and RN nursing programs
Description: Collaborated with other nursing faculty on the development of a new nursing curriculum which incorporated LPN education in the first year of the program and RN education in the second year.
Riverland Community College
Austin, Minnesota

Advanced Experiential Learning: A Simulation-Based Curriculum — 05/2008 - 12/2010
Program Specialty: Critical Care Fellows
Description: Simulation-based education including 10 modules designed for education of critical care fellows on topics related to care of patients in the ICU as well as teamwork and communication skills.
Department of Nursing, Mayo Clinic
Rochester, Minnesota

B. Teaching

Blood Disorders — 11/2003
Presented to associate degree nursing students.
Riverland Community College
Austin, Minnesota

Pediatric and Obstetric Trauma — 02/2004
Presented to associate degree nursing students.
Riverland Community College
Austin, Minnesota

Endocrine Disorders — 03/2004
Presented to associate degree nursing students.
Riverland Community College
Austin, Minnesota

Pediatric Concepts — 02/2005
Presented to associate degree nursing students.
Riverland Community College
Austin, Minnesota

Management in Nursing — 02/2006
Presented to associate degree nursing students.
Riverland Community College
Austin, Minnesota

Burn Management — 04/2006
Presented to associate degree nursing students.
Riverland Community College
Austin, Minnesota

Obstetric Complications — 09/2006
Presented to associate degree nursing students.
Riverland Community College
Austin, Minnesota

Gastrointestinal System and Accessory Organ Disorders Presented to associate degree nursing students. Riverland Community College Austin, Minnesota	10/2006
Neurologic Assessment and Disorders Presented to associate degree nursing students Riverland Community College Austin, Minnesota	02/2007
Fundamentals of Simulation Presented with JJ Arnold Mayo Clinic Educators Department of Nursing, Mayo Clinic Rochester, Minnesota	08/2010
Assessing Competencies Presented to Nurse Preceptors Department of Nursing, Mayo Clinic Rochester, Minnesota	10/2010
RN Preceptor Essentials: Assessing Competencies Presented to Nurse Preceptors Department of Nursing, Mayo Clinic Rochester, Minnesota	10/2010 - 03/2012
RN Preceptor Essentials: Application of Concepts Presented to Nurse Preceptors Department of Nursing, Mayo Clinic Rochester, Minnesota	03/2011 - 06/2012
Standard Operating Process for Utilizing Medical Actors at the Mayo Clinic Multidisciplinary Simulation Center Poster Presentation Mayo Clinic Quality Academy Conference, Mayo Clinic Rochester, Minnesota	05/2011
Stress Management and Resiliency Training (SMART) Program for Newly Hired Nurses Poster Presentation Mayo Clinic Nurses' Poster Fair, Department of Nursing, Mayo Clinic Rochester, Minnesota	04/2012
Stress Management and Resiliency Training for Nurses Complementary and Integrative Medicine Seminar Series Department of Nursing, Mayo Clinic Rochester, Minnesota	07/2012
Is Simulation-Based Education Effective in Improving Nurse Preceptor Confidence in Providing Effective Feedback to Orientees? A Pilot Study Simulation Center Grand Rounds, Mayo Clinic Multidisciplinary Simulation Center Rochester, Minnesota	03/2013

Team STEPPS for Simulation Center Staff 06/2013 - 07/2013
Presented to simulation center staff and leadership
Mayo Clinic Multidisciplinary Simulation Center
Rochester, Minnesota

C. Mentorship

Individual and Position	Timeframe & Description	Outcomes	Current Status
Helgeson, Danyel Nurse	2008 - 2009	Successful approval of the nursing program by the Minnesota State Board of Nursing	Nursing Program Director

D. Academic Career Development

The Art of Supervision 09/2007
Frontline Leadership, Minnesota State Colleges and Universities
Mankato, Minnesota

The Science of Supervision 11/2007
Frontline Leadership, Minnesota State Colleges and Universities
Mankato, Minnesota

Reflective Practice in Nursing Education 07/31/2008
Department of Nursing, Mayo Clinic
Rochester, Minnesota

Instructor Training: Simulation as a Teaching Tool 09/24/2008
Center for Medical Simulation
Cambridge, Massachusetts

Strategic Vision: A Nursing Leadership Essential for the 21st Century 03/22/2010
Department of Nursing, Mayo Clinic
Rochester, Minnesota

