

THE EFFECTS OF A HARDINESS EDUCATIONAL INTERVENTION  
ON HARDINESS AND PERCEIVED STRESS  
OF BACCALAUREATE NURSING STUDENTS

A Dissertation

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by

Paula R. Jameson

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**Title of Dissertation:**

The Effects of a Hardiness  
Educational Intervention on  
Hardiness and Perceived Stress  
of Baccalaureate Nursing Students

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August 2012

**Submitted in partial fulfillment of the requirements for the degree of  
Doctor of Philosophy**

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**Paula R. Jameson**

**2012**

## Dedication

To the Greater Honor and Glory of God  
and to the Service of all the People of God

To the Congregation  
of the Sisters, Servants of the Immaculate Heart of Mary (IHM)  
of Immaculata, Pennsylvania

In Loving Memory of my Mother  
Elizabeth Mary Agnes Purcell Jameson, RN  
Whose Goodness, Example, and Love  
Inspire me Still



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**Paula R. Jameson**

**Abstract**

Despite the known benefits of hardiness education, no published research has been found on the effects of hardiness education with nursing students. Thus, the purposes of this study were first to determine if an increase in hardiness and a decrease in perceived stress in baccalaureate nursing students occurred in those who participated in a hardiness educational intervention. Secondly, to compare hardiness and perceived stress between baccalaureate nursing students who participated and those who did not participate in a hardiness educational intervention. A substruction of the application of Khoshaba and Maddi's Hardiness Model and the Roy Adaptation Model provided the theoretical basis for this research.

The literature on stress verified its omnipresence and ongoing study. The nursing literature was replete with evidence of the stress of undergraduate nursing students. Appraisal of initial hardiness research facilitated the eventual establishment of a measurement instrument of hardiness and the inauguration of a hardiness educational program. Review of the Hardiness Model and the Roy Adaptation Model established connections and conceptual collaboration.

A quasi-experimental non-equivalent control group design with pretest and posttest was used with a nonprobability convenience sample ( $N = 79$ ) of full-time junior level baccalaureate nursing students enrolled in a clinical nursing course recruited from six National League for Nursing Accreditation Commission or Commission on Collegiate Nursing Education accredited nursing programs in Delaware and Pennsylvania.

Baccalaureate nursing students in the experimental group ( $n = 40$ ) participated in a hardiness educational intervention. Baccalaureate nursing students in the control group ( $n = 39$ ) did not participate in the hardiness educational intervention. The nursing students completed pretest and posttest measurements of hardiness (PVS III-R), perceived stress (PSS), and demographic data. Results of statistical analysis by independent and paired  $t$ -tests revealed that the hardiness educational intervention did not have a statistically significant ( $p \geq .05$ ) effect on increasing hardiness scores. The hardiness educational intervention did have a statistically significant effect on decreasing perceived stress scores.

Findings were discussed relative to current literature and the theoretical framework. The lack of significant increase in hardiness was equivocal with Khoshaba and Maddi's Hardiness Model. The significant decrease in perceived stress was congruent with the Hardiness Model and the Roy Adaptation Model. The substruction of the application of the HM and the RAM requires further research and evaluation. Further hardiness research among baccalaureate nursing students, utilizing the entire hardiness educational intervention, was recommended.

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## **Chapter I**

### **Introduction**

Baccalaureate nursing education presents nursing students with multiple simultaneous challenges demanding focused persistence to reach the goal of becoming a professional nurse (Hegge, Melcher, & Williams, 1999; Hensel & Stoelting-Gettelfinger, 2011). One may view nursing education as a pursuit in a constellation of circumstances, persons, places, and things that could lead to stress (Watson et al., 2008). Examples of stress for nursing students include the amount of content to be learned, studying for examinations, not knowing how to prepare for examinations, and the requirement to successfully pass a nursing course before progressing in the program (Dutta, Pyles, & Miederrhoff, 2005; Gibbons, Dempster, & Moutray, 2009). Other examples of stress were academic overload, frequent examinations, grades, strained relationships with nursing faculty and role conflict with physicians, perceived lack of clinical knowledge, preparing for clinical, clinical experiences, trying to remain impersonal with patients, or the alternative of discussing sensitive issues with patients (Dutta et al., 2005). In addition, personal concerns related to lack of leisure time, to the need for longer hours of study, to financing one's education, and to trying to find the balance between work and life, particularly for nursing students with children potentially complicates one's ability to handle stress (Gibbons Dempster, & Moutray, 2008).

According to Selye (1976, 1984), stress is the nonspecific or common response of the body to any demand or change on it. Stress in Roy's (Roy & McLeod, 1981) early writing and theory development was defined as the "transaction between the

environmental demand for adaptation and the person's response" (p. 54). Following her review of the nursing literature from the 1930s to the 1970s, McKay (1978), wrote that the nursing literature frequently identified the stress of nursing education. Sawatzky (1998) continued the identification of nursing students' personal, social, academic, and clinical experiences of stress.

The stress of nursing education continues to be documented into the 21<sup>st</sup> century (Beddoe & Murphy, 2004; Gibbons et al., 2008, 2009, 2011; Goff, 2011; Jones & Johnston, 1999, 2000; Lo, 2002; Magnussen & Amundson, 2003). Only the stress of medical school and dental school are more stressful than the stress of baccalaureate nursing education (Beddoe & Murphy; Dutta et al., 2005). Consequently, not every person who started a baccalaureate nursing program completed it for a range of complex academic, personal, and social reasons (Bowden, 2008; Glogowska, Young, & Lockyer, 2007; Glossop, 2002). This researcher questioned what could be done and what needed to be done to assist nursing students to cope with the stress of nursing education.

Hardiness is a personality characteristic that is linked to the ability to buffer, offer resistance to, and cope with stressful situations (Kobasa, 1979). It can be taught and hardiness education, a tool for stress management, has been found to facilitate learning hardiness (Maddi, 2007; Maddi, Kahn, & Maddi, 1998; Maddi et al., 2002). Pagana (1990) investigated the relationship between hardiness, social support, and nursing students' appraisal of stress in their initial clinical experience. Nursing students who scored high in hardiness appraised their initial clinical experience positively, that is, challenging, but not threatening. Nursing students who scored low in hardiness appraised

their initial clinical experience negatively, that is threatening. The results of Pagana's study suggested that efforts could be made to affect nursing students' appraisal of stress by strengthening the mediating variables of hardiness and social support.

Despite the known benefits of hardiness education, little research has been done to explore the effects of hardiness education with nursing students. Early identification of hardiness, the need for hardiness education, or stress management in this population may have an impact on persistence and completion of a nursing program (Hegge et al., 1999; Hensel & Stoelting-Gettelfinger, 2011). There is a hardiness educational program, based on theory, research, and practice, that emphasizes several sessions and a workbook to enhance the attitudes, coping strategies, and interaction patterns of hardiness. Thus far, research has shown that students who completed the hardiness educational program, subsequently improved in grade point average (GPA), college retention rates, and health (Maddi et al., 2002).

Working adults improved in performance, job satisfaction, and health with hardiness education (Maddi, 2005). Maddi, Harvey, Khoshaba, Fazel, and Resurreccion (2009a) found that hardiness education produced a greater increase in hardiness attitudes, hardicoping skills, and GPA scores. Edwards et al. (2010) recommended that future research with nursing student stress should be concentrated on effective stress interventions. Galbraith and Brown (2011) concurred with Edwards' et al. recommendation for the direction of future nursing student stress research and added a systematic review to identify types of interventions that were effective in reducing nursing students' stress. Nursing education is challenging and stressful, and little



research had been published on the effects of hardiness education on nursing students, therefore, measuring the effects of a hardiness educational intervention on the hardiness and perceived stress of nursing students is important and potentially beneficial for the successful completion of a baccalaureate of science nursing degree.

### **Background**

The term stress has existed since the 12th century (Cox, 1978) and, according to Selye (1984), had been used so loosely that the concept needed to be defined carefully. Selye distinguished between eustress or good stress and distress or bad stress, respectively. Selye posited that the body goes through the same common nonspecific responses for each type of stress. Eustress causes much less damage than distress, which demonstrated to Selye that it was “how you take it” that ultimately, determined whether one adapted successfully to changes (p. 74).

Kobasa (1977) studied how highly stressed people who remain healthy differed from those who show illness with high stress. Hardiness was a personality characteristic, which Kobasa defined as having three component parts, commitment, control, and challenge. Hardy individuals had a “commitment to activities, their interpersonal relationships, and to self; believed they could control or influence events; and viewed changes as challenges rather than as threats” (Kobasa, 1979, p. 3). Hardiness was linked to the ability to buffer, offer resistance to, and cope with stressful situations. Studying those high stress/low illness individuals amounted to inquiring about the mediating factors that affected the way they reacted to stress. Kobasa proposed that high stress/low illness people had a personality structure different from people who become ill under

high stress. This personality difference was best described by the term hardiness. Kobasa (1979) hypothesized that people under stress who feel committed versus alienated, with a sense of control versus powerlessness, and who viewed change as a challenge versus a threat would remain healthy.

Further extending the concept of hardiness, Salvatore R. Maddi founded “The Hardiness Institute, Incorporated” (n.d.) in 1984, then developed and preliminarily tested a relevant educational program in 1987 to teach hardiness. The earliest hardiness educational program engaged “cognition, emotion, and action” (Maddi et al., 1998, p. 79), to help participants to cope effectively with stressful circumstances and used the feedback from this process to deepen participants’ control, commitment, and challenge. The 1998 study by Maddi et al. further evaluated the effectiveness of the hardiness educational program.

The aim of hardiness education was to teach coping skills to decrease the stressfulness of life’s circumstances. Maddi et al. (1998) discovered that hardiness education increased hardiness scores more than relaxation/meditation or passive listening. Hardiness education engages thought, feeling, and action in coping effectively with stressful circumstances. The feedback, from the hardiness educational process, helps to deepen the attitudes of commitment, control, and challenge held about oneself and one’s situations.

### **Purposes of the Study**

The purposes of this study were first to determine if an increase in hardiness and a decrease in perceived stress in baccalaureate nursing students occurred in those who

participated in a hardiness educational intervention. Secondly, to compare hardiness and perceived stress between baccalaureate nursing students who participated and those who did not participate in a hardiness educational intervention.

### **Statement of the Problem**

Stress is inherent in nursing education. Therefore, nursing students experience stress in their nursing education and learning how to cope with stress is important for a successful outcome (Edwards et al., 2010; Gibbons et al., 2008, 2009, 2011; Jones & Johnston, 1999, 2000; Magnussen & Amundson, 2003; McKay, 1978; Sawatzky, 1998). An underlying factor in negotiating, and one way of coping with stress, is hardiness (Kobasa, 1977; Maddi, et al., 1998).

Kobasa (1977) proposed that people who experienced high degrees of stress without becoming ill might have a personality construct different from persons who became sick under stress. The personality difference was described as hardiness. Individuals with personality hardiness possess three characteristics: commitment, control, and challenge. Those with hardiness believe they control or influence the events contributing to their experiences. They feel deeply involved and committed to the activities of their lives. They anticipate change as a challenge to continued development (Kobasa, 1979). The personality construct of hardiness has emerged as a buffer between stress and illness (Maddi, 1999).

Rice (1997) developed and tested a hardiness education program with university women. Maddi et al. (2002) found that hardiness education was effective for at risk undergraduates. Maddi et al. (2009a) studied the effectiveness of hardiness education on

academic performance among college students. However, there is a lack of published research and attention to the effectiveness of hardiness education on nursing students.

### **Research Questions**

The following research questions were addressed in this study:

1. What is the hardiness of baccalaureate nursing students?
2. What is the perceived stress of baccalaureate nursing students?
3. What effect does a hardiness educational intervention have on the hardiness of baccalaureate nursing students?
4. What effect does a hardiness educational intervention have on the perceived stress of baccalaureate nursing students?
5. What is the difference in hardiness between baccalaureate nursing students who participate in a hardiness educational intervention and baccalaureate nursing students who do not participate in a hardiness educational intervention?
6. What is the difference in perceived stress between baccalaureate nursing students who participate in a hardiness educational intervention and baccalaureate nursing students who do not participate in a hardiness educational intervention?

### **Hypotheses**

The following hypotheses were tested:

1. A hardiness educational intervention will increase the hardiness of baccalaureate nursing students.
2. A hardiness educational intervention will decrease the perceived stress of baccalaureate nursing students.

3. Baccalaureate nursing students who participate in a hardiness educational intervention will have higher hardiness posttest scores than baccalaureate nursing students who do not participate in a hardiness educational intervention.
4. Baccalaureate nursing students who participate in a hardiness educational intervention will have lower posttest perceived stress scores than baccalaureate nursing students who do not participate in a hardiness educational intervention.

### **Definitions of Terms**

*Stress* is any physical or psychological stimulus that disturbed the adaptive state and provoked a coping response (Roy, 2009). Total scores of perceived stress were measured on the Perceived Stress Scale (PSS) (Appendix A) (Cohen, Kamarck, & Mermelstein, 1983).

*Hardiness* is a personality characteristic that enables persons under stress to feel committed versus alienated, to have a greater sense of control versus powerlessness, and to view change as a challenge versus a threat to remain healthy (Kobasa, 1979).

Pretest and posttest hardiness were measured by total scores on the Personal Views Survey Third Edition-Revised (PVS III-R) (Appendix B). The hardiness literature does not support the separation into subscales of the hardiness components of commitment, control, and challenge (Maddi & Khoshaba, 2001a; Cole, Feild, & Harris, 2004).

*Hardiness education* is a comprehensive approach to managing stressful circumstances (Maddi et al., 1998; Khoshaba & Maddi, 2008). Operationally, the hardiness educational intervention was a 5-week course of 1-hour hardiness instruction each week (Khoshaba & Maddi, 2008).

*Baccalaureate nursing students* are men and women who were full-time junior level nursing students enrolled in a clinical course in an accredited baccalaureate nursing program.

### **Theoretical Framework**

The theoretical framework for this study is an application of the Roy Adaptation Model (RAM) and the Hardiness Model (HM), which resulted in a theoretical substruction of the HM (Khoshaba & Maddi, 2008), and the RAM (Roy, 2009). Theoretical substruction is a strategy that isolates “concepts, statements, and propositions from existing theories and arranges them into a diagram with a vertical and horizontal configuration that represents the theories and the operational” plan for a study (Dunn, 2004, p. 80). The use of the substruction process and illustration is to “assess the congruence in a research design and to identify the correspondence among the variables of interest” (Bekhet & Zauszniewski, 2008, p. 206). Additional uses of substruction are to re-evaluate models and to make the results of theory testing explicit. Concepts from each of these models, namely: stress and stimuli, hardicoping skills and the cognator coping subsystem, and hardiness, the hardiattitudes, and the self-concept adaptive mode offered support for the study.

#### **The Hardiness Model**

Hardiness exemplified the existential personality view that growth results from the process of decision making as well as a grasping of the possibilities of life with full knowledge that stress was ubiquitous but manageable (McHenry, 1992).

The Hardiness Model (HM) provided a blueprint for the hardiness educational



Maddi (2002) stated that the mechanisms through which hardiness influenced performance in a stressful circumstance was a theoretical concern. However, once the practical applications of hardiness education supplemented the initial abstract and conceptual research, the hardiness model emerged (Khoshaba & Maddi, 2008).

Stress is anything that makes one feel tense or in some way uncomfortable. Stress can be acute or chronic. Acute stress is the disruptive, day-to-day, and time-limited change that happened. Acute stress was often unexpected. Chronic stress has less to do with change and more to do with ongoing mismatches between what one wants and what one gets. These two kinds of stress can accumulate to the point at which strain reactions occur (Khoshaba & Maddi, 2008).

Strain is a depletion of bodily resources and can affect one physically and/or mentally. Signs of physical or mental strain include muscle tightness, headaches, palpitations, increased or decreased appetite, irritability, anxiety, lack of concentration, and sleep disturbance. Extended strain adversely affects health, morale, and performance. If strain is prolonged, personal ineffectiveness, which occurs at the physical, mental, and behavioral levels, can result. One might have strain symptoms without recognizing the stressors (Khoshaba & Maddi, 2008).

Impaired physical health, due to personal ineffectiveness, involves a suppressed immune system with susceptibility to flu and viruses, headaches, and vague aches and pains. Symptoms of personal ineffectiveness at the mental level are a narrow focus, mental fatigue, poor memory and judgment, and anxiety. Personal ineffectiveness at the behavioral level is exhibited in deficits in performance ranging from missing deadlines,



apathy, and self-defeating actions such as aggression, irresponsibility, and food and chemical substance abuse.

Personal ineffectiveness can lead to physical, mental, or behavioral breakdowns. These wellness breakdowns are based on one's inherited vulnerabilities. Genetic inheritance defines one's strengths and weaknesses. For example, a person with a family history of cardiovascular disease, risks cardiovascular symptoms in times of strain and personal ineffectiveness. If one can clearly identify stress, one might solve the stress with the tools of hardiness and hardicoping (Khoshaba & Maddi, 2008).

Tier 2 represents the stress resistance resources of hardicoping and hardy health practices, which buffer stress from becoming strain and personal ineffectiveness. The semi-circle arrows symbolize the stress resistance resources. The stress resistance resource of hardicoping decreases the stress of situations and prevents strain. At the mental level, hardicoping broadens one's perspective and the way one thinks about a stressful situation and deepens one's understanding of it. Broadened perspectives and understanding allow one to plan action and behavior that transform the stress into an opportunity for learning and development. Implementation of the action plan completes the hardicoping process (Khoshaba & Maddi, 2008).

The major hardy health practices are exercise, relaxation, nutrition and vitamins, and medication. Hardicoping and hardy health practices can be difficult to do when one feels stressed. Stress can undermine motivation and discipline. The hardiattitudes of commitment, control, and challenge and hardy social support provide the courage and motivation to carry on hardicoping and hardy health practices during stressful situations.

They amount to the courage and motivation to face stress accurately rather than to deny or catastrophize stress (Maddi, 2005). Therefore, hardicoping and hardy health practices ought to be taught prior to the occurrence of stress or in a non-stressful environment. Such an approach facilitates informed decisions as to how to proceed according to a person's need after experiencing stress (Maddi, 2005; Khoshaba & Maddi, 2008).

The hardiattitudes of commitment, control, and challenge and the hardy social supports are in Tier 3. Persons strong in commitment believe they can increase the value of whatever they are doing by involving themselves deeply in it. They are not likely to avoid or pull away from things. Persons strong in control believe that they can influence the direction and outcome of things going on around them. They are neither passive nor likely to feel powerlessness. Persons strong in challenge believe that what makes their lives worthwhile is to grow in knowledge and wisdom from their positive and negative experiences. They are not likely to feel entitled to easy comfort and security. Hardy social supports involve being able to give and get encouragement and assistance from others. Encouragement and assistance from others motivates one's efforts at hardicoping and hardy health practices (Khoshaba & Maddi, 2008).

### **The Roy Adaptation Model**

The foundations for the Roy Adaptation Model (RAM) are rooted in von Bertalanffy's systems theory and the parent theory of Helson's adaptation-level (Roy, 2009). The RAM describes people as holistic adaptive systems in constant interaction with a changing environment. The person as a holistic adaptive system, with wholeness

and related parts, has inputs, outputs, and control and feedback processes. The RAM is illustrated in Figure 2.

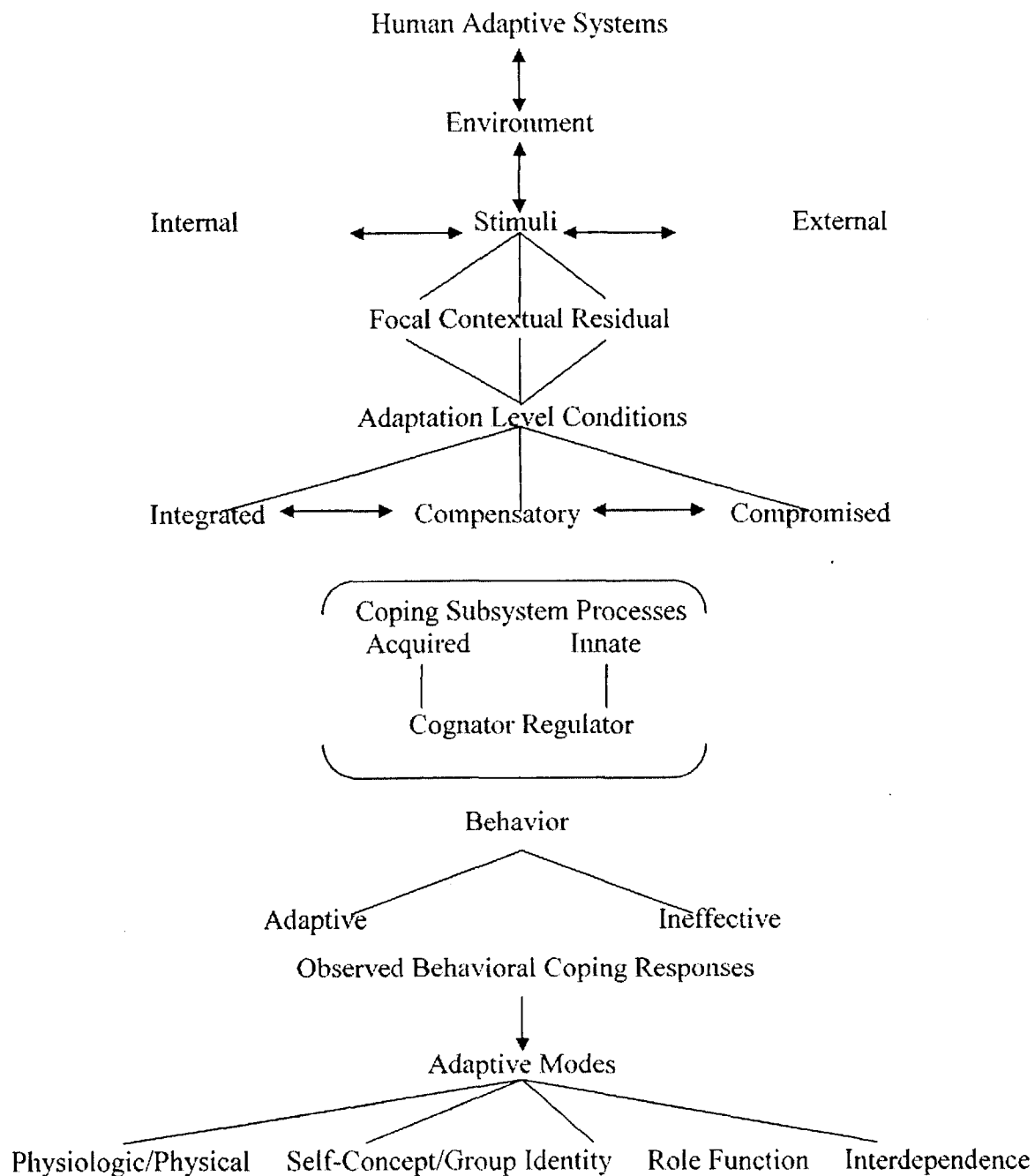


Figure 2. The Roy Adaptation Model. Adapted from Roy, C. (2009). *The Roy adaptation model* (3<sup>rd</sup> ed.). Upper Saddle River, NJ: Pearson.

People, as human systems, affect and are affected by the world around them. The world around them is their environment, their stimuli. Input for people is termed stimulus. A stimulus is anything that provokes a response or degree of change. Stimulus is the point at which the person and environment interact (Roy).

According to the RAM, stimuli originate in the internal environment or come externally from the environment. Stimuli are focal, contextual, or residual. Focal stimuli are the events most present to the person. Contextual stimuli are all the other stimuli present in the events that add to the affect of the focal stimuli. Residual stimuli are environmental factors inside or outside the person (Roy, 2009).

“Among a person’s focal, contextual, and residual stimuli, there is a significant internal input, the adaptation level” (p. 36). The adaptation level is affected by accumulated stimuli. Adaptation level is always changing. It is influenced by the demands of a situation and a person’s current internal resources. Adaptation level represents three conditions of the life processes of the human adaptive system. The three levels of the adaptation are integrated, compensatory, and compromised. The goal is to restore adaptation to the integrated level (Roy, 2009).

The varying levels of adaptation affect the ability to cope with a changing environment. The integrated adaptation level describes the life process working as a whole to meet human needs. For example, intact skin acts a defense to protect against infection. The compensatory adaptation level is activated by a challenge to the integrated adaptation level. An example of compensatory adaptation level is fever. The fever inhibits the growth of bacteria and increases metabolic rate to enhance repair. The

compromised adaptation level exists when both the integrated and compensatory levels are inadequate. Disrupted skin integrity and infection are examples of compromised adaptation level (Roy, 2009).

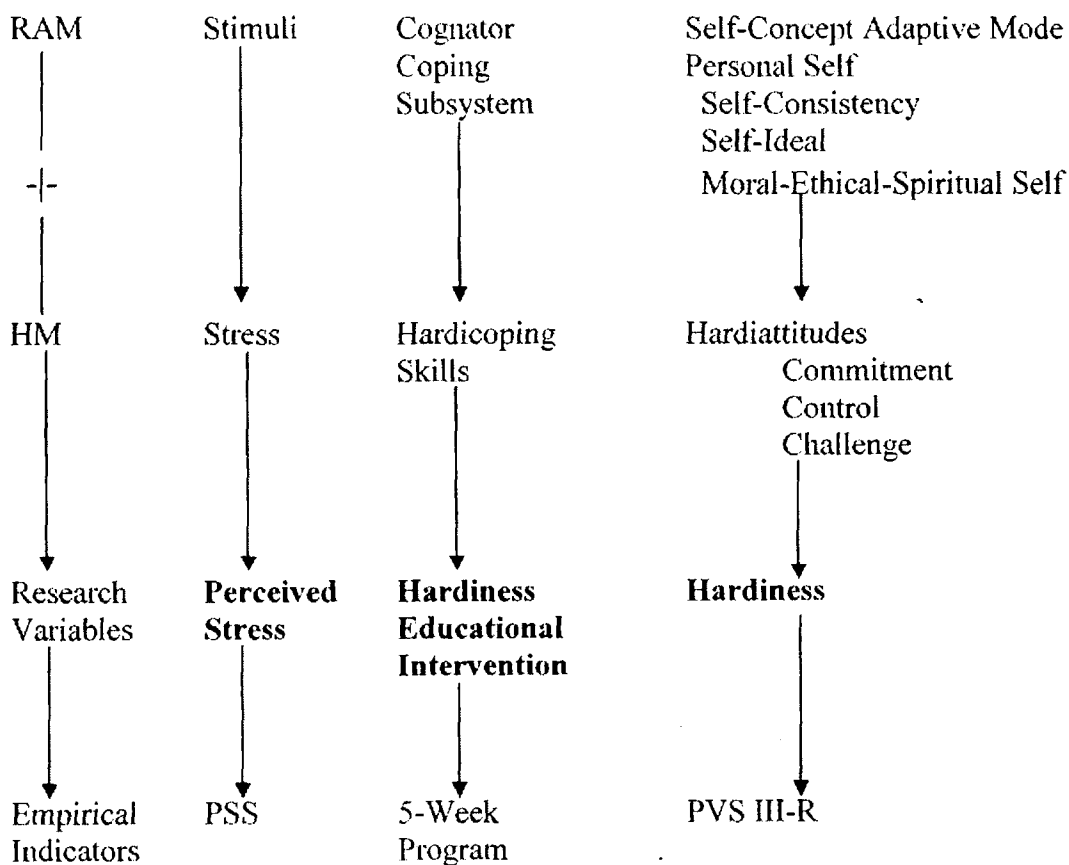
**Coping subsystem processes.** Output, or behavioral response, is a function of the input stimuli and the individual adaptation level. Behavior, as the output of human systems, is either an adaptive response or an ineffective response. These behavioral responses act as feedback or input into the human system, which allow the person to decide whether to increase or decrease coping efforts regarding stimuli. Coping processes are a person's innate or acquired way of responding to and influencing the changing environment. Acquired coping processes are developed through strategies such as learning. In the RAM model, the processes for coping are labeled regulator and cognator subsystems. The regulator and cognator subsystems are internal processes and cannot be directly observed. They act to maintain the integrated adaptation level. Input to the regulator coping subsystem elicits an automatic unconscious response and has a role in forming perceptions. The cognator coping subsystem responds through learning, problem-solving, and decision making. The integrated, compensatory, and compromised adaptations levels are revealed in behavior (Roy, 2009).

**Adaptive modes.** The output behaviors, manifestations of the coping subsystems, which result from the coping processes can be observed in four adaptive modes. They are physiologic-physical, self-concept/group identity, role function, and interdependence modes. Behaviors and functions of the adaptive modes are indicators of how well the person is adapting in interaction with the environment (Whittemore & Roy, 2002).

Adaptation can be observed through these four modes. “Adaptation is the process and outcome whereby thinking and feeling people as individuals or groups use conscious awareness and choice to create human and environmental integration” (Roy, 2009, p. 26). The physiologic adaptive mode is concerned with the physical aspects of human systems. The self-concept adaptive mode involves the personal aspects of the human system. The role function adaptive mode pertains to behavior in roles that the person has in society. The interdependence adaptive mode concerns interdependent relationships. The interdependence mode focuses on interactions related to the giving and receiving of love, respect, and value (Roy, 2009).

The theoretical underpinning for this study is an application of the RAM (Roy, 2009) and the HM (Khoshaba & Maddi, 2008) resulting in a substruction of the two models. Substruction is a method that progresses from the abstract to the concrete. Theoretical substruction is a dynamic process that provides clarity in the presentation and understanding of models and theories. Substruction visibly connects the concepts of models and theories and their measurement (Wolf & Heinzer, 1999). Theoretical substruction takes existing models or theories and pictorially arranges the concepts into a vertical and horizontal outline. In the substruction of the HM and RAM, each vertical configuration represents a descending level of abstraction of the HM and the RAM. The horizontal axis represents the relational statements expressed in the HM and the RAM. In addition, the horizontal and vertical configurations are completed with the inclusion of the research study variables and empirical indicators. The substruction is an assessment that identifies the major variables to be studied (Dunn, 2004). Elements of the models

that were variables in this study are in bold print. The application of the substruction diagram to the RAM and HM is illustrated in Figure 3.



*Figure 3.* Representation of the Theoretical Substruction of the Hardiness and Roy Adaptation Models Applied to this Study

### **Application of the Hardiness Model and the Roy Adaptation Model to This Study**

The people, the adaptive systems, were nursing students in constant interaction with their ever-changing and stressful environment, which made demands on them and provoked responses (Khoshaba & Maddi, 2008; Roy, 2009). Their entire environment was comprised of stimuli. The focal stimuli were all the stressful elements of students' nursing education. The contextual stimuli were all the other stimuli present in their lives.

These stimuli might have included non-nursing courses, resident or commuter life issues, personal and familial responsibilities, employment, and any other stimuli that could add to the affect of their focal stimuli. Residual stimuli were environmental factors inside or outside the person, whose effects are not clear in the current situation. Examples of residual stimuli could be the nursing students' previous experiences of stress, illness, dying, and death. In this study, the researcher anticipated that the acquired hardicoping skills of a hardiness educational intervention influenced and decreased the focal stimuli, the stress of nursing education, in the experimental group.

It was intended that nursing students, while facing and interacting with the many and varied stresses of their internal and external environmental stimuli, could learn to cope and adapt (Roy, 2009). They could learn, through a hardiness educational intervention, to shape their experiences through broadening perspective, decision-making, claiming of values, and planning and goal setting (Kobasa & Maddi, 1977). Nursing students' response to the degree of stress, change, stimuli, or demand in the environment was their process of adaptation or coping capacity. The response may be positive or negative (Roy, 2009).

The cognator coping subsystem responded through learning, problem solving, and decision making and paralleled Khoshaba and Maddi's (2008) concept of hardicoping, which is the foundational component of the hardiness educational intervention (Roy, 2009). A further assumption was that nursing students could learn hardiness through the instruction of hardicoping skills. The aim of hardicoping skills is to help broaden the way students adapted to the stress of nursing education (Khoshaba & Maddi, 2008).



As a result of the hardicoping component of the hardiness educational intervention, the researcher projected that coping adaptive behavior would be observed in an increase in hardiness, in a decrease in perceived stress, in an increase of the hardiattitudes, and in an enhanced personal self component of the self-concept adaptive mode. The self-concept adaptive mode of the RAM has two components, the physical self and the personal self. For this study, the researcher explored the personal self component. The personal self component has three elements: self-consistency, self-ideal, and moral-ethical-spiritual self that corresponded to the three hardiattitudes of commitment, control, and challenge, respectively (Khoshaba & Maddi, 2008; Roy, 2009).

Roy (2009) defined the elements of the personal self as:

Self-consistency strives to maintain a consistent self-organization, to avoid disequilibrium, and have an organized system of ideas about oneself. Self-ideal relates to what a person would like to be or is capable of being. The moral-ethical-spiritual self is the aspect of the personal self that includes a belief system and evaluates who one is in relation to the universe. (pp. 322-323)

Khoshaba and Maddi (2008) correspondently described the hardiattitudes: people strong in commitment believed they can increase the interest, value, and importance of whatever they are doing by involving themselves deeply into it. They are not likely to pull back and avoid things. People strong in control believe that if they struggle and try, they may well be able to influence the direction and outcome of things going on around them. They are not likely to sink into powerlessness. People strong in challenge believe that what makes their lives

worthwhile is to continue to grow in knowledge and wisdom through what they learn from experience, whether positive or negative. They are not likely to feel entitled to comfort and security. (p. 8)

The definitions of the commitment, control, and challenge are congruent with the definitions of the elements of the personal self component. Nursing students strong in commitment believe they could influence the assessment of whatever their stress was by involving themselves in it. That commitment matches self-consistency, which strives to maintain a consistent self-organization. Nursing students strong in control believe that they can control the direction and outcome of the stress going on around them and that attitude paralleled self-ideal related to what a person was capable of being. Nursing students strong in challenge hold the belief that what makes their lives meaningful is to grow in knowledge and wisdom from their positive and negative stressful experiences and the moral-ethical-spiritual self is the equivalent of a belief system.

