NOTICE

The quality of this microform is heavily dependent upon the quality of the original thesis submitted for microfilming. Every effort has been made to ensure the highest quality of reproduction possible.

If pages are missing, contact the university which granted the degree.

Some pages may have indistinct print especially if the original pages were typed with a poor typewriter ribbon or if the university sent us an inferior photocopy.

Previously copyrighted materials (journal articles, published tests, etc.) are not filmed.

Reproduction in full or in part of this microform is governed by the Canadian Copyright Act, R.S.C. 1970, c. C-30.

AVIS

La qualité de cette microforme dépend grandement de la qualité de la thèse soumise au microfilmage. Nous avons tout fait pour assurer une qualité supérieure de reproduction.

S'il manque des pages, veuillez communiquer avec l'université qui a conféré le grade.

La qualité d'impression de certaines pages peut laisser à désirer, surtout si les pages originales ont été dactylographiées à l'aide d'un ruban usé ou si l'université nous a fait parvenir une photocopie de qualité inférieure.

Les documents qui font déjà l'objet d'un droit d'auteur (articles de revue, tests publiés, etc.) ne sont pas microfilmés.

La reproduction, même partielle, de cette microforme est soumise à la Loi canadienne sur le droit d'auteur, SRC 1970, c. C-30.

Canada

THE UNIVERSITY OF ALBERTA

THE HARDINESS OF CRITICAL CARE NURSES: AN EVALUATION OF A MEASURE OF STRESS RESISTANCE

BY

DENISE F. BROWN

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE

OF MASTER OF NURSING

FACULTY OF NURSING

EDMONTON, ALBERTA

FALL, 1988

ISBN 0-315-45574-8

THE UNIVERSITY OF ALBERTA

RELEASE FORM

NAME OF AUTHOR: Denise F. Brown

NAME OF THESIS: The hardiness of critical care nurses: an evaluation of a measure of stress resistance

DEGREE FOR WHICH THIS THESIS WAS PRESENTED: Master of Nursing

YEAR THIS DEGREE GRANTED: 1988

Denise F Brown

(Student's signature)

Box 8 Group 378 RR3

(Student's permanent address)

Winnipeg Manitoba

Date: Oct 11, 1988

THE UNIVERSITY OF ALBERTA

FACULTY OF GRADUATE STUDIES AND RESEARCH

The undersigned certify that they have read, and recommend to the Faculty of Graduate studies and Research, for acceptance, a thesis entitled THE HARDINESS OF CRITICAL CARE NURSES: AN EVALUATION OF A MEASURE OF STRESS RESISTANCE submitted by DENISE F. BROWN in partial fulfillment of the requirements for the degree of MASTER OF NURSING.

Supervisor

Date: September 26, 1988

DEDICATION

To my parents for their unyielding love and support.

ABSTRACT

Measures of the hardiness of critical care nurses were evaluated for their reliability and validity. Hardiness, a personality characteristic that functions as a stress resistance resource, was measured with the third edition of the Hardiness Test. Two sets of measures were evaluated, one set calculated by the Hardiness Institute, and another calculated by the investigator. Concurrent and retrospective survey data was collected from female general duty registered nurses employed on a full-time basis in adult critical care (n=160) and obstetrical units (n=54) in selected hospitals in Edmonton, Alberta. A contrast was expected between the hardiness of nurses working in critical care (a high stress environment) and obstetrics (a low stress environment).

Factor analysis using principle components analysis and varimax rotation provided minimal evidence of construct validity. Alternate tests measuring hardiness and its dimensions were derived from the factor solution and were the basis for scores calculated by the investigator. Limited evidence of the stress buffering of hardiness was found: one measure interacted significantly with level of work stress on psychological symptoms and several others had significant direct effects on the dependent variables. Small to moderate sized significant relationships between some hardiness and dependent variables (psychological symptoms, perceptions of well-being, absenteeism due to illness, and job enjoyment) provided evidence of criterion related validity. Limited evidence of criterion related validity was provided by the contrasted groups method: few hardiness measures were significantly greater for the critical care group in

comparison to the obstetrical group. Although the measures calculated by the investigator were limited by low internal reliability (.6810 to .7506), analysis of these measures provided more substantial evidence of validity than analysis of the measures calculated by the Hardiness Institute. In addition, the biographical characteristics, and reported psychological symptoms, well-being, absenteeism due to illness, and job enjoyment of the nurses are described. Limitations and implications of the findings are discussed and recommendations for further research are presented.

ACKNOWLEDGMENTS

I wish to thank my committee members, Dr. J. Kerr, Dr. D. Forrest, and Dr. H. Northcott, for their contributions to this thesis. Their insightful comments, penetrating questions, and painstaking editing of this work were greatly appreciated, as was their warm support. I would especially like to thank my Chairperson, Dr. Kerr, for her encouragement, patience, and guidance. I gratefully acknowledge the information and encouragement received from Dr. Jan Atwood, College of Nursing, University of Arizona and Dr. Sharon Summers, School of Nursing, University of Kansas. Thanks must be given to Dr. S. Stinson, University of Alberta Faculty of Nursing, for her influence on my literature review and my education. I also proudly recognize the contribution of the graduate faculty of the McGill University School of Nursing to my graduate education; special thanks must be given to Professor F. MacKenzie and Dr. M. E. Jeans. Lastly, thanks must be given to the respondents and other employees of the hospitals surveyed who generously donated their time to this study.

This research was funded in part by a National Health M.Sc. Fellowship from the National Health Research and Development Program and by a research bursary from the Alberta Foundation for Nursing Research.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER I

THE RESEARCH PROBLEM AND ITS SIGNIFICANCE

Statement and Significance of the Problem

Hardiness is a personality structure that was originally identified and investigated by existential psychologists at the University of Chicago (e.g., Kobasa, 1979; Kobasa, Maddi, & Courington, 1981). These investigators proposed that hardiness functions as a stress resistance resource; it distinguishes individuals who remain healthy when experiencing high levels of stress from those who become sick (Kobasa). The numbers of critiques of hardiness research (e.g., Lazarus & Folkman, 1984; Lambert & Lambert, 1987; Lefcourt, 1983), published investigations (see Appendix A - Hardiness: a selection of published studies), and dissertations (Barlone, 1984; Berger, 1984; Contrada, 1985; Helrich, 1985; Sagert, 1985) attest to the growing interest and information about this construct.

The third edition of the Hardiness Test has been in use since 1984 (H. Kahn, personal communication, March 1987). Information concerning the reliability and validity of this edition have been released recently (Hardiness Institute, personal communication, May 1988). Satisfactory estimates of the reliability and validity of the second edition have been obtained for predominantly male professional populations, but not for samples of critical care nurses (Ducette, 1986; Summers, 1986).