8. INSTITUTIONAL/DEPARTMENTAL ADMINISTRATIVE RESPONSIBILITIES, COMMITTEE MEMBERSHIPS AND OTHER ACTIVITIES

Mayo Clinic in Rochester

Department of Nursing
- Department Committees
  - Holistic Wellness Conference Planning Committee
    - Member 2011 - Present
  - Nursing Orientation Advisory Group
    - Member 2011 - Present
  - Spiritual Care Research Conference Planning Committee
    - Member 2008 - Present
- Division Committees
  - EPD Guideline Workgroup
    - Member 2011 - Present

Mayo Clinic Multidisciplinary Simulation Center
Process Optimization Workgroup
Member 2008 - Present
Simulation Curriculum Subcommittee
Member 2008 - Present

Activities at Other Institutions

Riverland Community College
Admission of Nursing Students Committee
Member 2006 - 2007
Chair 2007 - 2008
Curriculum Development for Associate Degree and Practical Nursing Programs Committee
Member 2006 - 2008

9. PRESENTATIONS

International

Simulation-Based Workshop Improves Critical Care Fellows' Moderate Sedation Skills 01/2011
Poster Presentation
Co-Presenters: Dong Y, Pickering B, Torsher L, Warner M, Bali B, Judd M, Dunn W, Kashani K
International Meeting on Simulation in Healthcare
New Orleans, Louisiana

National

Facilitation and Reflection: The Art, Science, and Practice of Debriefing 10/2009
Presented with JJ Arnold at the National Conference on Professional Nursing Education and Development
Continuing Nursing Education Conference, Department of Nursing, Mayo Clinic
Rochester, Minnesota

Regional

Newborn Assessment and Charting Workshop 02/1998
Presented to RNs and LPNs.
Austin Medical Center, Mayo Health Systems
Austin, Minnesota

Skin Care 04/1998
Lecture/discussion with 7th grade class.
Ellis Middle School
Austin, Minnesota

Evaluation and Research in Staff Development and Nursing Curriculum 03/2001
Presented to Master of Science-Nursing student colleagues.
Winona State University
Rochester, Minnesota

Spirituality in Nursing Education Presented to Master of Science-Nursing student colleagues. Winona State University Rochester, Minnesota	03/2001
Reimbursement for Advanced Practice Nurses Presented to Master of Science-Nursing student colleagues. Winona State University Rochester, Minnesota	04/2001
Nurse Educator Roles and Responsibilities Presented to Master of Science-Nursing student colleagues. Winona State University Rochester, Minnesota	11/2001
Constipation Management Presented to Master of Science-Nursing student colleagues. Winona State University Rochester, Minnesota	11/2001
Human Responses in CNS Practice – Spirituality Presented online to Master of Science-Nursing student colleagues. Winona State University Rochester, Minnesota	10/2006
Skill in Simulation Debriefing Minnesota Health Educators Conference Chaska, Minnesota	04/2010
Simulation-Based Education at the Mayo Clinic Multidisciplinary Simulation Center Minnesota Simulation Conference, Mayo Clinic Multidisciplinary Simulation Center Rochester, Minnesota	05/2013

10. RESEARCH INTERESTS

Nurse Transition from School to Practice
Stress Management for Nurses
Mind-Body Interventions for Stress Reduction
Outcomes of Simulation-Based Education

11. RESEARCH GRANTS AWARDED

Active Grant

[Institution]

Principal Investigator	Integration of a Stress Management And Resiliency Training (SMART) Program into a Nurse Residency Program. Funded by [Institution] Sponsorship Research Committee Competitive Funding Grant.	07/2012 - 12/2013

12. BIBLIOGRAPHY

Peer-reviewed Articles

1. Arnold JJ, Johnson, LM, Tucker SJ, **Chesak SS**, Dierkhising RA. Comparison of three simulation-based teaching methodologies for emergency response. Clinical Simulation in Nursing. 2011 Dec 15. [Epub ahead of print] DOI:10.1016/j.ecns.2011.09.004.

Letters

1. **Chesak SS**. "The essentials of debriefing in simulation learning: a concept analysis". Nurs Educ Perspect. 2010 Jan-Feb; 31(1):46; author reply 46. PMID:20397482.