### **Assumptions of the Study**

The assumptions of the study were:

1. Life and the environment are always changing and therefore stressful (Maddi, 1976; Roy, 2009).
2. Baccalaureate nursing education is stressful (Gibbons et al., 2008, 2009, 2011; Jones & Johnston, 1999, 2000; Magnussen & Amundson, 2003; McKay, 1978; Sawatzky, 1998).
3. Hardiness mediates stress (Kobasa, 1977).
4. Hardiness can be learned (Maddi et al., 1998; Maddi et al., 2002).

5. The nursing students responded honestly on, and in good faith to, the research instruments.

### **Significance of the Study**

Findings from this study had significance for nurse education, nursing science and research, and nursing practice. This study addressed the paucity of the application of hardiness education to nursing education and furthered the investigation of hardiness into the 21st century with hardiness educational research on nursing students. Such research was significant in that, by researching the preparation of nursing students and their potential learning of hardiness the possibilities for student success were numerous. In addition, the potential existed for a positive influence of hardiness educated baccalaureate prepared nurses on the health care system. Further, this study set the stage for other investigations, possibly outcomes research, into the effects of hardiness education on scores on the National Council Licensure Examination (NCLEX) or even on nursing care that future nurses would provide in the health care system.

### **Nursing Education**

The implications of hardiness research for nursing education included the use of a hardiness educational tool for nursing education, designed specifically to support nursing students through the stress of nursing education. Hardiness education would enrich the baccalaureate nursing curriculum in the initial formation of future professional nurses (Jacob, 2010). A hardiness educational intervention could be an effective active teaching and learning strategy for stress management, which promoted student success. Stress

management through the hardiness approach could be an ongoing effort for nursing students through each level of their undergraduate nursing education.

There was a body of knowledge about stress in undergraduate nursing students (Gibbons et al., 2008, 2009, 2011; Jones & Johnston, 1999, 2000; Magnussen & Amundson, 2003). Through the study of hardiness among nursing students, new knowledge about nursing students' management of stress was generated. The contributions of new knowledge could have included the early identification of stress and inadequate ineffective coping in undergraduates and the incorporation of the principles and applications of the concept of hardiness education into the undergraduate nursing curriculum. The importance of developing stress management interventions for nursing students is becoming more evident (Galbraith & Brown, 2011).

### **Nursing Science and Research**

There was published research on the benefits of hardiness for and in the military (Maddi, 2007), and firefighters, but no published research had been found on the influence of hardiness education on nursing students. The increased nursing knowledge of hardiness, from this study, would extend what was already known about hardiness in nursing students with the evidence of the effects of a hardiness educational intervention. While the hardiness educational intervention was not unique, the new knowledge gained from testing the hardiness educational intervention with nursing students would add to the body of nursing research by informing nursing about the effectiveness of hardiness education on increasing hardiness and decreasing perceived stress.

The influence of hardiness education on nursing science could lead to the development of an educational theory of a hardiness educational intervention for nursing students. The design of stress management interventions ought to be driven by theory (Galbraith & Brown, 2011). The development and testing of a learning theory of a hardiness educational intervention for nursing students would add to the validity of the utility of the RAM as a framework to guide further studies of the hardiness approach to stress management, adaptive and transformational coping. This study tested hypotheses derived from a theoretical substruction of Khoshaba and Maddi's (2008) and Roy's (2009) models.

### **Nursing Practice**

Decades ago, Lambert and Lambert (1987) suggested that nurses should take advantage of hardiness education, given their stressful job requirements. Similarly, Pollock (1989) claimed that once nurses understand the effects of hardiness and its health promoting and adapting aspects in their patients and the healthy, the implications for nursing practice were limitless. Lambert and Lambert further suggested that if nurse educators and nurse administrators recognized that if they possessed or acquired hardiness they would feel more committed to their work, feel more control over their lives, and grow from the challenges of their lives.

The practice of nursing is stressful. Previous research had suggested that nursing practice may be positively affected by hardiness education (Judkins, 2005; Judkins, Reid, & Furlow, 2006). If a hardiness educational intervention were effective in increasing the hardiness and decreasing the perceived stress of nursing students, then its use could be

extended to practicing nurses. They could use hardiness ultimately to provide quality patient care. Nurses could also use hardiness as a way of better understanding and potentially relieving burnout in their ranks (Ouelette, 1993).

Stress contributed to negative outcomes for the retention of new nurses in the nursing workforce (Watson et al., 2008). If nursing students learned how to buffer stress in their initial nursing education they could be better prepared to face the magnitude of their work (Ouelette, 1993) and may reduce reality shock. There was the potential for the development of a hardiness culture in the profession of nursing and a sustainable nursing hardiness intervention for health promotion (Jacob, 2010). Fox, Aiken, and Messikomer (1990) claimed that hardiness and hardiness skills were useful tools for legitimizing the practices of caring in nursing practice through hardiness' underpinnings in people's search for meaning.

### **Chapter Summary**

The purposes of this study were first to determine if an increase in hardiness and a decrease in perceived stress in baccalaureate nursing students occurred in those who participated in a hardiness educational intervention. Secondly, to compare hardiness and perceived stress between baccalaureate nursing students who participated and those who did not participate in a hardiness educational intervention.

Baccalaureate nursing students face much stress and many challenges during their undergraduate nursing education. The road to a nursing career is not easy. Nursing education presented nursing students with struggles demanding focused persistence to reach the destination. Despite the known benefits of hardiness, little research had been

conducted on the effect of hardiness education on nursing students. Given the theoretical proposition that hardiness was important for negotiating stress and that nursing education was stressful, measuring the effectiveness of a hardiness educational intervention on nursing students' hardiness and stress was important.

The purposes of this study were to explore the hardiness and perceived stress of nursing students, to evaluate the effects of a hardiness educational intervention, and to compare hardiness and perceived stress between baccalaureate nursing students who participated and those who did not participate in a hardiness educational intervention. were introduced in this chapter. The problem of the inherent stress of nursing education was discussed. The theoretical framework for this investigation was a theoretical substruction of the blending of the Hardiness Model (Khoshaba & Maddi, 2008) and the Roy Adaptation Model (2009). Six research questions and four hypotheses were presented. Theoretical and operational definitions were constructed. The significance of the study was discussed in terms of the value of an investigation of hardiness and perceived stress levels and the influence of a hardiness educational intervention on them for nursing students, nursing education, nursing science and research, and nursing practice.

## Chapter II

### Review of the Literature

The purposes of this study were first to determine if an increase in hardiness and a decrease in perceived stress in baccalaureate nursing students occurred in those who participated in a hardiness educational intervention. Secondly, to compare hardiness and perceived stress between baccalaureate nursing students who participated and those who did not participate in a hardiness educational intervention. The review of literature was organized around the concepts of stress, the stress of undergraduate nursing for students, the PSS, the history of hardiness, a hardiness educational intervention, the HM, and the self-concept adaptive mode of the RAM. This literature review was conducted by manual and computer-based search methods.

The databases searched included the Cumulative Index to Nursing & Allied Health Literature (CINAHL), PubMed, PsycArticles, PsycBooks, PsycINFO, Education Resources Information Center (ERIC), Academic Search Premier, Health Source: Nursing/Academic Edition, the Humanities International Index, ProQuest Dissertations and Theses, and Social Work Abstracts. Stress, perceived stress, nursing students' hardiness, college students, hardiness education, hardiness model, the Roy adaptation model, and self-concept adaptive mode were the keywords and phrases searched through the years of 1977 to 2011. The references lists of journal articles, doctoral dissertations, and relevant texts were also searched for this review of the literature. This chapter consists of an overview of the literature pertaining to stress and the stress of



baccalaureate nursing education. Hardiness, a hardiness educational intervention, the hardiness model, and the self-concept adaptive mode of the RAM, are also included.

### Stress

Canon (1929) coined the phrase fight or flight to describe the response to threats or stress. Selye (1976, 1984) wrote that when he first introduced the concept of stress into medicine, in its present meaning, his English was not proficient for him to distinguish between stress and strain. He claimed that he should have called his phenomenon the strain reaction and its cause, ought to have been called, stress to parallel the use of these terms in physics. The researcher found in the literature that the term stress was qualified into eustress or good stress and distress, the harmful side effects of stress. The phrases counterproductive stress, psychological stress, distress, and unmitigated stress in the literature are often referred synonymously to stress.

Twenty years after Selye's 1956 definition of stress as the nonspecific or common response of the body to any demand or change on it, Cox (1978) described stress as a psychological phenomenon that arose from a comparison between the demand on the person and his ability to cope. Lazarus and Folkman (1984) offered a working definition that qualified stress as psychological stress appraised by a person as harmful to well-being. Roy (1984) noted that stress influenced stimuli and could produce resultant behavioral manifestations and problems. Andrews and Roy (1986) expanded Roy's definition of stress to include the results of any physical or psychological stimulus disturbing the adaptive state. Schafer (1992) defined stress as too much or too little arousal resulting in harm to body and mind. Lazarus (2000) dedicated more than 50

years of research and theoretical efforts to the topics of stress, emotions, and the coping process. His frame of reference was always the emphasis of the individual's self-appraisal of stress. His approach to stress and coping research concerned the meaning that an individual constructed as a result of the social and physical environment. He emphasized stress as a process through which persons struggle to press on and adapt.

McEwen (2005) wrote that stress is a constant factor in modern life and yet, for its omnipresence, it is an ambiguous term. He also suggested that in addition to one's biological response to stress, that one's social environment has an impact on stress, coping, and adapting. The last 50 years of advances in biomedicine accounted for the awareness of the social environmental influence on stress. The autonomic nervous system and the endocrine and immune systems protected a person and allowed coping and adaptation in the face of stress. When these systems were needed to respond to prolonged environmental, human, and social stress, their stress mediation might fail and persons were predisposed to illness.

McEwen (2005) reinterpreted Selye's stress response of alarm, resistance, and exhaustion as the need for a process leading to adaptation, with stress resistance reflecting the protective aspects of adaptation, and exhaustion as resistance overload. McEwen further contended that the concept of stress has evolved and attention is now focused on how to improve the efficiency of the adaptation to stress while minimizing the overuse of stress resistance and mediators. Khoshaba and Maddi (2008) differentiated acute stress and chronic stress. Acute stress happened with change that was unexpected and temporarily inconvenienced one. Chronic stress has less to do with change and more

to do with a continuing mismatch between what one wants and what one gets (Khoshaba & Maddi, 2008).

Stress research continued to build on the ideas of Hans Selye. Developments in the understanding of stress included progress in identifying developmental and genetic origins of susceptibility to stress (Russell, 2007). Roy (2009) also ascribed to Selye's local and general adaptation syndrome theory and likened her regulator and cognator coping subsystems, respectively to them. Her definition of stress evolved from the transaction between environmental demands requiring adaptation and a person's regulator and cognator coping processes. She proposed that an individual, through education and practice, could learn to cope with stress. Roy viewed the terms stress and stressor as synonymous with her concept of focal stimulus.

Rusk and Rothbaum (2010) suggested how attachment theory and goal orientation theory interventions could be integrated to maximize functioning in stressful situations. They used the phrase from stress to learning. Acknowledging the area of longstanding and ongoing interest in how people deal constructively with stress, Rusk and Rothbaum brought together two theories especially concerned with beneficial responses to stress that allow for learning. They argued that the theories each contributed to understanding what added and what interfered with learning in stressful situations. Attachment theorists and goal orientation theorists examined the views of people who were likely to re-engage in learning after stressful experiences and the people's views that interfered with learning.

Rusk and Rothbaum (2010) compared the views that were studied and recommended two complementary pathways for fostering people's ability to respond usefully to stressors. The common threads and differences between attachment and goal orientation theories have set the stage for the design of interventions that borrow from both. The task of integrating theories to help people cope effectively with stressful situations has begun. To cope effectively with stressful circumstances people need secure views in the stressful situation, that is, care and protection, and must believe that through effort and practice, incremental views, they can improve their ability to cope with stressful situations in the future.

Given the costs of stress for mental and physical health, Weinstein and Ryan (2011) determined that understanding how stress was experienced and how it was coped with had theoretical and clinical significance. They considered the framework of self-determination theory for understanding motivation and personality concerning stress related issues. Self-determination theory suggested that less stressful experiences and better coping with stress were associated with greater autonomy, higher mindfulness, more interest in internal events, and a lifestyle more interested in pursuing intrinsic goals. Stress reduction and effective coping with stress were dependent on supportive environments. School and workplaces were often focused on outcomes and not aware enough of their students' and employees' psychological needs to be supportive. When considering stress reducing interventions, it was essential, from a self-determination theory perspective to know what helped and hindered a person's need satisfaction, as these are the ultimate sources of stress.

Varvogli and Darviri (2011) conducted a review of literature and identified several evidence-based reduction techniques that were easy to learn and practice, with good outcomes for people with stress. These techniques included progressive muscle relaxation, relaxation response, cognitive behavioral therapy, guided imagery, diaphragmatic breathing, transcendental meditation, and mindfulness-based stress reduction. They purported the necessity for healthcare professionals to master a repertoire of self-stress management practices and to teach them to their patients.

Stress management techniques were applicable to people who manifested a stress related disease or disorder, and also to healthy people. Stress reduction practices, when added to daily routine, served as a valuable intervention for the ill and well. Health promotion as one of the approaches to stress reduction could play a role in the design and application of interventions to reduce and prevent stress, which contributed to future health and wellness. Varvogli and Darviri (2011) noted the need for further extensive randomized control trials of stress reduction techniques to establish their utility in the prevention and management of disease.

### **Summary of Stress Literature**

Based on Cannon's (1929) fight or flight description of stress, Selye's (1984), general adaptation syndrome definition, and accounts of stress, it was evident that the concept of stress has been recognized for a long time. Yet, it was an ambiguous term. The expression, stress, evolved to include conterminous subjects such as, eustress or good stress and distress, the harmful side effects of stress. In addition, the phrases counterproductive stress, psychological stress, and unmitigated stress in the literature

refer synonymously to stress. There were numerous journals dedicated to the ongoing research of stress (Lazarus, 2000). Lazarus' frame of reference emphasized individuals' self-appraisal of stress.

More recent attention has focused on the improvement of people's adaptation and coping with stress. Stress research continues to build on the work of Selye (Roy, 2009; Russell, 2007). Rusk and Rothbaum (2010) suggested that interventions from the integration of the theories of attachment and goal orientation could maximize the best functioning in stressful circumstances. Their hope was that their study would encourage further theoretical cross-fertilization and mutual learning in stress management. Weinstein and Ryan (2011) discussed a self-determination theory approach to understanding the experience of stress and people's response to stress. They proposed that need satisfaction results in stress regulation and more active coping. Varvogli and Darviri (2011) reviewed techniques that constitute a safe and effective approach to stress reduction. Stress reduction techniques could benefit the well and ill. Healthcare professionals could learn these practices, use them, and teach the interventions to their patients.

### **Stress in Undergraduate Nursing Students**

From Garrett, Manuel, and Vincent (1976), Lindop (1989, 1991), to Sawatzky (1998), Jones and Johnston (1999, 2000), Glossop (2000) and beyond (Beddoe & Murphy, 2004; Gibbons, Dempster, & Moutray, 2008, 2009, 2011; Goff, 2011; Hensel & Stoelting-Gettelfinger, 2011; Jimenez, Navia-Osorio, & Diaz, 2010), studies have reported that nursing students have experienced stress related to the nursing education

process. Pagana (1990) investigated the stressful nature of the clinical experience of the nursing student. The students' appraisal of their initial medical-surgical clinical experience as a threat or challenge was determined, as well as, the relationship of the mediating variables of hardiness and social support. The following hypotheses were tested:

1. Hardiness and social support will be positively related to the evaluation of an initial clinical nursing experience as challenging.
2. Hardiness and social support will be negatively related to the evaluation of an initial clinical nursing experience as threatening.
3. Social support will be positively related to the evaluation of an initial clinical nursing situation as challenging.
4. Social support will be negatively related to the evaluation of an initial clinical nursing situation as threatening.
5. Those who have high levels of hardiness and social support will be more challenged and less threatened than those with low levels of hardiness and social support. (Pagana, p. 257)

The study was conducted using the perspective of Lazarus' theory of cognitive appraisal of stress. The key feature of the theory was that a person appraises each transaction with the environment with respect to the significance of the person's well-being. According to the theory of cognitive appraisal of stress, a person assesses stress as a threat, challenge, or harm-loss. Threat referred to the potential for harm, challenge referred to the potential for growth, and harm-loss referred to damage already done, as in

harm to a relationship, health, or self-esteem. It was expected that nursing students' in their first clinical situation would feel challenged or threatened. Hardiness was defined as a personality characteristic that was a stress resistance resource (Pagana, 1990).

The researcher recruited 246 female and 15 male nursing students. Due to the small number of men, the study was restricted to females. The sample was 246 subjects, in their first clinical experience, from seven different colleges and universities in Pennsylvania. The mean age was 22 and the majority (85.3%) was Caucasian. The nursing students had their first medical-surgical clinical experience with 24 different faculty at 15 different hospitals (Pagana, 1990).

The Clinical Stress Questionnaire (CSQ) measured challenge and threat. The instrument was used to determine the extent to which challenge and threat were experienced in relation to the clinical experience. Open-ended questions elicited qualitative data. Total hardiness and commitment, control, and challenge were measured by the third generation 50-item hardiness survey. The Norbeck Social Support Questionnaire (NSSQ) measured social support. The NSSQ was a self-report questionnaire that measured multiple aspects of social support. Subjects listed specific persons in their lives who provided personal support and who were important to them (Pagana, 1990).

The highest possible score for commitment, control, and challenge, was 49. The study sample scores ranged from 20 to 48. The highest possible score for hardiness was 99.99. Scores for the study sample ranged from 44.30 to 91.90. The hardiness percentile ranking score ranged from 0 to 99. The use of the hardiness percentile ranking score and



the total hardiness score supported the first hypothesis, that hardiness would be positively related to the evaluation of challenge. The Pearson correlation coefficient for challenge and hardiness percentile ranking score was .22, ( $p < .001$ ) and for challenge and the hardiness score it was .23, ( $p < .001$ ). The second hypothesis, that hardiness would be negatively related to the evaluation of threat was supported using the hardiness percentile ranking score, ( $r = -.11, p = .04$ ). The hypothesis was not supported using the hardiness score, ( $r = .10, p = .07$ ) (Pagana, 1990).

For the third hypothesis, indicating that social support would be positively related to the evaluation of challenge, there was support only when using the work support scale ( $r = .11, p = .05$ ) of the NSSQ. The work support scale refers to work support that facilitates one to relax after a clinical experience. The fourth hypothesis which indicated that social support would be negatively related to the evaluation of threat was not supported using either the total functional support score, ( $r = .08, p = .13$ ), or the work support score ( $r = .13, p = .02$ ). The fifth hypothesis, which suggested that nursing students with high levels of hardiness and social support would be more challenged and less threatened than nursing students with low levels, was analyzed with a multivariate analysis of variance (MANOVA) and multiple regression was not supported. The stress of the initial clinical experience was evident from the nursing students' response to a question regarding the amount of stress that they were experiencing. The correlation between stress and threat was .58, ( $p < .001$ ) compared to the correlation between stress and challenge -.15, ( $p = .008$ ) (Pagana, 1990).

Pagana (1990) indicated that more rigorous testing of hardiness was needed on populations other than middle-aged male executives and she encouraged further longitudinal hardiness research with nursing students. Other strengths were the large sample size and data collection in seven nursing programs. The exclusion of male nursing students was a limitation for the study and Pagana remarked that the newness of the CSQ, and that the NSSQ was not the best instrument to measure social support, could have limited the findings of the study. Pagana also gained qualitative data from open-ended questions. However, the majority of the qualitative data obtained from the research focused on the threatening aspects of the initial clinical experience.

Magnussen and Amundson's (2003) qualitative study, used convenience sample, of 12 undergraduate nursing students. The sample included three men and nine women who had completed at least two semesters of a six semester nursing program. Six of the participants were Asian and six were white of European descent. They were asked open-ended questions from an interview guide. Using a constant comparative method, four major themes that described the lived experience emerged from the data: "meeting conflicting demands, feeling overworked, feeling unprepared, and seeking respect and support from faculty" (p. 263). A description of a period of time in the life of a developing professional with obstacles and stress emerged, when the themes were linked together.

The potential use for this study in terms of what the themes identified may help nursing faculty in understanding the impact of their approaches, methods, and strategies of teaching. The researchers (2003) recommended expanding the research to other

institutions and redesigning it to follow students throughout their undergraduate nursing education. Magnussen and Amundson acknowledge that the suggestions for faculty arose from their practice as nursing faculty.

The identified themes of nursing students' stress support the findings of other researchers who have investigated the undergraduate nursing student experience. A strong point was highlighting the importance of the role that nursing faculty have in the knowledge and skills acquisition of nursing students. Limiting the study was the fact that all participants were from the same institution.

Dutta, Pyles, and Miederhoff (2005) aimed to determine the extent to which health profession students experienced stress. An extended literature review identified documented stress in the disciplines of medicine, dentistry, nursing, and allied health. The effects of stress were ranked to be most adverse on medical students, followed by dental students, and then nursing students. As a result of the literature review, the authors delineated stress that is commonly present in health profession students. Among nursing students, stress included: academic overload, frequent examinations and grades, strained relationships with nursing faculty and role conflict with physicians, perceived lack of clinical knowledge, trying to remain impersonal with patients or having to discuss sensitive issues with patients, lack of leisure time, and financing their education.

In a qualitative study, Gibbons et al. (2008) aimed to identify experiences that led to both eustress and distress, then to recommend measures to help students cope with undergraduate nursing course demands. The study was based on the theoretical model of Yerkes and Dodson's curve to demonstrate levels of perceived stress and physiological

arousal. The theory claims that performance increases with physiological arousal, but decreases when levels of arousal become too high. The optimal amount of stress or arousal is eustress.

The convenience sample for the study consisted of 16 volunteer final year female nursing students, targeted, due to their exposure to the most potential stressors. Their ages ranged from 18 to 42 years and they were all female. One-hour sessions with four focus groups were recorded and later transcribed. Data were reduced to key phrases and statements and analyzed as broad themes (Gibbons et al., 2008).

Gibbons et al. (2008) identified four themes from the data: “clinical experience, levels and sources of support, learning and teaching experience, and course structure” (p. 285). The first theme, clinical experience, referred to those nursing skills and activities that prepared nursing students for experiences in clinical placements. The nursing students felt that while the skills and competency examinations helped to prepare them for the clinical experience there was a disconnect between how they were taught to practice skills and how the students saw the skills actually practiced in their clinical experiences.

The levels and sources of support theme indicated the nursing students’ range of experiences on the types and usefulness of available support. Nursing students were assigned a personal tutor, who was the designated resource of support until their nursing program was completed. According to the nursing students, there were differences in the quality, availability, and helpfulness of the tutoring. A common perception was that tutors who were most effective in helping the nursing students manage their stress were

the tutors who gave their undivided attention to the nursing students. The length of time was not as important as the quality of the interaction (Gibbons et al., 2008).

The learning and teaching experience theme was the description of the nursing students' mixed feelings about the quality of teaching by nursing faculty. Some students claimed their learning was adversely affected by other students' disruptive behavior and that little was learned from overly didactic faculty. Others shared that they always had good teachers, but that some could be more approachable. The perception among the nursing students that some students were getting more support and guidance from certain nursing faculty and others were not was a source of stress. An additional stressor was the occurrence of delayed faculty feedback on assignments (Gibbons et al., 2008).

The fourth theme, course structure, included a number of factors from level of organization of the courses to how information was communicated to students. The pace, intensity, and demands of courses included many comments. Nursing students who worked part-time and those who had children commented that they needed to know their course and clinical schedules well in advance for work scheduling and child care arrangements. Recommendations for the study included the development of social support systems, initiate personal tutoring, and to consider integrating curricular changes around the work-life balance of students with children. (Gibbons et al., 2008).

A strength of this study was the use of qualitative design research with focus group data collection to examine undergraduate nursing student stress, a topic dominated by quantitative studies. The authors also differentiated between sources of eustress and distress. Their findings concurred with early research and added to the literature on

nursing student stress. The sample included only female nursing students, which was a limitation of the study. Male nursing students were not excluded, but none responded to the recruitment for volunteer participation. In the future, another recruitment technique might be employed to recruit male nursing students to capture their experiences and perspectives, which would add to research findings.

From 1994 to 1997, a longitudinal cohort study of stress in nurses and nursing students was conducted. The researchers explored the relationships between various demographic and circumstantial factors and stress in nurses and nursing students. The theory underpinning the study was the Deary transactional model of work related stress. This theory recognized that there are various personality, environmental, and demographic factors that act as antecedents to stress. Although the sample initially included 359 participants, completed data were obtained for only 192 participants, ( $n = 89$ ) new graduate nurses and ( $n = 103$ ) nursing students beginning their program (Watson et al., 2008).

Three instruments were used to measure the variables under investigation, including the Brief Life Events Inventory (BLEI), an 8-item questionnaire which measures stressful life events in the last year; the Work-Stress Inventory (WSI), which is a 15-item work-related stress questionnaire; and the 28-item General Health Questionnaire (GHQ) used to measure current psychological distress. Women scored higher on stress than men ( $p = .044$ ). This finding offers an implication for this study and provides an impetus and rationale for the researcher to examine the perceived stress scores related to gender of the nursing students. Nursing students scored higher than new

nurses did for stressful life events in 1997 ( $p = .001$ ). New nurses scored higher than nursing students on stress level ( $p < .001$ ) and stress frequency ( $p < .001$ ) in 1994 to 1997 (Watson et al., 2008).

The longitudinal data strengthened and added to the knowledge base regarding stress in undergraduate nursing students and new graduate nurses. An additional strength was the use of the transactional model of stress theory which allowed the study of the influence of the antecedent demographics, personality, and environmental factors on stress over time. The longitudinal design provided insight with the possibility of establishing cause and effect as compared to a cross-sectional study (Watson et al., 2008). A limitation of the study was the lack of tracking of the transition from nursing student to graduate nurse.

Internationally, researchers have identified a number of sources of distress in nursing students, but little has been done to understand and measure the sources of eustress, stress likely to enhance performance. Gibbons et al. (2009) reported the results of a study to test the proposed factor structure of the Index of Sources of Stress in Nursing Students (ISSN). The ISSN is a 29-item instrument in which respondents are asked to rate a source of stress first as a source of distress and then as a source of eustress. The researchers used the term *hassle* for distress and the term *uplift* for eustress. The proposed three-factor structure included learning and teaching, clinical placement, and course organization. There were 19 items on the learning and teaching factor, 6 items on the placement related factor, and 4 items on the course organization factor. The

ISSN was subjected to confirmatory factor analysis to further test construct validity (Gibbons et al., 2009).

The focal point of the transactional model of work related stress was how a source of stress is perceived and appraised, and responses used for coping. A convenience sample of ( $N = 176$ ) final year nursing students, who were enrolled in an adult health nursing course, in one university in Northern Ireland participated. Findings supported the ISSN as a valid measure of sources of stress, measuring both distress, hassles and eustress, uplifts (Gibbons et al., 2009).

Gibbons et al.'s (2009) research added to the measurement of stress in undergraduate nursing students, the student perspective of sources of stress that are likely to contribute to eustress, as well as distress. Sources of stress included the volume of learning clinical simulations, learning to analyze and evaluate, and lecturers who enforce discipline. The student perspective regarding the sources of stress that were rated as distressing and those sources of stress valued as helping them to achieve could inform nursing curriculum planning. In addition, Gibbons et al. pointed out that if the ISSN were used together with measures of learning and well-being, it would be possible to identify sources of stress which are the strongest predictors of learning and well-being. The ISSN could be combined with coping style measurements of personality, self-efficacy, and well-being to determine the strength of the coping resources on the appraisal of stress (Gibbons' et al.).

Jimenez, Navia-Osorio, and Diaz (2010) continued to study stress in undergraduate nursing students and identified the differences in novice and experienced



nursing students on stress. They sought answers to research questions about the types of stressful events and degrees of stress perceived by the common biopsychosocial responses of and the differences in reports of stress by nursing students during clinical rotations. Theories that contributed to their study were Lazarus and Folkman's theoretical framework and Pollock's Adaptation Nursing Model. The sample was ( $N = 357$ ) nursing students, who represented 71% of the nursing student body at one university, throughout their nursing program. Data were collected over an 8-month period. The Perceived Stress Scale (PSS) and the Biopsychosocial Response Scale (BRS) were used to collect data.

The results revealed no differences between years of study or experience regarding overall measures on the PSS. The authors identified types of nursing students' stress as clinical, academic, and external with two categories of stressful symptoms, physiological and psychological, that were linked to the nursing students' clinical practice. Factor analysis isolated six major sources of stress and six symptoms of stress. Students perceived more clinical stress than academic stress and exhibited more psychological than physiological symptoms. Second year students were most vulnerable to somatic anxiety and common stress symptoms (Jimenez et al., 2010).

The cross-sectional design weakened the study, and Jimenez et al. (2010) suggested a longitudinal study for future research. Identification of the causes of the nursing students' stress could extend their future research findings. The large sample was a strength of the study. The authors aimed to inform nursing students about the potential stress of their profession, through early identification of stress was a strength. Examining

the differences in stress for novice and experienced nursing students could be the foundation for a peer stress reduction initiative.

Hensel and Stoelting-Gettelfinger (2011) piloted a study to investigate the relationship between stress and self-concept among baccalaureate nursing students. They specifically examined how a wellness course affected stress levels and self-concept acquisition. Their research questions included inquiries about how well a wellness course that includes stress management influences nursing students' stress and how stress and nurse self-concept formation are related. Cowin's model of nurse self-concept provided the theoretical framework. Fifty-two female and predominantly (96%) Caucasian sophomore nursing students comprised the sample. Their mean age was 21.3 years. Data were collected pretest and posttest with the Nurse Self-Concept Questionnaire (NSCQ) and the Stress Warning Signals (SWS) checklist.

The findings, after the wellness course treatment, indicated no significant changes in stress, a significant increase in self-concept, and no significant relationships between stress and self-concept or self-concept acquisition. It was not clear if the sample was an adequate size. The study also lacked a control group. A longitudinal design might have created a broader picture of changes in stress and self-concept in nursing students. Although the sources of nursing students' stress were not identified, Hensel and Stoelting-Gettelfinger (2011) attempted to ameliorate it. The authors' inclusion of plans for future research to determine best practices for teaching stress management to nursing students strengthened the study. An additional strengthening factor was their plan to design nursing curricular adjustments to reduce unnecessary stress for nursing students.

Goff (2011) in an exploratory correlational study examined research questions about the relationship between stressors and academic performance and the effect of learned resourcefulness on the relationship among stressors and academic performance in baccalaureate nursing students. In addition, Goff investigated how race and ethnicity, gender, marital status, enrollment status, or work status moderated the relationship between stressors and academic performance in baccalaureate nursing students. She developed a conceptual framework for the study based on theories of stress from Selye, Lazarus and Folkman, and a self-control theory of Rosenbaum's.

The convenience sample consisted of 53 junior and senior baccalaureate nursing students. Ninety-four percent were enrolled full-time, 92.5% were female, and 84.9% identified themselves as Caucasian. at a large urban university. Subjects ranged in age from 20 to 54 ( $M = 24.83$ ,  $SD = 7.46$ ). The majority (71.7%) lived off campus, 18.9% were married, 23.1% with children, and 52.8% worked part-time (Goff, 2011).

Goff (2011) used the 51-item Student-Life Stress Inventory (SSI) to measure personal and academic stressors. The 36-item Self-Control Schedule (SCS) measured learned resourcefulness. High levels of both personal and academic stressors were found, but they were not significant predictors of academic performance. The type of stressor most reported was in the pressure subscale ( $M = 4.31$ ,  $SD = 0.66$ ) and involved deadlines, that is, the ability to make payments on time and submit papers when they were due. An overload of things to do ( $M = 4.11$ ,  $SD = 0.83$ ) and competition in grades, work, and relationships ( $M = 4.00$ ,  $SD = 1.00$ ), were also reported. Stressors from the self-imposed subscale included test anxiety ( $M = 3.75$ ,  $SD = 1.05$ ), procrastination ( $M = 3.60$ ,

$SD = 1.14$ ), and perfectionism ( $M = 3.48$ ,  $SD = 1.01$ ). Regarding reactions to stressors, emotional reaction, such as, fear, anxiety, and worry, ( $M = 4.11$ ,  $SD = 0.96$ ) were most frequently reported. Behavioral responses of crying ( $M = 3.33$ ,  $SD = 1.09$ ) and irritability toward others ( $M = 3.33$ ,  $SD = 1.00$ ), and physiological reactions of exhaustion ( $M = 3.47$ ,  $SD = 1.16$ ) and sweating ( $M = 3.11$ ,  $SD = 1.15$ ) were reported.

Age had a higher correlation with academic performance than stressors ( $F [2, 46] = 4.83$ ,  $p = .012$ ). When learned resourcefulness was added to the model, age continued to have the highest correlation to academic performance  $r = .374$ ,  $n = 46$ ;  $F (2, 46) = 2.83$ ,  $p = .042$ ). Analysis by  $t$ -test revealed no significant effects on academic performance from race and ethnicity and gender difference. Neither the one-way ANOVA for academic performance, marital status, and work status nor the  $t$ -test regarding enrollment status were significant (Goff, 2011).

Strengthening the study was its initial appraisal of both academic and personal stressors relative to academic performance and the exploration of learned resourcefulness in baccalaureate nursing students. Findings further validated the high levels of stress experienced by nursing students. The SSI results confirmed that academic stressors are the most irritating and frustration, as a personal stressor, were most often cited. Goff (2011) proposed directions for the reduction and management of stress. The study was limited by a small sample size ( $N = 53$ ). There were gaps in data ( $n = 45$ ) for the SSI and ( $n = 49$ ) for the SCS. The data were collected from one institution.