Since the advent of critical care (CC) units in the 1960's, critical care nursing (CCN) has been portrayed as stressful, challenging, and even heroic (e.g., Claus & Bailey, 1980; Hay & Oken,

1972). The stressors of this complex, technological nursing specialty have been described, enumerated, measured and compared with stressors of other nursing specialties and other occupations (Cross & Fallon, 1985; Leatt & Schneck, 1985). These stressors are reputed to have had detrimental effects on the well-being of nurses and therefore, the cost and quality of care provided to critically ill patients (Hay & Oken; Millar, 1980; Norbeck, 1985a). Growing recognition of the variation in stressors between nursing specialties and in nurses' responses to these stressors has lead to the belief that certain nurses are less vulnerable to these stressors and more suited to CCN (Leatt & Schneck; Maloney & Bartz, 1983). Although the professional orientations, personality profiles, and demographic characteristics of CC nurses have been the subject of numerous investigations (Claus & Bailey; Cross & Kelly, 1984; Hutchinson, 1984; Lewandoski & Kramer, 1980; Mohl, Denny, Mote, & Coldwater, 1982), the personal factor or factors responsible for the resistance of particular CC nurses to these occupational stressors have yet to be identified.

According to Schlotfeldt (1984), nursing research "should be guided by theories propounded about human beings' health assets" (p. 104). Since the Hardiness Test has been proposed as a measure of a health asset, the reliability and validity of the Test should be addressed by nursing. The testing of this measure with a sample of CC nurses is warranted by the need for substantive information about the stress resistance resources of CC nurses, and the relationship among these resources, occupational stressors, and their effects; the present shortage of skilled critical care nurses in Canada (Morningstar, 1986; Wiebe, 1987) and the turnover rate of CC nurses in

Alberta (Alberta Health and Social Services Disciplines Committee, 1985) provide evidence of the timeliness of this study. If information concerning the hardiness of CC nurses is to be obtained, it is imperative that issues of instrument reliability and validity be addressed. Therefore, the investigator will estimate the reliability and validity of the Hardiness Test for a sample of critical care nurses; nurses who are exposed to a large number and variety of occupational stressors.

Purpose and Objectives

The investigator's primary purpose was to estimate the psychometric properties of the third edition of the Hardiness Test for a sample of critical care nurses. This information was anticipated to contribute to the body of knowledge concerning hardiness, CC nurses, and CCN occupational stresses. It was hoped the findings would ultimately contribute to improvements in the health and professional well-being of CC nurses and the well-being of critically ill patients and the health care system.

The specific objectives were to:

1. estimate the internal reliability by calculation of Cronbach's alpha;
2. evaluate construct validity by factor analysis; and
3. evaluate the criterion related validity by assessing the relationship between hardiness and selected variables found to be associated with CCN stress, and by assessing evidence of validation by the contrasted groups method.

Hypotheses

Hypotheses were generated to direct the evaluation of the measure's criterion related validity and to limit the risks associated with improper interpretation of data (Kerlinger, 1973). The first two hypotheses examine differences within individual criterion related variables and relationships among them. The remaining hypotheses address the relationships between the hardiness variables and biographical and criterion related variables. The fourth hypothesis concerns assessment of validity by the contrasted groups method. Findings from the literature review led to the expectation that membership within a CCN group required greater stress resistance than membership within an obstetrical nursing group.

H1 Significant relationships among job enjoyment, psychological symptoms, and absenteeism will be found.

H2 Significant differences in levels of job enjoyment, psychological symptoms, and absenteeism will be found between units.

H3 Relationships between hardiness and biographical factors will not be significant.

H4 The mean level of hardiness of nurses who work in high stress areas (CC) will be significantly higher than the mean level of hardiness of nurses who work in low stress areas (obstetrics).

H5 Nurses with higher levels of hardiness are more likely to have lower levels of psychological symptoms and absenteeism, and higher levels of job enjoyment.

H6 The interaction of level of hardiness and level of work stress will have a significant effect on nurses' job enjoyment, psychological distress, and absenteeism.

Assumptions

Interpretations of the findings should give due consideration to the assumptions upon which this study was based:

1. "stress is a particular relationship between the person and the environment that is appraised as taxing or exceeding his or her resources and endangering his or her well-being" (Lazarus & Folkman, 1984, p. 19);

2. a stressor is an environmental demand that is appraised as taxing;

3. hardiness, a personality factor that increases resistance to stress, can be measured;

4. selected criterion variables are significantly related to stress and resistance to stress;

5. selected measures of criterion variables will have sufficient reliability and validity to permit the estimation of the hardiness measure's criterion related validity;

6. greater numbers of demands reside within the critical care nursing environment than the obstetrical post partum nursing environment;

7. levels of hardiness and the criterion variables will differ among nurses; and

8. the subjects will respond to the questionnaire honestly.

Definition of terms

General Duty Registered Nurse: a registered nurse employed to provide direct patient care; may supervise other staff occasionally.

Critical care unit: a hospital unit designated for the care of the critically ill; also called an intensive care unit.

Obstetrical unit: a hospital unit designated for the care of pregnant women, new mothers, and newborn; care may also be provided to women with gynecological problems.

Level of nursing education: includes registered nursing diploma, registered psychiatric nursing diploma, bachelor degree in nursing, master's degree in nursing, and selected categories of post-basic education relevant to the study.

Overview of the Thesis

The thesis is composed of five chapters and appendices. The following chapter presents a review of selected literature relevant to the research objectives. Chapter three describes the methods and procedures used to collect and analyze the data and a description of the sample. The results are presented and discussed in chapter four, and in the last chapter the implications and recommendations arising from the findings are described.

CHAPTER II

A SELECTED REVIEW OF THE LITERATURE

A review of the salient theoretical issues and research methods relevant to the research objectives is presented in this chapter. A vast body of literature was identified from the disciplines of nursing, psychology, sociology, and education by manual and computer searches. The review was restricted to references written in the English language. Published and unpublished theses and dissertations were examined when accessible.

The review will be presented in the following sequence: (1) Overview of stress models and research; (2) Hardiness; (3) The stress of critical care nursing; (4) Selected correlates of critical care nursing stress; and (5) Measurement theory.

Overview of Stress Models and Research

The concept of stress is complex, multifaceted, and frequently misunderstood. The multiplicity of meanings ascribed to this term by theorists in diverse fields may be attributed to the ubiquitous nature of this phenomenon (Lazarus & Folkman, 1984). According to Goldberger and Breznitz (1982), wide spread interest in stress has created a field that is vast, uneven, and uncoordinated.

Cox (1978) states there are three main approaches to the study of stress. Advocates of the first approach focus on particular physiological responses, which they label as stress. For example, Selye (1974) defines stress as "the nonspecific response of the body to any demand made upon it" (p. 14). Proponents of the second approach, stimulus based definitions and models, treat stress as an independent variable; they strive to identify and quantify the

characteristics of stimuli that are deemed to be stressful (Cox). The third approach, the interactionalist or transactionalist, describes stress as the result of a particular relationship between an individual and his environment. Advocates of this approach recognize and attempt to explain individual variation in responses to stimuli.

Within the past decades, there has been a rapid increase in the number and the complexity of interactional models (e.g., Coehlo, Hamburg, & Adams, 1974; Lazarus & Folkman, 1984; Monat & Lazarus, 1985). Lazarus and Folkman chart the evolution of the traditional cause and effect model to the multi-dimensional process oriented stress model. The latter depicts variables (causal antecedents, mediating processes, and immediate and longterm effects) that are social, psychological, and physiological in nature. Lazarus and Folkman assert that the relationships among stress, appraisal, coping, the personal and environmental antecedents of stress and coping, and the short and long term adaptational outcomes can be analyzed at social, physical, and psychological levels. They define psychological stress as "a particular relationship between the person and the environment that is appraised by the person as taxing or exceeding his or her well-being" (p. 19). Models for the stress buffering functions of coping resources such as, social support, personality factors, and coping strategies have been proposed (Wheaton, 1985). Conceptualizations of stress as changes have been considered inadequate, for they exclude sources of stress, such as, daily "hassles", and acute and chronic problems (Cohen, 1979; Pearlin & Schooler, 1978).