### **Summary of Stress in Undergraduate Nursing Students**

In the literature, several theories of stress were found including Cox (1978), Selye (1984), and Lazarus and Folkman (1984). Stress is ubiquitous. Cox described stress as psychological phenomenon that arose from a comparison between the demand on the person and his ability to cope. According to Selye, (1984, p. 74) it is “how you take it”, that is, stress determines one’s response to stress. Lazarus and Folkman qualified stress as psychological stress that was appraised by a person as harmful to well-being. The stress of nursing education has been described at length in the literature. Pagana (1990) considered the stress of the clinical experience of the nursing student as threatening or challenging and linked the incident to the mediating variables of hardiness and social support.

Stress from meeting conflicting demands, feeling overworked, feeling unprepared, and seeking respect and support from faculty were reported by Magnussen and Amundson (2003). Dutta et al. (2005) described a period of time in the life of developing health care professionals with obstacles and stress. Specifically, among nursing students that stress ranged through academic overload, frequent examinations, relationships with nursing faculty, and financing an education. Gibbons et al. (2008) aimed to identify experiences that caused both eustress and distress and recommended measures to help students cope with undergraduate nursing course demands.

Watson’s et al. (2008) research added that unmitigated stress leads to psychological distress and attrition. Another finding was that female nursing students scored higher on stress than male nursing students. Gibbons’ et al. (2009) research

contributed an instrument for the reliable measurement of stress in undergraduate nursing students. Information regarding the sources of stress that undergraduate nursing students rate as distressing and those sources of stress rated as helping them to achieve could promote positive adjustments in undergraduate nursing curriculum. If sources of stress for nursing students were measured along with measures of learning and well-being, it would be possible to identify sources of stress, which might be the strongest predictors of learning and well-being (Gibbons et al.).

Jimenez et al. (2010) suggested proactively informing nursing students about the potential stress of their profession, through early identification of their stress. Hensel and Stoelting-Gettelfinger (2011) advocated for inclusion of stress management course in nursing curriculum and reduction of unnecessary stress. Goff (2011) explored the evident high levels of academic and personal stress, learned resourcefulness and academic performance in baccalaureate nursing students.

### **Perceived Stress Scale**

There was a common assumption among health researchers that the impact of objective stress was determined by one's perception of the stress. Cohen et al. (1983) discussed the limitations of objective and subjective measures of stress used to assess global and specific event stress levels. The authors argued that "theoretical perspective has not been accompanied by the development of valid measures of perceived stress" (Cohen et al., p. 385). They proposed that a psychometrically sound global measure of perceived stress could provide valuable additional information regarding the relationship

between stress and pathology. Therefore, they developed the PSS, which measures the degree to which situations in one's life were appraised as stressful (Cohen et al.).

Research on the role of psychological and environmental stress as risk factors for physical, mental, and behavioral illness used objective measures of stress. In those studies, various versions of life-events scales, the original was Holmes and Rahe's Social Adjustment Scale, were used to calculate a cumulative stress score. The scores were based on either the number of stressful events in the last 6 to 12 months or on the sum of the weights assigned by the difficulty in adjusting to the stressful life-events. The use of objective measures of stress implied that stressful events are, of themselves, the cause of physical, mental, and behavioral illness. That implication was contrary to Cohen's et al. (1983) view that persons actively interacted with their environments, appraising potentially threatening and challenging stress in the light of available coping resources. Considered from that view, the effects of stress were assumed to occur when a situation was appraised as demanding or threatening and there were insufficient resources to cope with the situation (Cohen et al.).

The cause of stress was the "cognitively mediated emotional subjective response to the event, not the objective event itself" (Cohen et al., 1983, p. 386). Stress appraisal was dependent on personal factors and the context of situations, not just based on the intensity or quality of a situation. The cognitive appraisal process raised the suggestion of assessing perceived stress in addition to measuring objective stress. Perceived stress measured the experienced level of stress, coping processes, and personality factors. Therefore, Cohen et al. developed the PSS. It is a 14-item measure of the degree to

which situations are appraised as stressful. The PSS items were designed to assess the degree to which persons considered their lives “unpredictable, uncontrollable, and overloading” (Cohen et al., p. 387). These three issues have been found to be central components of the experience of stress. The PSS included questions about current levels of stress, was administered in only a few minutes, and was easy to score. It is also economical. (Cohen et al.).

Data were collected and presented from three samples. One sample consisted of residence hall dwelling college freshman students ( $N = 332$ ), of whom ( $n = 209$ ) were female and ( $n = 121$ ) were male. Two students did not specify gender. The mean age, for this sample, was 19.01 years. The second sample ( $N = 114$ ) of students were enrolled in a personality psychology course of which ( $n = 53$ ) were female, ( $n = 60$ ) male, and one student did not specify gender. The mean age was 20.75 years for this sample. Subjects ( $N = 64$ ) in the third sample consisted of ( $n = 37$ ) females and ( $n = 27$ ) males enrolled in a community smoking-cessation program offered by a local university. The mean age, for this sample, was 38.4 years (Cohen et al., 1983).

The first and second college student samples completed five scales measuring life events, social anxiety, depressive symptomatology, physical symptomatology, and perceived stress. The smoking-cessation group sample completed a different life-event scale, with items appropriate to a community population, a physical-symptom checklist, and the PSS, pre-treatment and post-treatment (Cohen et al., 1983).

Findings included the mean scores on the PSS. In the freshmen group, the scores ranged from 6 to 50 ( $M = 23.18$ ). Scores of the students enrolled in the psychology



course ranged from 5 to 44 ( $M = 23.67$ ). The smoking-cessation groups' scores ranged from 7 to 47 ( $M = 25.00$ ). There was no statistical significance between females and males in any of the samples. Alpha coefficient reliability in the samples for the PSS was .84, .85, and .86, respectively. For the PSS, two test-retest intervals were available, two days and six weeks. The test-retest reliability over two days was .85 for 82 college students from both groups. The test-retest reliability was .55 after six weeks for the 64 subjects in the smoking-cessation group. There was a small to moderate correlation between the number of life events and the PSS, in the three samples, ( $r = .20, p < .01$ ;  $r = .17, p < .01$ ; and  $r = .38, p < .01$ ). The correlation increased in the two college student samples when the score included the subjects' perception and impact of the life events, ( $r = .35, p < .01$  and  $r = .24, p < .01$ ) (Cohen et al., 1983).

Cohen et al. (1983) offered a caution that although appraised stress might be symptomatic of psychological disorder, the PSS assessment of perceived stress was not a measure of psychological symptomatology. The study included only resident students in one of the samples. Cohen et al. also recommended the PSS for use with other scales in an effort to establish whether concepts such as, social support, hardiness, and locus of control protect persons from the effects of stress by changing the appraisal of stress. The PSS measured appraised stress over the past month compared to the Holmes and Rahe's Social Adjustment Scale, which was based on the number of stressful events in the last 6 to 12 months. As a global measure of perceived stress, the PSS was also sensitive to chronic stress, derived from ongoing stressful circumstances, and stress from expectations about future events (Cohen et al.).

Cohen and Williamson (1988) presented and discussed data from a probability sample of the United States that allowed for the reexamination of the psychometric characteristics of the PSS and description of the distribution of perceived stress levels in the U.S. population. These data provided norms for the PSS and evidence for differences in perceived stress for categories based on gender, age, socioeconomic status, race and ethnic background, smoking, and drinking status. They sought to answer the question whether the PSS measured what it was designed to assess, that is, the perceived degree to which environmental demands and changes exceeded abilities to cope.

Based on Bureau of Census information, a national area-probability sample was developed from the non-institutionalized adult population of the United States. The subjects ( $N = 2,387$ ) who met the inclusion criteria for the sample were females ( $n = 1,427$ ) and males ( $n = 960$ ) 18 years of age and older and residents of the United States. The subjects completed a 31-minute telephone interview. They represented 69.6% of the 3,430 potential subjects with whom telephone contact was made. A total of 7,787 numbers were called. There were 926 individuals who refused to participate and 117 who withdrew from the study prior to completion (Cohen & Williamson, 1988).

Cohen and Williamson (1988) theorized that the perception of stress, as measured by the PSS, is not simply a measure of psychological symptoms and that events can be appraised as stressful without resultant psychological symptoms. The PSS provided better predictions than did objective life-event scales. The PSS was appropriate in studies investigating factors influencing or influenced by perceived stress appraisal. The instruments used for data collection were the PSS, with four additional individual stress

questions, a self-reported health and health services, health behaviors, life satisfaction, help seeking behaviors, and demographic data (Cohen & Williamson).

The data were analyzed to provide information about the psychometric properties of the PSS. Cronbach's alpha coefficient for the internal reliability of the PSS was .75. Mean perceived stress scores for the sample were 19.62, with the range of 0 to 45. Levels of stress were higher for females ( $M = 20.2, p < .001$ ) than for males ( $M = 18.8, p < .001$ ). There was a small, but significant negative correlation ( $r = -.13, p < .001$ ) between age and the PSS. Living environment factors were also related to perceived stress. Reports of perceived stress increased as the number of people living in the subject's household increased (Cohen & Williamson, 1988).

Comparing the PSS with the other stress measures revealed that the PSS scores were correlated with reports of the amount of stress experienced during an average week, ( $r = .36, p < .001$ ), and the amount of stress experienced now as compared to one year ago, ( $r = .26, p < .001$ ). Scores on the PSS correlated, ( $r = .30, p < .001$ ), with a measure of the number of stressful life events. Health status measure was correlated with reports of stress, ( $r = .23, p < .001$ ). Use of health services was related to PSS scores ( $r = .21, p < .001$ ), non-serious illness factors ( $r = .31, p < .001$ ), and symptoms associated with influenza ( $r = .32, p < .001$ ). Statistically significant, but small correlations were observed between the PSS scores and shorter periods of sleep, ( $r = -.08, p < .001$ ), infrequent eating of breakfast, ( $r = -.09, p < .001$ ), and increased alcohol consumption, ( $r = .10, p < .001$ ) (Cohen & Williamson, 1988).

The authors emphasized that the PSS was not the only scale appropriate for use in stress research. They admitted that the conceptual viability of a subjective perceived stress scale is controversial and supported the collaborative use of objective and subjective stress. Cohen and Williamson (1988) argued that stress is a symptom of psychological distress and acknowledged that scales that measured stress and psychological distress ought to have been used in the study.

Deckro et al. (2002) hypothesized that college students who attended a six-week relaxation response (RR) and cognitive behavioral intervention (CBI) would have reductions in psychological distress, anxiety, and perceived stress, compared to a waiting list control group. The theoretical assumption of the RR was that regular practice of RR increases one's resilience to stress. The RR was elicited by repeating a word, phrase, sound, prayer, or a muscle activity while passively ignoring distracting thoughts. The theoretical support for the CBI was the argument that "emotions are influenced by thoughts and negative thoughts often contain distortions and exaggerations" (Deckro et al., p. 282). In addition, stress was caused more by the way a problem was thought about, that is, perceived, than by the problem itself.

The randomly assigned sample ( $N = 128$ ) of female ( $n = 77$ ) and male ( $n = 51$ ) graduate (34%) and undergraduate students (66%) ranged in age from 17 to 60 years ( $M = 24$ ). The experimental group ( $n = 63$ ) was expected to attend six 90 minute weekly group-training sessions. The control group ( $n = 65$ ) did not receive any intervention during the study and were put on a waiting list. Seventy percent of the sample ( $N = 90$ ), completed the posttest instruments. In the experimental group, 46 subjects completed the

RR and CBI intervention and posttests. Of the experimental group, 20 attended all of the RR and CBI intervention sessions, 21 attended 3 to 5 sessions, and 5 attended 2 or less sessions. In the control group, 44 subjects completed the posttest instruments (Deckro et al., 2002).

Each session format of the six-week RR and CBI intervention consisted of lecture, discussion, demonstration of new content, group discussion of weekly practice and the experiences of the RR and CBI skills. The RR and CBI intervention was then offered to the control group after the study. Data were collected pretest and posttest on changes in psychological distress, measured by the Global Severity Index(GSI) of the Symptom Checklist-90-R (SCL-90-R); in anxiety, measured by the State Trait Anxiety Inventory (STAI); in perceived stress, measured by the PSS; and in health-promoting behaviors, measured by the Health-Promoting Lifestyle Profile II (HPLPII). There was also a demographic and health habits survey (Deckro et al., 2002).

To compute the change in the GSI of the SCL-90-R scores the authors used an “intent-to-treat analysis, assigning a 0-change score for values missing as a result of subjects’ leaving the study” (Deckro et al., 2002, p. 284). They calculated change scores by subtracting the posttest scores from the pretest scores. There was a significant improvement on the GSI, ( $p < .02$ ), for the experimental group compared to the control group. The GSI scores were also reported for those subjects who completed the study. There was a significant difference ( $p < .03$ ) in change scores between the experimental group and the control group. The decrease in change scores on the STAI between the

experimental and control groups was significant ( $p < .001$ ), as well as the decrease on the PSS scores between the experimental and control groups ( $p < .01$ ) (Deckro et al., 2002).

The authors offered strong recommendations for stress management programs to be an integral part of new college student orientation programs. To promote attendance the intervention was offered on three different evenings. Deckro's et al. (2002) findings confirmed the result of others who had previously employed the RR and CBI intervention and demonstrated reductions in anxiety in nursing students. The study had a broad student age range. There was the potential for a wide range of health and stress conditions across the age groups. Therefore, in future studies, it might be important to look at undergraduate and graduate students separately. They scheduled the intervention during a period of time that overlapped with examinations. For this study, the researcher chose the PSS to measure the perceived stress of nursing students given that the PSS was suggested for examining the role of appraised stress an outcome measure of experienced levels of stress.

In 2009, Wichianson, Bughi, Unger, Spruijt-Metz, and Nguyen-Rodriquez conducted a study to investigate the associations among perceived stress, night-eating syndrome (NES), and coping strategies in college students. They questioned if higher levels of perceived stress would be associated with NES. Additionally, they proposed to examine the mediating and moderating effects of adaptive and maladaptive coping strategies on the relationship between perceived stress and NES.

In college students, stress was a given with 60% or more of college students reporting high or very high levels of stress. Research had found associations between

stress and problem eating. Increased use of maladaptive coping and decreased use of adaptive coping have been associated with problem eating. The NES was defined as an “eating pattern marked by morning anorexia and evening hyperphagia” (Wichienson et al., 2009, p. 236). They theorized that poor coping and high levels of stress resulting from college life and undergraduate studies make students prone to problem eating behaviors (Wichienson et al., 2009).

A convenience sample of college students ( $N = 95$ ) who were attending a private university, were recruited over a 6-month period. They were recruited from randomly selected locations across the campus. The subjects ranged from first year to fifth year students and were from various academic majors. Their ages ranged from 18 to 29 ( $M = 20.44$ ,  $SD = 3.45$ ). The sample was predominantly female (69%), Caucasian (41%), and Asian (31%). The PSS, the Night-Eating Questionnaire (NEQ), and the brief COPE survey were used to measure perceived stress, NES, and coping, respectively (Wichienson et al., 2009).

There were no significant differences in perceived stress, NES, or coping mean scores among ethnic groups or number of years of study. Female subjects ( $n = 65$ ) had significantly higher adaptive coping scores ( $t = -2.32$ ,  $p < .02$ ) than males ( $n = 30$ ). Multiple linear regression analyses, with age and gender as covariates, demonstrated significant associations between perceived stress and NES ( $\beta = 0.26$ ,  $p < .05$ ), perceived stress and maladaptive coping ( $\beta = 0.56$ ,  $p < .001$ ), and maladaptive coping and NES ( $\beta = 0.25$ ,  $p < .05$ ) (Wichienson et al., 2009).

This research helped to further the study of perceived stress and unhealthy eating behaviors among college students. The study presented data in guiding the development of health promoting interventions for college students. More knowledge regarding the issues of the transition to college life could be beneficial to college students and administrators. A larger sample would have added strength to the study.

### **Summary of Perceived Stress Scale Literature**

There was a common assumption among health researchers that the impact of stress was determined by one's perception of the stress. Therefore, Cohen et al. (1983) developed the PSS, which measured the degree to which situations in one's life were appraised as stressful. Cohen et al. developed the PSS for examining the role of appraised stress as an outcome measure of experienced levels of stress and in behavioral disorders. The PSS was recommended also, for use with other scales in an effort to establish whether concepts such as, social support, hardiness, and locus of control protect persons from the effects of stress by changing the appraisal of stress.

Research on the role of psychological and environmental stress as risk factors for physical, mental, and, behavioral illness used objective measures of stress. The subjective PSS provided better predictions than did objective life-event scales. Comparing the PSS with other stress measures revealed that the PSS scores were correlated with reports of the amount of stress experienced during an average week and the amount of stress experienced in the present and as compared to one year prior. Data generated from the use of the PSS would be useful in guiding the development of health promoting interventions for college students. More knowledge regarding the issues of



the transition to college life could be beneficial to college students, faculty, staff, and administrators. Stress management programs, based on the research with the PSS could be an integral part of new college student orientation programs.

### **Hardiness**

The “seeds of hardiness” were planted in 1974 when a graduate student showed Maddi a magazine article advising the avoidance of stress and the ill effects of stressful changes (Maddi, 2002, p. 173). This assertion was considered to be contrary to his contention that some people found change(s) to be stimulating. The contrast between the two positions seemed to highlight individual differences. While stressful changes may be debilitating for some people, perhaps they are “developmentally provocative” for others (Maddi, p. 173).

In 1977, Kobasa expressed doubt about the causal link between stress and illness and the avoidance of stress as a way to guarantee a person’s chance of not falling ill in the future. She wondered about people who had experienced stressful life events and not become ill. They demonstrated hardiness. The consideration of people who remain well in spite of stress facilitated the question of what are the mediating and predisposing factors that either strengthen or weaken the connection between stress and illness.

Kobasa (1977) presented 16 hypotheses about the personality differences between high stress/low illness individuals and high stress/high illness individuals. They were based on adult and coping literature. She grouped them into the categories of control, commitment, and challenge. There were four relevant to autonomy and personal control. Six hypotheses were relevant to commitment and six relevant to an orientation to change.

The theoretical foundations for her study were personality theory, specifically existential personality theory, adult and coping behavior, a model of interaction among stress, personality, and health. The sample was 670 business executives working for one large public utility company. They were considered a likely source of people living stressful lives. Their stress was associated with changes in the utility company, the federal government's affirmative action demands, and job evaluations that had led to many demotions. Subjects were male, 40 to 59 years old, married with two children, and had wives who did not work outside the home. Subjects represented middle or upper management, had at least a college degree, were employed for six years in the public utility company, were Protestant, and attended religious services very or fairly often. Females were excluded (Kobasa).

The executives completed a demographic questionnaire, personality questionnaire, an Executive Stress Study, which was a stress and illness questionnaire, consisting of items from the Holmes and Rahe Schedule of Recent Life Events tool. The personality questionnaire consisted of a selection of items from four standardized questionnaires: "the Jackson's Personality Research Form; Hahn's California Life Goals Evaluation Schedules; Rotter's test for Internal versus External Locus of Control; and the Alienation versus Commitment Test" (Kobasa, 1977, p. 80). The two non-standardized instruments measured role consistency and work perception goals and were designed by Kobasa.

The results established that there were high stress/low illness (HS/LI) hardy executives, compared to high stress/high illness (HS/HI) executives, who were more

committed to a sense of self, experienced more control over their lives, and valued the challenge of an ever-changing environment. The three personality dimensions of commitment, control, and challenge were derived from an existential approach to personality (Kobasa & Maddi, 1977). Significant mean differences were found between the HS/LI and the HS/HI groups in commitment, control, and challenge. Differences between the two groups were identified by *t*-tests for one commitment variable, alienation from versus commitment to self, ( $t[668] = 2.97, p < .01$ ); three variables that measured control, powerlessness versus control ( $t[668] = 1.82, p < .05$ ) nihilism versus meaninglessness ( $t[668] = 1.82, p < .05$ ), and external versus internal locus of control ( $t[668] = 2.05, p < .05$ ); and two challenge variables, vegetativeness versus vigorousness ( $t[668] = 1.82, p < .05$ ), and adventurousness versus responsibility ( $t[668] = 1.78, p < .05$ ) (Kobasa, 1977, 1979).

This study made contributions to stress and illness research, especially research that took the psychological impact of stress into account. It added the examination of personality characteristics to the concerns of stress and illness and contributed empirical support to the existential personality theory (Kobasa, 1977). From this study and theory came the impetus for hardiness education. Contributing to its strength is the recommendation that people ought to attempt to develop certain personality characteristics rather than avoid stressful life events. The chief shortcoming of this study was that female executives were excluded. The absence of female executives, who had the same employment and socioeconomic status as the male executives, limited the comparability of the components of hardiness across gender. Kobasa noted the limits of

the Holmes and Rahe scale as a measurement of stress. In future research, she suggested the use of a more specific measure of stressful events to attempt a better understanding of subjects' responses.

Drawing on her doctoral dissertation research on all male executives, Kobasa (1979) posited that persons with personality hardiness do not succumb to illness despite stressful lives and warned that people who avoid stress might be missing an opportunity to better their lives. She suggested there was much more to be learned about personality hardiness and the connection between stressful life events and illness or health. Kobasa advised that if further studies with prospective designs confirmed her initial findings, then, rather than warning people to avoid stressful situations researchers will be able to devise ways to develop personality hardiness.

Kobasa, Maddi, and Kahn (1982a) conducted a prospective design study to test the hypothesis that hardiness and its components, commitment, control, and challenge, function to decrease the effects of stressful life events and the production of illness symptoms. Existential personality theory suggested that the authentic personality developed through tendencies toward commitment, control, and challenge if one has experienced a breadth and variety of events; support and stimulation for independent thoughts and deeds, role models who advocate and demonstrate hardiness. Integrating various theoretical models, Kobasa (1977) proposed that hardiness was a summation of personality characteristics that functioned as a resistance resource when stressful life events were encountered.

The initial subject pool was 670 middle and upper level managers in a large utility company. The first composite questionnaire, Time 1, was mailed and included measures of stressful life events and illness symptoms that took place over the previous three and one-half years. The response rate was 86%. Soon after, another composite questionnaire was mailed to 400 subjects randomly selected from the original subject pool and included measures of commitment, control, and challenge. The questionnaire was returned by 81% of the subjects. The mailed questionnaires, Time 2 and Time 3, were separated from Time 1 and each other by one-year intervals. The questionnaires for Times 2 and 3 had the same measurements of stressful life events and illness symptoms as Time 1, but subjects were instructed to complete them for the previous year. The return rates were 80% and 78%, respectively (Kobasa et al., 1982a).

The final sample was ( $N = 259$ ) middle and upper level managers. They were predominantly Protestant, white, married, without close ethnic ties, and again, all male. The age range was 32 to 65, length of time at job level ranged from less than one year to more than 20 years. The majority of them had spent 6 to 10 years at their current job level. On these varied characteristics, the sample resembled the initial pool of all management personnel in the utility company (Kobasa et al., 1982a). The demographic data included in the questionnaire were items indicating age, education, level of job, length of time in job level, religion, ethnicity, and marital status.

The measure of stress was an adaptation of the Schedule of Life Events. Illness symptoms were measured through the Seriousness of Illness Survey. Two scales measured each of the hardiness components, commitment, control, and challenge. The

Alienation from Self and the Alienation from Work scales measured commitment. The External Locus of Control Scale and the Powerlessness Scale of the Alienation Test measured control. The Security Scale of the California Life goals Evaluation Schedule and the Cognitive Structure Scale of the Personality Research Form measured challenge (Kobasa et al., 1982a). The major findings were that the tendency toward commitment, control, and challenge, the components of hardiness, functions prospectively as a stress resistance resource. Therefore, it became relevant to ask further research questions. How does hardiness develop? What is hardiness' role among other stress resistance resources, such as social support and constitutional strengths? In addition, hardiness has its greatest health preserving effect when stress mounts (Kobasa et al.).

A strength of the study was the demonstration that hardiness functions as a stress resistance resource in buffering the effects of stressful events. The researchers considered the prospective design strengthening to hardiness research, and considered longitudinal studies as a future direction. Again, the subjects in this study were exclusively male. The estimates of stress involved stressful events that occurred as much as five years in the past. That length of time seems too long a time to demonstrate a strong prospective effect of stressful life events (Kobasa et al., 1982a).

During the remainder of the 1980s, there were research studies on hardiness as a stress resistance resource (Allred & Smith, 1989; Funk & Houston, 1987) and its stress resistance properties in relationship with other variables, such as, exercise and social support (Kobasa, Maddi, & Puccetti, 1982b; Kobasa, Maddi, Puccetti, & Zola, 1985), overall health (Hull, VanTreuren, & Vernelli, 1987), and attributional style (Hull,

VanTreuren, & Propson, 1988). Wiebe (1991) conducted the first study to make a direct comparison of hardiness effects across gender. Adding to the research about the stress moderating effects of hardiness, she sought to investigate and to answer whether or not “hardiness influenced stress appraisal, if potential appraisal differences were associated with differences in stress responses, and did those effects differ by gender” (p. 90).

Wiebe (1991) stated that she used the hardiness theory of the three interrelated components of commitment, control, and challenge, which reflect the capability to make adaptive interpretations when encountering stress, in her study. Theoretically, the beliefs of commitment, control, and challenge were protective since they reduced the stressfulness of an event. Therefore, hardiness moderated the stress and diminished the capacity of stress to affect health. Those beliefs were that commitment was choosing to be involved in the meaningfulness of life’s activities, not alienated from them; that persons could choose to control their lives, and challenge saw the omnipresent changes of life as an opportunity, not a threat.

The design was a 2 x 2 x 3 x 2 between-groups experimental research design. In group sessions, 820 female and male undergraduate students who were enrolled in introductory psychology courses completed a hardiness scale. A triadic split was calculated on the composite hardiness scores. Those scores in the upper and lower thirds were identified as high hardiness and low hardiness groups. Sixty female and 60 male subjects were randomly selected from the high hardiness group and from the low hardiness group ( $n = 240$ ). They were each assigned to one of the six experimental conditions, that is, high or low commitment, high or low control, or high or low

challenge. Therefore, there were 10 subjects in each hardiness, gender, hardiness component, and component level cell (Wiebe, 1991).

All subjects completed an evaluative threat task that was manipulated to influence appraisals of stress. The evaluative threat task was a 4-minute taped lecture to which the subjects listened. The subjects had to repeat the lecture, while being videotaped. Then, two psychology professors would view the tape and ask them questions. After the evaluative threat manipulation, the commitment, control, and challenge were manipulated. The subjects received a set of instructions to manipulate high or low levels of one of the hardiness components. All data were collected in an experimental room (Wiebe, 1991).

Five scales measured hardiness, the External Locus of Control Scale, the powerlessness scale of the Alienation Test, the security scale of the California Life Goals Evaluation Scale, and the alienation from self and the work scales of the Alienation Test. Lower scores represented higher hardiness. A 10-item adjectival checklist measured affect before and after the evaluative threat task. Subjects rated five positive and five negative adjectives to indicate their feelings (Wiebe, 1991).

A frustration tolerance task measured the tendency to persist in the midst of failure or difficulty. It was included since hardiness had been purported to influence the appraisal of stress. Frustration tolerance was used as a dependent variable to gain initial information on the potential relationship between hardiness and frustration tolerance, as stress moderating resources. Wiebe (1991) reasoned that commitment, control, and challenge would be enhanced by the tendency to persist in the midst of failure and



difficulty could have beneficial effects when encountering stress. The frustration tolerance task consisted of tracing over all the lines of four geometric designs without lifting the pencil or retracing a line. The first and third designs were unsolvable. The subjects were allowed to make as many attempts as they wished. The frustration tolerance task was scored by counting the number of attempts made on each design (Wiebe).

Subjects with high hardiness displayed higher frustration tolerance. A significant main effect for hardiness was found, ( $F[4, 213] = 2.53, p < .05$ ). High hardiness subjects made more attempts on the unsolvable designs on the frustration tolerance task than did low hardiness subjects, ( $F[1, 216] = 4.04, p < .05$ ). High hardiness subjects appraised the evaluative threat task as less threatening, ( $F[1, 216] = 8.45, p = .004$ ) and responded to the evaluative threat task with more positive, ( $F[1, 215] = 5.11, p < .05$ ) and less negative, ( $F[1, 215] = 5.21, p < .05$ ) affect than did low hardiness subjects. In a second set of analyses, correlations between stress appraisal and composite hardiness scores were computed for females and males separately. Among males, appraisal was significantly correlated with hardiness scores ( $r = -.25, p < .01$ ); positive affect ( $r = .25, p < .01$ ); and number of attempts made on both unsolvable frustration tolerance tasks ( $r = .26, p < .02$ ;  $r = .21, p < .02$ ). Among females appraisal was not significantly correlated ( $p > .15$ ) with hardiness scores; but was significantly correlated with positive affect ( $r = .36, p < .001$ ); negative affect ( $r = -.28, p < .002$ ); and number of attempts on one of the unsolvable frustration tolerance tasks ( $r = .27, p < .003$ ) (Wiebe, 1991).

The results suggested that hardiness did moderate stress and that there was evidence that this occurs through an adaptive stress appraisal process. This study was the first to make a direct comparison of hardiness across gender. However, Wiebe (1991) strongly asserted that the hardiness scale in use at that time was developed using a sample of exclusively male executives and not an adequate measure of hardiness in females. She advised that further hardiness research include gender as a factor. The question remains if hardiness effects would have emerged among females if the subjects had been exposed to more interpersonally or academically related stress than to only the achievement - oriented stress. A study that includes responses to multiple stresses might clarify gender effects.

Sansone, Wiebe, and Morgan (1999) claimed that persons intentionally regulated their interest in an activity when they had the need and a reason to put forth the effort. This study examined hardiness and conscientiousness as moderators of a self-regulating interest process when subjects had the options of quitting, persisting, or engaging in interest-enhancing strategies. Sansone et al. contended that uninteresting activity could be stressful. Their research question asked how do people choose to perform an uninteresting activity. They also wanted to test individual characteristics in the self-regulatory process. Additionally, they planned to contrast differences associated with deciding to self-regulate interest. Coping with an uninteresting and potentially stressful activity takes time, attention, and effort. Choosing not to cope with an uninteresting and potentially stressful activity might take more of a toll on well-being (Sansone et al.).

The theory used in the study was the theory of self-regulating interest. The theory suggested that the value and expectation of attaining a particular outcome could motivate one to initiate an activity. It further suggested that once an activity is started the "experience of interest while engaged in the activity could be the motivation for continued engagement in the activity" (Sansone et al., 1999, p. 703). When an activity was not interesting, the model suggested that people responded by quitting the activity, by persisting for a period of time due to self-motivation, or by turning it into something positive with interest-enhancing strategies. Such strategies were goal setting and reconstructing the activity to focus on its interesting properties and value. Developing interest-enhancing strategies was considered a coping mechanism, which helped persons maintain motivation (Sansone et al.).

Complete data were collected on female and male undergraduate subjects ( $N = 111$ ), in an introductory psychology course, who received extra credit for their participation. They were randomly assigned to either the benefit condition ( $n = 56$ ) or to the no-benefit ( $n = 55$ ) condition. The subjects were randomly assigned to a workstation. Their task was to copy letters into the blank boxes at the bottom of the page. To ensure that they knew the decision to stop the task was their own, subjects were told to work at the task until they were familiar enough with the task to answer questions concerning their reactions. Those subjects in the benefit manipulation condition were told that their participation in the study would help researchers develop good jobs for others (Sansone et al., 1999).

The total number of letters copied, by the subjects, during the task measured persistence. How subjects changed or varied their writing measured the interest-enhancing strategies. A checklist with eight possible choices reflected subjects' reasons for stopping the copying task. The conscientiousness subscale of the NEO Personality Inventory (NEO-PI) measured conscientiousness. The 50-item Personal Views Survey (PVS) measured hardiness (Sansone et al., 1999).

Results indicated that the benefit manipulation did not have a statistically significant effect on hardiness and conscientiousness scores. Subjects in the benefit condition were significantly more likely ( $t[109] = 1.78, p = .05$ ) to use an interest-enhancing strategy than the subjects in the no-benefit condition. Those who chose an interest-enhancing strategy ( $t[109] = 2.16, p < .05$ ) copied more letters than those who did not. Strategy use was associated with greater persistence. High conscientious subjects persisted longer ( $F([, 120] = 4.32, p < .05)$ , than low conscientious subjects independently of the benefit manipulation or strategy use. There was a significant interaction between the benefit manipulation and hardiness ( $F[1, 104] = 4.78, p < .05$ ), the high hardiness subjects copied more letters when they were provided the additional benefit information and this effect was mediated through their attempt to make the task more interesting. For persons high in hardiness having a good reason to perform an uninteresting activity was associated with greater use of strategy (Sansone et al., 1999).

Sansone et al. (1999) generalized that when faced with an uninteresting task to facing a variety of stresses, hardiness could reflect an adaptive approach to the amount of stress experienced in one's environment. When high hardiness persons were exposed to

stress, they would decide to engage in coping strategies to transform the stress into something positive. They recommended further research with hardiness on various other types of stress. Demographic data were not discussed in the study. There might have been another form of compensation offered to the subjects different from the extra credit, since the subjects may feel coerced to remain in the study. Sansone et al. were limited as to what they could generalize from one study. Therefore, they suggested that future research was needed to discover if hardiness would hold true for other kinds of stress.

Hague and Leggat (2010) conducted an exploratory study to gain an understanding of the perceptions that senior health executives had in their staff. They cited previous hardiness research that had shown that hardiness is important in the workplace as a means of reducing the negative impact of stress, which then had an association with the maintenance of individual health and performance. The authors sought to determine whether the senior executives had identified hardiness, and its components of commitment, control, and challenge, as a factor in their staff, how they recognized it within their staff, and how hardiness might be enhanced throughout the organization. In-depth semistructured interviews were completed with six senior managers of a large regional health service in the State of Victoria in Australia to explore participants' perception of hardiness. The sample consisted of three men and three women. Among the participants, there was a mix of clinical and corporate management positions and five held academic qualifications in a health care or management field.

Hague and Leggat (2010) recorded and transcribed the interviews. After transcription was completed, a copy was returned to each participant for confirmation or

alteration of the content. The transcribed interviews were coded using open, axial and selective processes. The results of the coding became the basis for theme development and discussion. Three themes were identified. Although the senior managers had not been previously exposed to the concept of hardiness, they could all recognize hardy behavior among their staff; they associated hardiness with better workplace performance; and they felt that hardiness was innate, and while it could not be trained there were organizational strategies that could support staff in enhancing their hardiness.

In addition, there was a considerable level of understanding of hardiness by the senior managers. It was clear that although the terms and definitions varied somewhat there was association with the commitment, control, and challenge attributes of hardiness. Regarding the education to enhance hardiness, it seemed that formal classroom-based methods were not necessary, but that on the job experiences were more likely methods to teach hardiness identify and teach hardiness among healthcare workers (Hague & Leggat, 2010).

The results were limited by the small sample in one large regional healthcare organization. Hague and Leggat (2010) acknowledged that their findings were not generalizable to other organizations, but ought to be regarded as a basis for further investigations. The study uncovered useful information for how healthcare organizations could consider hardiness among healthcare workers. Utilizing a qualitative research approach to hardiness was a strength and an initiative since there were few published articles found that explored hardiness qualitatively. They suggested a proactive effort, as

a first step, to include hardiness identification in the recruitment processes of healthcare organizations (Hague & Leggat).

Hystad, Eid, and Brevik (2011) prospectively examined the relationships among hardiness, job control, job demands, and sickness absence. They also wanted to address some of the issues concerning the association between hardiness and health. There were two hypotheses. Psychological hardiness was negatively related to sickness absence. Hardiness would act as a buffer between job strain and sickness absence; in low-control and high-demand situations, employees scoring high on hardiness would have less sickness absences compared with employees scoring low on hardiness.

The theoretical framework was not explicitly stated however, Hystad et al. referenced the demand-control model of Karasek and Theorell. Their model implied that jobs characterized by high demands and low control were assumed to result in psychological strain and stress related illness. The sample was 7,239 employees of the Norwegian Armed Forces Health Register who returned a questionnaire, which examined health and psychosocial factors at work. The sample included civilian (30.2%) and military (69.8%) employees whose majority (84.3%) were male, had a mean age of 40.8 years, and ages ranged from 20 to 72.

The research instruments that Hystad et al. (2011) used were a 15-item Norwegian adaptation of the Dispositional Resiliency Scale (DRS) to measure hardiness, the Health Register's personnel survey to measure job control and demands, and archival data from the Norwegian Labour and Welfare Administration to measure employees' sickness absence. A "2-component hurdle regression" (p. 265) was used in the statistical

analyses of the sickness absence data. The results of their data analysis revealed that for a 1 standard deviation increase in hardiness, an employee's expected number of sickness absences decreased by 6.5%. Similarly, increases in job physical demands and low-control resulted in 7.1% and 8.7% increases in mean sickness absence, respectively. The hypothesis that hardiness would be negatively related to sickness absence was supported. Hardiness did not act as a buffer between job strain and sickness absence. Therefore, the second hypothesis was not supported.

A significant interaction was found among hardiness, job demands, and job control that underscored the importance of hardiness relative to those job characteristics. For employees with low hardiness, job control seemed to have unfavorable effects. When job demands were high, high job control was associated with more absence among employees low in hardiness. Bias was limited by using the objectively recorded sickness absence record rather than self-report of absence. The prospective design of the study allowed for causal inferences about the positive effects of hardiness on health and sickness absence.

The study population consisted exclusively of employees of the Norwegian Armed Forces and more research in other organizations would be needed to generalize the results. To gain a broader understanding of the methods by which hardiness had an effect on sickness absence, which could be caused by a wide range of factors, future research ought to explore the moderating role of hardiness related to the many outside forces known to influence absenteeism (Hystad et al., 2011).



### **Summary of Hardiness Literature**

The theoretical foundations for Kobasa's (1977) initial study were personality theory, specifically existential personality theory, adult and coping behavior, a model of interaction among stress, personality, and health. She wondered about those who had experienced stressful life events and had not become ill. They demonstrated a personality characteristic that she labeled, hardiness. The terms for the three dimensions of hardiness, commitment, control, and challenge were derived from an existential approach to personality (Kobasa & Maddi, 1977). The consideration of persons who remain well in spite of stress facilitated the question of what are the mediating and predisposing factors that either strengthen or weaken the connection between stress and illness. Hardiness research made contributions to stress and illness studies, especially research that took the psychological impact of stress into account. Kobasa suggested there was much more to be learned about personality hardiness and the connection between stressful life events and illness or health.

Hardiness research findings suggested that, rather than warning people to avoid stressful situations researchers should be able to devise ways to develop personality hardiness. It was decided that further research questions needed to be asked and answered. How did hardiness develop? Could hardiness be learned? What was hardiness' role among other stress resistance resources, such as social support and constitutional strengths?

During the 1980s, there were research studies on hardiness as a stress resistance resource. Weibe (1991) posited that the three components of commitment, control, and

challenge, reflected the capacity to make adaptive interpretations when encountering stress. Convinced of the benefits of hardiness Maddi, Kobasa's mentor, decided to develop a hardiness education program, to teach the skills of the hardiness approach to stress management, which will be discussed in the following section. Hague and Leggat (2010) findings suggested that healthcare organizations can teach the concept of hardiness, select hardy employees, and develop strategies to assist employees to increase their levels of hardiness in the workplace. Hystad et al.'s (2011) findings pointed to hardiness as an important individual resource in relation to health.

### **Hardiness Education**

To facilitate the practical application of hardiness, Maddi (1987) developed a program to teach hardiness skills. The conceptual model (Maddi, 1987; Maddi & Kobasa, 1984) that guided the development of this education program assumed that if life circumstances were appraised as stressful, either acute or chronic, and the stress accumulated, strain would result. There was a transformational coping process aimed at understanding the stress more fully, putting stress in a broader perspective, and making decisions and planning actions that transformed the stress into an opportunity for learning and development. The earliest hardiness education program engaged "cognition, emotion, and action" in coping effectively with stressful circumstances and used the feedback from this process to deepen participants' control, commitment, and challenge (Maddi et al., 1998, p. 79). The hardiness educational program might be especially useful for people who are at risk of encountering major stress because of their occupations or life circumstances (Maddi, 2005).

Aware of the development of a hardiness educational intervention, and further aware that no published research had examined the explicit teaching of hardiness skills for university women, Rice (1997), decided to determine if a 6-week hardiness intervention would significantly alter female subjects' personal and psychological perceptions of hardiness, depression, hopelessness, negative life events, and self-esteem. She hypothesized that there were no significant differences between the pretest, Time 2, and posttest, Time 3, scores of the female subjects, on the mean scores of total hardiness, of the hardiness components measured by the HardiSurvey, of depression measured by the Beck Depression Inventory (BDI), of hopelessness as measured by the Beck Hopelessness Scale (BHS), of negative appraisal of stressful life events as measured by the Life Experience Survey (LES), and of self-esteem subscales and total self-esteem as measured by the Tennessee Self-Concept Scale (TSCS). A second hypothesis stated there were no significant correlations following the hardiness educational intervention among the total hardiness and hardiness components scores with the scores of the previously mentioned variables (Rice).

Rice (1997) was not explicit regarding her utility of a theoretical framework, however, she referred to stress management guidelines for working women. The study sample consisted of 62 female students who were attending a university and who had sought counseling services, however, data from only 40 subjects were used in the study. Those who had extreme medical concerns requiring physician monitoring were excluded from the study. The students self-selected to participate and expressed the ability to participate actively in a group format for the study. The subjects were between the ages

of 18 to 54, married and unmarried, undergraduates and graduates, and enrolled in various academic disciplines.

The study was a time series single group design. Subjects received a packet that included demographic forms and research instruments with self-explanatory directions for completion. The research instruments included the HardiSurvey, the BDI, the BHS, the LES, and the TSCS. Subjects completed the instruments three times. Time 1 was six weeks before the hardiness intervention and Time 2 was during the initial meeting of the hardiness intervention group. The hardiness intervention group received a general explanation of prior testing results following the second completion of the questionnaires. The subjects obtained a hardiness training coaching workbook, were asked to complete assignments, and actively contribute to the group sessions. Six separate groups of subjects attended 6 hardiness intervention sessions. After the hardiness intervention, subjects again completed the questionnaires, Time 3 (Rice, 1997).

Results from the analysis of variance (ANOVA) indicated significant differences between Time 2, just prior to the hardiness intervention, and Time 3, upon completion of the hardiness intervention, scores on total hardiness ( $F[2,78] = 27.88, p < .001$ ), commitment ( $F[2,78] = 23.51, p < .001$ ), control ( $F[2,78] = 22.29, p < .001$ ), and challenge ( $F[2,78] = 20.83, p < .001$ ). The ANOVA indicated that from Time 2 to Time 3 results differed significantly on depression ( $F[2,78] = 23.36, p < .001$ ), hopelessness ( $F[2,78] = 21.80, p < .001$ ), and negative life events ( $F[2,78] = 16.31, p < .001$ ). The Time 2 and Time 3 scores for self-esteem, as measured by the TSCS, differed significantly on the composite score of total positive self-esteem, ( $F[2,78] = 7.71,$

$p = .001$ ), and all subscale scores for example, the physical subscale, ( $F[2,78] = 5.48$ ,  $p < .001$ ), and the personal subscale, ( $F[2,78] = 27.10$ ,  $p = .001$ ), except the identity subscale. The first hypothesis was rejected (Rice, 1997).

The Time 3 scores had significant negative correlations between total hardiness and depression ( $r = -.34$ ,  $p < .05$ ), as well as, control and depression ( $r = -.31$ ,  $p < .05$ ). There was a significant correlation of the Time 3 scores of total hardiness with the composite score of total positive self-esteem, ( $r = .65$ ,  $p < .001$ ). Similarly, there were significant correlations between commitment, control, and challenge and each of the subscales of self-esteem: identity, satisfaction, behavior, physical, ethical, personal, family, and social (Rice, 1997).

The study offered to female university students a hardiness intervention, which had previously been used only with male executives. Although the design of the study would have been altered, the inclusion of a control group might have added to knowledge of the effects of the hardiness intervention. A fuller description of how the hardiness intervention groups were conducted and by whom they were conducted would have added to the study.

The pursuit of ongoing evaluation led Maddi to test again the effectiveness of hardiness education. The sample was 46 managers in a utilities company assigned at random to three treatment conditions. There were three treatment conditions, hardiness ( $n = 18$ ), meditation/relaxation ( $n = 12$ ), and passive listening ( $n = 16$ ). In all three conditions, the gender ratio was about 60% men and 40% women, and the management-level ratio was about 50% lower level and 50% middle and upper level. Data were

collected with pretest and posttest questionnaires, the Personal Views Survey, the Hopkins Symptom Checklist, the Seriousness of Illness Survey, and a Perceived Social Support scale (Maddi et al., 1998).

The hardiness education treatment increased hardiness more than either the relaxation/meditation, ( $t[29] = 1.82, p < .001$ ), or passive listening conditions, ( $t[33] = 10.28, p < .001$ ). Maddi proposed that hardiness can be learned, and hardiness education can be taken seriously as a tool for stress management (Maddi et al., 1998). Strengths of the study were the inclusion of women in the sample, the use of the education condition of a common stress management technique, and that a variety of trainers can be used. A weakness was that the study included only managers and there is need to investigate the use of hardiness education for specific problems rather than general stressful situations (Maddi et al., 1998).

Building on previous hardiness education studies (Maddi, 1987, Maddi et al., 1998) with working adults, Maddi et al. (2002) evaluated the effectiveness of hardiness education in improving the retention rates and GPA with high-risk undergraduate students. Maddi et al. (2002) hypothesized that hardiness education would lead to an increase in GPA and retention among first semester high-risk undergraduates.

The researchers questioned whether hardiness attitudes were inborn or developed and based their hypothesis on the assumption, that hardiness can be learned, on the theoretical hardiness model developed from the results of earlier studies (Khoshaba & Maddi, 1999; Maddi, 1998; Maddi & Kobasa, 1984).

The model depicts how accumulated acute stressors, such as unexpected change and chronic stress, for example, ongoing conflicts, can put a person at risk for performance and health breakdown. Genetic vulnerabilities, such as, a familial history of cardiovascular disease, can hasten the breakdown. However, hardiness attitudes and skills can lead to mental perspectives and actions that lessen the stressful situations. The aim of hardiness education was to teach participants coping skills to decrease the stressfulness of life's circumstances. When hardiness education has been completed, participants ought to have learned the skills of transformational coping and should have the motivation to use them (Maddi et al., 2002).

First semester students ( $n = 40$ ) participated in the hardiness education two-credit course treatment group and were compared with ( $n = 53$ ) first semester comparison group students who took a time management, study skills and remediation course, or a leadership education course. Both groups were predominantly Caucasian, unmarried, in the 20-year age range, with documented problems in mathematics and writing. In the first and last classes the researchers administered the HardiSurvey III-R (Maddi & Khoshaba, 2001b) a 65-item questionnaire using a 4-point Likert scale, (0 = not true to 3 = true), to all the research subjects. Demographic information and the number of credit hours each student had successfully completed at the time of enrollment in any of courses were collected in the study (Maddi et al., 2002).

No between-group differences were found on gender. Posttest stress score results ( $t[91] = 2.73, p < .009$ ) demonstrated that students in the hardiness education group experienced decreased stress compared to the pretest stress scores. Similarly, the

hardiness attitudes posttest scores ( $t[91] = 5.50, p < .001$ ) confirmed more positive hardiness attitudes compared to the hardiness attitudes pretest scores. The comparison groups posttest stress scores ( $t[91] = 0.39, p = ns$ ) showed little significant change compared to their pretest scores (Maddi et al., 2002).

Subjects in the hardiness education group showed a higher GPA in the year following the course ( $M = 3.06$ ) than the students in the comparison groups ( $M = 2.75$ ). Grade point averages were calculated for courses taken before the semester began when the subjects registered for the hardiness education course or the student enrichment course and then again one year later. The retention rate one year after the hardiness education course was 73% and 55% after the enrichment course (Maddi et al., 2002).

A strength of the study was that the hardiness education was given to female and male undergraduate students, a substantial change from earlier studies on all male business managers. Another strength of the research was the focus on the specific areas of GPA and retention. A weakness of the study was that all only high-risk and first year students were researched. It was possible that hardiness education may benefit students who were not at risk and who were at any undergraduate level.

Judkins' et al. (2006) exploratory pilot study investigated the short-and long-term effects of a longitudinal model of a hardiness training program (HTP) to determine whether stress could be reduced and hardiness could be increased and sustained among nurse managers. They developed their HTP following a review of hardiness literature and established the content to include hardiness, stress management, adaptive coping strategies, healthy communication, conflict management, and problem-focused



resolution. In addition to the initial HTP, Judkins et al. conducted follow-up sessions over a 6 to 24 month time period. Twelve nurse managers participated. The demographic characteristics comprised eight female and four male nurse managers with ages ranging from 37 to 61. The majority (66%) were married, held master degrees in nursing (84%) and had experience in nursing management that ranged from 1 to 3 years to greater than 12 years.

Judkins et al. (2006) measured hardiness with a 45-item hardiness scale and stress was assessed using the 14-item PSS. The nurse managers participated in the HTP over multiple sessions. After pretest measurement, the managers attended an intensive training session over 2.5 days, which was followed by the first posttest measurement. The managers then attended 2-hour sessions once a week for 6 weeks, followed by the second posttest measurement. Additional 2-hour sessions were conducted at 6 and 12 months with the third and fourth posttests after each session, respectively.

There was a significant increase in hardiness scores from pretest to the first posttest ( $t = -3.3, df = 11, p = <.05$ ). The significant increase was sustained at the second posttest ( $t = -.60, df = 11, p = <.05$ ). Hardiness scores decreased significantly from the second to the third posttest. The investigators did not include the results from the fourth posttest since “two of the managers left the organization, which caused extreme skewing of data” (p. 206). There were no significant differences in stress scores.

This study represented an initiative to develop a hardiness educational program designed for nurses, in the role of manager. Judkins et al. (2006) incorporated follow-up hardiness educational sessions after the initial instruction, once a week for 6 weeks and

then again at 6 and 12 months after the HTP. The authors used an alternative hardiness scale. The study sample was small. The results of the 12 month intensive follow-up session were not reported. Inclusion of the specifics of the statistical analyses of the nurse managers' stress would have added information. In addition, the PSS could have been administered posttest with the hardiness scale.

Maddi, Harvey, Khoshaba, Fazel, and Resurreccion (2009a) hypothesized that hardiness education would produce a greater increase in hardiness attitudes and skills and a greater increase in GPA scores. Maddi et al. (2009a) theorized that hardiness afforded positivity, the state of being positive, and resilience to people experiencing stressful changes. The group that received the hardiness education ( $N = 349$ ) undergraduate students, registered for and completed an 11-week hardiness education course. The undergraduate students were not identified by their major. The course was offered three times in one year. The comparison group consisted of undergraduate students ( $N = 378$ ) in the same institution who registered for and completed an 11-week psychology course.

All subjects completed the Hardi-Survey III-R (Maddi & Khoshaba, 2001b) at the beginning and end of the course. There were no significant differences between the groups in age, gender, or race, and ethnicity. The hardiattitudes scores of those who received the hardiness educational intervention increased from pretest to posttest ( $t[725] = -2.18, p < .007$ ) compared to the control group pretest to posttest ( $t[725] = -0.80, p = ns$ ). The hardicoping scores of those who received the hardiness education increased from pretest to posttest ( $t[725] = -2.36, p < .02$ ) compared to the hardicoping scores of the comparison group pretest to posttest ( $t[725] = 0.40, p = ns$ ).

There was a small, but significant increase in stress scores pretest to posttest ( $t[725] = -3.54, p < .001$ ) among those who received the hardiness educational intervention. During the hardiness education course, the subjects were asked to list their stressors. In order to cope effectively with stress, one needs to be keenly aware of one's stressors, which in turn could increase stress. This increase was explained by the researchers as consistent with the trainees becoming more aware of their stressors. Among the comparison group, there was no increase in hardiness scores. There were no statistically significant differences in GPA among the treatment and control groups at the beginning of hardiness education. The hardiness education group showed higher GPAs over the comparison group at the end of hardiness education, ( $t[725] = -7.04, p = .001$ ). The GPAs of the hardiness education group at graduation, between 6 and 24 months after education, were sustained over the comparison group ( $t[725] = -3.34, p < .001$ ) (Maddi et al., 2009a).

Offering hardiness education to greater numbers of female and male undergraduate students is a strength of the study. The results of the study imply that hardiness educational intervention may benefit undergraduate students' academic performance by providing them with the skills to assess stress as an opportunity for growth instead of an adversity (Maddi et al., 2009a). The more hardiness educational intervention was offered the more undergraduate students there would be who benefit from it. An explanation or acknowledgment of the expected increase in stress scores to the subjects might have prevented concern among the subjects in the hardiness educational intervention.

## **Summary of Hardiness Education Literature**

The hardiness educational program was developed from research on people who exhibited personality and psychological hardiness with its three components of control, commitment, and challenge. The first hardiness education program was in 1984, with the establishment of the Hardiness Institute, Inc. (Maddi, 1987). Rice (1997) investigated the effects of a 6-week hardiness intervention on female subjects' personal and psychological perceptions of hardiness, depression, hopelessness, negative life events, and self-esteem. The hardiness educational program was first offered to all male middle managers, then to high-risk undergraduates, and now, it is offered to students at community colleges, universities, and it is available as an online course (Maddi et al. 2002; Maddi et al., 2009a). Maddi asserted that hardiness education is an effective approach for stress management. Hardiness education promoted adaptive coping and a pathway to resilience for people experiencing stressful changes.

### **The Hardiness Model**

The first explication of the HM was in 1984 when Kobasa and Maddi derived it from the results of the Kobasa's first hardiness research study. The HM was the conceptual framework that guided the development of the hardiness educational intervention. The first aim of the HM was to outline the skills of transformational, adaptive rather than regressive or avoidant, coping. Transformational coping flows from existential personality theory. The second aim was to deepen the motivational skills of commitment, control, and challenge. Selye's theory was used to describe the stress response.

The HM assumes that if life circumstances were appraised as stressful and accumulate, then a strain reaction would result. If strain were prolonged wellness breakdown might occur. To decrease the appraised stressfulness of circumstances, it was important that there was transformational coping. Transformational coping processes were aimed at understanding stress more fully, putting it into perspective, and taking decisive action to change it (Maddi et al., 1998).

Maddi and Khoshaba generated the present HM. They introduced the concept of inherited vulnerabilities (Khoshaba & Maddi, 1999). The HM involved transformational coping versus regressive coping. The distinction they made concerned whether one immersed oneself in stress or avoided it. Regarding social support persons with hardiness engaged in the supportive patterns of giving and getting encouragement and assistance in dealing with stress. In self-care, as stress increased, those with hardiness practiced relaxation, avoided stress eating, and worked on physical fitness, all of which facilitated their coping (Maddi, 2004).

The HM contended that if hardiattitudes were strong, the resulting courage and motivation would facilitate hardy action patterns. Courage and motivation were needed for this process. Hardicoping, while the most effective in turning stress to an advantage, was also more difficult than coping by denial, avoidance, striking out, using destructive competition, or overprotection. The aspects of performance that were expected to be enhanced from the HM included effectiveness in carrying out difficult tasks, taking a leadership role, and increased awareness (Maddi, 2006).

### **Summary of the Hardiness Model Literature**

The HM was the conceptual framework that guided the development of the hardiness educational intervention (Khoshaba & Maddi, 1999). The HM was derived from the initial research study of managers. It has developed from 1984 to the present. The principles of transformational coping and immersion in stress rather than avoidance of it made it unique. The combination of strong hardiattitudes social support, and self-care were expected to enhance performance and wellness.

### **The Roy Adaptation Model**

#### **Self-Concept**

In anticipation of the 21<sup>st</sup> century, Roy (2009) provided a redefinition of adaptation and a restatement of the assumptions foundational to the RAM. "Adaptation is the process and outcome whereby thinking and feeling people as individuals or groups used conscious awareness and choice to create human and environmental integration" (Roy, p. 26). According to the RAM, the goal of nursing is enhancing life processes to promote adaptation. The human adaptive system's coping strategies were the responses, innate or learned, that were used to achieve and maintain adaptation.

In the RAM model, the processes for coping are labeled regulator and cognator subsystems. The regulator and cognator subsystems are internal processes and cannot be directly observed. Input to the regulator coping subsystem elicits an automatic unconscious response and has a role in forming perceptions. The cognator coping subsystem responds through learning, problem-solving, and decision making (Roy, 2009).

While it is not possible to observe the functioning of the regulator and cognator subsystems directly, the responses that are created by them can be observed. The output behaviors that result from the coping processes can be observed in four adaptive modes. They are physiologic-physical, self-concept-group identity, role function, and interdependence modes. Adaptation can be observed through these four modes. The adaptive modes are interrelated. Anything that happens in one area of the adaptive human system affects the whole system and all of its parts. The self-concept adaptive mode involves the personal aspects of the human system. The basic need for this mode is psychic and spiritual integrity, the need to know who one is so that one can exist with a sense of unity (Roy, 2009).

One component of the self-concept adaptive mode is the physical self, including body image and body sensation. The other component is the personal-self, and consists of these three parts, self-ideal, moral-ethical-spiritual self, and self-consistency. Self-ideal concerns what a person would like to be or is capable of being. The moral-ethical-spiritual self is the aspect of the personal self which includes a belief system and evaluates who one is in relation to the universe. Self-consistency strives to maintain a consistent self-organization, to avoid disequilibrium, and has an organized system of ideas about oneself (Roy, 2009). For this study, the researcher explored the personal-self component of the self-concept adaptive mode of the RAM

The adaptive modes are ways of coping and maintaining the integrity of the person. Although the adaptive modes are interrelated, one mode can be assessed at a time (Andrews and Roy, 1986). Undergraduate students with a clearer self-concept

tended to make use of active and adaptive coping strategies, such as, planning and action (Smith, Zhan, Huntington, & Wethington, 1992). In the RAM, the adaptive mode concerning the personal aspect of the adaptive human system, is the self-concept mode. The personal self component of the self-concept is identified as a medium through which behavioral responses to stimuli are expressed. The behavioral responses are expressed through the physical self, which includes body sensations and body image and the personal self, which included self-consistency, self-ideal, and moral-ethical-spiritual self behaviors (Stein, 1995). "Internal perceptions and perceptions of others' reactions" formed the self-concept (Roy, 1999, p. 101). The sum of the beliefs and feelings held about oneself at a given time is the self-concept. Self-concept, or the perceptions that one holds of oneself, directs behavior.

Vicenzi and Thiel (1992) designed a study to describe college students' AIDS beliefs, condom beliefs, and behaviors related to AIDS prevention, then investigated the relationship between those variables and Roy's self-concept, role function, and interdependence adaptive modes. They used a quasi-experimental design to test their hypothesis that a 2-hour safer sex education module will change college students' AIDS beliefs, condom beliefs, sexual regard, and safer sex practices. The authors selected the RAM as the framework to increase understanding and direct inquiry. They chose the adaptive modes of self-concept, role function, and interdependence as relevant to their research. Self-concept was operationalized as self-esteem, interdependence as sexual regard, and contextual stimuli as AIDS beliefs and condom beliefs. Together those



adaptive modes were seen as possible determinants of the role function of safer sex practices (Vicenzi & Thiel).

Forty-nine 18 to 22 year old female (80%) and male (20%) Caucasian residence hall students comprised the sample for the study. The Rosenberg self-esteem scale was used to measure the self-concept mode and Vicenzi developed a 48-item questionnaire to measure interdependence. The Cochran-Mantel-Haenszel test was used to find differences in the experimental and control groups on AIDS beliefs, condom beliefs, and sexual regard. The same 49 survey subjects made up the treatment group ( $n = 22$ ) and the control ( $n = 27$ ) for the 2-hour safer sex workshop intervention. Data were collected by questionnaire, by the treatment and control groups, prior to the safer sex workshop and by mailed questionnaire four months after the workshop intervention (Vicenzi & Thiel, 1992).

Almost all (92%) of the subjects indicated that their beliefs about AIDS were enough to protect them from its transmission. Most (86%) were not embarrassed to use or to discuss condoms. Certain (98%) that they would not be insulted if their partner wanted to use one, one-third (33%) agreed they felt confident in using a condom, others (22%) were not confident, and others (27%) believed condoms were good for students to use. Regarding behaviors related to AIDS prevention, few (2%) avoided dating, some (18%) avoided sexual intercourse, most (82%) avoided high-risk partners, and few (14%) asked their partners about HIV status. The authors reported no significant correlations between AIDS beliefs, condom beliefs, and related AIDS prevention behaviors and Roy's self-concept, role function, and interdependence adaptive modes. Pretest and posttest

safer sex practices workshop intervention comparisons demonstrated no significant changes in college students' AIDS beliefs, condom beliefs, sexual regard, and safer sex practices (Vicenzi & Thiel, 1992).

Giovinco (1993) commented that a strength of the study was the emergence of self-esteem and sexual regard as two separate concepts, but correspondent to the self-concept and interdependence interrelated adaptive modes, as theorized by the RAM. The study provided material for the further direction of nursing research on primary prevention of AIDS on college campuses. There was a limiting lack of study data displayed. The presentation of each study was limited by the combined presentation of both.

Kuhns' (1997) concern at the paucity of published research on the consequences, for adult children of alcoholics (ACOA) who are college students, of growing up in an alcoholic family prompted the investigation of the consequence of emotional instability, observed as depression. Clinicians have used two different types of group therapy approaches in the treatment of ACOA with depression. One approach is the self-help groups and the other approach is group psychotherapy. Previous research findings reported that group psychotherapy was a superior treatment modality for ACOA who exhibited depression. Kuhns designed a quasi-experimental pretest-posttest interventional study to test the following two hypotheses. The mean depression score of ACOA who have attended psychotherapy groups will be less than the mean depression score of ACOA who attended self-help groups as measured by the Center for Epidemiologic Studies Depression Scale (CES-D). The aggregate mean of depression for

the psychotherapy and the self-help groups for ACOA will be less than the mean depression score for the control group of ACOA as measured by the CES-D.

The behaviors of the alcoholic parent(s) were the stimuli that prompt the cognator coping subsystem, in which ACOA could learn coping mechanisms from psychotherapy or self-help groups. In turn, coping produced behavioral responses related to the adaptive modes. Self-concept was influenced by the alcoholic family system. The greater the dysfunction, the greater the impact there was on the emotional stability of the ACOA. The goal of nursing was to enable a person to achieve the highest level of adaptation in a constantly changing environment. That adaptation achievement was group therapy (Kuhns, 1997).

The sample was 64 randomly assigned subjects, with 22 subjects in the psychotherapy group, 18 subjects in the self-help group, and 24 subjects in the control group. The treatment group was primarily female (85%), White (90%), single (100%), Catholic (63%), senior students (35%), and in a school of nursing (45%). The control group was primarily female (75%), Caucasian (92%), single (92%), Catholic (75%), sophomore students (38%), and in a school of nursing (29%). All subjects were ACOA, college students with no treatment history for depression, and between the ages of 18 to 25.

To identify ACOA, potential subjects took the Children of Alcoholics Screening Test (CAST). All subjects completed the CES-D. The test measured depressed mood in the general population, but not clinical depression. On the CES-D, the cut-off point for

depressed was 16. After 11 weeks of group therapy, all subjects again completed the CES-D (Kuhns, 1997).

The range of scores on pretest for the psychotherapy treatment group was 4 to 55 points, with a mean score of 22.36. On the posttest, the range was 5 to 38 points, with a mean score of 18.13. The change score was -4.23, which suggests that the psychotherapy group helps relieve symptoms of depression, which is a sign and symptom of an “inured” (p. 66) self-concept, for ACOA. The range of scores on pretest for the self-help treatment group was 7 to 50 points, with a mean score of 20.55. On the posttest, the range was 5 to 45 points, with a mean score of 14.27. The change score was -6.28, which suggests that the self-help group helps relieve symptoms of depressed mood for ACOA. Thus, the first hypothesis was not supported. Statistical significance was not reported (Kuhns, 1997).

The range of scores of the CES-D for the two treatment groups was 4 to 55, with an aggregate mean of 21.54 for the pretest. On the posttest, the range of scores of the CES-D was 5 to 45, with an aggregate mean of 16.39. The change score was -5.15, which is suggestive that group treatment reduces symptoms of depression. The range of scores of the CES-D for the control group was 1 to 45, with a mean of 14.67 for the pretest. On the posttest, the range of scores of the CES-D was 0 to 53, with a mean of 16.39. The change score was +1.83, which suggests that depressive symptoms were not reduced in the control group, but were increased. Therefore, the second hypothesis was supported. Statistical significance was not reported (Kuhns, 1997).

A strength of the study was that that the findings warrant further research since the results did not support group psychotherapy as a better treatment for depression in

ACOA. In addition, the findings encouraged the implementation of a longitudinal study. Kuhns (1997) pointed out that ACOA were prone to emotional instability, as observed by depressive symptoms, it might have strengthened the study to utilize an instrument that measured clinical depression rather than depression in the general population.

Modrcin-Talbott, Pullen, Zandstra, Ehrenberger, and Muenchen. (1998) believed that nursing needed to examine adolescent self-esteem in order to develop its own prevention and intervention strategies. Few nursing studies have investigated self-esteem directed by a nursing theory and fewer have used the RAM. Therefore, they constructed two research questions for a descriptive correlational study and examined the self-report of adolescents on self-esteem. Is there a difference in levels of self-esteem by age group, that is, early, middle, and late adolescence, gender, exercise participation, or smoking in a community sample of adolescents aged 12 to 19? What is the relationship between levels of self-esteem in a community sample of adolescents aged 12 to 19 and the variables of parental alcohol usage, depression, and anger?

The framework of the adaptive modes of the RAM, especially the self-concept adaptive mode guided Modrcin-Talbott et al.'s, research (1998). Although the physiologic, self-concept, role function, and interdependence adaptive modes are interrelated, one mode may be assessed at a time. According to the RAM, the adaptive modes were ways of coping and maintaining the integrity of the person. Further, Andrews and Roy (1986) agreed that self-esteem is part of each component of the self-concept adaptive mode. A person experienced varying degrees of self-esteem related to

the quality, number, and degree of stimuli with which the person was confronted (Modrcin-Talbott et al.).

The convenience sample included 140 adolescent subjects in all stages of adolescence who participated in youth activities at a church. There were 83 females (60%) and 56 males (40%). One subject did not report gender. Subjects were categorized as early adolescents (12 to 14 years,  $n = 38$ ), middle adolescents (15 to 16 years,  $n = 40$ ), and late adolescents (17 to 19 years,  $n = 38$ ). A demographic questionnaire and five research instruments were completed. They were the Coopersmith Self-Esteem Inventory (SEI), the Beck Depression Inventory (BDI), the Children's Depressive Inventory (CDI), the Children of Alcoholics Screening Test (CAST), and the State-Trait Anger Expression Inventory (STAXI) (Modrcin-Talbott et al., 1998).

The research question regarding how the level of self-esteem differs by age group, gender, exercise participation, or smoking in a community sample of adolescents aged 12 to 19 was analyzed by ANOVA. Only main effects and two-way interactions were examined due to the limited sample size. There were no significant differences found in self-esteem by age group, gender, or smoking. However, those who exercised regularly scored higher on self-esteem ( $M = 73$ ) than those who were non-exercising ( $M = 57$ ). In response to the second research question regarding the relationship between levels of self-esteem in adolescents aged 12 to 19 and the variables of parental alcohol usage, depression, and anger, there was no significant correlation between self-esteem and parental alcohol use. There was a significant negative correlation between self-esteem and both the CDI ( $r = -.74, p = .01$ ) and BDI scores ( $r = -.57, p = .01$ ). Finally, there was

a significant negative correlation between self-esteem and the STAXI's six components of anger expression ( $r = -.02, p = .001$ ) (Modrcin-Talbott et al., 1998).

Conducting nursing theory based research on a vulnerable population was a strong point of the study. The findings indicated that the adolescents who exercised had higher self-esteem scores which provided insight for a health promotion profile for a healthy adolescent. Choosing a sample of adolescents who attended church youth activities placed a limitation on the study. Conversely, that same choice might lead to future study replication in a diverse adolescent population.