Characteristics of individuals appear to be significant

determinants of appraisals of situations, choices of coping strategies, and outcomes of interactions (Lazarus & Folkman, 1984; Pearlin, 1985). According to Folkman, Lazarus, Gruen, and Delongis (1986), individuals should demonstrate some stability in stress appraisal and coping processes related to their personality characteristics. Lazarus and Folkman state that commitments "are clearly important as determinants of psychological distress" (p. 63); commitments sustain coping efforts, and determine areas of meaningfulness and vulnerability. Beliefs which concern personal control (Lazarus & Folkman; Lefcourt, 1983; Lefcourt, Martin, & Saleh, 1984) and which enable meaning to be created from life events (Frankl, 1963; Lazarus & Folkman) also affect appraisal of events and coping. Pearlin and Schooler (1978) found personal mastery, which is similar to control, and self esteem to be effective coping resources. "Mastery" as well as interpersonal trust were found to explain a significant amount of variance in psychological symptoms (Folkman et al., 1986). Perceptions of being externally controlled have been linked to higher levels of trait anxiety in the literature (Archer, 1979). Endler & Edwards (1982) report that individuals high in trait anxiety develop greater anxiety in stressful situations than individuals low in trait anxiety.

Although Cohen (1979) and Mechanic (1974) justifiably declare that most stress studies relate personality factors to illness behavior rather than actual physical illness, evidence of a relationship between personality factors and modes of coping with and recovery from illness has been established (e.g., Cohen & Lazarus, 1979; Cousins, 1985; Lipowski, 1970; Moos & Tsu, 1977). In addition,

particular behaviors have been linked to the onset of cardiac disease (Brand, Rosenman, Sholtz, & Friedman, 1976; Suinn, 1982). Antonovsky (1979) theorized that a major component of personality, a sense of coherence, has significant effects on one's ability to cope with stressors and level of health. Antonovsky defines a sense of coherence as:

> a global orientation that expresses the extent to which one has a pervasive, enduring though dynamic feeling of confidence that one's internal and external environments are predictable and that there is a high probability that things will work out as well as can be reasonably be expected. (p. 123)

According to Lazarus and Folkman (1984), the appraisal of an event as threatening triggers coping strategies and emotions which may be responsible for specific disturbances in health and functioning; variations in the appraisal-coping process may be related to variations in functioning and health.

A surge of interest in occupational determinants of stress (e.g., publications by Cooper & Marshall, 1976; Cooper & Payne, 1979; Holt, 1982; Lowe & Northcott, 1986; McGrath, 1983; McLean, 1979) may be attributed to evidence that suggests a relationship between these factors and an increase in coronary heart disease (CHD) risk factors, incidence of CHD, mental health problems (Cooper & Marshall; Cooper & Payne) job dissatisfaction (Bedian & Armenakis, 1981; Locke, 1976), and a variety of other physiological, psychological, and behavioral problems (French, Jr. & Caplan, 1972; Holt). An interactive approach to the understanding of stress in the workplace has been emphasized by McMichael (1979). Caplan (1983), French, Jr., Rodgers, and Cobb (1974), and Harrison (1979) conceptualize job stress as the result of the misfit of the actual and perceived supplies and demands of the

worker and the environment.

Although occupational stresses can have profound effects, Pearlin (1985) finds that the structural separation of roles permits an individual to segregate the strains and stresses that arise in one role from experiences in other roles. Further testing is required to determine the generalizability of this finding.

A summary of the evolution of stress models has been presented and selected components of the most widely endorsed models, the interactional, have been described. According to this model, stress is an idiosyncratic phenomenon; it arises from the relationship between an individual and the environment.

Hardiness

Conceptual basis.

Hardiness has been conceptualized as a personality structure that functions as a stress resistance resource (Kobasa, 1979). In this paper the term refers to the construct initially identified by Kobasa and her associates. This conception of hardiness originated from a variety of theories derived from the writings of existential philosophers, the clinical experience of existential psychotherapists, and the research of personality theorists (Kobasa). Hardiness is considered to be one of many psychosocial variables related to individual variation in responses to stressful life events.

According to Kobasa (1982b), "an existential theory of personality... is central to this research" (p. 6). Existentialists believe that personality traits are not static; personality is continuously and dynamically constructed (Kobasa). They consider authenticity an ideal; authentic people demonstrate a high degree of

awareness of themselves and the world around them, and make decisions based on the belief they have influence over events in their lives (Kobasa & Maddi, 1983). Existentialists theorize that "existential sickness", a perceived lack of meaning in life, is the result of psychological, social, and biological stresses (Kobasa & Maddi). To measure levels of meaninglessness (vegetativeness, nihilism, adventurousness, and powerlessness) in relation to work, social institutions, family, other persons, and self, Maddi, Kobasa, and Hoover (1979) developed the Alienation-Commitment Test (or the Alienation Test).

Kobasa (1979) states that the hardy personality has three dimensions: commitment, control, and challenge. Committed individuals have a sense of purpose in life; they find meaning in and become involved with, rather than alienated from people, things, and life events. Individuals who perceive they have control over events in their lives, use a variety of coping strategies and are unlikely to act helpless when confronted by stressful life events (Kobasa et al., 1982). Individuals who exhibit the challenge dimension perceive life events as interesting opportunities for growth and attempt to profit from them. Kobasa and her associates propose that the dimensions of commitment, control, and challenge influence appraisal of and responses to life events. Kobasa, Maddi, and Courington (1981) state these "components should not be regarded as mutually exclusive aspects of hardiness, but rather, as inextricably intertwined aspects that bear a considerable resemblance to each other" (p. 369). Kobasa (1982b) indicates that these dimensions bear similarities and differences to each other. "They can be viewed as interlocking parts

of an overall orientation or style of stress resistance - a style that can be termed hardiness...; when life is stressful, hardiness decreases the number and severity of illness reports" (p. 8).

Empirical investigations.

Authors of studies attempted to explicate the relationships among hardiness, sources of stress, and possible effects of stress (see Appendix A - Hardiness: A selection of published studies). A variety of terms have been applied to hardiness, a stress moderator (Kobasa & Puccetti, 1983), mediator (Kobasa et al., 1981), buffer (Kobasa, Maddi, Puccetti, & Zola, 1985), and resistance resource (Kobasa et al., 1982). According to Wheaton (1985), a moderator is a particular type of buffer that interacts with stress so "that effects of stress will be significantly attenuated at higher levels of... [the buffer]" (p. 354).

Few authors attempted to model hypothesized causal relationships; none depicted estimations of these relationships. Kobasa (1982a) proposed that life events and hardiness have direct effects on strain and indirect effects on strain through coping. Kobasa and Puccetti (1983) hypothesized that hardiness has direct effects on coping and indirect effects on coping through social assets; coping was proposed to have interactive effects, moderating the relationship between life events and strain. Recognizing the complexity of these relationships, they proposed a multidimensional model composed of "two directional arrows, feedback loops, and indirect paths" (p. 849) be developed and tested.