### **Summary of the Roy Adaptation Model Self-Concept Literature**

In the RAM (Roy, 2009) model, the processes for coping are the regulator and cognator subsystems. The subsystems' coping strategies are the innate and learned responses used to achieve and maintain adaptation. The behaviors and adaptation that result from the coping subsystem processes can be observed in the adaptive modes. The self-concept adaptive mode is the mode that involved the personal aspects of the human system. The personal-self component consists of these three parts, self-ideal, moral-ethical-spiritual self, and self-consistency. The self-concept personal self component is identified as a means by which behavioral responses to stimuli were expressed. In addition, the personal self, self-concept component relates to the "value or worth one holds of oneself" (Roy, p. 330). For this study, the researcher proposed to explore the personal-self component of the self-concept adaptive mode of the RAM.

Vicenzi and Thiel (1992) investigated the relationship between those variables and Roy's self-concept, role function, and interdependence adaptive modes. Kuhns'

(1997) concern at the paucity of published research on the consequences, for adult children of alcoholics (ACOA), of growing up in an alcoholic family prompted her to investigate the consequence of emotional instability, observed as depression. Self-concept was influenced by the alcoholic family system. Modrcin-Talbott et al. (1998) believed that nursing needed to examine adolescent self-esteem in order to develop its own prevention and intervention strategies. Few nursing studies have investigated self-esteem directed by a nursing theory and fewer have used the RAM.

### **Synthesis of the Literature**

The review of the literature included an examination of quantitative and qualitative research and theoretical reviews on stress, stress in undergraduate nursing students, the PSS, hardiness, hardiness education, the HM, and the RAM, and self-concept. The review of the HM and the RAM demonstrated connections and conceptual collaboration. The general research on the PSS supported its use in this study. Review of the literature on self-concept adaptive mode of the RAM emphasized that interrelatedness of the variable self-concept, with other psychosocial factors. The concept of stress has been acknowledged and studied for many years, it is ever-present. Stress research continues to build on the work of Selye (Roy, 2009; Russell, 2007).

The existence of the concept of stress has long been acknowledged. Early stress research harkened back to Cannon and Selye. Theoretical stress research continues to build on the work of Selye. The most recent research focus is on the improvement of people's adaptation to and coping with stress. Suggestions for stress management from the literature include interventions from the integration of the theories of attachment and



goal orientation, a self-determination theory approach to understanding the experience of stress and people's response to stress, and that need satisfaction results in stress regulation and more active coping. Now and in the future, the construction of stress management techniques that constitute safe and effective approaches might benefit the eustressed and the distressed.

The nursing research literature abounded with claims of the stress of undergraduate nursing students. Stress among nursing students ranged from academic overload, frequent examinations, relationships with nursing faculty, to financing an education. Notwithstanding the inherent stress of life and the concomitant stress of nursing education, researchers sought ways for nursing students and faculty to identify stress, prevent it, and cope with the inevitable stress of nursing education.

Unmitigated stress led to psychological distress and nursing student attrition. Research suggested that female nursing students scored higher on stress than male nursing students. Since the majority of nursing students are female, the imperative to find ways to decrease stress is justified. Information regarding the sources of stress that undergraduate nursing students rate as distressing, and those sources of stress rated as helping them to achieve could promote positive adjustments in undergraduate nursing curriculum. Recent research suggests proactively informing nursing students about the potential stress of the nursing profession, advocates for inclusion of stress management course in nursing curriculum, and reduction of unnecessary stress.

Subsequently, among stress and coping researchers there surfaced the supposition that the impact of stress was determined by one's perception of stress. Measurements of

objective and subjective appraisals of stress were constructed. One such instrument was Cohen et al.'s (1983) PSS, which measured the degree to which situations in one's life in the past month were appraised as stressful. Data generated from the use of the PSS might be useful in guiding the development of stress management programs and health promoting interventions for undergraduate students.

Kobasa (1977) wondered about people who had experienced stressful life events and had not succumbed to the effects of stress and related illnesses. Those people demonstrated a personality characteristic that she labeled, hardiness. Commitment, control, and challenge were the three components of hardiness (Kobasa & Maddi, 1977). Early hardiness research findings suggested that, rather than warning people to avoid stressful situations, researchers would be able to devise ways to develop personality hardiness then teach hardiness skills as a pathway to effective coping. Subsequent hardiness studies emphasized hardiness as a stress resistance resource and that its commitment, control, and challenge, reflected the capacity to make adaptive interpretations when encountering stress. Further research findings suggested that healthcare organizations could apply the concept of hardiness, select hardy employees, and develop strategies to assist employees to increase their levels of hardiness in the workplace.

Convinced of the benefits of hardiness, Maddi (1987) decided to develop a hardiness education program, to teach the skills of the hardiness approach to stress management. The hardiness educational program was developed from research on people who exhibited hardiness and its components of control, commitment, and

challenge. The hardiness educational program was first offered to all male middle managers and then to high-risk undergraduates. Hardiness researchers have developed education programs adapted to female undergraduates and nurse managers. Hardiness education promoted adaptive coping and a pathway to resilience for people experiencing stressful changes. Hardiness education was an effective approach to stress management and the promotion of adaptive coping. Today the hardiness educational program is available to students and the general public as well. It is also delivered in an online format. The HM was the conceptual framework that guided the development of the hardiness educational intervention (Khoshaba & Maddi, 1999).

In the RAM model, the self-concept adaptive mode was identified as a medium through which behavioral responses to stimuli are expressed (Roy, 2009). While the published literature of the application of the self-concept adaptive mode of the RAM on undergraduate students was limited, there were studies that focused on college students' AIDS knowledge and beliefs and ACOA. Modrcin-Talbott et al. (1998) believed that nursing needed to examine adolescent self-esteem, as related to self-concept, in order to develop its own prevention and intervention strategies.

As the review of the literature evolved and grew, a foundation developed for the justification of this research study. The literature on stress was a re-education on the primary basis for wanting to approach the topic of hardiness in the discipline of nursing, among students. Likewise, stress in undergraduate nursing students in the literature was the platform on which to build the argument for the need for a hardiness educational intervention. There were gaps in the published studies on stress in undergraduate nursing

students that merited a closer investigation. Examination of the hardiness education studies supported that published research on a hardiness education intervention with baccalaureate nursing students had not been previously accomplished. That was assuring that the contribution of this study might be original. The hardiness research studies provided a historical context within which to frame the study. The reviews of previous research on the PSS and RAM, specifically, the self-concept adaptive mode highlighted a direction for the study.

### **Chapter Summary**

The review of literature consisted mainly of the concepts of stress, the stress of undergraduate nursing for students, the history of hardiness, a hardiness education, the Hardiness Model, and the self-concept adaptive mode of the RAM. This literature review was conducted by manual and computer-based search methods. Several databases were searched for journal articles, doctoral dissertations, and relevant texts regarding the topics of the literature review through the years of 1977 to 2011.

The reality of the concept of stress is ever-present. The nursing research literature was abundant with claims of the stress of undergraduate nursing students. Kobasa's (1977) wondered about those people who had experienced stressful life events and had not succumbed to the effects of stress and related illnesses. Those people demonstrated a personality characteristic that she labeled, hardiness. Commitment, control, and challenge were the three components of hardiness (Kobasa & Maddi, 1977). Early hardiness research findings suggested that researchers would be able to devise ways to develop hardiness as a pathway to coping. Original hardiness research encouraged the

development of a hardiness educational program. Today the hardiness educational program is available to students and the public as well. The review of the Hardiness Model and the Roy Adaptation Model demonstrated connections and conceptual collaboration. Review of the literature on self-concept adaptive mode of the RAM emphasized the interrelatedness of self-concept, with other psychosocial factors.

### Chapter III

#### Methodology

The purposes of this study were first to determine if an increase in hardiness and a decrease in perceived stress in baccalaureate nursing students occurred in those who participated in a hardiness educational intervention. Secondly, to compare hardiness and perceived stress between baccalaureate nursing students who participated and those who did not participate in a hardiness educational intervention. This chapter provides an overview of the methodology that guided this study. Topics that are covered in this chapter are research design, threats to internal and external validity, sample and setting, instrumentation, data collection, data analysis, additional analyses, and delimitations.

#### Research Design

A quasi-experimental non-equivalent control group design with pretest and posttest as shown in Table 1, was used for this study.

Table 1

*Quasi-experimental non-equivalent control group design with pretest and posttest*

(Experimental Group)	$O_{a,b}$	X	$O_{a,b}$
(Control Group)	$O_{a,b}$	-	$O_{a,b}$

Key: O = measurement  
 X = hardiness education  
 a = hardiness score  
 b = perceived stress score

The purpose of quasi-experimental research design is to examine cause-and-effect relationships between independent and dependent variables in which complete control was not feasible (Burns & Grove, 2009). The researcher explored if a hardiness educational intervention would increase the hardiness and decrease the perceived stress of nursing students in the experimental group compared to the hardiness and perceived stress of nursing students in a control group that did not participate in the hardiness educational intervention. The design was appropriate to answer the research questions posed by the study, since the researcher was examining the effects of an intervention. Quasi-experimental design helps to control threats to validity when at least one of the three components of true experimental design, including random sampling, control groups, and manipulation of the treatment, is lacking. According to Burns and Grove, internal validity is the extent to which the effects of the manipulation of the independent variable occurred due to a treatment rather than the result of other extraneous variables. External validity is concerned with the extent that a research study's findings could be generalized beyond the sample used in the study (Burns & Grove).

The nonequivalent control group design generally is interpretable since it rules out most, but not all, threats to internal validity. The threats to internal validity that remained and were addressed were: self-selection bias, maturation, instrumentation, statistical regression, testing, history, mortality, and diffusion or imitation of treatments. The threats to external validity that were addressed were interaction of selection and treatment and reactive arrangements (Burns & Grove, 2009; Campbell & Stanley, 1963; Cook & Campbell, 1979).

### **Threats to Internal Validity**

According to Campbell and Stanley (1963), in quasi-experimental non-equivalent control group design, in which the experimental and control groups are alike in recruitment and the pretest scores confirmed the equivalence, the design controls for the “main effects of history, maturation, testing, and instrumentation” (p. 48). The researcher had to think through how each of the internal validity threats might have influenced the data. Then the researcher had to examine the data to assess which threats could be ruled out (Cook & Campbell, 1979).

#### **Self-Selection Bias**

A selection threat more likely occurs in studies in which there is a non-random sample. Selection addressed the process by which subjects were chosen to take part in a study and how subjects were grouped within a study (Burns & Grove, 2009). Since students self-selected to participate or not to participate in the study, this threat was not controlled. Conversely, since randomization assures unbiased assignment and the study lacked randomization, the threat still existed (Campbell & Stanley, 1963). Nevertheless, in an effort to reduce the threat and ensure that the experimental and control groups were similar, independent *t*-tests were computed on pretest hardiness and pretest perceived stress scores to assure comparability of the experimental and control groups prior to any intervention. There were no significant differences between the groups on either dependent variable. If the groups had significantly different pretest scores, then all pretest and posttest scores would have been standardized prior to data analyses. Standard statistical packages, such as, Statistical Package for Social Sciences (SPSS) make



correcting for self-selection bias attainable; however, this was not necessary since the two groups were equivalent.

### **Maturation**

The threat of maturation occurs when an observed effect is due to research subjects growing older, wiser, and more experienced between the pretest and posttest, when the maturation is not the researcher's intent (Cook & Campbell, 1979), and the effect of unplanned and unrecognized changes influence study findings, not the effect of the treatment (Burns & Grove, 2009). The experimental and control groups were exposed to the same expected developmental processes that could produce changes, which decreased the threat of maturation. If the study had lasted for months or years, subjects' hardiness might have increased and their perceived stress decreased regardless of treatment. It was anticipated that the nursing students would mature; however, the research study was conducted over a 7-week period, including a pretest week, 5-weeks of the intervention, and a posttest week, which contributed to the reduction of the threat of maturation. All data collection took place during the same time intervals. That is, there were 5-weeks between pretest and posttest, for the experimental and control groups.

### **Instrumentation**

Effects can be due to changes in the measurement instruments between the pretest and the posttest (Burns & Grove, 2009). Instrumentation is a threat when an effect is not due to a treatment or an intervention, but due to a change in a research instrument (Cook & Campbell, 1979). To reduce the chance of this potential threat, only instruments with known reliability and validity were used for this study. The same instruments were used

for pretest and posttest and were administered by the researcher. The length of time between pretest and posttest was seven weeks, which also controlled for the instrumentation threat.

### **Statistical Regression**

According to Burns and Grove (2009), statistical regression is the movement of extreme scores toward the mean in studies using a pretest-posttest design. It operates to increase low pretest scores or to decrease high pretest scores due to measurement error. For this study, the potential existed for the high and low pretest scores to regress to the mean by chance effects and not as a treatment effect of the hardiness educational intervention. This threat was reduced by using reliable research instruments. Statistical regression was reduced by adding a control group (Campbell & Stanley, 1963). This threat was further reduced by examining raw data for extreme scores so as to exclude them from analysis; however, this was not necessary. The experimental and control groups' pretest hardiness and perceived stress mean scores were similar which minimized the statistical regression threat.

### **History**

The threat of history describes an event that occurred during the time of the study (Burns & Grove, 2009). It is a threat when an observed effect might be due to an event, not related to the study, which took place between the pretest and the posttest. To decrease this threat, the researcher was aware of the events taking place in the departments, divisions, and schools of nursing that might have added to the stress of undergraduate nursing education. In addition, the researcher constructed a demographic

data questionnaire posttest regarding significant events at the participating schools. Some examples included a change in faculty or a National League for Nursing Accreditation Commission (NLNAC) or Commission on Collegiate Nursing Education (CCNE) site visit during this study.

The researcher was aware that one participating nursing program was preparing for a scheduled NLNAC site visit and another for a scheduled CCNE site visit, during the time of the study. Nursing students made the researcher aware of events that were occurring within the time period of the study. They described pre-registration and registration events, classmates leaving the nursing program, nursing examinations during the time of the study, and content delivery by several different faculty. In addition, events may have occurred in the experimental and control nursing programs of which the researcher did not know.

### **Mortality**

Subjects who withdraw from a study before its completion represent the mortality threat (Burns & Grove, 2009). In an effort to reduce this potential threat, the researcher traveled to the accredited nursing programs and the study was conducted in nursing classrooms or other suitable spaces. To decrease the threat of mortality, a thorough explanation of the research study was given and questions were answered completely. The use of incentives was expected to help control for mortality. The researcher provided food and beverage at lunchtime for the experimental group each week of the study. The control group had food and beverage provided in the pretest and posttest weeks. Tokens of encouragement, such as, pens, post-it notes, door prizes, and raffles

were offered to the experimental group during each week of the study and to the control group during the first and last weeks of the study. The subjects also received a certificate of appreciation, upon completion of the posttest data collection. In addition, to control for this possible threat, the researcher increased the size of the sample and oversampled by 20% (Light, Singer, & Willett, 1990). In spite of the aforementioned measures to reduce mortality, it remained a threat. There were 13 experimental and 4 control research subjects who withdrew from the study.

### **Testing**

The effect of being measured or tested a number of times allows the subject to remember responses and modify them (Cook & Campbell, 1979). Familiarity with the test itself may have influenced the subject's attitudes and knowledge and effects may have been due to re-testing rather than the hardiness educational intervention. For this study, this threat was minimally controlled since the same instruments were used for the pretest and posttest. However, it was unlikely that the subjects would have recalled their specific answers six weeks after the pretest.

### **Diffusion or Imitation of Treatments**

The threat of diffusion or imitation of treatments exists when the control group gains access to the treatment or information intended for the experimental group (Burns & Grove, 2009). For this study, the diffusion or imitation of treatments threat was controlled. Half of the accredited nursing programs were selected for the experimental group and the other half of accredited nursing programs were selected for the control group. Acknowledging the presence of instant communication, using different intact

nursing programs for the experimental and control groups limited the opportunity for the groups to communicate and any interaction between the groups.

### **Threats to External Validity**

#### **Interaction of Selection and Treatment**

According to Burns and Grove (2009), the threat of interaction of selection and treatment exists if there are potential subjects who are eager volunteers, which makes generalizing the findings of the research study to an entire population hard to justify. Even though all the subjects were nursing students, those who volunteered might have been those who possessed more hardiness and less perceived stress. To control for this threat, this study was planned to limit the demands on the time of subjects and hopefully improve participation from students who otherwise might not have volunteered to participate. One way to reduce this threat is to make participation and cooperation in the study as convenient as possible (Cook & Campbell, 1979).

In order to make the study more convenient for subjects, the researcher chose to teach only the hardicoping foundational component of the hardiness educational program, which was five weeks in length. Teaching each of the five components of the hardiness educational intervention separately was an approved method for presenting the hardiness approach to stress management content (Khoshaba & Maddi, 2008). In addition, the study was conducted in nursing classrooms where food and beverage were provided.

#### **Reactive Arrangements**

According to Campbell and Stanley (1963), a source of the threat of reactive arrangements is the subjects' knowledge that they are participating in a research study.

Their responses can also be affected by their participation in a research study. This threat risked the generalizability of the study. Campbell and Stanley's solution is to randomize whole classrooms to either the experimental or control groups. The researcher's selection of certain accredited nursing programs for the experimental and control groups attempted to control for this threat.

### **Sample and Setting**

#### **Characteristics of the Sample**

The sample for this study was a non-probability convenience sample of female and male full-time junior level baccalaureate nursing students attending accredited nursing programs within the Delaware (DE), New Jersey (NJ), and Pennsylvania (PA), tri-state area within a 70-mile radius of the researcher's residence. The accredited nursing programs were selected from the lists of baccalaureate nursing programs cited on the respective State Boards of Nursing Websites ("Baccalaureate Schools-Nursing Program". 2009; "DE Nursing Programs". 2009; "Registered Nursing Programs". 2011). Ten of the 22 potential nursing programs in the DE, NJ, and PA area responded with letters of support for the accession of their nursing students. Eight institutions gave Institutional Review Board (IRB) approval. One nursing program while expressing support suggested that the researcher access the nursing students at a Student Nurse Association of Pennsylvania (SNAP) convention and another institution's IRB did not respond to the researcher's inquiries.

For inclusion in the study, the subjects were enrolled full-time in clinical nursing courses, at the junior level. One subject was removed from the study due to part-time

enrollment. Full-time baccalaureate nursing students who already held a bachelor degree were included in this study. While subjects with a previous bachelor degree would have already experienced the stress of achieving an undergraduate degree, they had not experienced the stress of baccalaureate nursing education.

### **Sample Size**

The minimum number of subjects needed in this study was determined by a priori power analysis using Sample Power version 2.0 (SPSS, 2004). The required minimum sample was 102 subjects with 51 subjects in the experimental and control groups, respectively. Planning for oversampling and an estimated 20% attrition rate, an additional 10 subjects in both the experimental and control groups were needed (Light et al., 1990). Therefore, 61 subjects were needed in each group, which yielded a total projected sample of 122. The level of significance was set at  $p \leq .05$  one-tailed, since the hypotheses were directional. The significance level was chosen to limit Type I error to 5%. A Type I error occurs when a true null hypothesis is rejected (Munro, 2005). The power level of .80 was selected since it was the desirable and recommended level (Cohen, 1988) to limit the chance of a Type II error to .20 (Light et al., 1990). A Type II error occurs when a false null hypothesis is accepted (Munro, 2005).

According to Cohen, the effect size is treated as a factor that takes the value of zero when the null hypothesis is true and a nonzero value when the null hypothesis is false. The effect size acts as a guide to the measure of separation from the null hypothesis. A medium effect size will give sufficient evidence to support or refute the

hypotheses (Light et al.). Therefore, the medium effect size of .50 was estimated to be adequate to detect differences between groups.

The initial sample included 99 subjects (experimental group  $n = 54$ ; control group,  $n = 45$ ). The final sample size in this study was 79 subjects (experimental group  $n = 40$ ; control group  $n = 39$ ), which was less than the minimum required sample size of 102 subjects with the minimum of 51 subjects for each research group, needed for a power of .80. The actual power for statistical analysis in this study was .72, which yielded a Type II error risk of .28 (Munro, 2005). The actual size of the sample for this study was not adequate to avoid a Type II error.

Table 2 includes the number of subjects at each data collection site.

Table 2

*Number of Subjects at Data Collection Sites (N = 79)*

Group	Pretest	Posttest	Withdrew	Removed	Final
Experimental site 1	16	12	4	0	12
Experimental site 2	1	1	0	1	0
Experimental site 3	25	16	9	0	16
Experimental site 4	12	12	0	0	12
Total	54	41	13	1	40
Control site 1	34	30	4	2	28
Control site 2	11	11	0	0	11
Total	45	41	4	2	39

The researcher initially collected data at three experimental and two control sites. In order to obtain additional nursing students subjects, a fourth site was added for the



experimental group. Therefore, data were collected at four experimental group sites.

There were a third and fourth control group sites, but no subjects were recruited.

### Description of the Sample

The final sample ( $N = 79$ ) included the experimental group ( $n = 40$ ) and the control group ( $n = 39$ ). The sample was predominantly female (97.5%), white (63.3%), non-Hispanic (94.9%), not married (78.5%), and indicated that English was their primary language (89.9%). Ages ranged from 19 to 50 years ( $M = 25.72$ ,  $SD = 7.89$ ). The mean age differed slightly between the experimental ( $M = 24.10$ ,  $SD = 7.39$ ) and the control group ( $M = 27.38$ ,  $SD = 8.13$ ). The average number of hours worked weekly varied in the experimental ( $M = 8.25$ ,  $SD = 11.75$ ) and control ( $M = 14.13$ ,  $SD = 13.07$ ) groups. Statistical details of the descriptive statistics for the continuous demographic data are displayed in Table 3.

Table 3

#### *Descriptive Statistics of Continuous Demographic Data ( $N = 79$ )*

Variable	Total Sample $N = 79$	Experimental Group $n = 40$	Control Group $n = 39$
<b>Age (in years)</b>			
Mean	25.72	24.10	27.38
Std. Deviation	7.89	7.39	8.13
Range	19-50	19-50	20-49
<b>Average hours worked weekly</b>			
Mean	11.15	8.25	14.13
Median	6.00	4.00	10.00
Std. Deviation	12.69	11.75	13.07
Range	0-40	0-40	0-40

The frequencies and percents for categorical demographic data characteristics are presented in Table 4.

Table 4

*Frequencies and Percents of Categorical Demographic Data (N = 79)*

Variable	Total Sample <i>n</i> (%)	Experimental Group <i>n</i> (%)	Control Group <i>n</i> (%)
<b>Gender</b>			
Female	77 (97.5)	39 (97.5)	38 (97.4)
Male	2 (2.5)	1 (2.5)	1 (2.6)
<b>Race</b>			
White	50 (63.3)	23 (57.5)	27 (69.2)
African American	19 (24.1)	12 (30.0)	7 (17.9)
Asian	4 (5.1)	2 (5.0)	2 (5.1)
Other	6 (7.6)	3 (7.5)	3 (7.7)
<b>Hispanic/Latino</b>			
Yes	4 (5.1)	2 (5.0)	2 (5.1)
No	75 (94.9)	38 (95.0)	37 (94.9)
<b>Primary language *</b>			
English	71 (89.9)	39 (97.5)	32 (82.1)
Other	6 (7.6)	1 (2.5)	5 (12.8)
<b>Marital status</b>			
Not married	62 (78.5)	34 (85.0)	28 (71.8)
Married	10 (12.7)	3 (7.5)	7 (17.9)
Partnered	1 (1.3)	1 (2.5)	0 (0.0)
Separated	1 (1.3)	0 (0.0)	1 (2.6)
Divorced	5 (6.3)	2 (5.0)	3 (7.7)
<b>Transfer student</b>			
Yes	34 (43.0)	11 (27.5)	23 (59.0)
No	45 (57.0)	29 (72.5)	16 (41.0)

(continued)

Table 4 continued

Variable	Total Sample <i>n</i> (%)	Experimental Group <i>n</i> (%)	Control Group <i>n</i> (%)
<b>International student</b>			
Yes	3 (3.8)	1 (2.5)	2 (5.1)
No	76 (96.2)	39 (97.5)	37 (94.9)
<b>Associate degree</b>			
Yes	13 (16.5)	6 (15.0)	7 (17.9)
No	66 (83.5)	34 (85.0)	32 (82.1)
<b>Bachelor degree</b>			
Yes	7 (8.9)	1 (2.5)	6 (15.4)
No	72 (91.1)	39 (97.5)	33 (84.6)
<b>Employed in health care</b>			
Yes	24 (30.4)	10 (25.0)	14 (35.9)
No	55 (69.6)	30 (75.0)	25 (64.1)
<b>Capacity of health care employment</b>			
Nursing assistant	10 (12.7)	3 (7.5)	7 (17.0)
EMT	1 (1.3)	1 (2.5)	0 (0.0)
Other**	15 (19.0)	7 (17.5)	8 (20.5)

*Note.* \* Indicates missing data.

\*\* Two subjects' responded no employment in health care, but indicated a capacity in health care employment.

There was gender parity with one male in the experimental group (2.5%) and one male in the control group (2.6%). There was little variability among the demographic characteristics for the research groups except on race, health care employment, and capacity in health care employment. The variables of English as primary language,

marital status, transfer student, and previous bachelor degree had more variation between the experimental and control groups.

### **Description of Setting**

The researcher planned that the setting for data collection would be nursing classrooms, or other suitable spaces, in several NLNAC or CCNE accredited baccalaureate nursing programs in the DE, NJ, and PA tri-state area within a 70-mile radius of the researcher's residence. The actual nursing classroom settings varied among the data collection sites. A conference room was the setting for the experimental site 1, as the nursing classroom was already scheduled for use. Nevertheless, the conference room proved adequate and was used each week of the study. At the experimental site 2, the classroom was an auditorium for the first week of the study and thereafter, the location changed two times during the study.

The nursing classroom, an auditorium, at experimental site 3 remained the same throughout the study, but the classroom for the nursing course changed. At experimental site 4, a nursing conference room was provided for the study. The location changed once during the study. An auditorium and a large nursing classroom were the settings for the study at the two control group sites. The researcher was able to accommodate to all the settings provided for the presentation of the hardiness educational intervention and the food and beverage was provided for the nursing students.

### **Instrumentation**

The researcher collected descriptive data about the subjects using a Demographic Data Questionnaire Pretest (Appendix C) and a Demographic Data Questionnaire Posttest

for the experimental group (Appendix D) and a Demographic Data Questionnaire Posttest for the control group (Appendix E). The research instruments that were used for this study were the Personal Views Survey III-R (PVS III-R) to measure hardiness and the hardiattitudes of commitment, control, and challenge (Maddi & Khoshaba, 2001a) and the Perceived Stress Scale (Cohen et al., 1983) to measure perceived stress. These instruments were completed pretest and posttest.

#### **Demographic Data Questionnaire Pretest-Both Groups**

The Demographic Data Questionnaire Pretest was a collection of descriptive features and characteristics of the subjects in the study to describe the sample (Burns & Grove, 2009). The Demographic Data Questionnaire Pretest had 15 items. The questions inquired about personal characteristics such as, age, gender, race, marital status, year in school, and student enrollment status. The items were written at the nominal, ordinal, interval, and ratio levels of measurement.

#### **Demographic Data Questionnaire Posttest**

**Experimental group.** The Demographic Data Questionnaire Posttest for the experimental group had five items regarding attendance at hardiness education sessions, stressful personal life events and significant stressful school events during the time of the research study, and a rating of the helpfulness of the hardiness educational intervention. The items were written at the nominal and interval levels of measurement.

**Control group.** The Demographic Data Questionnaire Posttest for the control group had two items regarding stressful personal life events and significant stressful

school events that occurred during the extent of the research study. The items were written at the nominal level of measurement.

### **Personal Views Survey III-R**

**Description.** The original measure of hardiness, the Personal Views Survey, was part of Kobasa's (1977) doctoral dissertation study. It consisted of six available scales from other tests that seemed relevant to commitment, control, and challenge. The questionnaire was criticized due to the use of one of the scales used to measure challenge (Funk & Houston, 1987; Hull, Van Treuren, & Virnelli, 1987). The Personal Views Survey, Second Edition (PVS II) and then the Third Edition (PVS III) were developed and included only items written for relevance to hardiness, rather than including scales already in use for other purposes. The Personal Views Survey, Third Edition-Revised (PVS III-R) avoided the difficulties of the previous surveys (Maddi & Khoshaba, 2001a).

The PVS III-R was used for this study. Maddi (2005) recommended the usefulness of evaluating hardiness by administering the PVS III-R to people who were likely to experience stress due to their education, work, or social patterns. The PVS III-R was an 18-item hardiness measurement questionnaire developed by Maddi et al. (2006). In developing the PVS III-R, many scale items were composed to express aspects of commitment, control, or challenge beliefs. Subjects responded to each item on a 4-point Likert scale from 0 = not at all true to 3 = very true. The hardiness components of commitment, control, and challenge were each measured by three positively and three negatively worded items (Maddi et al.). The positively and negatively worded items, for each component, are identified in Table 5.

Table 5

*Personal Views Survey III-R*

<u>Hardiness Component</u>	<u>Positively Worded Items</u>	<u>Negatively Worded Items</u>
Commitment	3, 11, 14	7, 15, 18
Control	1, 6, 9	2, 5, 13
Challenge	8, 16, 17	4, 10, 12

**Validity.** Confirmatory factor analysis (Kline, 1998) was computed on the PVS III and the PVS III-R. An estimate of the factor loadings on commitment, control, and challenge on total hardiness in the PVS III-R were .87, .76, and .67, respectively (Maddi et al., 2006). In further evaluation of construct validity, several tests of emotion measures, the Center for Epidemiological Studies, Depression Scale ( $r = -.47, p < .001$ ), the Cook-Medley Hostility Scale ( $r = -.40, p < .001$ ), the Taylor Manifest Anxiety Scale ( $r = -.26, p < .01$ ), and the Impact of Events, Avoidance of Intrusive Thoughts Scale ( $r = -.28, p < .01$ ) were included along with the PVS III-R, for comparison. The tests emphasized subjects' perceptions of and attitudes toward themselves, others, and circumstances. The tests were negatively related to hardiness. That was consistent with the view that hardiness was the existential courage that helped one avoid blaming oneself or others when stresses mounted (Maddi, Harvey, Khoshaba, Fazel, & Resurreccion, 2009b).

**Reliability.** Maddi and Khoshaba (2001) noted that studies have shown the PVS III-R to have internal consistency reliability ranges for commitment from .70 to .75, for control from .61 to .84, for challenge from .60 to .71, and for total hardiness from .80 to

.88. Test-retest reliability for total hardiness was reported at .58 over a three-month period and was reported at .57 over a six-month period. To establish internal consistency reliability, estimates of the latent construct (Nunnally, 1978) of hardiness were obtained for both the 30-item PVS III and the 18-item PVS III-R. The co-efficient alpha .80 was the same for both tests. On the PVS III, the co-efficient alphas for the three components were commitment .69, control .57, and challenge .69. On the PVS III-R, the co-efficient alphas for the three components were commitment .69, control .57, and challenge .73. The internal consistency reliability of total hardiness, the Cronbach alpha coefficient was .74 (Maddi et al., 2006). The PVS III-R showed the expected pattern of positive correlations of commitment .82, control .74, and challenge .76 with hardiness.

When “testing multifaceted constructs, such as, hardiness most researchers have opted to use the total score approach” (Cole, Feild, & Harris 2004, p. 70). However, Cole et al. (2004) noted that analyzing only total hardiness scores resulted in the innate loss of statistical information, since the outcome is based solely on a the total score. In addition, using statistical analyses of the commitment, control, and challenge component subscales had another problem, that of increased likelihood of capitalizing on chance.

**Reliability for current study.** As previously noted, the Hardiness Institute Inc. has proprietary rights over the scoring of the PVS III-R and supplied the researcher with the Cronbach alpha coefficient for internal consistency reliability for the posttest hardiness measurement. Therefore, Maddi computed the Cronbach alpha coefficient for internal consistency reliability, using data from this study and sent it to the researcher. The internal consistency reliability on total hardiness scores was .76. The alpha



coefficients were below the minimum acceptable level of .70 at .61 for commitment, .39 for control, and .52 for challenge, which suggested that the PVS III-R items were not reliable measures of commitment, control, and challenge (Burns & Grove, 2009). The reliability coefficients of the components of hardiness, that is, commitment, control, and commitment supported the hardiness literature that suggested reporting only the reliability of total hardiness scores and dissuaded separating out the hardiattitudes as subscales (Cole et al., 2004). The total alpha coefficient on total hardiness scores suggested that the PVS III-R was an adequate measurement of hardiness.

**Scoring.** The scoring algorithm of the PVS III-R was the intellectual property of “The Hardiness Institute, Incorporated” (n.d.). They have proprietary rights to the scoring algorithm and it was not available to researchers (S. R. Maddi & D. M. Khoshaba, personal communication, April 22, 2010). The possible range of scores for total hardiness was 18 to 54 with higher scores reflecting greater hardiness. The ranges of scores for commitment, control, and challenge were 6 to 18. Higher scores reflect greater commitment, control, and challenge.

The researcher entered each subject’s responses online and immediately received a report of the raw scores on total hardiness, commitment, control, and challenge. Each test administration remains in the researcher’s personal online database for perusal at any time. The Hardiness Institute Incorporated provides a manual with the percentile rank averages for the raw scores. Hardiness scores in the 40% to 60% range are interpreted as average. Scores above or below that range suggest ample or insufficient hardiness, respectively. The PVS III-R measures hardiness as a continual dimension. Individuals

will vary in their levels of hardiness along a continuum from low to high, with a relatively small percentage scoring at the extreme low/high ends. The PVS III-R manual provided the researcher with the information needed to perform the necessary statistics on the data (Khoshaba & Maddi, 2008).

### **Perceived Stress Scale (PSS)**

**Description.** The Perceived Stress Scale (PSS) was used for this study. Cohen et al. (1983) developed the PSS. The PSS was designed to measure the degree to which situations in one's life were appraised as stressful. The PSS was brief and easy to administer. Cohen et al. suggested the PSS for use as an outcome measure of experienced levels of stress. The PSS provided a potential tool for examining issues about the role of appraised stress levels in the cause of disease and behavioral disorders (Cohen et al.).

The PSS was a 14-item instrument using a 5-point Likert scale with 0 = never to 4 = very often. In addition to the original 14-item instrument, there was a 10-item version (PSS 10) (Cohen & Williamson, 1988) and a 4-item version of the PSS (Cohen et al., 1983). The PSS 10 was a 10-item questionnaire that measured people's evaluation of stress in the past month of their lives. The short 4-item scale could be made from questions 2, 4, 5, and 10 of the PSS 10-item scale (Cohen & Williamson, 1988). For this study, total scores on the original 14-item PSS were used in the data analysis.

**Validity.** Cohen et al. (1983) stated that convergent construct validation data were collected on three samples. They expected the PSS to be a better predictor of health outcomes, that is, depressive symptoms and physical symptoms. Sample 1 was 332

freshmen undergraduates, sample 2 was 114 undergraduates in an introductory psychology class, and sample 3 was 64 participants in a smoking cessation program. Subjects completed five different instruments. One measured stressful life events, another social anxiety, the third depressive symptoms, the fourth physical symptoms, and finally perceived stress. The PSS scores were a better predictor of health outcomes, in Sample I ( $r = .52, p < .001$ ); in Sample II ( $r = .65, p = .001$ ); and in Sample III ( $r = .70, p < .001$ ) than the stressful life-event scores (Sample I,  $r = .23, p < .001$ ; Sample II,  $r = .32, p = .001$ ; and Sample III,  $r = .51, p < .001$ ).

**Reliability.** The PSS had adequate internal consistency and test-retest reliability. The alpha coefficient reliability for the PSS was .84, .85, and .86 in each of the three samples. Test-retest intervals for the PSS were two days and six weeks. For a state measure, such as the PSS, test-retest correlations ought to be higher for short retest intervals than for longer ones. The test-retest reliability over two days was .85 for 82 college students. The 82 undergraduates were from among the freshmen subjects in sample 1 and the subjects in the psychology class from sample 2. The test-retest reliability was only .55 for the 64 subjects in the smoking-cessation group who were retested after six weeks (Cohen et al., 1983).

**Reliability for the current study.** Internal consistency reliability was assessed using Cronbach's alpha coefficient. For the pretest, the alpha coefficient was .77 for the experimental group and .88 for the control group. For the posttest, the alpha coefficient was .88 for the experimental group and .84 for the control group. All internal consistency

reliability coefficients were above the minimum acceptable level of .70 (Burns & Grove, 2009).

**Scoring.** Scores on the PSS were obtained by reversing the scores on the seven positive items, which were, 4, 5, 6, 7, 9, 10, and 13, and then summing the scores across all 14 items. Total scores could range from 0 to 56. A higher score on the PSS indicated a higher level of perceived stress (Cohen et al., 1983).

### **Data Collection**

#### **Protection of the Rights of Human Subjects**

The researcher submitted an application for review of protection of the rights of human subjects and received approval to conduct the study from the Widener University IRB. The researcher also submitted for review of protection of the rights of human subjects and received approval to conduct the study from the Research and Ethics Review Boards (RERB) and IRBs at the other accredited programs of nursing that agreed to participate in the study.

**Risks.** The subjects, in the experimental group, experienced a minimal risk of social pressure to complete the hardiness educational course. To manage or control this risk subjects could withdraw from the study at any time, for any reason, and without loss or penalty to their nursing course or clinical grade. There were minimal to no foreseeable risks of harm or injury to subjects occurring as a result of participation in this research study. There were minimal to no foreseeable risks regarding invasion of privacy and loss of confidentiality.

**Benefits.** There were no direct benefits of participating in this study. A potential benefit from this study was the subjects' increased understanding of the research process and the opportunity to learn the findings of the study. Students in the experimental group could have benefited personally from the hardiness educational program.

**Privacy, confidentiality, and anonymity.** All information collected in this study was kept strictly confidential. Data collected in this research were coded so that subjects' identities could not be linked to their responses, to protect subjects' anonymity. The subjects were given directions to create their own code, which was the subject's mother's first initial, last initial, and last four digits of the subject's home phone number. The codes were recorded on the demographic data questionnaires and research instruments, pretest, and posttest. Raw data were accessible only to the researcher and the dissertation committee members. Subjects' identities will remain anonymous in any presentations, reports, or publications that result from this study.

**Data storage.** The data collected for this study and consent forms were kept in a locked cabinet in the researcher's locked office in the researcher's home. Flash drives were password protected. Raw data will be destroyed by shredding, one year after publication of the study. The computer file with anonymous raw data will be kept indefinitely.

**Informed consent.** The researcher traveled to the accredited nursing programs to obtain informed consent from the potential subjects. There were separate written consent forms for the experimental group (Appendix F) and the control group (Appendix G). Informed consent was acquired after the study was thoroughly explained to the potential

subjects and they had the opportunity to ask questions. The study, the background, benefits, risks, alternatives, confidentiality, termination, and compensation were explained to the potential subjects in written and verbal form. Subjects signed two informed consent forms and kept one as their own personal copy. The Flesch-Kincaid Readability reading level of the language of the informed consent form was grade 12, which was acceptable for this study sample, since the potential subjects were college and university students.

**Compensation.** The subjects in the experimental and control groups were compensated with food and beverages for each week they participated in this study. Tokens of encouragement, such as, pens and post-it notes were distributed to all subjects. Each week, the researcher raffled off a prize of a \$10.00 Wawa card and there was a grand prize of \$50.00 cash the last week. Even if a subject had won a weekly raffle prize, the subject was eligible to win the remaining weekly prizes. Each week that subjects were present for the study, they received an additional raffle ticket chance for the final drawing of the grand prize. Upon completion of the posttest data collection, they also received a certificate of appreciation (Appendix H) as a gesture of gratitude.

**Alternative therapies or procedures.** The alternative procedure was not to participate in the study.

### **Data Collection Procedures**

For access to subjects for this study, the researcher contacted the Deans, Chairs, and Directors of baccalaureate nursing programs within the DE, NJ, and PA tri-state area (Appendix I). The names and addresses were available from lists obtained from the DE,

NJ, and PA State Boards of Nursing Websites (“Baccalaureate Schools-Nursing Program”, 2009; “DE Nursing Programs”, 2009; “Registered Nursing Programs”, 2011).

The researcher made initial contact by letter to ask permission to access their students for this study. After one week, the researcher followed up through e-mail and telephone contact. If permission were given, the researcher followed the institutions’ IRB procedures, after obtaining approval from Widener University IRB.

Following permission from the Deans, Chairs, and Directors and IRB approval of the institutions, the researcher asked nursing faculty (Appendix J) for permission for time to speak to their students at the end of a class to explain the study, answer questions, and recruit subjects. The researcher arranged for the use of a classroom, or another suitable space, for one hour over lunchtime for the extent of the study. Data collection commenced in the Fall 2011 semester, in nursing classrooms, at lunchtime. The data collection procedure is displayed in Table 6.

Table 6

*Data Collection Procedure*

	Measurement of Dependent Variables (Hardiness and Perceived Stress)	Manipulation of Independent Variable (Hardiness Educational Intervention)	Measurement of Dependent Variables (Hardiness and Perceived Stress)
Experimental Group	Pretest Week 1	Intervention Weeks 2 to 6	Posttest Week 7
Control Group	Pretest Week 1		Posttest Week 7

The researcher provided food and beverages for the subjects. The first accredited nursing program to respond favorably was a site whose nursing students were in the experimental group and received the hardiness educational intervention. The second accredited nursing program to respond favorably was a site whose nursing students were in the control group and did not receive the hardiness educational intervention. The process continued until the researcher exhausted the number of nursing programs that agreed to participate.

**Experimental group.** The researcher traveled to the accredited nursing programs that agreed to allow their junior nursing students to be invited to participate in the study. The study was explained and questions were answered. There was an outline for the experimental group (Appendix K) and one for the control group (Appendix L). The students then signed the consent forms. These forms were collected and placed in an envelope which was sealed and kept in a locked cabinet in the researcher's home. The subjects were given directions to create their own codes to write on the research instruments. The code was each subject's mother's first initial, last initial, and last four digits of the subject's home phone number.

Each subject completed the demographic data questionnaire pretest, the pretest PVS III-R, and the pretest PSS questionnaires. The pretests were collected, placed in a second envelope, and returned to the researcher. This process took approximately 45 minutes. To maintain students' anonymity, consent forms and research questionnaires were collected and stored separately. The researcher distributed flyers with a timeline of



the dates, times, and places of the five hardiness educational intervention sessions and the posttest data collection session.

The researcher returned, once a week, for 5 weeks, weeks 2 to 6 of the study, to teach the subjects the hardicoping component of the hardiness educational intervention. The time commitment for each session was 1-hour. Participating faculty and subjects provided their e-mail addresses. Each session of the coping component of the hardiness educational intervention was to be one hour in length. The researcher modified the method of delivering the hardiness program by not planning for weekly discussions sessions. Prior to each session, the researcher contacted the experimental group via e-mail blind carbon copy to remind the subjects of the next session, and that lunch would be provided. In addition, the cooperating faculty were contacted. Motivational messages, based on the content of the hardiness educational intervention, were e-mailed blind carbon copy twice a week to each of the experimental groups. Subjects were encouraged to attend all of the sessions; however, subjects' absence was acceptable.

The researcher's decision to teach only the hardicoping component of the hardiness educational intervention was to maximize the likelihood that the nursing students would remain in the study. In addition, the researcher wanted to minimize the challenges involved in coordinating a 5-week course of hardiness education for nursing students among several accredited nursing schools. In an effort to encourage subjects to continue to attend the hardiness educational intervention sessions, the researcher provided incentives. The incentives were tokens to promote encouragement and participation, such as pens, post-it notes, and door prizes. Subjects were encouraged to

practice the hardicoping skills for stress management outside the sessions. Total time commitment was 7-hours.

According to Khoshaba and Maddi (2008), the five hardiness educational program components could be taught separately. In March 2008, as part of remote preparation to conduct this study, the researcher attended a Hardiness Train-the-Trainer workshop, conducted by Maddi and Khoshaba, at the University of California. A copy of the contract between the Hardiness Institute, Inc. and the researcher is documented in Appendix M.

For this study, the researcher taught the foundational component, which was, the hardicoping component. The content was presented in the format of lecture, discussion, case study, and application exercises (Khoshaba & Maddi, 2008). Appendix N contains the 7-week outline of the hardicoping component. During the final session, week seven, the subjects completed the demographic data questionnaire posttest, the posttest PVS III-R, and the posttest PSS.

**Control group.** The researcher traveled to the accredited nursing programs that agreed to allow their junior nursing students to be invited to participate in the study. The study was explained (Appendix L) and questions were answered. The students then signed the consent forms. These forms were collected and placed in an envelope which was sealed and kept in a locked cabinet in the researcher's home. The subjects were given directions to create their own codes to write on the research instruments, which was each subject's mother's first initial, last initial, and last four digits of the subject's home phone number. Each subject completed the pretest demographic questionnaire, the

pretest PVS III-R, and the pretest PSS questionnaires, which were collected, placed in a second envelope, and returned to the researcher. This process took approximately 45 minutes.

The researcher distributed flyers with the date, time, and place for the completion of the posttest research questionnaires. Food and beverages were provided. The researcher created an e-mail list of participating faculty and students and sent a reminder of the date, time, and place of posttest research questionnaires session.

The nursing students who were in the control group did not receive the hardiness educational intervention. They received no treatment. The researcher returned during the seventh week, to the assigned classroom, and the subjects completed the demographic data questionnaire posttest, the posttest PVS III-R, and the posttest PSS. These questionnaires were collected, placed in one envelope, and returned to the researcher. Food and beverage were provided. If the hardiness educational intervention was effective in increasing hardiness and/or decreasing perceived stress of the nursing students in the experimental group, the researcher would offer the hardiness educational intervention to the nursing students in the control group, after the study was completed.

Some of the nursing students in the control group verbalized some disappointment at not participating in the hardiness intervention, but were satisfied that they would participate in the hardiness intervention if it were effective with the experimental group. Since the hardiness educational intervention was effective in reducing the perceived stress of the experimental group, the researcher contacted the control group sites to arrange to present the hardiness intervention. Dates, times, and classrooms were

scheduled in the Spring 2012 semester. The nursing students were contacted via e-mail and flyers were posted. However, no one chose to participate.

## **Data Analysis**

### **Introduction**

The Statistical Package for Social Sciences (SPSS) for Windows version 18, on a personal computer, was used for data analyses. Data analyses included descriptive statistics, independent *t*-tests, and paired *t*-tests. There were no differences in pretest hardiness or perceived stress scores; therefore, there was no need for an analysis of covariance (ANCOVA) (Burns & Grove, 2009; Cook & Campbell, 1979; Munro, 2005).

### **Treatment of Missing Data**

Missing data on the demographic data questionnaire pretest were left blank. Missing data on the PVS III-R and the PSS were examined for amount, frequency, and patterns (Munro, 2005). The researcher estimated “missing data by imputation” and used mean replacement for missing data (Munro, p. 60). If a subject had less than 10% of the questionnaire blank, missing data was replaced with the subject’s mean score for that item before analysis. If a subject had more than 10% missing data, that subject was removed from the study. Therefore, a subject could have two missing items on the PVS III-R and one missing item on the PSS. The researcher replaced one data bit for two subjects on the PVS III-R, as well as one data bit for each of five subjects on the PSS.

### **Demographic Data Questionnaire Pretest**

Descriptive statistics were used to describe and summarize the characteristics of the sample (Munro, 2005). Measures of central tendency, mean, median, and mode and

dispersion, range, standard deviation, and variance for interval and ratio level variables, and frequencies and percentages for nominal and ordinal level variables were computed.

### **Demographic Data Questionnaire Posttest**

Measures of central tendency, mean, median, and mode and measures of dispersion, range, standard deviation, and variance for interval level variables, and frequencies and percentages for nominal variables were computed. There was a separate demographic data posttest questionnaire for the experimental group and the control group. The use of open-ended questions elicited subjects' expression of opinions, concerns, and experiences that occurred during the study that were significantly stressful. Eliciting responses regarding stressful events helped with the interpretation of perceived stress data.

### **Comparability of Study Groups**

An independent *t*-test was computed to compare the experimental and control groups on pretest hardiness and perceived stress scores to ensure equality of the groups prior to data analysis. The independent *t*-test compared the means of two independent samples contrasting the experimental group with the control group (Norman & Streiner, 1999) for significant differences between the two samples (Burns & Grove, 2009). There were no significant differences, therefore, the groups were equivalent on pretest hardiness and perceived stress scores.

### **Research Questions #1 and #2**

What is the hardiness of baccalaureate nursing students? What is the perceived stress of baccalaureate nursing students? Descriptive statistics of a summary table,

frequencies, percentages, and measures of central tendency, measures of dispersion, and shape of the curve of the distribution of scores were computed for the data analysis of these research questions (Munro, 2005). Descriptive statistics, according to Norman and Streiner (1999), were appropriate in order to describe results without trying to generalize to any group beyond the sample.

### **Research Questions #3 and #4/Hypotheses #1 and #2**

What effect does a hardiness educational intervention have on the hardiness of baccalaureate nursing students? What effect does a hardiness educational intervention have on the perceived stress of baccalaureate nursing students? The following hypotheses were formulated from the research questions. A hardiness educational intervention will increase the hardiness of baccalaureate nursing students. A hardiness educational intervention will decrease the perceived stress of baccalaureate nursing students.

The appropriate statistic to test the research hypotheses was the paired *t*-test, which the researcher computed on the pretest and posttest hardiness means of the experimental and control groups and pretest and posttest perceived stress means of the experimental group and the control group (Munro, 2005). According to Munro (2005), the paired *t*-test is computed when a one group of subjects is measured twice, that is, compared on their pretest and posttest hardiness and perceived stress scores.

### **Research Questions #5 and #6/Hypotheses #3 and #4**

What is the difference in hardiness between baccalaureate nursing students who participate in a hardiness educational intervention and baccalaureate nursing students

who do not participate in a hardiness educational intervention? What is the difference in perceived stress between baccalaureate nursing students who participate in a hardiness educational intervention and baccalaureate nursing students who do not participate in a hardiness educational intervention? The following hypotheses were formulated from the research questions. Baccalaureate nursing students who participate in a hardiness educational intervention will have higher hardiness posttest scores than baccalaureate nursing students who do not participate in a hardiness educational intervention. Baccalaureate nursing students who participate in a hardiness educational intervention will have lower posttest perceived stress scores than baccalaureate nursing students who do not participate in a hardiness educational intervention.

The appropriate statistic to test the hypothesis was the independent *t*-test, which the researcher computed on the means of the posttest hardiness and perceived stress scores of the experimental and control groups (Munro, 2005). The researcher compared the hardiness and perceived stress posttest scores between the experimental and control groups. Comparing the two groups answered the question of the difference between the experimental and control groups (Campbell & Stanley, 1963).

### **Additional Analyses**

In the event that the two groups have significantly different pretest hardiness or perceived stress scores, additional analyses would include an analysis of covariance (ANCOVA) using the pretest hardiness and perceived stress scores as covariates to control for their effect on the posttest scores. According to Munro (2005), removal of the effect of the covariate increased the ability to control for initial group differences. The

ANCOVA was not needed since there were no statistically significant differences in pretest hardiness or perceived stress scores in the experimental and control groups. The researcher explored demographic data in relation to the research variables; analyzed the pretest demographic data of gender differences, employment in health care, and primary language on pretest hardiness and perceived stress scores by computing independent *t*-tests. In addition, the experimental group posttest demographic data of attendance and stressful events on posttest hardiness and perceived stress scores and posttest demographic data of rating of helpfulness of the hardiness educational intervention were analyzed by a one-way ANOVA. Crosstabs of the experimental and control groups on posttest demographic personal and school stress data were also computed.

### **Delimitations**

According to Locke et al. (2007) delimitations define the limits applied to a study by the researcher. A delimitation of this study was offering the hardiness educational course, over 5 weeks instead of 14 weeks. It should be noted that limiting the hardiness educational intervention to 5 weeks was acceptable to the originators of the harditraining program (S.R. Maddi, personal communication, March 15, 2008). The rationale for teaching only the hardicoping component of the hardiness educational course was to maximize the chance that subjects would complete the hardiness intervention and remain in the study. In addition, the researcher foresaw challenges in coordinating a 7-week study with a 5-week intervention of hardiness education for nursing students among several accredited nursing schools.



The researcher limited the geographical area, to the DE, NJ, and PA tri-state area from which to gain access to nursing students. The study was limited to full-time junior level baccalaureate nursing students enrolled in clinical courses. While there was support in the literature for the overall stressfulness of nursing education, the stress was increased in clinical nursing courses, as nursing students begin to apply nursing content and concepts to the care of patients (Jimenez, Navia-Osorio, & Diaz, 2010). In addition, departments, divisions, and schools of nursing varied in their structure of the Fall semester junior level clinical courses. Another delimitation was the lack of randomization.

The study was delimited by subject recruitment challenges. In order to accomplish the recruitment of subjects, the researcher used time at the end of nursing classes. In past hardiness literature, the control group received the choice of alternative stress resistance techniques. The researcher limited the control group to no other stress management intervention or approach, of which she was aware. The researcher collected data in the Fall semester only and not over an entire academic year. Collecting data for one semester restricted the potential of obtaining a larger sample.

### **Chapter Summary**

A quasi-experimental non-equivalent control group design with pretest and posttest was used to examine six research questions and test four hypotheses. Full-time junior level nursing students enrolled in clinical nursing courses were the non-probability convenience sample. The setting was nursing classrooms, conference rooms, and auditoriums in NLNAC and CCNE accredited baccalaureate nursing programs. The

independent variable was a hardiness educational intervention, with the experimental group. The two dependent variables were hardiness and perceived stress, the PVS III-R, and the PSS, measured them respectively. This study was reviewed by the RERBs and IRBs of the participating nursing programs, for the protection of human subjects. SPSS for Windows version 18, on a personal computer, was used for data analyses that included descriptive statistics for demographic data, and inferential statistics of independent and paired *t*-tests, Crosstabs and Chi-square, and one-way ANOVA.

## Chapter IV

### Findings

The purposes of this study were first to determine if an increase in hardiness and a decrease in perceived stress in baccalaureate nursing students occurred in those who participated in a hardiness educational intervention. Secondly, to compare hardiness and perceived stress between baccalaureate nursing students who participated and those who did not participate in a hardiness educational intervention. This quasi-experimental non-equivalent control group design with pretest and posttest investigation explored differences between the experimental and control groups of full-time junior baccalaureate nursing students enrolled in clinical nursing courses. Students were recruited from six accredited CCNE and NLNAC nursing programs in DE and PA. The experimental group participated in a hardiness educational intervention and the control group did not.

This chapter includes a presentation of the description of the sample, findings, and results of the data analysis for six research questions, four hypotheses, and additional analyses. Descriptive and inferential statistical analyses were used to give meaning to the data. Data analyses included frequencies, descriptive statistics, independent and paired *t*-tests, Chi-square, and one-way ANOVA.

#### Profile of Sample Subjects

Data were collected from the Fall semester, August 2011 to December 2011. Initially, the sample was comprised of 99 nursing students. The final sample was 79 subjects. The sample consisted of an experimental ( $n = 40$ ) and control group ( $n = 39$ ); subjects were full-time junior nursing students enrolled in clinical courses. The pretest

demographic data were reported descriptively in Tables 3 and 4 in Chapter III, both the experimental and control groups were demographically similar.

### Comparability of Study Groups

The independent *t*-test was computed on the sample pretest hardiness and perceived stress raw scores to determine the equality of the study groups. The Levene's test for equality of variances was not significant ( $p = .50$ ), indicating that the population variances were equal and the equal variances assumed *t*-value was used (Munro, 2005). The means of the experimental group on pretest hardiness scores and pretest perceived stress scores were not significantly different from the control group means on pretest hardiness scores and pretest perceived stress scores. The results of the independent *t*-test for the comparability of the research groups are found in Table 7.

Table 7

*Independent t-test for Comparability of Experimental and Control Groups (N = 79)*

Pretests	<i>n</i>	<i>M</i>	<i>SD</i>	<i>t</i>	<i>df</i>	<i>p</i>
Hardiness-PVS III-R						
Experimental	40	38.18	5.77	.71	77	.47
Control	39	27.18	6.05			
Perceived Stress-PSS						
Experimental	40	37.21	6.33	-.10	77	.91
Control	39	27.33	7.28			

### Research Question #1

What is the hardiness of baccalaureate nursing students?

The researcher submitted the subjects' responses to the Hardiness Institute, Inc., which has proprietary rights over the scoring of the PVS III-R. The Hardiness Institute,

Inc. requires that they score the PVS III-R to maintain their large hardiness database of over 2000 subjects. The raw scores were received, by the researcher, online immediately, and a text file of the scores was received via e-mail. The Cronbach's alpha coefficients for internal consistency reliability and the alpha coefficients were calculated at the Hardiness Institute, Inc. and sent via e-mail to the researcher. The Hardiness Institute, Inc. scored the 18-item PVS III-R, for the 79 subjects. The possible range of scores for total hardiness was 18 to 54, with a mid-point of 36. Higher scores reflect greater hardiness (Maddi & Khoshaba, 2001a). Descriptive statistics, measures of central tendency, measures of dispersion, and shape of the curve of the distribution of scores were computed for the total sample ( $N = 79$ ), the experimental group ( $n = 40$ ), and the control group ( $n = 39$ ).

The total raw scores ( $N = 79$ ) for pretest hardiness had a minimum of 19 and a maximum of 47 with a mean of 37.70. The mean of the pretest hardiness scores was ( $M = 38.18$ ,  $SD = 5.77$ ) for the experimental group ( $n = 40$ ) and ( $M = 37.21$ ,  $SD = 6.33$ ) for the control group ( $n = 39$ ). Scores ranged from a minimum of 19 to 47 in the experimental and 20 to 47 in the control group. The pretest hardiness scores were examined for symmetry, modality, skewness, and kurtosis. The total sample had one mode, while both the experimental and control groups were bimodal.

According to Munro (2005), a skewness measurement falls between -1.00 and 1.00  $SD$  units. Values outside that range indicated substantive skewness. The curves of the sample distribution for both the experimental and control groups were negatively skewed. Details of the descriptive statistics are presented in Table 8. Therefore, the

Table 8

*Descriptive Statistics of Pretest Hardiness Scores (N = 79)*

Hardiness PVS III-R Range (18 to 54)	Total Sample (N= 79)	Experimental Group (n = 40)	Control Group (n = 39)
Mean	37.70	38.18	37.21
Median	39.00	39.00	39.00
Mode(s)	39.00	38.00 & 39.00	39.00 & 42.00
Std. Deviation	6.03	5.77	6.33
Skewness	-1.08	-1.13	-1.05
Kurtosis	1.54	2.21	1.27
Range	19-47	19-47	20-47

largest portion of the pretest hardiness scores were above the mean. Pearson's skewness coefficients (Munro) for the total sample and experimental group pretest hardiness scores indicated normal distributions, but the control group scores were severely skewed. The kurtosis of a distribution explained the peakedness of the curve and a kurtosis measure of zero indicated that a distribution was mesokurtic (Burns & Grove, 2009). The values for kurtosis for this study were above zero and the frequency distribution for the pretest hardiness scores was leptokurtic.

According to the Hardiness Institute, Inc. manual, "The Hardiness Institute, Incorporated" (n.d.) the percentile rank averages for hardiness range from 1% to 99%. The sample's hardiness raw scores mean ( $M = 37.70$ ,  $SD = 6.03$ ) was in the 69% to 72% range. The hardiness percentile rank averages of the experimental group ( $M = 38.18$ ,  $SD = 5.77$ ) mean was in the 73% to 76% range. The control group hardiness percentile rank averages ( $M = 37.21$ ,  $SD = 6.33$ ) mean was in the 69% to 72% range. The percentile rank average of the sample on hardiness ranged from 2% to 98%. Hardiness

raw scores in the 30 to 35 range, which is the 40% to 60% range, are interpreted, by the Hardiness Institute, Inc., as average hardiness.

Therefore, the percentile rank average of the pretest hardiness scores of the baccalaureate nursing students was above average and the majority of their raw hardiness scores were above the mean. However, Maddi (2012) recently recommended harditraining for people with hardiness percentile rank averages at the 50% or below, on the PVS III-R. That is a raw score of 32 or less on the PVS III-R.

### **Research Question #2**

What is the perceived stress of baccalaureate nursing students?

Descriptive statistics including measures of central tendency, measures of dispersion, and the shape of the curve of the distribution of scores were computed to answer this research question. The total pretest perceived stress scores ranged from 10 to 46 with a mean of 27.25. The pretest perceived stress scores of the experimental group ( $M = 27.18$ ,  $SD = 6.05$ ) ranged from 17 to 41. The control group scores ( $M = 27.33$ ,  $SD = 7.28$ ) varied from 10 to 46. The pretest perceived stress scores were examined for the characteristics of symmetry, modality, skewness, and kurtosis.

The total sample had one mode, while both the experimental and control groups were bimodal. The skewness values for the total sample, the experimental group, and for the control group all fell within -1.00 and 1.00. The kurtosis of the distribution explained the peakedness of the curve and a kurtosis measure of zero indicating that the distribution was mesokurtic. The values for kurtosis for the total sample and the control group were

slightly above zero, while the kurtosis of the experimental group was slightly below zero.

Details of these descriptive statistics are presented in Table 9.

Table 9

*Descriptive Statistics of Pretest Perceived Stress Scores (N = 79)*

Perceived Stress PSS Range (0-56)	Total Sample (N= 79)	Experimental Group (n = 40)	Control Group (n = 39)
Mean	27.25	27.18	27.33
Median	27.00	27.50	27.00
Mode(s)	30.00	30.00 & 32.00	22.00 & 23.00
Std. Deviation	6.64	6.05	7.28
Skewness	.29	.11	.39
Kurtosis	.39	-.57	.84
Range	10-46	17-41	10-46

Since the range of scores for the PSS was 0 to 56, with higher scores indicative of more perceived stress, the pretest perceived stress of the baccalaureate nursing students was only slightly below mid-range ( $M = 27.25$ ,  $SD = 6.64$ ). The experimental ( $M = 27.18$ ,  $SD = 6.05$ ) and control ( $M = 27.33$ ,  $SD = 7.2$ ) groups registered similar pretest perceived stress scores. Therefore, the perceived stress of the baccalaureate nursing students was mid-range, as measured by the PSS.

**Research Question #3/Hypothesis #1**

What effect does a hardiness educational intervention have on the hardiness of baccalaureate nursing students? A hardiness educational intervention will increase the hardiness of baccalaureate nursing students.

A paired *t*-test was computed to compare the mean posttest hardiness scores to the mean pretest hardiness scores of the experimental group ( $n = 40$ ), who participated in the



hardiness educational intervention, to test the effectiveness of the hardiness educational intervention. The correlation between the posttest and pretest hardiness scores was moderate at .44 and significant at the .001 level. The paired samples *t*-test showed the means differed by only .53. The posttest mean score ( $M = 38.70$ ,  $SD = 6.78$ ) and the pretest mean score ( $M = 38.18$ ,  $SD = 5.76$ ) revealed no statistically significant increase in the hardiness of the baccalaureate nursing students after participating in the hardiness educational intervention ( $t = .71$ ,  $df = 39$ ,  $p = .24$  1-tail). The research hypothesis that a hardiness educational intervention will increase the hardiness of baccalaureate nursing students was not supported.

#### **Research Question #4/Hypothesis #2**

What effect does a hardiness educational intervention have on the perceived stress of baccalaureate nursing students? A hardiness educational intervention will decrease the perceived stress of baccalaureate nursing students.

A paired *t*-test was computed to compare the posttest mean perceived stress scores to the pretest mean perceived stress scores of the experimental group ( $n = 40$ ), who participated in the hardiness educational intervention, to test the effect of the hardiness educational intervention. The correlation between the posttest and pretest perceived stress scores was .32, and significant at .042. The paired samples *t*-test showed the means of posttest and pretest perceived stress scores were different by 2.80. The posttest mean score ( $M = 24.38$ ,  $SD = 8.33$ ) and the pretest mean score ( $M = 27.18$ ,  $SD = 6.05$ ) demonstrated a statistically significant decrease in the perceived stress of the baccalaureate nursing students after participation in the hardiness educational

intervention ( $t = -2.07$ ,  $df = 39$ ,  $p = .023$  1-tail). This research hypothesis that a hardiness educational intervention would decrease the perceived stress of baccalaureate nursing students was supported.

### **Research Question #5/Hypothesis #3**

What is the difference in hardiness between baccalaureate nursing students who participate in a hardiness educational intervention and baccalaureate nursing students who do not participate in a hardiness educational intervention?

An independent  $t$ -test was computed comparing the experimental ( $n = 40$ ) and control ( $n = 39$ ) groups on their posttest hardiness scores. The test of the assumption of the equality of variance was not significant ( $p = .70$ ). Since the group variances were equal, the equal variances assumed  $t$ -formula was used (Munro, 2005). The means differed by 1.67. The analysis indicated that the posttest hardiness scores ( $M = 38.70$ ,  $SD = 6.78$ ) of the baccalaureate nursing students who participated in a hardiness educational intervention did not statistically significantly differ ( $t = .92$ ,  $df = 77$ ,  $p = .18$  1-tail) from the posttest hardiness scores ( $M = 37.33$ ,  $SD = 6.49$ ) of baccalaureate nursing students who did not participate in the intervention. The research hypothesis that baccalaureate nursing students who participate in a hardiness educational intervention will have higher hardiness posttest scores than baccalaureate nursing students who do not participate in a hardiness educational intervention was not supported.

### **Research Question #6/Hypothesis #4**

What is the difference in perceived stress between baccalaureate nursing students who participate in a hardiness educational intervention and baccalaureate nursing

students who do not participate in a hardiness educational intervention? Baccalaureate nursing students who participate in a hardiness educational intervention will have lower posttest perceived stress scores than baccalaureate nursing students who do not participate in a hardiness educational intervention.

The experimental ( $n = 40$ ) and control ( $n = 39$ ) groups were compared on their posttest perceived stress scores with an independent  $t$ -test. The Levene's test for the equality of variance was not significant ( $p = .84$ ). The equal variances assumed  $t$ -formula was used. The means differed by  $-3.16$ . The  $t$ -test was computed and the results indicated that there was a significant difference in the perceived stress scores between the two groups. The experimental group, who participated in a hardiness educational intervention had lower posttest perceived stress mean scores ( $M = 24.38, SD = 8.34$ ) than the posttest perceived stress mean scores ( $M = 27.54, SD = 7.44$ ) of the control group who did not participate in the intervention. The difference in the posttest perceived stress scores was statistically significant ( $t = -1.78, df = 77, p = .04$  1-tail). The research hypothesis that baccalaureate nursing students who participate in a hardiness educational intervention will have lower posttest perceived stress scores than baccalaureate nursing students who do not participate in a hardiness educational intervention was supported.

### **Posttest Demographic Data**

Posttest demographic data were collected with separate questionnaires for the experimental and control groups, with five items and two items, respectively. The experimental group was asked the number of sessions of the hardiness educational intervention they attended. The majority of subjects (60%) ( $n = 24$ ) of the experimental

group ( $n = 40$ ) subjects, attended all five hardiness educational intervention sessions. Two subjects (5%) attended three sessions and four subjects (35%) attended four sessions.

They also rated the helpfulness of the hardiness educational intervention on a scale of 1 (not helpful) to 10 (very helpful) on increasing their hardiness and decreasing their perceived stress. The frequencies of ratings of helpfulness of the hardiness educational intervention on increasing hardiness, ranged from a minimum of 1 (5%) to 10 (15%). Thirty-eight subjects of the experimental group ( $n = 40$ ) who participated in the hardiness educational intervention indicated that the hardiness educational intervention was helpful in increasing their hardiness. The most frequent rating on the helpfulness of the hardiness educational intervention for increasing hardiness was 8 for 20% of the experimental group. Regarding the helpfulness of the hardiness educational intervention for decreasing perceived stress, the ratings ranged from a minimum of 2 (5%) to a maximum of 10 (12.5%). Descriptive statistics for the helpfulness of the hardiness educational intervention scale for the experimental group are presented in Table 10.