Significant correlations were found between stressful life events and illness, ranging from .23 ($p<.025$) (Kobasa et al., 1982) to .43

($p<.001$) (Kobasa & Puccetti, 1983), or stressful life events and strain, .29 ($p<.0003$) (Kobasa, 1982a). Correlations between stressful life events and hardiness were small, but significant, ranging from .07 ($p<.10$) (Kobasa et al., 1982) to .18 ($p<.01$) (Kobasa & Puccetti, 1983). In the latter instance, correlations between stressful life events and illness ($r=.43$, $p<.001$) and hardiness and illness ($r=.30$, $p<.005$) were comparatively larger and more significant.

Neither stress, illness, nor hardiness generally appeared to be reflections of demographic characteristics in relatively homogeneous male populations. The one significant finding was the correlation between hardiness and time at particular level of job ($r=.14$, $p<.05$) (Kobasa et al., 1982). However, Kobasa (1982b) reported differences in the relationships among hardiness, stressful life events, and illness between different occupational groups. Correlations between stressful life events and reported illness were significant and strong for army officers, small for executives, and nonsignificant for lawyers; a significant moderate correlation between life events and strain was seen for the latter group. In addition to having high correlations between stress and illness, Army officers had the lowest levels of hardiness of the three groups.

Few investigators have studied the hardiness of women. Since the majority of these investigators (Ganellen & Blaney, 1984; Keane, Ducette, & Adler, 1985; Kobasa & Hill, 1981, cited by Kobasa, 1982b; Maloney & Bartz, 1983; Rhodewalt & Agustsdottir, 1984; Rich & Rich, 1987) failed to report the reliability and validity of their measures, their findings must be interpreted with caution. Summers (1986) and Ducette (1986), who attempted to estimate the hardiness of nurses,

reported low estimates of the internal reliability of the second edition of the Hardiness Test. Rich and Rich, measured the hardiness of 100 female staff nurses with a 60 item test developed by Kobasa, Maddi, and Kahn (1982). Factor analysis using a varimax rotation yielded a solution composed of two independent factors: commitment/control and need for security. Significant correlations were found between hardiness and burnout ($r=-.39$, $p<.001$), age ($r=.20$, $p<.01$), and days of illness ($r=-.43$, $p<.001$), and an insignificant correlation was found between hardiness and experience ($p>.05$). By means of analysis of variance it was determined that the main effects of age ($F=11.70$, $p=.001$) and hardiness ($F=7.63$, $p=.007$) on burnout were significant, but the interactive effects were not ($F=0.078$, $p=.78$). McCranie, Lambert, and Lambert, Jr. (1987) tested 260 staff nurses, a predominantly female group, with a 36 item abridged Hardiness Scale developed by Kobasa, Maddi, Donner, Merrick, and White (1984) and obtained a coefficient alpha reliability of .81. They found nurses who were more hardy experienced less burnout ($r=-.43$, $p<.05$). Although hardiness explained significant increments of variance in burnout over and above the effects of shift, the interaction of hardiness and type of stress was not significant.

Evidence suggests that hardiness and variables correlated with hardiness diminish the potentially negative effects of stress. Barling (1986) determined that "hardiness moderated the inter-role conflict / marital adjustment relationship significantly ($F(1,66) = 6.63$, $p<.01$) accounting for 6 percent of the variance [in a sample of fathers]" (p. 4). Kobasa (1979) determined that a group of executives with high stress and low illness scores had significantly lower alienation

scores, and higher challenge and internal locus of control scores than a group with high stress and high illness scores. These findings were determined using a portion of the sample and then cross-validated on the remainder of the subjects. According to Kobasa, the "cross-validation results offer support for the stability and generalizability of the results obtained through discriminant function analysis" (p. 9).

In order to determine whether hardiness was a result of rather than a predictor of health, Kobasa et al. (1982) conducted a longitundinal study over a period of two years. At time 1, data concerning illness and sources of stress for the preceding two year period and measures of hardiness were gathered. Information concerning illness and sources of stress was also collected at time 2 which was one year following time 1, and time 3, a year following time 2. Two groups, one with high scores and the other with low scores on the independent variables (stressful life events and hardiness) were formed. When an analysis of covariance was performed, stressful life events (measured at time 2 and 3), hardiness, and the interaction of hardiness and stressful life events demonstrated significant effects on the dependent variable, total illness at time 2 and 3 (the covariate being illness at time 1). When the independent variables were stressful life events (time 1) and hardiness, hardiness and the interaction of hardiness and events had significant effects.

The combined impact of hardiness, sources of stress, and other resources or personality types has also been analyzed. Kobasa et al. (1981) reported findings concerning constitutional predisposition to illness, hardiness (time 1), stressful life events (times 1, 2, and 3)

and illness (times 1, 2, and 3). Correlations between these variables were small (.03 - .07). Groups with high and low scores on the independent variables were formed. When an analysis of variance was performed, hardiness, constitutional predisposition, and stressful life events (time 1) demonstrated significant main effects on total illness at times 2 and 3. The investigators concluded these independent variables had an additive effect with regard to illness. When an analysis of covariance was performed, hardiness and constitutional predisposition were found to have significant main effects on illness change from time 1 to times 2 and 3. These results should be interpreted cautiously since the reliability and validity of the measure of constitutional predisposition were not reported.

Rhodewalt and Agustsdottir (1984) noted that type A-B personality and hardiness were correlated ($r=.16$, $p<.001$), but had different effects on the stress-illness relationship. They found high levels of hardiness were associated with positive perceptions of life events and perceptions rather than numbers of life events were better predictors of distress.

The impact of each of three social resource variables (perceived family support, boss support, social assets), stressful life events, and hardiness on illness was estimated by a series of 3 way analyses of variance (Kobasa & Puccetti, 1983). Hardiness and stressful life events had significant main effects on reports of illness, whereas perceptions of boss support, family support, and social assets did not. The interactions of stressful life events and boss support ($F=5.89$, $p<.01$), stressful life events and hardiness ($F=2.52$, $p<.01$), hardiness and family support ($F=4.67$, $p<.05$), and stressful life

events, hardiness, and family support ($F=3.30$, $p<.01$), had significant effects on reports of illness. Stressful life events (beta=.38, $p<.05$), lack of hardiness (beta=.19, $p<.05$), and perception of support from one's boss (beta=-.14, $p<.05$), accounted for .24 of the variance in reported illness when a regression was performed ($R^2=.24$, $F[3,150]=18.62$, $p<.01$).

Hardiness, social support, and exercise explained a significant amount of variance in concurrent and prospective reports of illness (Kobasa et al., 1985). Hardiness alone explained .22 and .33 of the variance in reports of concurrent and prospective illness, respectively.

Significant correlations between types of social support and hardiness (Kobasa & Puccetti, 1983; Kobasa et al., 1985) or dimensions of hardiness, commitment and challenge ($r=.35$ - $.42$, $p<.001$), have been found (Ganellen & Blaney, 1984). Limited comparisons can be made between these findings, since the measures of hardiness and life stresses differed. Correlations between support and hardiness are attributed to the active coping strategies thought to be characteristic of hardy persons. Regressive coping strategies have been found to be significantly correlated to measures of alienation ($r=.20$ $p<.01$) (Kobasa, 1982a). Regressive coping, stressful life events, alienation, and social support explained .47 of the variance in lawyers' strain (physical and mental symptoms associated with stress) (Kobasa).