Table 10

*Descriptive Statistics of HEI Helpfulness of Increasing Hardiness and Decreasing Perceived Stress Scale of Experimental Group ( $n = 40$ )*

Experimental Group ( $n = 40$ ) Range (1-10)	HEI Helpfulness Increased Hardiness	HEI Helpfulness Decreased Perceived Stress
Mean	7.00	6.78
Median	7.00	7.00
Mode	8.00	8.00
Std. Deviation	2.38	2.27
Range	1-10	2-10

All 40 subjects rated the hardiness educational intervention as helpful in decreasing their perceived stress. The most frequent rating on the helpfulness of the hardiness educational intervention for decreasing perceived stress was also 8 for 20% of the experimental group.

On the posttest demographic questionnaires, the experimental and control groups were asked to respond to items inquiring about the occurrence of events in their personal lives and school lives, during the time of the study, which they perceived as stressful. The experimental group ( $n = 40$ ) reported more perceived personal life stressors (60%) than the control group ( $n = 39$ ) (48.7%) during the course of this study. Regarding the perception of school life stress during the time of the study, 95% of the experimental group experienced stress while, only 69.2% of the control group reported experiencing stress. In addition to the posttest demographic items that elicited responses regarding the occurrence of perceived personal and school life stress since the study began, if the subjects had stressful personal and school life events occur, subjects were asked to specify the stress. Specifying their personal and school life stress allowed the subjects' expression of opinions, concerns, and experiences that occurred during the study that were significantly stressful.

Their specific personal and school life stress comments summarized in Appendix P were consistent with the literature on undergraduate nursing students' stress. The subjects indicated that the top three sources of personal life and school life stresses were examinations and tests ( $n = 51$ ), relationship issues ( $n = 17$ ), and family issues ( $n = 16$ ). The stress of grades ( $n = 15$ ), nursing course content ( $n = 15$ ), and financial issues

( $n = 15$ ) were reported by equal numbers of subjects. The frequency distribution and percents of these posttest categorical data are presented in Table 11.

Table 11

*Frequencies and Percents of Posttest Perceived Stressfulness of Personal and School Life (N = 79)*

Perceived stressfulness	Total Sample		Experimental Group		Control Group	
	<i>n</i>	(%)	<i>n</i>	(%)	<i>n</i>	(%)
Personal life						
Yes	43	(54.4)	24	(60.0)	19	(48.7)
No	36	(45.6)	16	(40.0)	20	(51.3)
School life						
Yes	65	(82.3)	38	(95.0)	27	(69.2)
No	14	(17.7)	2	(5.0)	12	(30.8)

### Additional Analyses

The researcher explored demographic data in relation to the research variables. Analyses of the pretest demographic data ( $N = 79$ ) of employment in health care and primary language on pretest hardiness and perceived stress scores were conducted by computing independent *t*-tests and ANOVA. In addition, the experimental group posttest demographic data of attendance and stressful events on posttest hardiness and perceived stress scores and posttest demographic data of rating of helpfulness of the hardiness educational intervention were analyzed by one-way ANOVAs. Further investigation using Chi-square analysis was computed on posttest demographic personal life and school life stress data of the experimental and control groups.

The researcher examined the change between the experimental group and control groups' pretest and posttest hardiness and perceived stress scores after the hardiness educational intervention, in order to explore their patterns of change. The measurement of change is the subtraction of pretest scores from posttest scores. Discussion surrounding the interpretation of and use of change scores to determine the effectiveness of an intervention is ongoing (Gall, Gall, & Borg, 2007). Some subjects' hardiness and perceived stress increased and some subjects' hardiness and perceived stress decreased. The frequencies and percentages of the experimental ( $n = 40$ ) and control ( $n = 39$ ) groups' hardiness and perceived stress pretest to posttest change scores are in Table 12.

Table 12

*Frequencies and Percentages of Change in Hardiness and Perceived Stress Scores  
( $N = 79$ )*

Hardiness & Perceived Stress	Positive Change		Negative Change		No Change	
	<i>n</i>	(%)	<i>n</i>	(%)	<i>n</i>	(%)
Experimental ( $n = 40$ )	15	(37.5)	8	(20)	1	(2.5)
Control ( $n = 39$ )	11	(28)	14	(35)	1	(2.6)

**Statistically significant findings.** The percentage (95%) of the posttest demographic data school life stress of the experimental group ( $n = 40$ ) compared to the control group ( $n = 39$ ) of (69.2%) suggested further analysis. Although methods of analysis were established prior to data collection, analysis could be modified to suit the

data actually obtained (Munro, 2005). Crosstabs and Chi-square analyses of the experimental and control groups by posttest and school life stress were computed to explore the associations between the experimental and control groups on school life stress.

There was a significant association ( $\chi^2 = 7.31, df = 1, p = .007$ ) between the experimental and control groups' report of school life stress. A greater percentage of experimental groups nursing students reported experiencing more school life stress than the control group nursing students. This finding was an extraneous variable that might have mitigated the effectiveness of the hardiness educational intervention on the experimental group.

Following the finding that the hardiness educational intervention had a statistically significant effect on decreasing the perceived stress of the experimental group ( $n = 40$ ), the researcher examined the measure of change between the experimental group's pretest and posttest scores to compare further the effect of the hardiness educational intervention. The computation of change scores provided the researcher with information regarding the actual difference in perceived stress scores after the hardiness educational intervention. The independent *t*-test analysis computed on the mean perceived stress change scores confirmed that the hardiness educational intervention had a statistically significant effect on decreasing the perceived stress of the experimental group. Descriptive statistics of the perceived stress change scores of the sample are presented in Table 13. There was a statistically significant difference between the mean



change scores of the experimental and control groups on perceived stress, seen in Table 14.

Table 13

*Descriptive Statistics of Perceived Stress Change Scores (N = 79)*

Perceived Stress- (PSS) Change Range (-34 to 14)	Sample (N = 79)	Experimental (n = 40)	Control (n = 39)
Mean	-1.32	-2.80	.21
Median	-2.00	-2.50	1.00
Mode	7.00	-3.00	7.00
Std. Deviation	7.68	8.57	6.41
Range	-34 to 14.00	-34 to 13	-13 to 14

Table 14

*Independent t-test Comparing Experimental and Control Groups' Perceived Stress Change Scores*

Difference Score	Group	M	SD	t	p 1-tail
Perceived Stress	Experimental (n = 40)	-2.80	8.57	-1.76	.04
	Control (n = 39)	.21	6.41		

**Statistically non-significant findings.** The computation of change scores provided the researcher with information regarding the actual difference in the hardiness scores. The independent *t*-test analysis revealed that there was no statistically significant difference on the mean change scores of the experimental and control groups on

hardiness. The independent *t*-test analysis of the subjects who were or were not employed in health care, revealed no statistically significant difference on pretest hardiness scores or on pretest perceived stress scores. Between those subjects who reported English as their primary language and those who did not, there was no statistically significant difference on pretest hardiness scores and pretest perceived stress scores, which was demonstrated by the independent *t*-test results.

The experimental group's attendance at three, four, or five weeks of the hardiness educational intervention was compared by one-way ANOVA on the posttest mean scores of hardiness, perceived stress, and rating of helpfulness of hardiness educational intervention. There were no statistically significant differences among the attendance groups on any of the variables. Since the difference in percentage of the posttest demographic data, school life stress of the experimental group compared to the control group was considerable, the researcher chose to examine personal life stress also. Crosstabs and Chi-square analyses of the experimental and control groups by posttest on personal life stress were computed. There was no significant association between the experimental and control groups' report of personal life stress.

### **Chapter Summary**

This research was designed to determine if there was an increase in hardiness and a decrease in perceived stress of baccalaureate nursing students due to participation in the hardiness educational intervention. Secondly, the design compared hardiness and perceived stress between baccalaureate nursing students who participated and those who did not participate in a hardiness educational intervention. This chapter included a

presentation of the findings and results that answered the six research questions and tested the four hypotheses of this study. There were 79 subjects (experimental  $n = 40$ ; control  $n = 39$ ) who completed the study. Descriptive and inferential statistical analyses were computed on the research data.

An independent  $t$ -test on the sample pretest hardiness and perceived stress raw scores of the experimental and control groups established their comparability. The paired  $t$ -test indicated that there was no statistically significant increase in the hardiness of the baccalaureate nursing students after participating in the hardiness educational intervention. Conversely, the paired  $t$ -test indicated that there was a statistically significant decrease in the perceived stress of the experimental group after they participated in the hardiness educational intervention. Further, independent  $t$ -test analysis demonstrated no statistically significant difference in the posttest hardiness scores between the experimental group who participated in the hardiness educational intervention and the control group who did not. However, there was a statistically significant difference between the posttest perceived stress scores of the experimental group and the control group. Additional analyses with independent  $t$ -tests and one-way ANOVA on pretest and posttest demographic data relative to hardiness and perceived stress failed to achieve statistical significance.

Subjects' responses to open-ended posttest demographic items were summarized. Crosstabs and Chi-square analysis showed a non-significant association between the experimental and control groups report of personal life stress, but a significant association between the groups' report of school life stress. Analyses by independent  $t$ -

test was computed on the changes in pretest and posttest hardiness and perceived stress scores of the research groups. There was no statistically significant difference on the mean change scores of the experimental and control groups on hardiness, but there was a significant difference on the change scores of the experimental and control groups on perceived stress.

## Chapter V

### Discussion, Conclusions, Implications, and Recommendations

The purposes of this quasi-experimental pretest and posttest design study were: to determine the effectiveness of a hardiness educational intervention in increasing the hardiness and decreasing the perceived stress of nursing students, and secondly to compare hardiness and perceived stress between baccalaureate nursing students who participated and those who did not participate in a hardiness educational intervention. This chapter comprises a discussion of the analysis of the results, conclusions, and limitations of the study. Implications for nursing education, nursing science and research, and nursing practice, as well as, recommendations for future nursing research are presented in this chapter.

#### Research Question #1

What is the hardiness of baccalaureate nursing students?

Seventy-nine nursing student research subjects completed the hardiness measurement instrument, the PVS III-R. Higher pretest scores on the PVS III-R indicated greater hardiness. The pretest hardiness mean score was above the mid-range of 36 according to the scoring of the PVSIII-R. All measures of central tendency were above the possible mid-point of hardiness scores and the majority of scores were above the mean. Those measures indicated that the pretest hardiness of the nursing students was above average. The experimental and control groups exhibited equivalent pretest measures of hardiness.

The above average pretest scores of hardiness of the junior level nursing students in the study might be due to the fact that the nursing students might have had to demonstrate commitment, control, and challenge to cope and to progress successfully through the competitive acceptance process into the nursing major and on to upper level nursing courses. Conversely, perhaps those nursing students with less hardiness chose not to participate, which might be an illustration of the threat to external validity of interaction of selection and treatment. The researcher reiterates that the PVS III-R measures hardiness as a continual dimension. Individuals will vary in their levels of hardiness along a continuum from low to high, with a relatively small percentage scoring at the extreme low/high ends.

The PVS III-R was recommended for the evaluation of hardiness in those people likely to experience stress in their educational situations (Maddi & Khoshaba, 2001a; Maddi, 2005). As McHenry (1992) noted, hardiness exemplifies the development that results from decision making with full knowledge that the stress of nursing education is present but manageable. The sample size of this study was too small to generalize. Perhaps men and women who are drawn to study nursing might exhibit above average hardiness. Further hardiness research with baccalaureate nursing students is needed. Pagana (1990) found that the hardiness scores of her sample of 246 nursing students, in their first clinical experience, ranged from 20 to 48. The hardiness percentile rank average ranged from 0% to 99%. Weibe (1991) and Sansone et al. (1999) conducted other hardiness research, with undergraduates, although not specifically nursing students. They identified high hardiness, but did not specify hardiness scores. Rice (1997)

conducted hardiness research with a sample of all female university students, which was unique, since prior to her study hardiness research had been conducted mostly on males.

According to the Hardiness Model, (Khoshaba & Maddi, 2008) people strong in commitment believe they can increase the value of whatever they are doing by involving themselves deeply in it. People strong in control believe that they can influence the outcomes of things going on around them. Those strong in challenge believe that what makes their lives worthwhile is to grow in knowledge and wisdom from their positive and negative experiences. The RAM states that coping processes are a person's innate or acquired ways of responding to and influencing the stress of a changing environment (Roy, 2009). The subjects in this study reported above average hardiness. Therefore, they exhibit commitment, control, and challenge described by the HM and they exhibit the coping processes described by the RAM.

It is possible that the scores on the PVS III-R were subject to a ceiling effect. Gall et al. (2007) state that the ceiling effect places a limitation on the distribution of change scores, meaning that subjects scoring high on a pretest have little room to increase their scores following an intervention. Therefore, the PVS III-R items might have failed to measure the entire range of achievement possible on hardiness. The ceiling effect places a limitation on the distribution of change scores on the PVS III-R.

### **Research Question #2**

What is the perceived stress of baccalaureate nursing students?

The results of the second research question provided the description of perceived stress of the sample subjects. The 79 sample subjects completed the PSS, which

measured the degree to which the subjects appraised their lives as stressful. Higher scores on the PSS were indicative of higher perceived stress. The sample pretest perceived stress mean was mid-range. The mean pretest perceived stress scores of the experimental and control groups were comparable and mid-range, with the experimental group evidencing a smaller range of perceived stress scores. However, 38 subjects scored above the mean for this study, which included 20 experimental and 18 control subjects. The pretest and posttest PSS scores of the control group did not change. After the hardiness educational intervention, the experimental group posttest perceived stress mean decreased statistically significantly.

Perhaps those subjects with the most perceived stress chose not to participate in this study. Ironically, they might have felt too stressed to engage in another activity. Again, the threat to external validity of interaction of selection and treatment might have been operating, in spite of the fact that the researcher tried to make participation and cooperation in the study as convenient as possible. According to the HM, if stress is not buffered with stress resistance resources, such as hardiness, strain can result from the accumulated stress. One can have strain symptoms and no longer recognize the causative stress (Khoshaba & Maddi, 2008).

Although the experimental group's pretest perceived stress mean score was mid-range, the subjects verbalized their stress during each week of the study. Deckro et al. (2002) posited that stress was caused more by the way a problem was thought about, than by the problem itself. The subjects' responses to the posttest demographic questions that elicited examples of personal and school events that they perceived as stressful revealed a



plethora of specific examples. The nursing students referred to sources of their stress to be: nursing and non-nursing course work, tests, quizzes, finances, family issues, and relationship issues, among many others. The items on the PSS referred to being upset by unexpected events, feeling out of control, and coping with hassles and irritations. It is possible that the items did not sufficiently reflect the sources of stress experienced by the subjects in this study.

The PSS might not be sensitive enough to register the nursing students' perceived stress, in spite of its reliability. One male nursing student shared with the researcher that he was reluctant to acknowledge perceived stress. He stated that he felt frustration more than stress. According to Khoshaba and Maddi's (2008) definition of stress, stress is anything that makes one feel tense or in some way uncomfortable. His source of stress was frustration. However, the posttest scores on the PSS did decrease significantly for the hardiness educational intervention, experimental group.

Rice (1997) recommended the teaching of hardiness coping skills to lessen the stress of university women. Since the majority of nursing students are female, finding ways to decrease stress is justified. In contrast to the PSS, Gibbons et al. (2009) suggested the use of the Index of Sources of Stress for Nursing Students (ISSN) for the measurement of stress in undergraduate nursing students, as it includes the student perspective of sources of stress. Hensel and Stoelting-Gettelfinger's (2011) research suggested the Stress Warning Signals (SWS) checklist for the measurement of nursing students' stress. Goff (2011) used the 51-item Student-Life Stress Inventory (SSI) to measure personal and academic stressors. In addition, Modrcin-Talbott et al. (1998)

believed that nursing needed to examine adolescent self-esteem, which Roy (2009) considered synonymous with self-concept, in order to develop its own stress prevention and intervention strategies. A person experienced varying degrees of self-esteem related to the quality, number, and degree of stimuli with which the person was confronted. They found that as stress increased self-concept decreased. Further research is needed on the development of a valid and reliable measurement tool of nursing student stress that correlates with nursing students' self-report of perceived stress.

### **Research Question #3/Hypothesis #1**

What effect does a hardiness educational intervention have on the hardiness of baccalaureate nursing students? A hardiness educational intervention will increase the hardiness of baccalaureate nursing students. Analysis by paired *t*-test revealed that a hardiness educational intervention had no statistically significant effect on the nursing students' hardiness. The hardiness mean score increased by less than one point from pretest to posttest. Therefore, the research hypothesis that a hardiness educational intervention will increase the hardiness of baccalaureate nursing students was not supported.

Perhaps, an explanation for the hardiness educational intervention pretest-posttest hardiness scores not being statistically significant was due to the ceiling effect. The ceiling effect can lead to the conclusion that the treatment had no effect, impairing the researcher's ability to determine the meaning of the collected data (Cramer & Howitt, 2005). The experimental group nursing students' hardiness pretest and posttest mean was above mid-range on the PVS III-R. According to Gall et al. (2007), the ceiling effect

places a restriction on the distribution of change scores. Twenty-nine nursing students in the experimental group scored above the hardiness pretest mean. Possibly, due to the ceiling effect, they could only achieve a minimal change score after the hardiness educational intervention.

The lack of statistical significance differs from the findings of the following hardiness literature. Rice (1997) offered to female university students a 6-week hardiness intervention, which had previously been used only with male executives, which resulted in statistical significance. Maddi et al. (1998) found that a hardiness education treatment increased hardiness more than two other treatment conditions of relaxation/meditation and passive listening. Maddi et al. (2002) evaluated the effectiveness of hardiness education with high-risk undergraduate students. Their hardiness posttest scores were higher hardiness scores compared to the hardiness attitude pretest scores. Judkins' et al. (2006) investigation concluded that there was a significant increase in hardiness as the effect of a hardiness training program for nurse managers. Maddi et al. (2009a) found that hardiness education would produce a greater increase in hardiness in college students.

In spite of the non-significant results on the hardiness educational intervention for increasing hardiness, according to the posttest demographic data questionnaire, the nursing students perceived that the hardiness educational intervention was helpful in increasing their hardiness. The researcher attributes the relationship that developed with the experimental group during this study to their perception of the helpfulness of the hardiness intervention. According to the RAM (Roy, 2009), the processes for adapting

and coping are the regulator and cognator subsystems. Input to the regulator coping subsystem has a role in forming perceptions. Perhaps, the regulator subsystem ought to be considered in further hardiness research and modification of the theoretical substruction. Thirty-eight subjects of the experimental group indicated that the hardiness educational intervention was helpful in increasing their hardiness. The lack of significant effect of the hardiness educational intervention for increasing hardiness for the experimental group could be explained by the fact that the HM (Khoshaba & Maddi, 2008) does not work, is not applicable to baccalaureate nursing students, the hardiness intervention needs to be delivered over a longer time to see a change, and needs further investigation and testing.

Maddi (2002) acknowledged that the method by which hardiness influenced performance in a stressful circumstance was a theoretical concern, since the Hardiness Model emerged from Maddi's (1987) first hardiness training program. These non-significant findings could add to the body of knowledge that the hardicoping elements of the HM needed further refinement. Maddi (personal communication, March 14, 2008) stated that he considered further development of the HM by combining hardiness and positive psychology philosophies. However, the theoretical origin of the HM was in existential personality theory (Kobasa & Maddi, 1977) which Maddi, Harvey, Khoshaba, Fazel, and Resurreccion (2012) have recently reiterated. Existential personality theory claimed that persisting in the face of anxiety and stress, by choosing to change regardless of the stressful circumstances was considered to be the way to growth, development, and authenticity. Maddi and Kobasa equate authenticity to hardiness. The paucity of

published literature on the effectiveness of hardiness education on nursing students and the findings of this study added to the need for more testing of the HM.

Regarding the theoretical substruction of the application of the HM (Khoshaba & Maddi, 2008) and RAM (2009), the nursing students' response to their environmental stress and stimuli was their coping capacity or cognator coping subsystem. The cognator coping subsystem which responds through learning, problem solving, and decision making corresponds to Khoshaba and Maddi's (2008) hardiness and hardicoping skills. The researcher hypothesized that through the hardiness educational intervention, the nursing students could learn to cope and adapt (Roy, 2009), thereby exercising their cognator coping subsystem and achieving an increase in their hardiness scores. In addition, since the effect of the hardiness educational intervention was not statistically significant therefore, further testing of the HM and RAM models is needed.

Another plausible explanation was the researcher's delimitation of the hardiness educational intervention presentation to the shortest acceptable length of time, five weeks, and to the foundational component of hardicoping. The intervention was originally created to be taught over a full academic semester. According to the HardiTraining Program, the participants would meet twice a week. One class meeting was for lecture with case studies and the other meeting was for discussion of the hardiness content and feedback. One possible way to remediate the failure of the hardiness educational intervention to achieve statistical significance in increasing hardiness, in this study would be to conduct a study in which the hardiness educational intervention was offered in its entirety. Five weeks might be too short a time to

appreciate an increase in hardiness and the delimitation of shortening the intervention is not an acceptable modification. Hardiness is a life skill that ought to be taught before stress accumulates, and needs to be practiced to be further developed (Khoshaba & Maddi, 2008).

Another possible reason for the hardiness educational intervention not increasing the hardiness of the subjects could be that the nursing students, once the researcher gave the initial instruction about hardiness, felt that they were hardy and had an understanding of hardiness. Then after participating in the hardiness educational intervention, they realized they did not have as much hardiness, as they had thought. The experimental group might have become reflective and gained an appreciation for how much they still had to learn about hardiness. Bloom's revised taxonomy of learning suggested that achieving effective knowledge transfer to application required familiarity with paradigms relative to specific content (Su & Osisek, 2011); therefore, it was possible that the subjects did not have enough time to become familiar with hardicoping skills to effectively transfer and apply the knowledge of hardiness. Khoshaba and Maddi's (2008) desired outcome of the Hardiness Model was that hardicoping skills would be taught and acquired, practiced outside of the classroom situation, and discussed during weekly discussion and feedback sessions. This researcher did not plan for weekly discussions, but did e-mail students twice a week during the study to encourage them to practice the hardiness content that had been presented, to remind them of the next session, and that lunch would be provided. The nursing students verbalized their appreciation of the encouraging reminders and asked the researcher to continue after the study ended.

Another plausible explanation for a non-significant result and the unsupported hypothesis was methodological weakness; the study had a small underpowered sample at .72. In a larger sample differences might be detected, the study could achieve statistical power, and lower the risk that the researcher would reject the research hypothesis if it were true. Committing a Type II error means that in reality, the findings were significant, but, due to methodological weakness, the significance was not detected (Burns & Grove, 2009).

#### **Research Question #4/Hypothesis #2**

What effect does a hardiness educational intervention have on the perceived stress of baccalaureate nursing students? A hardiness educational intervention will decrease the perceived stress of baccalaureate nursing students. A paired *t*-test comparison of the pretest and posttest perceived stress mean scores of the nursing students who participated in the hardiness educational intervention, revealed that the effect of the hardiness educational intervention was a statistically significant decrease in their perceived stress. The hypothesis that a hardiness educational intervention will decrease the perceived stress of baccalaureate nursing students was supported.

The statistically significant results of this study supported previous research findings. Rice's (1997) research tested the effectiveness of a hardiness intervention with a sample of university women. Statistical analyses verified a significant reduction in appraisal of stressful life events, as measured by the Life Experience Survey, after Rice's hardiness intervention. Maddi et al. (1998) found the hardiness training treatment was more effective than relaxation/meditation and placebo/social support for decreasing stress

and strain. In 2002, Maddi et al., obtained significant results of decreased stress, on the HardiSurvey III-R, among female and male first year university students after a hardiness education course. However, Judkins et al. (2006) found no significant decrease in stress, measured by the PSS, after their hardiness training program. Likewise, Maddi et al. (2009a) realized a small but significant increase in stress after their hardiness education program.

The findings of this research lent support to Kuhns' (1997) interventional study. Kuhns hypothesized that the self-concept adaptive mode of adult children of alcoholics (ACOA) college students could be enhanced by learned coping mechanisms from psychotherapy groups and self-help groups. The aggregate mean of depression for the psychotherapy and the self-help groups for ACOA was less than the mean depression score for the control group of ACOA. Therefore, the hypothesis was supported. The behaviors of the alcoholic parent(s) were the stimuli that prompted the cognator coping subsystem, in which ACOA could learn coping mechanisms from psychotherapy or self-help groups. In turn, coping produced behavioral responses related to the self-concept adaptive mode.

The empirical indication of a statistically significant reduction in the PSS stress scores highlights that stress resistance resources of the HM through the hardicoping skills of the hardiness educational intervention were adequate to reduce the focal stimuli of the nursing students (Khoshaba & Maddi, 2008; Roy, 2009). The nursing students' response to their stress and focal stimuli was their process of adaptation or coping capacity. Behaviors and functions of the adaptive modes are indicators of how well people adapt in



interaction with their stressful environment (Whittemore & Roy, 2002). As a result of the hardiness educational intervention, the significant decrease in PSS scores signified that coping adaptive behavior might be observed in an enhanced personal self component of the self-concept adaptive mode (Khoshaba & Maddi; Roy).

### **Research Question #5/Hypothesis #3**

What is the difference in hardiness between baccalaureate nursing students who participate in a hardiness educational intervention and baccalaureate nursing students who do not participate in a hardiness educational intervention? Baccalaureate nursing students who participate in a hardiness educational intervention will have higher hardiness posttest scores than baccalaureate nursing students who do not participate in a hardiness educational intervention. The independent *t*-test computed comparing the research groups on their posttest hardiness scores affirmed that although the experimental group posttest mean hardiness score was higher than the control group posttest mean hardiness score, the groups did not differ significantly. The hardiness educational intervention did not significantly increase the posttest hardiness scores of the nursing students who participated in it. Therefore, the research hypothesis was not supported.

In order to compare further the difference in hardiness between the experimental and control groups, an analysis of the changes in control group pretest and posttest hardiness scores was also computed. Independent *t*-tests resulted in no statistically significant difference on the mean change scores of the experimental and control groups on hardiness. These analyses underscored the finding that the hardiness educational

intervention did not affect a statistically significant increase in hardiness of the experimental group.

The lack of significance of the hardiness educational intervention did not concur with earlier studies of hardiness related to the effectiveness of a program to teach hardiness (Rice, 1997; Maddi, et al., 1998; Maddi et al., 2002; Judkins et al., 2006; Maddi et al., 2009a). In addition, the researcher's belief that through the substruction of the application of the blended HM (Khoshaba & Maddi, 2008) and the RAM (Roy, 2009), that nursing students in the midst of their focal stimuli, the stress of nursing education, could learn to cope and adapt through the hardiness educational intervention hardicoping skills, with a resultant increase in their hardiness was false. The researcher would add a feedback loop to the substruction for ongoing refinement and assessment of the HM and the RAM. A further supposition that if hardiness were increased the personal self component of the self-concept adaptive mode, with its three elements: self-consistency, self-ideal, and moral-ethical-spiritual self that corresponded to the three hardiattitudes of commitment, control, and challenge would increase was also false.

#### **Research Question #6/Hypothesis #4**

What is the difference in perceived stress between baccalaureate nursing students who participate in a hardiness educational intervention and baccalaureate nursing students who do not participate in a hardiness educational intervention? Baccalaureate nursing students who participate in a hardiness educational intervention will have lower posttest perceived stress scores than baccalaureate nursing students who do not participate in a hardiness educational intervention. The independent *t*-test was computed

on the difference in posttest perceived stress between baccalaureate nursing students who participated in a hardiness educational intervention and baccalaureate nursing students, who did not. The difference was statistically significant. Therefore, the research hypothesis was supported.

This finding of a statistically significant decrease in the nursing students' perceived stress supports Maddi's et al. (2002; 2009a) assertion that hardiness education is an effective approach for stress management. This study's findings are similar to Deckro et al.'s (2002) research findings that college students who attended a six-week relaxation stress management intervention would have reductions in perceived stress, compared to a waiting list control group. After the intervention, the difference in perceived stress between the experimental and control groups was statistically significant as measured by PSS mean scores. To decrease the appraised stressfulness of circumstances, it was important that there was transformational coping.

The finding supported the application of the HM (Khoshaba & Maddi, 2008) and the RAM (Roy, 2009). There was a decrease in perceived stress, which suggested that there was an increase in coping adaptive behavior. Nursing students' response to their focal stimuli, undergraduate nursing education, after participating in the hardiness educational intervention was adaptation or coping capacity to cope through adaptation. Their process of adaptation or coping capacity was a positive response to their focal stimuli. The significant decrease in posttest perceived stress after the hardiness educational intervention could identify their response as positively adaptive. The hardicoping adaptive processes taught in the hardiness educational intervention were

aimed at nursing students acknowledging stress, putting it into perspective, and taking action to change it. The evidence, supported by the findings of this study, of the nursing students' effective hardicoping, was in reduced perceived stress. The self-concept adaptive mode was identified as a medium through which behavioral responses to stress were expressed. People with a clearer self-concept tend to make use of active and adaptive coping strategies, such as, identifying stress, planning, and taking action to manage it. Possibly, the behavior of a significant reduction in perceived stress suggests that the nursing students might have a clearer self-concept. Modrcin-Talbott et al. (1998) believed that nursing needed to examine adolescent self-concept in order to develop its own intervention strategies to enhance self-concept and decrease stress.

#### **Additional Analyses**

Additional analyses afforded the researcher the opportunity to examine the study variables in diverse ways. The researcher explored demographic data in relation to the research variables. Analyses of pretest demographic data of gender differences, hours worked per week, employment in health care, and primary language on pretest hardiness and perceived stress scores were conducted. In addition, the experimental group posttest demographic data of attendance and stressful events on posttest hardiness and perceived stress scores and posttest demographic data of rating of helpfulness of the hardiness educational intervention were analyzed by a one-way ANOVA.

**Employment.** This researcher explored the influence of the number of hours worked per week on nursing students' hardiness and perceived stress. The control group reported working more hours per week than the experimental group. Analysis

demonstrated that the pretest hardiness means of those nursing students who were employed were lower than those who were not employed. Perhaps, the nursing students who were employed found it more difficult to be committed, feel in control of the events of their lives, and see challenges as opportunities. The nursing students, employed or not, had the same mean pretest perceived stress scores.

Jeffreys (2002) documented that nursing students found employment to be a source of moderate stress regardless of number of hours worked or the flexibility of work hours schedule. The researcher found no further literature on the influence of employment on nursing students' hardiness or perceived stress. Since the study sample was small, it would be premature to offer an explanation on the influence of employment on hardiness and perceived stress. In addition the researcher found no hardiness literature to support or refute the influence of employment or number of hours worked per week on hardiness.

**Primary language.** The researcher also explored the potential impact on nursing students for whom English was not their primary language, hardiness and perceived stress scores. Symes, Tart, Travis, and Toombs (2002) recommended the support of a Student Success Program to help nursing students for whom English is not their primary language with stress and time management, study skills, and written and oral communication. The six nursing students whose primary language was not English, had higher pretest scores on hardiness and lower pretest perceived stress scores. This was an unexpected, but non-significant finding. Perhaps, nursing students whose primary language is not English have learned to be more committed, in control, and with an

ability to find opportunities and realized less perceived stress. Further research and investigation is needed.

**Attendance at the hardiness educational intervention.** The experimental group's attendance at three, four, or five weeks of the hardiness educational intervention was compared on the posttest mean scores of hardiness, perceived stress and rating of helpfulness of the hardiness educational intervention. Although the one-way ANOVA revealed no statistically significant differences, it was of interest to note that the nursing students who attended the least number of sessions, that is three sessions, had the highest posttest hardiness mean score, the lowest posttest perceived stress mean score, and gave the hardiness educational intervention the highest mean helpfulness rating. Those nursing students who attended all five sessions of the hardiness educational intervention had the lowest posttest hardiness score, the highest posttest perceived stress scores, and rated the hardiness educational intervention helpful.

The higher posttest perceived stress scores could be accounted for with the same explanation that Maddi et al. (2009a) gave when their hardiness educational research with undergraduates realized a significant increase in stress scores pretest to posttest. One of the first steps in hardiness educational intervention was to identify and list one's stresses to become more aware of them in order to cope with their stresses. The increased awareness and discussion of stresses during the hardiness educational intervention could increase perceived stress, while the nursing students were learning skills to decrease it. However, the experimental group also had a significant increase in hardiness scores after the intervention.

**Personal life and school life stressful events.** The percentage (95%) of the experimental group nursing students who had stressful school events since the beginning of the study was compared to the (69.2%) of control group nursing students. There was a significant association between the experimental and control groups report of school life stress. The nursing students who participated in the hardiness educational intervention perceived more stressful school events than the control group during the time of this study. Including the open-ended items on the posttest data questionnaire to elicit responses regarding stressful events did help as planned with the interpretation of perceived stress data. This finding resonated with the advice from previous hardiness research, which was, hardicoping practices should be taught prior to the occurrence of stress and in a non-stressful environment (Khoshaba & Maddi, 2008; Maddi, 2005). The use of a stress measurement tool that separates out nursing students' sources of stress might provide more data about nursing students' stress. One example would be the Gibbons et al. (2009) Index of Sources of Stress in Nursing Students (ISSN).

A possible reason for the high percentage of specified stressful school events among the experimental group might be the relationship that the experimental group developed with the researcher during this study. Part of the exercises of hardiness educational intervention was for the experimental group to identify their stress verbally and in writing. The identification of their stress was furthered when the nursing students were asked to indicate if they had perceived any stressful school events during the extent of the study. In addition, the nursing students completed the posttest demographic questionnaires close to the end of their semester, which can be a stressful time.

### **Conclusions of the Study**

The findings of this study generated the following conclusions.