Many threats to the internal and external validity of these studies have been addressed by the investigators. Ambiguity about the direction of causal inference was recognized as a limitation of cross

sectional research involving retrospective accounts of life changes and illnesses (e.g., Kobasa, 1979; Kobasa & Puccetti, 1983). The investigators subsequently implemented longitundinal studies in which hardiness and the interaction of hardiness and life events were determined to have significant effects on prospective reports of illness (e.g., Kobasa et al., 1981; Kobasa et al., 1982; Kobasa et al., 1985). However, these longitudinal studies could be susceptible to threats related to subject selection, mortality, and testing. Generalization of the findings is limited by the non-random selection of subjects.

Methodological and theoretical concerns regarding instrumentation have been identified. As mentioned previously, the findings of numerous studies have been threatened by the absence of reported reliability and validity of measures for the samples tested. Kobasa (1979) recognized that self report measures would yield less reliable and valid estimates of physical illness than physiological measures. However, she determined that self report measures could not be solely related to illness behavior, since high scores on these tests were related to illnesses not amenable to self diagnosis. Kobasa et al. (1981) evaluated the medical records of 48 subjects and found the mean level of agreement between self reports of these illnesses and physicians' records was 89%.

Kobasa (1982b) indicated Holmes and Rahe's Schedule of Recent Life Events was used to measure stress because the items have consensus rather than subjective weights, which represent the effects of personality. Kobasa (1979) revised existing items and added others to increase the clarity and relevance of the Schedule. However, items,

which Cohen (1979) referred to as possible consequences or "presymptomatic manifestations of incipient illness" (p .93), were not identified as being altered.

According to Monat and Lazarus (1985) and O'Brien (1984), additional evidence is required to substantiate Kobasa's claims regarding the hardy personality. Folkman, Lazarus, Dunkel-Schetter, DeLongis, and Gruen (1986) and Lazarus and Folkman (1984) indicated the need for empirical evidence of the coping strategies attributed to hardy individuals. Despite these criticisms, Lefcourt (1983), Monat and Lazarus, and O'Brien commended Kobasa's promising efforts to understand and predict the interaction among stress, personality, and illness.

In summary, the evidence from these studies suggests hardiness may decrease the potentially negative effects of stress and thus is a construct worthy of further investigation.

The measurement of hardiness.

A variety of tests have been used to measure hardiness. Pollack (1986) developed the Health Related Hardiness Scale to measure the hardiness of chronically ill adults in relation to their physiological and psychological adaptation to illness. This test yielded higher estimates of internal consistency for this sample than the Hardiness Test (see Appendix A). Ganellen & Blaney (1984) measured hardiness using the Alienation Test and the Levinson Locus of Control Scale. The Alienation Test, the Security Scale of Hahn's California Life Goals Evaluation Schedule, and Rotter's Locus of Control Scale were used by Maloney and Bartz (1983) to measure hardiness in a sample of nurses. Kuo and Tsai (1986) indicated they measured hardiness, but appear to

have measured locus of control.

Hardiness was originally measured by a battery of instruments. The control dimension was measured by the Achievement and Dominance scales of the Jackson Personality Research Form, the Leadership Orientation scale of Hahn's California Life Goals Evaluation Schedule, the Internal-External Locus of Control Scale, and the Nihilism versus Meaningfulness and Powerlessness versus Personal Control scales of the Alienation Test by Maddi, Kobasa, and Hoover. The commitment dimension was measured by the Alienation Test, and the Role Consistency Test which was adapted from the Gergen and Morse Self Consistency Scale. Orientation to challenge was measured by the Need for Cognitive Structure and Need for Endurance scales of the Jackson Personality Research Form, the Preference for Interesting Experiences and Security Orientation scales of Hahn's California Life Goals Evaluation Schedule, and the Vegetativeness versus Vigorousness and the Adventurousness versus Responsibility scales of the Alienation Test. According to Kobasa (1979), "the standardized tests were chosen for their theoretical relevance and empirical reliability and validity" (p. 5). Scores for each subscale and each dimension of hardiness were computed.

The second edition of the Hardiness Test included: the Powerlessness, Alienation from Self, and Alienation from Work Scales of the Alienation Test; the Security Scale of Hahn's California Life Goals Evaluation Schedule; and the Internal-External Locus of Control Scale by Rotter, Seeman, and Liverant (Kobasa et al., 1981). The Cognitive Structure Scale of Jackson's Personality Research Form was excluded because it did not appear to be an indicator of challenge and

did not share common variance with the other variables. Analysis of the literature indicates that long and short versions of this test were administered.

Kobasa et al. (1982) presented more detailed evidence of the reliability and validity of individual Alienation scales than Maddi et al. (1979), the reference they cite. Kobasa et al. stated the internal consistency (coefficient alpha) of the alienation from self and work scales averaged .85 and .79, respectively. The correlations of scores from administrations separated by 3 weeks were .77 and .70 respectively. These scales demonstrated "construct validity in negative relationships with such variables as empathy, achievement, motivation, purpose-in-life, and role consistency" (Kobasa et al., pp. 171-172).

Kobasa et al. (1982) stated the powerlessness scale had an average internal consistency of .88 and a stability correlation of .71 over a 3 week period. Construct validity was demonstrated by "a negative correlation with dominance, and positive correlations with trait anxiety, external locus of control, and conformism" (p. 172). They also indicated that the Internal-External Locus of Control, the Security and the Cognitive Structure scales had been used frequently with normal adult populations and demonstrated reliability and validity.

The hardiness score, the sum of weighted Z scores for the scales, measured lack of hardiness; that is, a low hardiness score indicated a high level of hardiness. According to Kobasa (1982b), the scores for the challenge dimension were doubled since this dimension was indexed by only one scale. Intercorrelations of the five scales ranged from

.31 - .74 ($p<.005$). Test-retest reliability correlations were estimated at .61 over a 5 year period (Kobasa & Puccetti, 1983). Construct validity was demonstrated by the power of the instrument to significantly discriminate between groups with high stressful life event scores and low illness scores and those with high stressful life event scores and high illness scores. Construct validity has also been tested by factor analysis. A principal components factor analysis of the six scales lead to the emergence of one factor which accounted for 46.5% of the variance. This supports the belief that the three dimensions are highly inter-related and can be summed to measure hardiness (Kobasa et al., 1981), but does not provide evidence of the existence of three distinct dimensions. Concurrent and predictive validation of the test has been seen in cross sectional and longitudinal studies. Although Lazarus and Folkman (1984) questioned whether an alienation scale can measure commitment and a security scale can measure challenge, the definitions applied to the construct and the scales by the respective authors appear to be congruent.

Since many investigators did not report estimates of the reliability and validity of measures, it is not possible to declare that this measure is suitable for all populations. As indicated previously, Summers (1986) and Ducette (1986) found that estimates of internal consistency (coefficient alpha) for measures from this edition of the Hardiness Test were unsatisfactory.

The 50 items predicting the most variance in hardiness were selected for the third edition of the Hardiness Test (Kahn, personal communication, March 1987). However, substantial differences in the wording and format of items from the second and the third editions

have been noted by this investigator.

Three estimates of internal reliability (alpha coefficients) for the third edition have been reported by the Hardiness Institute. The initial estimates, based on a sample of 1511 men and 223 women, most of whom were professionals, were: total hardiness - .90s, commitment, challenge and control - .70s (Hardiness Institute, personal communication, January 1987). The second estimates, based on a sample of 1151 men and 1114 women, were: total hardiness .81, commitment .65, challenge .65, and control .45 (Hardiness Institute, personal communication, March 1987). The final estimates, based on a sample of 306 men and 1103 women, were: total hardiness .88, commitment .79, challenge. 75, and control .69 (Hardiness Institute, personal communication, March 1988). The alpha coefficients for the males and females, respectively were: total hardiness .89 and .87, commitment .83 and .78, challenge .75 and .74, and control .73 and .68. The difference in the three sets of estimates may be attributed to the difference in samples; the sex of respondents is undoubtedly a significant factor. Kahn reported the stability correlation of the third edition of the Scale should be comparable to that of the second, .61 over a five year period (personal communication, March 1987). A principle components factor analysis (varimax rotation) of this test using a minimum Eigenvalue of 2.0 resulted in the emergence of three factors (Hardiness Institute, personal communication, March 1988). The first factor, identified as commitment, had an Eigenvalue of 7.84 and explained 15.7% of the variance. The second factor, identified as a general factor composed of commitment, challenge, and control items, had an Eigenvalue of 3.43 and explained 6.9% of the variance. The last

factor, identified as challenge, had an Eigenvalue of 2.19 and explained 4.4% of the variance. Oblique rotation resulted in factor pattern matrix very similar to the varimax matrix (Hardiness Institute, personal communication, March 1988). According to Kahn, the test has been used since 1984, but no studies have been published as yet (personal communication, March 1987).

In summary, since limited information is available concerning the reliability and validity of the third edition Hardiness test, there is a need to establish its ability to measure this construct in a variety of populations.

The stress of critical care nursing

Overview

An expansive body of literature concerning the stresses of critical care nursing was uncovered. The summaries of numerous notable reviews may be found in Appendix B. For the purposes of this review, the term critical care (CC) unit refers to general intensive care units (ICUs), surgical ICUs, post anesthesia-recovery rooms, neurosurgical ICUs, burn units, coronary care units, pediatric ICUs, and neonatal ICUs.

Since the advent of CC units in the early 1960s, critical care nursing (CCN) has been portrayed in the literature as stressful, challenging, and even heroic. Notable authors such as, Strauss (1968), Vreeland and Ellis (1969), and Hay and Oken (1972) have vividly depicted the difficulties experienced by these "pioneers" of technological patient care. According to Voorman (1981), these "supernurses" were "frightened by ... awesome responsibility, mortal privileges, and undefined scope of practice" (p. 3).

Although the majority of current articles concerning this subject are written by nurses, the early articles were primarily authored by social scientists, physicians, or other health care professionals. These authors substantiated the phenomenon of CCN stress by reporting their observations and analysis of environmental stressors, and suggesting individual and organizational coping strategies. Threatening rather than challenging aspects of CCN were emphasized; for example, Bilodeau (1973) purported to discuss the sources of satisfaction identified by CC nurses, but primarily discussed the stressors. More recently, authors have attempted to determine the job factors associated with satisfaction (Claus & Bailey, 1980; Norbeck, 1985a).

One of the significant developments in this literature was the introduction of a theoretical orientation. The majority of early articles lacked operational definitions and explicit references to conceptual frameworks; as indicated by Claus and Bailey (1980), definitions of stress were either insufficient or absent.

A variety of models have been applied to the analysis of CCN stress (Stehle, 1981). Some of the theorists whose models have been cited are: Selye (Bailey, Steffen, and Grout, 1980), Mason (Grout, Steffen, & Bailey, 1981; Jacobsen, 1983), Sidle, Moos (Jacobsen, 1981), Antonovsky (Keane et al., 1985), Aguilera and Messick (Oskins, 1979; Sterling-Rollheiser, 1983), Matteson and Ivancevich (Numerof & Abrams, 1984), McGrath (Leatt & Schneck, 1983), Maslach (Stone, Jebson, Walk, & Belsham, 1984), LaRocco, House, and French (Norbeck, 1985a, 1985b; Vachon, 1987) Lazarus (Oskins) and Kobasa (Keane et al.; McCranie, Lambert, & Lambert, Jr., 1987; Rich & Rich, 1987). A trend

to conceptualizing stress from an interactional perspective is apparent. As a result, factors related to individual variation in responses, such as, social and psychological buffers, are being examined more frequently.

The initial method for identifying stressors, coping strategies, and levels of stress was subjective observation (e.g, Hay & Oken, 1972). Although qualitative studies have been noted (e.g., Hutchinson, 1984; Pyles & Stern, 1983), the majority of reports documented the employment of quantitative methods, especially the cross sectional survey. An abundance of measures have been used, for example: the Nursing Stress Audit (Bailey, Steffen, & Grout, 1980), the Questionnaire of Stressful Factors in ICU Nursing (Huckabay & Jagla, 1979; Norbeck, 1985a), the Nursing Stress Scale (Cronin-Stubbs & Rooks, 1985; McCranie et al., 1987), the Nursing Stress Instrument (Numerof & Abrams, 1984); the Neonatal Nurse Stress Coping Assessment Inventory (Gribbins & Marshall, 1982), the Nursing Coping Scale (Jacobsen, 1981, 1983), the Staff Burnout Scale for Health Professionals (Cronin-Stubbs & Rooks; Rich & Rich, 1987), the Maslach Burnout Inventory (Stone et al., 1984), the Tedium Scale (McCranie et al.), and the Stress and Coping Behavior Questionnaire (Kelly & Cross, 1985). Reports of the repeated use of tests are rare (e.g., the Bailey Steffen and Grout questionnaire). With few exceptions (e.g., Hammer, Jones, Lyons, Sixsmith, & Afficiando, 1985), limited justification has been provided for this proliferation of measures. In addition, little or no information has been presented concerning the development, testing, and reliability and validity of many instruments. As a result, limited numbers of valid comparisons may be drawn between the

findings of various studies.

Critical care nursing stressors.

Although some authors have focused on individual stressors, such as decision making (Bourbonnais & Bauman, 1985), the majority have attempted to identify and classify all stressors indigenous to CCN. The stressors identified in the literature reviewed are: technology, work space, and physical work environment (Marshall & Kasman, 1980; Civetta, 1981; Campbell & Leatt, 1982; Oskins, 1979; Birnbaum, 1984; Gorney, 1985); ethical and emotional reactions to death and illness, and other factors related to the care of critically ill patients (Anderson, & Basteyns, 1981; Oskins); the patient's family (Marshall, & Kasman, 1980; Oskins); factors related to management, communication patterns, and nursing leadership styles (Bailey, Steffen, & Grout, 1980; Millar, 1980; Duxbury, Armstrong, Drew, & Henly, 1984); the lack of rewards from administrators (Bailey, Steffen, & Grout; Consolvo, 1982); role strain and tension from multiple expectations (Allen, Jackson, & Youngner, 1980; Leatt, & Schneck, 1980; Noroian, & Yasko, 1982); staffing and workload (Bailey, Steffen, & Grout; Leatt, & Schneck, 1983; Phillips, Chong, & Gordon, 1983); inter and intradisciplinary communication problems (Bailey, Steffen, & Grout; Oskins); the perception of inadequate knowledge and skills (Bailey, Steffen, & Grout; Walker, 1982; Leatt, & Schneck, 1983); and conflict between family and professional responsibilities (Astbury, & Yu, 1982; Jacobsen, 1981). These stressors were also identified in Vachon's (1987) study of occupational stress in the care of the critically ill, dying, and bereaved. She noted organizational environmental stressors were the major stressors in all professional groups.