1. Baccalaureate nursing students reported above average hardiness that is, commitment, control, and challenge.
2. Baccalaureate nursing students identified their perceived stress as moderate.
3. The hardiness educational intervention did not increase the hardiness of baccalaureate nursing students.
4. The majority of the baccalaureate nursing students indicated that the hardiness educational intervention was helpful in increasing their hardiness.
5. The effect of the hardiness educational intervention on the perceived stress of baccalaureate nursing students did reduce their perceived stress.
6. The baccalaureate nursing students indicated that the hardiness educational intervention was helpful in decreasing their perceived stress.
7. There was minimal change in hardiness between baccalaureate nursing students who participated in a hardiness educational intervention and baccalaureate nursing students who did not.
8. There was considerable change in perceived stress between baccalaureate nursing students who participated in a hardiness educational intervention and baccalaureate nursing students who did not.
9. The theoretical substruction of the application of the HM and the RAM requires further research and evaluation.



10. The PVS III-R needs further development of items that more reliably express commitment, control, and challenge.

### **Implications of the Study for Nursing**

The implications of the research findings for nursing are the meanings of the conclusions for the body of knowledge, theory, and practice. Implications provide specific suggestions for the implementation of findings (Burns & Grove, 2009). Stress still exists in nursing education. Empowering nursing students with skills to increase their inherent hardiness and decrease their perceived stress is an imperative.

### **Nursing Education**

This study generated understanding of the construct of hardiness and perceived stress in baccalaureate nursing students and introduced the use of a hardiness educational intervention for the acquisition of hardiness skills and techniques. Through this study of hardiness among nursing students, new knowledge about nursing students' management of stress was generated. It is believed that a hardiness and perceived stress assessment could identify hardiness and perceived stress in nursing students at the inception of their nursing education. Following an assessment, hardiness and its concomitant skills could be introduced to nursing students early in their nursing education, before nursing education stress accumulates. Appraisal of hardiness might be considered part of a new student orientation program and could be an ongoing endeavor for nursing students through each level of their undergraduate nursing education.

Hardiness education might enrich the baccalaureate nursing curriculum in the initial formation of future professional nurses by incorporation of the principles and

applications of the concept of hardiness education in the undergraduate curriculum. A hardiness educational intervention could be an effective active teaching and learning strategy for stress management, which promotes student success and could be offered as a nursing course or a nursing elective. Nurse educators, once apprised of the skills of hardiness, could review the steps of hardiness at the beginning of each nursing course. Armed with the results of hardiness assessment nurse educators would have additional information to enhance academic advisement, academic coaching, and academic support services.

A hardiness educational program could be designed specifically to support nursing students through the stress of their nursing education. In addition, senior nursing students could be encouraged to peer-teach, thus incorporating a service learning component to hardiness education. Hardiness education scenarios could also be incorporated into the nursing simulation laboratory.

### **Nursing Science and Research**

This study has contributed to nursing science and research given the fact that no published research to date has been found on the influence of hardiness education on nursing students. With the evidence of the effects of a hardiness educational intervention, from this foundational research, nursing knowledge of hardiness in nursing students was extended. While the hardiness educational intervention was not unique, the new knowledge gained from testing the hardiness educational intervention with nursing students added to the body of nursing research by informing nursing of the effectiveness of hardiness education on potentially increasing hardiness and decreasing perceived

stress. The hardiness literature review suggested that hardiness skills ought to be introduced before stress increases, to be more effective.

The findings of this study have implications for hardiness research instrumentation. Maddi and Khoshaba (2001) considered that the PVS III-R was constructed of items that were relevant to hardiness in contrast to the earliest hardiness surveys that were a composite of several different measurements of existing stress and anxiety tools (Kobasa, 1977, 1979). As the hardiness measurement evolved with further development of the PVS III-R, the tool demonstrated acceptable reliability on total hardiness, but not consistently on the hardiness components of commitment, control, and challenge. In this study, the adequate internal consistency reliability on total hardiness was reconfirmed. Research is needed to continue to determine items that would reliably measure and determine commitment, control, and challenge and further expand the assessment of hardiness. The utility of hardiness component subscales could identify specific areas for strengthening the hardiness attitudes and skills.

An implication for nursing science derived from this study is the foundation for the development of an educational practice theory of a hardiness education for nursing. The results of this study led this researcher to recommend further testing of aspects of the Hardiness Model. The researcher aims the evaluation to progress from a substruction of the Hardiness Model and the Roy Adaptation Model to a modified theory of adapting to perceived stress in nursing education. The goal of nursing in the RAM is enhancing life processes to promote adaptation (Roy, 2009) and the goal of the HM (Khoshaba & Maddi, 2008) is to facilitate the adaptation (Burns & Grove, 2009). This adaptive

learning theory of hardiness education for nursing would be a framework to guide further research studies of the hardiness approach to stress management, adaptive and transformational coping.

### **Nursing Practice**

The implications for hardiness and hardiness education on nursing practice are unlimited. The practice of nursing suggests that nurses should take advantage of hardiness education, given their stressful job requirements (; Judkins, 2005; Judkins et al., 2006; Ouelette, 1993). To foster the concept of hardiness in nursing practice, hardiness education is needed for nurses to understand the effects of hardiness and its health promoting and adapting aspects in their patients and the healthy. Previous hardiness educational research has suggested that nursing practice could be positively affected by hardiness education (Lambert & Lambert, 1987; Judkins; Judkins et al.). Although in this study, the hardiness educational intervention was not effective in increasing hardiness, it was effective in decreasing the perceived stress of nursing students; its use could be extended to practicing nurses.

Stress has contributed to negative outcomes for the retention of new nurses in the nursing workforce (Watson et al., 2008). If nursing students learned how to buffer stress in their initial nursing education, they could be better prepared to cope with initial nursing practice and may reduce reality shock. There is the potential for the development of a hardiness culture in the profession of nursing and a sustainable nursing hardiness intervention for health promotion (Jacob, 2010). Fox, Aiken, and Messikomer (1990) stated that hardiness and the application of hardiness skills was a useful practice tool that

adds to the theoretical basis for the practices of caring in nursing practice through hardiness' underpinnings in people's search for meaning. Once nursing students enter nursing practice their acquired hardiness skills could be ultimately used to provide quality care.

### **Study Limitations**

Limitations are restrictions or problems in a research study that inhibit the generalizability of the results (Burns & Grove, 2009). The generalizability of this study was limited by the small underpowered sample size ( $N = 79$ ) with the experimental ( $n = 40$ ) and the control ( $n = 39$ ) groups compared to the 102 subjects needed, or 51 subjects in each of the groups. Another methodological restriction was the lack of random assignment. Due to the limitation of the non-random convenience sample real size, the power, recalculated for statistical analysis, was .72, which yielded a Type II error probability of .28 and increased the researcher's risk of rejecting the research hypothesis if it were actually true. The small sample size could have been a challenge to achieving statistical significance of the hardiness educational intervention in increasing the hardiness of the experimental baccalaureate nursing students. Another constraint on this study was the dearth of male nursing student participation. Males were underrepresented ( $n = 2$ ) in this study's sample.

In this study, data collection was completed in only six schools, four experimental and two control sites, in two Mid-Atlantic states. Generalization was limited due to the limited geographic area of this study. Another unforeseen limitation was the change of data collection nursing classrooms at three of the cooperating nursing programs, which

could have contributed to the attrition rate. A potential limiting factor was the single setting of nursing classrooms, conference rooms, and auditoriums after a nursing class, for data collection. The delivery of the hardiness educational intervention might have been more acceptable in other settings and at other times.

Although the researcher delimited the study to the shortest acceptable time period of five weeks for the foundational component of hardicoping skills. It may be that it is not feasible for nursing students to learn a new life-skill concept in such a short time. Continued investigations of hardiness in baccalaureate nursing students could provide more understanding of ways to cultivate and promote hardiness. The researcher's choices limited the study by excluding additional data analyses of pretest demographic data on posttest measurements of hardiness and perceived stress. Posttest demographic data were limited with the omission of an item to inquire to what extent the experimental group practiced the hardicoping skills in their daily lives during the extent of this study.

### **Theoretical Limitations**

According to Burns and Grove (2009), mixed results are a common occurrence in research studies. The mixed results on the effectiveness of the hardiness educational intervention could be due to methodological weakness, such as the differing reliabilities of two research instruments measuring dependent variables. Mixed results also indicate the need for additional study and the need to modify existing theory. Each of those factors offered plausible explanations for the non-significant effect of the hardiness educational intervention to increase hardiness and the significant effect of decreasing perceived stress. A theoretical framework based on the researcher's blending of the HM

(Khoshaba & Maddi, 2008) and the RAM (Roy, 2009) was used to help to explain and clarify this research study. However, the researcher has not found any published research that has employed a theoretical substruction of the application of the HM and the RAM from which to examine and compare this study's findings. While the substruction of the HM and RAM assessed the congruence in the research design and identified the correspondence among the research variables, the mixed results seemed to suggest a consistency with stress, but gaps and inconsistencies with hardiness, which echoed Maddi's (2008) theoretical concern with the HM.

The desired result of an increase in hardiness, reflecting increased coping adaptive behavior, after participation in the hardiness educational intervention was not realized. There was however, a decrease in perceived stress, which suggested that there was an increase in coping adaptive behavior, relative to the nursing students' response to their focal stimuli, after their participation in the hardiness educational intervention. For this study, the researcher explored the personal self component of the self-concept adaptive mode, with its three elements: self-consistency, self-ideal, and moral-ethical-spiritual self that corresponded to the three hardiattitudes of commitment, control, and challenge, respectively. Since there was no significant increase in hardiness, there was no enhanced personal self component of the self-concept adaptive mode. This finding led to another question. As a consequence of the hardiness educational intervention, if there was no increase in hardiness and therefore, no enhanced self-concept, but there was decreased perceived stress, was there increased self-concept related to the decreased perceived stress? The addition of another measurement tool could possibly provide the answer.

### **Recommendations for Future Research Studies**

The study results were a clarion call, for future hardiness research in nursing, to apply the additional uses of substruction (Bekhet & Zauszniewski, 2008), which are the re-evaluation of existing models and to make the results of theory testing explicit. Continued use of substruction should strengthen the tentative application of the HM and RAM framework. It would assist the researcher in building the body of knowledge related to hardiness educational theory that can then be applied to nursing situations with greater confidence. The following recommendations for future hardiness research studies in nursing have emerged from the completion of this study, the examination of its implications, and the results of previous studies of hardiness.

1. Replicate the study with a larger sample to increase and achieve statistical power.
2. Replicate the study with an expanded sampling frame to include a wider geographical area and use a variety of data collection sites.
3. Analyze the qualitative data collected from the open-ended questions on the posttest demographic data questionnaires.
4. Conduct a study to follow-up with the present study's nursing students to measure and to describe their hardiness and perceived stress in their senior year of undergraduate nursing education and to assess their success in their nursing program.
5. Conduct a study to follow-up with the present study's nursing students to measure and to describe their hardiness and perceived stress in their nursing practice.



6. Use a longitudinal research design in the same sample of nursing students to examine hardiness and its correlation with their level of success throughout their undergraduate nursing education.
7. Replicate the study using the online 65-item (Maddi & Khoshaba, 2001b) research measurement tool designed to be used with the HardiTraining Program.
8. Repeat the study delivering the entire HardiTraining Program (Khoshaba & Maddi, 2008) over one complete academic semester.
9. Elicit data from the nursing students' regarding to what extent they practiced the hardicoping techniques and skills during the hardiness program.
10. Continue hardiness research instrument development studies to assure use of reliable hardiness component measures.
11. Continue to conduct further nursing research on hardiness in baccalaureate nursing students applying the Hardiness Model and the Roy Adaptation Model.
12. Conduct a qualitative study to explore the nursing students' experiences of participation in the Hardiness Educational Intervention.
13. Develop a valid and reliable measure of nursing student stress that correlates with nursing students' self-report of stress.
13. Conduct a longitudinal descriptive correlational study on hardiness related to undergraduate nursing outcomes, such as, retention rate, graduation rate, grade point average, and first time NCLEX success.
14. Conduct an exploratory study to increase the knowledge of hardiness and perceived stress in baccalaureate nursing students.

15. Include a learning style inventory, to guide the presentation of the hardiness educational intervention to nursing students.
16. The hardiness educational program should be taught, in its entirety, over an academic semester.

### **Chapter Summary**

The scarcity of published literature on hardiness and hardiness education in baccalaureate nursing students prompted this quasi-experimental non-equivalent control group design with pretest and posttest to determine if there were an effective increase in hardiness and an effective decrease in perceived stress of baccalaureate nursing students who participated in a hardiness educational intervention. Secondly, to compare hardiness and perceived stress between baccalaureate nursing students who participated and those who did not participate in a hardiness educational intervention. A theoretical substruction of the application of the HM (Khoshaba & Maddi, 2008) and the RAM (Roy, 2009) provided the conceptual framework for this study. The significant decrease in perceived stress supported the conceptual framework, but the lack of significant increase in hardiness did not support it.

The hardiness educational intervention had no statistically significant effect on increasing the experimental group's hardiness, although 95% of the nursing students rated the intervention as helpful in increasing their hardiness. A significant decrease in perceived stress was found in the experimental group, after the hardiness educational intervention. The findings seemed equivocal concerning past hardiness educational

research. Despite the mixed findings of this study, further testing of the utility of hardiness education for nursing students' success is indicated.

Nurse educators are looking for ways to help nursing students succeed. Teaching nursing students to navigate the stress of undergraduate nursing education is one of those ways and hardiness education could contribute to the negotiation of stress and student success. Refinement of hardiness measurement instruments to increase the reliability of the measurement of commitment, control, and challenge might offer direction for the course of improvement in each component. The theoretical substruction of the application of the HM and the RAM could facilitate the emergence of an educational practice theory.

The basic science of nursing is the care of humanity. Nurses can not care for others until they have cared for themselves. In nurses, from their earliest formation, the self-care of hardiness, consisting of commitment, control, and challenge, ought to be assessed, taught, and developed, to assist the fulfillment of nursing's quintessential responsibility, that of, increased hardiness and decreased stress for a health promoting care of society.

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## Appendix A

### Perceived Stress Scale

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 *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 each question fairly quickly. That is, do not try to count up the number of times you felt a particular way, but rather indicate the alternative that seems like a reasonable estimate.

For each question, choose from the following alternatives. Indicate by circling the number that describes how you felt or thought a certain way, using the following key.

- 0 = never
- 1 = almost never
- 2 = sometimes
- 3 = fairly often
- 4 = very often

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

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?
 

0	1	2	3	4
---	---	---	---	---
  
3. In the last month, how often have you felt nervous and "stressed"?
 

0	1	2	3	4
---	---	---	---	---
  
4. In the last month, how often have you dealt successfully with irritating life hassles?
 

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? 0 1 2 3 4
6. In the last month, how often have you felt confident about your ability to handle your personal problems? 0 1 2 3 4
7. In the last month, how often have you felt that things were going your way? 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? 0 1 2 3 4
9. In the last month, how often have you been able to control irritations in your life? 0 1 2 3 4
10. In the last month, how often have you felt that you were on top of things? 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? 0 1 2 3 4
12. In the last month, how often have you found yourself thinking about things that you have to accomplish? 0 1 2 3 4
13. In the last month, how often have you been able to control the way you spend your time? 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? 0 1 2 3 4

## Appendix B

### Personal Views Survey, Third Edition-Revised (PVS III-R)

Please answer the following 18 questions to the best of your ability, and as honestly as possible. This is important for report accuracy. There are no right or wrong answers. Please answer each question by circling the number that best describes your current views and life situation, using the following key.

0 = Not at all true  
 1 = Somewhat true  
 2 = True  
 3 = Very true

- |   |               |
|---|---------------|
| 1. By working hard, I can always achieve my goal.                   | 0   1   2   3 |
| 2. I do not like to make changes in my everyday schedule.           | 0   1   2   3 |
| 3. I really look forward to my work.                                | 0   1   2   3 |
| 4. I am not equipped to handle the unexpected problems of life.     | 0   1   2   3 |
| 5. Most of what happens in life is just meant to be.                | 0   1   2   3 |
| 6. When I make plans, I am certain I can make them work.            | 0   1   2   3 |
| 7. No matter how hard I try, my efforts usually accomplish little.  | 0   1   2   3 |
| 8. I like a lot of variety in my work.                              | 0   1   2   3 |
| 9. Most of the time, people listen carefully to what I have to say. | 0   1   2   3 |
| 10. Thinking of myself as a free person just leads to frustration.  | 0   1   2   3 |
| 11. Trying my best at what I do, usually pays off in the end.       | 0   1   2   3 |
| 12. My mistakes are usually very difficult to correct.              | 0   1   2   3 |
| 13. It bothers me when my daily routine gets interrupted.           | 0   1   2   3 |
| 14. I often wake up eager to take up life wherever it left off.     | 0   1   2   3 |

- |   |   |   |   |   |
|---|---|---|---|---|
| 15. Lots of times, I really do not know my own mind.            | 0 | 1 | 2 | 3 |
| 16. Changes in routine provoke me to learn.                     | 0 | 1 | 2 | 3 |
| 17. Most days, life is really interesting and exciting for me.  | 0 | 1 | 2 | 3 |
| 18. It is hard to imagine anyone getting excited about working. | 0 | 1 | 2 | 3 |

**Appendix C**

## Demographic Data Questionnaire Pretest

Code ID (Mother's first and last initial and last 4 digits of your phone number) \_\_\_\_\_

Directions: Please answer every item by either writing in your response or placing a mark (X) on the line.

1. Age in years \_\_\_\_\_

2. Gender     \_\_\_ Female

              \_\_\_ Male

3. Race       \_\_\_ White

              \_\_\_ Black, African American or Negro

              \_\_\_ Native American

              \_\_\_ Asian

              \_\_\_ Pacific Islander

              \_\_\_ Other

4. Are you of Hispanic, Latino, or Spanish origin?

              \_\_\_ Yes

              \_\_\_ No

5. What is your primary language?

              \_\_\_ English

              \_\_\_ Other (please specify) \_\_\_\_\_

## 6. Marital status

Not married

Married

Partnered

Separated

Divorced

Widowed

## 7. Are you a junior nursing student?

Yes

No

## 8. Enrollment status in nursing program

Full-time

Part-time

## 9. Transfer student

Yes

No

## 10. International student

Yes

No

## 11. Do you have an Associate Degree?

Yes (Please specify) \_\_\_\_\_

No

12. Do you have a Bachelor Degree in another discipline?

Yes (Please specify) \_\_\_\_\_

No

13. How many hours a week do you work? \_\_\_\_\_

14. Are you employed in health care?

Yes

No

15. If yes, in what capacity:

Nursing assistant

EMT

Paramedic

Orderly

Other (please specify) \_\_\_\_\_



### Appendix D

#### Demographic Data Questionnaire Posttest for Experimental Group

Directions: Please answer every item by either writing in your response, circling your response, or placing a mark (X) on the line.

1. How many of the 5 Hardiness Educational sessions did you attend? (Circle one)

1      2      3      4      5

2. Since you started in this research study, did any events occur in your personal life that you perceived to be particularly stressful?

Yes

No

If yes, please specify. \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

3. Since you started in this research study, did any significant events occur in your school life that you perceived to be personally stressful?

Yes

No

If yes, please specify. \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

4. On a scale of 1 to 10, please rate how helpful the Hardiness Educational Intervention sessions were to increase your hardiness. (One (1) was not helpful to increase hardiness; 10 was very helpful to increase hardiness)

Helpfulness of Hardiness Educational sessions to increase hardiness rating \_\_\_\_\_

5. On a scale of 1 to 10, please rate how helpful the Hardiness Educational Intervention sessions were to decrease your stress. (One (1) was not helpful to decrease perceived stress; 10 was very helpful to decrease stress)

Helpfulness of Hardiness Educational sessions to decrease perceived stress rating

\_\_\_\_\_

**Appendix E****Demographic Data Questionnaire Posttest for Control Group**

Directions: Please answer every item by either writing in your response or placing a mark (X) on the line.

1. Since you started in this research study, did any events occur in your personal life that you perceived to be particularly stressful?

\_\_\_ Yes

\_\_\_ No

If yes, please specify. \_\_\_\_\_

2. Since you started in this research study, did any significant events occur in your school life that you perceived to be personally stressful?

\_\_\_ Yes

\_\_\_ No

If yes, please specify. \_\_\_\_\_

## **Appendix F**

### **Informed Consent Form for the Experimental Group**

**INVESTIGATOR(S) NAME:** Paula R. Jameson, MSN, RN, PhD (candidate)

**STUDY TITLE:** The Effects of a Hardiness Educational Intervention  
on Hardiness and Perceived Stress of Baccalaureate Nursing Students

#### **PURPOSE OF THE STUDY**

The purpose of this study is to explore hardiness and perceived stress of baccalaureate nursing students.

I am being asked to be a subject in this study because I am a full-time junior level baccalaureate nursing student enrolled in a clinical nursing course.

#### **DESCRIPTION OF THE STUDY**

If I agree to participate in this study, I will attend a five-week hardiness education course. Each weekly session will be one hour long. If I participate in this study, I shall be asked to complete questionnaires one week before and one week after the hardiness education course. The length of the entire study is seven weeks. The amount of time required to participate in the study is seven hours. If I participate in this study, there are no known costs to me.

#### **RISKS AND DISCOMFORTS**

There are minimal to no foreseeable risks of harm or injury to subjects occurring as a result of participation in this research study. There are minimal to no foreseeable risks regarding invasion of privacy and loss of confidentiality. As a subject in this study, I might experience a slight risk of social pressure to complete the hardiness educational

course. I can control that risk by being able to withdraw from the study at any time, for any reason, and without loss or penalty to my nursing course or clinical grade.

### **BENEFITS**

I understand that there may be no direct benefits of participating in this study, for me. A potential benefit from this study is the subjects' increased understanding of the research process and the opportunity to learn the findings of the study. I understand that the knowledge and experience gained from the study may help nursing faculty to find ways to increase the hardiness and decrease the perceived stress of nursing students. I might benefit from the hardiness educational program if it is effective in increasing hardiness and decreasing perceived stress.

### **ALTERNATIVE PROCEDURES**

I understand that the alternative is not to participate in the study.

### **CONFIDENTIALITY**

I understand that all documents and information pertaining to this research study will be kept confidential except as may be required by law. I understand that I will be given directions to create a code. The code will be recorded on the demographic data questionnaires and research instruments, pretest, and posttest. I understand that data generated by the study may be reviewed by Widener University's Institutional Review Board, which is the committee responsible for ensuring my rights as a participant. If any presentations, reports, or publications result from this research, I shall not be identified by name. I understand that the information collected during my participation in this study will be kept in a locked cabinet in the researcher's locked office, in the researcher's home. Flash

drives will be password protected. Raw data will be destroyed by shredding, 5 to 7 years, after publication of the study. Electronic data will be incinerated or pulverized.

#### **TERMINATION OF PARTICIPATION**

I may choose to withdraw from this study at any time and for any reason. If I choose to stop my participation in the study, I will contact the researcher. Since this is an anonymous survey, research records cannot be destroyed following submission of the surveys.

#### **COMPENSATION**

If I choose to participate in this study, I shall receive food and beverages during each of the seven-week sessions, weekly incentives, and a certificate of appreciation in the study after the posttest data collection. There will be no cost to me for participating in this research.

#### **INJURY COMPENSATION**

Neither Widener University nor any government or other agency funding this research project will provide special services, free care, or compensation for any injuries resulting from this research. I understand that treatment for such injuries will be at my expense and/or paid through my medical plan.

#### **QUESTIONS**

All of my questions have been answered to my satisfaction and if I have further questions about this study, I may contact Paula Jameson, at 610.647.4400 extension 3665 or at [paula.jameson@gmail.com](mailto:paula.jameson@gmail.com). If I have any questions about the rights of research subjects, I may call the Chairperson of the Widener University's Institutional Review Board at 610-499-4110.

**VOLUNTARY PARTICIPATION**

I understand that my participation in this study is entirely voluntary, and that if I do not accept the invitation to participate there is no penalty or loss of benefits to me. I am free to decline the invitation to participate, withdraw or refuse consent, or to stop my participation in this study at anytime without affecting my grades or academic standing. I voluntarily give my consent to participate in this research study. I understand that I will be given a copy of this consent form.

Signatures:

\_\_\_\_\_  
Participant's Name (Print)

\_\_\_\_\_  
Participant's Signature

\_\_\_\_\_  
Date

\_\_\_\_\_  
Participant's E-mail Address

I, the undersigned, certify that to the best of my knowledge, the subject signing this consent form has had the study fully and carefully explained by me and have been given an opportunity to ask any questions regarding the nature, risks, and benefits of participation in this research study.

\_\_\_\_\_  
Investigator's Name (Print)

\_\_\_\_\_  
Investigator's Signature

\_\_\_\_\_  
Date

Widener University IRB has approved the solicitation of subjects for this study.

## **Appendix G**

### **Informed Consent Form for the Control Group**

**INVESTIGATOR(S) NAME:** Paula R. Jameson, MSN, RN, PhD (candidate)

**STUDY TITLE:** The Effects of a Hardiness Educational Intervention  
on Hardiness and Perceived Stress of Baccalaureate Nursing Students

#### **PURPOSE OF THE STUDY**

The purpose of this study is to explore hardiness and perceived stress of baccalaureate nursing students.

I am being asked to be a subject in this study because I am a full-time junior level baccalaureate nursing student enrolled in a clinical nursing course.

#### **DESCRIPTION OF THE STUDY**

If I agree to participate in this study, I shall be asked to complete questionnaires week one of the research study and week seven of the study. The length of the entire study is seven weeks. The amount of time required to participate in the study is two hours. If I participate in this study, there are no known costs to me.

#### **RISKS AND DISCOMFORTS**

There are minimal to no foreseeable risks of harm or injury to subjects occurring as a result of participation in this research study. As a subject in this study, I might experience a slight risk of social pressure to remain in the study. I can control that risk by being able to withdraw from the study at any time for any reason. There are minimal to no foreseeable risks regarding invasion of privacy and loss of confidentiality. I may withdraw from the study, at any time, without loss or penalty to my nursing course or clinical grade.



**BENEFITS**

I understand that there may be no direct benefits of participating in this study, for me. A potential benefit from this study is the subjects' increased understanding of the research process and the opportunity to learn the findings of the study. If the hardiness educational program is effective in increasing hardiness and decreasing perceived stress, then the hardiness educational course will be offered to me, at the completion of the study.

**ALTERNATIVE PROCEDURES**

I understand that the alternative is not to participate in the study.

**CONFIDENTIALITY**

I understand that all documents and information pertaining to this research study will be kept confidential except as may be required by law. I understand that I will be given directions to create a code. The code will be recorded on the demographic data questionnaires and research instruments, pretest, and posttest. I understand that data generated by the study may be reviewed by Widener University's Institutional Review Board, which is the committee responsible for ensuring my rights as a participant. If any presentations, reports, or publications result from this research, I shall not be identified by name. I understand that the information collected during my participation in this study will be kept in a locked cabinet in the researcher's locked office, in the researcher's home. Flash drives will be password protected. Raw data will be destroyed by shredding, 5 to 7 years, after publication of the study. Electronic data will be incinerated or pulverized.

**TERMINATION OF PARTICIPATION**

I may choose to withdraw from this study at any time and for any reason. If I choose to stop my participation in the study, I will contact the researcher. Since this is an anonymous survey, research records cannot be destroyed following submission of the surveys.

**COMPENSATION**

If I choose to participate in this study, I shall receive food and beverages during the first and last weeks of the study, incentives, and a certificate of appreciation after the posttest data collection. There will be no cost to me for participating in this research.

**INJURY COMPENSATION**

Neither Widener University nor any government or other agency funding this research project will provide special services, free care, or compensation for any injuries resulting from this research. I understand that treatment for such injuries will be at my expense and/or paid through my medical plan.

**QUESTIONS**

All of my questions have been answered to my satisfaction and if I have further questions about this study, I may contact Paula Jameson, at 610.647.4400 extension 3665 or at

. If I have any questions about the rights of research subjects, I may call the Chairperson of the Widener University's Institutional Review Board at 610-499-4110.

**VOLUNTARY PARTICIPATION**

I understand that my participation in this study is entirely voluntary, and that if I do not accept the invitation to participate, there is no penalty or loss of benefits to me. I am free to

decline the invitation to participate, withdraw or refuse consent, or to stop my participation in this study at anytime without affecting my grades or academic standing. I voluntarily give my consent to participate in this research study. I understand that I will be given a copy of this consent form.

Signatures:

\_\_\_\_\_  
Participant's Name (Print)

\_\_\_\_\_  
Participant's Signature

\_\_\_\_\_  
Date

\_\_\_\_\_  
Participant's E-mail Address

I, the undersigned, certify that to the best of my knowledge, the subject signing this consent form has had the study fully and carefully explained by me and have been given an opportunity to ask any questions regarding the nature, risks, and benefits of participation in this research study.

\_\_\_\_\_  
Investigator's Name (Print)

\_\_\_\_\_  
Investigator's Signature

\_\_\_\_\_  
Date

Widener University IRB has approved the solicitation of subjects for this study.

## Appendix H

Certificate of Appreciation

Certificate of AppreciationPresented To

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In Gratitude For Participation In:

The  
Effects of A Hardiness Educational  
Intervention on Hardiness and  
Perceived Stress of Baccalaureate  
Nursing Students Study

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Researcher's Signature

---

Date

## Appendix I

### Letter of Request for Access to Potential Subjects

Paula R. Jameson, IHM

(Month Date, 2011)

Name Dean/Chair  
School/Division/Department of Nursing  
City, State Zip Code

Dear Dean/Chair,

I am a doctoral candidate in the Widener University School of Nursing interested in studying the effects of a hardiness educational intervention on the hardiness and perceived stress of baccalaureate nursing students. Your assistance is requested. May I have your permission to access your junior level nursing students who will be enrolled in clinical courses in the Fall 2011 semester? From among your students, a portion of the study's convenience sample will be collected.

I would like to explain the study to you, at your convenience. If you agree to allow your nursing students to participate in this research effort, please send to me a letter of support in the enclosed self-addressed stamped envelope. Upon receipt, I shall promptly contact you to arrange a time to discuss this study. If you prefer to contact me by telephone, I can be reached at XXX.XXX.XXXX extension XXXX or by e-mail, at xxxxx.xxxxxxx@xxxxx.xxx.

Following Institutional Review Board approval, I shall seek permission to contact directly the nursing faculty teaching the Fall 2011 semester junior level clinical nursing courses for a convenient time to explain the study. In addition, I shall ask the nursing faculty for a time to speak to their students, explain the study, answer questions, and recruit subjects.

I thank you for considering this request for your students' and faculty members' participation in this study. Upon its completion, I would be happy to meet with you to share the findings or to send you a written summary, if desired.

Thank you for your cooperation.

Sincerely,  
Paula R. Jameson, IHM, MSN, RN, PhD (candidate)

**Appendix J**

Letter to Nursing Faculty

Paula R. Jameson, IHM

(Month Date, 2011)

Name  
School/Division/Department of Nursing  
City, State Zip Code

Dear

I am a doctoral candidate in the Widener University School of Nursing. I am interested in studying the effects of a hardiness educational intervention on the hardiness and perceived stress of baccalaureate nursing students. I am pursuing this research for my dissertation as a requirement for the degree of Doctor of Philosophy (PhD).

I understand that you will be teaching a junior level clinical nursing course in the Fall 2011 semester. I would like to explain the study to you, at a mutually convenient time. In addition, may I ask for some time to speak to your students to explain the study, answer questions, and recruit subjects?

This is my contact information. If you prefer to contact me by telephone, I can be reached at XXX.XXX.XXXX xXXXX. If you prefer to contact me by e-mail, my e-mail address is xxxxx.xxxxxxx@xxxxx.xxx.

Thank you for your cooperation.

Sincerely,

Paula R. Jameson, IHM, MSN, RN, PhD (candidate)

## Appendix K

### Outline for Explanation of the Study for Potential Subjects Experimental Group

- I. Introduction of Researcher
- II. Purpose of the Study: To explore hardiness and perceived stress of baccalaureate nursing students.
- III. Experimental Group
  - i. Hardiness Educational Intervention
- IV. Measurements
  - i. Week One Pretests and Week Seven Posttests
  - ii. Demographic Data Questionnaire Pretest and Posttest
  - iii. PVS III-R Pretest and Posttest
  - iv. PSS Pretest and Posttest
- V. Privacy, Anonymity, and Confidentiality
- VI. Benefits
  - i. Subjects
  - ii. Nursing Profession
  - iii. Summary Report of Findings
- VII. Explanation of Informed Consent
- VIII. Question and Answer Period

## Appendix L

### Outline for Explanation of the Study for Potential Subjects Control Group

- I. Introduction of Researcher
- II. Purpose of the Study: To explore hardiness and perceived stress of baccalaureate nursing students.
- III. Control Group
  - i. No Hardiness Educational Intervention
  - ii. Hardiness Educational Intervention if found effective
- IV. Measurements
  - i. Pretests Week One and Posttests Week Seven
  - ii. Demographic Data Questionnaire Pretest and Posttest
  - iii. PVS III-R Pretest and Posttest
  - iv. PSS Pretest and Posttest
- V. Privacy, Anonymity, and Confidentiality
- VI. Benefits
  - i. Subjects
  - ii. Nursing Profession
  - iii. Summary Report of Findings
- VII. Explanation of Informed Consent
- VII. Question and Answer Period



**Appendix M**

The Hardiness Institute, Incorporated

Hardiness Trainer in Training and Certified Hardiness Trainer Contract

**Appendix N**

**Hardiness Educational Intervention: Hardicoping Component**

## **Appendix O**

### **Hardiness Educational Intervention Terms**

**Appendix P**

## Summarized Responses of Specifications of

Personal and School Life Events Perceived as Stressful ( $N = 79$ )Perceived Personal Life Stress ( $n = 43$ )Relationship Issues ( $n = 17$ )Family Issues ( $n = 16$ )Financial Issues ( $n = 15$ )Health Issues ( $n = 7$ )Perceived School Life Stress ( $n = 65$ )Examinations/Tests ( $n = 51$ )Grades ( $n = 15$ )Nursing Course Content ( $n = 15$ )Organizational Issues ( $n = 10$ )Course Work Overload ( $n = 9$ )Time Management Issues ( $n = 9$ )Clinical Courses ( $n = 8$ )