Comparisons of the types of stresses experienced by nurses working in different specialties have been made (Cross & Fallon, 1985; Katka, 1985; Leatt & Schneck, 1983, 1985; Numerof & Abrams, 1984). Numerof and Abrams surveyed 154 nurses from a variety of specialties and determined CCN was one of the specialties that reported the highest stress. According to Leatt and Schneck (1985) one of "the two most important and probably most damaging types of stress, traumatic emotional stress" (p. 74) was relatively contained within CC units. In contrast, obstetrical nurses had the lowest score in this category. CC units were amongst those with highest scores in relation to physician/nurse relationship stress and lowest scores in relation to psycho-geriatric workload; CC scores in relation to personality role stress and scheduling of work stress were unremarkable.

The stress categories of role conflict, task difficulty, relief work, and workload, emerged from Leatt & Schneck's (1983) analysis of data from a sample of nurses from nine nursing specialties. CC nurses perceived significantly ($p=.05$) more stress related to task difficulty than obstetrical nurses. In addition, they perceived more stress related to role conflict than other nurses.

Katka (1985) analyzed data from a sample of 432 nurses from a variety of specialties. She determined CCN was characterized by stress resulting from "death and dying" and conflict with physicians, whereas, obstetrical nursing was characterized by stress resulting from conflict from physicians and nurses. She also found the interaction of type of shift and specialty had a significant effect on total stress score. Obstetrical nurses who worked days and pediatric nurses who worked nights experienced the least amount of stress.

Cross and Fallon (1985) compared the stressors identified by 118 nurses from four specialty areas. CC nurses reported the highest frequency of stressors, whereas, obstetrical nurses reported the least. Critical care nurses reported high levels of distress in relation to inability to meet patient needs, dealing with uncooperative patients, unnecessary prolongation of life, and the deaths of special patients. Obstetrical nurses reported the least; the one source of high level distress was the death of a special patient. Cross and Fallon stated this group of obstetrical nurses were the least stressed because they primarily cared for healthy mothers and newborns, had a greater number of nurses with higher education, and had the most experience in their specialty; absence of reported reliability and validity of the measures, and suspicion that the measure was not sensitive to the stresses of obstetrical nursing limit these findings.

Critical care nurses.

According to the National Institute of Health Consensus Development Conference on Critical Care Medicine (1983, cited by Rudy & Bertram, 1986), "Nurses are the key element in critic care. The continual presence and judgement of th professional nurse positively influence patient care outcomes" (p. 45). Numerous authors have attempted to describe the nature of CC nurses and the personal characteristics associated with their resistance or vulnerability to stress. Claus and Bailey (1980) surveyed 1800 American CC nurses and characterized the typical nurse as a 26 to 30 year old married female with no children, a registered nurse who is a graduate of a diploma school and not enrolled in school, and an employee of a general ICU or

ICU/CCU (coronary care unit) with two years of experience in that particular unit, experience of working in one other CC unit, and three to five years of total work experience. A greater percentage of the California nurses surveyed by Bailey Steffen, and Grout (1980) were younger, unmarried, and university educated, and had more prior CC nursing experience; 91% had resigned from CC nursing positions within the past 3 years. Oskins's (1979) survey of 79 nurses yielded similar findings: 78% of the predominantly female sample was less than 30; 44.3% had greater than 5 years of experience in nursing, 19% had 3 to 5 years, and 36.7% had less than 3 years.

A contributor to the AACN's (American Association of Critical Care Nurses) reference for critical care nursing, declared "the criteria used in the selection of National Aeronautics and Space Administration personnel fittingly describes the personality for high stress critical care nursing" (Voorman, 1981, p. 8). These prerequisites include enthusiasm, mutuality, self acceptance, and tolerance of ambiguity. Cassem and Hackett (1975) proposed that some personnel work in CC units because they like the physical intensity, high tension, and hectic pace of the setting. One would thus expect CC nurses to be significantly different from other nurses on type A-B personality dimensions; however, no significant differences in mean levels of this personality type were found between nurses in "high stress" units and nurses in other units (Frost & Wilson, 1983). Maloney and Bartz (1983) found that CC nurses scored significantly higher on external locus of control, alienation, powerlessness, adventureousness, and challenge scales than medical surgical nurses; however, the nature of the sample (army nurses) and the absence of

reported reliability and validity for the measures threaten the internal validity and limit the generalizability of the findings. Maloney (1982) found CC army nurses had lower levels of state and trait anxiety, somatic complaints, personal problems, and work load dissatisfaction than medical surgical army nurses.

According to Gardner, Parzen, and Stewart (1980), "the demand for quick and accurate decisions and faultless judgements" (p. 103) is present at all times in the coronary care unit. Cross and Kelly (1984), using the Myers-Briggs Type Indicator, found it was more likely that CC nurses would be classed as "thinkers" and medical surgical nurses classed as "feelers"; absence of reported reliability and validity for the measure require that the findings be interpreted with caution. Mohl, Denny, Mote, and Coldwater's (1982) interpretations of data concerning CC and non-CC nurses lead them to conclude CC nurses "are likely to be far more task oriented, seeking clarity, autonomy, and creativity in their work" (p. 373).

Perceptions of loss of control and unpredictability are believed to be related to the most common stressors (Anderson & Basteyns, 1981; Astbury & Yu, 1982; Huckabay & Jagla, 1979). However, the relationship between the locus of control of CC nurses and stress has not been rigorously studied. Researchers testing CC nurses (Kosmoski, & Calkin, 1986) and samples that included CC nurses (Frost & Wilson, 1983) found that nurses who had an internal locus of control were more likely to be satisfied with their jobs.

Claus and Bailey (1980) proposed the resistance or vulnerability of CC nurses to stress is determined by "hereditary factors, early childhood experiences, cultural patterns, and health status" (p. 16).

The effects of age, work experience, and education on stress have been equivocal. Bryson, Aderman, Sampiere, Rockmore, and Matsuda (1985) found no significant relationship between work experience and job tension. Norbeck (1985a) reported the absence of a relationship between demographic variables and job stress; however age and years of experience in nursing were significantly related to job satisfaction and psychological symptoms. Leatt and Schneck (1983) found that tenure was not related to stress. Numerof and Abrams (1984) surveyed 154 nurses from a variety of specialties and found that stress demonstrated a weak ($r=-.231$, $p=.078$) relationship with tenure, and significant relationships with age ($r=.377$, $p=.01$), and years of experience in specialty area ($r=-.256$, $p=.051$). Stone et al. (1984) and Keane et al. (1985) found that age and amount of work experience are associated with decreased likelihood of experiencing burnout. Huckabay and Jagla (1979) found a significant inverse relationship between stress and years of experience in CC, but not between stress and age, level of education, and years of non-CC nursing experience. Zindler-Wernet, Bailey, Walker, and Holzemer (1980) determined that participants in a stress management program reported fewer symptoms of stress, perceived fewer stressors at work, and had lower trait anxiety scores upon completion of the program.

Price and Murphy (1985) theorized that the following personal factors are associated with the emotional depletion of CC staff: unresolved grief, need to be perfect, projection of personal needs, overseriousness, lack of sharing with coworkers, and inappropriate sharing with significant others. According to Eisendrath and Dunkel (1979) and Gardner et al. (1980), CC personnel are especially

vulnerable to stress if they have high self expectations and if their self worth is tied to their patient's status. In addition, Davidson and Jackson (1985) indicated that nurses with "traumatic" histories are more vulnerable to stress.

A variety of factors have been proposed as stress buffers. Cognitive appraisal is believed to be an important determinant of stress. Bailey, Steffen, and Grout (1980), Cassem and Hackett (1975), Claus and Bailey (1980), and Norbeck (1985a) have noted that certain CC factors are considered to be sources of stress and satisfaction. Some CC nurses reported that the demands of CCN became stressors only when staffing was inadequate; lack of challenge and opportunities for learning were the reasons they cited for leaving CCN (Grout, Steffen, & Bailey, 1981). Stone et al. (1984) found that CC nurses' perceptions of situations as threats (R^2 increment .18, $p<.05$) and perceptions of the work environment as inefficient (R^2 increment .07, $p<.05$), explained a significant, but small amount of variance in burnout. Reports of fewer coping skills, greater life stress and less work experience also contributed the explanation of burnout (respective R^2 increments of .04, $p<.05$).

According to Bailey, Steffen, and Grout (1980) and Pines and Kanner (1982), the perception of positive working conditions, or satisfiers, may ameliorate the effects of stressors. Leatt and Schneck (1985) proposed that the personality of the CC nurse can "significantly moderate the relationship between traumatic emotional stress and technology and the environment" (p. 75).

The significance of CC nurses' beliefs about nursing have been reported by Hickey (1982) and Hutchinson (1984). Following a

qualitative study of neonatal ICU (NICU), Hutchinson theorized "nurses combat the horror of their situation by 'creating meaning'" (p. 87); their reconstruction of reality enables them to manage their work situation. "Nurses who stay in the NICU believe in the value of their work" (p. 87). Benner and Kramer (1972), Lewandowski and Kramer (1980), and Sanford (1985) have noted that stress and turnover can result from the lack of "fit" between the practice values of the individual CC nurse and the values of others in her environment.

Coping strategies.

Several authors have identified the types of coping strategies used by CC nurses by means of self report questionnaires; the findings of these studies are limited by the absence of reports of the validity of these measures. Oskins (1979) found that talking it out, taking action, and drawing upon past experience were the strategies most commonly reported by CC nurses. According to Cross and Kelly (1983), non-CC nurses reported more frequent use of palliative strategies (e.g., sleeping, crying, and eating) than CC nurses. Jacobsen (1983) identified three types of CCN coping strategies: cognitive processing, using personal skills, and escaping. She determined that "length of NICU experience, full or part time employment, years since graduation, type of basic nursing program, experience in other clinical areas, age, marital status, and having or not having children did not significantly affect the strategy ratings" (p. 80). However, Gribbins and Marshall (1982) found an association between amount of NICU experience and type of stressors and coping strategies reported. Twenty-four nurses were grouped according to amount of CC experience: 1 - 2 months, 2 months - 1 year, 1 - 3 years, and more than 3 years.

Nurses with 3 years of experience mentioned less stressors and stated they coped by using proactive strategies.

Numerous strategies for reducing critical care nursing stress have been recommended. Strategies that have been implemented include: educating nurses about CCN (Bauman & Bourbonnais, 1984), decision making (Bourbonnais & Bauman, 1982), dealing with patients' families (Bouman, 1984; Poster & Betz, 1984), and stress (Bailey, Walker, & Madsen, 1980; Newlin, 1984); providing CCN interneships (Holmes, Perez, & Duffy, 1981); implementing 12 hour shifts (Eaton & Gottselig, 1980); improving staffing numbers (Phillips, et al, 1983; Sheppard & Garland, 1983); developing a theoretical framework (Hickey, 1982); following up NICU patients (Sande, 1983); and organizing running programs (Zindler-Wernet, & Bailey, 1980). In addition to these strategies, Vachon (1987) indicated nurses reported strategies such as, evolving a specialized role, tailoring work assignments to meet their needs, setting short term goals and acknowledging meeting them, gaining control over one's practice, acquiring a sense of humor, avoiding or distancing themselves from patients, working part-time, and leaving the work situation temporarily or permanently.

Strategies involving social support have been frequently implemented and investigated. Support groups, composed of CC nurses and lead by nurses, chaplains, psychologists or psychiatrists provide the opportunity for expression of concerns and resolution of problems (Bohannan-Reed, Dugan, & Huck, 1983; Skinner, 1980; Stillman, & Strasser, 1980; Weiner, & Caldwell, 1983, 1983-84; Tyson, Laskey, Weiner, Caldwell, & Sumner, 1984). Weiner and Caldwell (1981) have documented their perceptions of successful groups, and the research of

Tyson et al. documents the benefits of a support group. Norbeck (1985b) surveyed CC nurses and determined that social support was negatively related to perceived job stress, job dissatisfaction, and psychological symptoms. Pyles and Stern (1983), conducting a qualitative study, detected the significant positive impact of the relationship between the novice and the experienced CC nurse.

Outcome of critical care nursing stress.

An AACN commissioned study noted that CCN stress and burnout are significant problems that affect the welfare of critically ill patients and can be addressed through nursing research (Lewandowski & Kositsky, 1983). Authors of anecdotal articles expressed great concern regarding the effects of stress on CC personnel, patients, and the health care system. Hay and Oken (1972) theorized that psychological distress jeopardized the CC nurse's ability to provide expert care and shortened her tenure in CCN. Birnbaum (1984) reported that the CC environment has become devoid of "humanism"; personnel have become emotionally "disinvolved", depressed and subject to abusing chemical substances. Orlowski (1982), noted pronounced physical, emotional, behavioral, and social effects of burnout in his critical care medicine colleagues. These effects were: chronic fatigue, exhaustion, minor ailments, absenteeism, lack of energy, negativism, detachment or over-involvement, impulsiveness, and increased use of caffeine, cigarettes, alcohol and drugs. Vachon (1987) noted reports of sleep disturbances, feelings of helplessness and insecurity, anxiety and difficulty with decision making, and anger, irritability, and frustration. Civetta (1981), Cullen (1981), and Millar (1980) attributed high rates of turnover and the shortage of CC nurses to the

demands of the CC environment. Holmes, Perez, and Duffy (1981) believed that "turnover among CC nurses can generally be related to the high stress and relatively low level of job satisfaction and high frustration experienced by these nurses" (p. 15). Although Duxbury and Thiessen (1979) observed that CCN and non CCN rates of turnover were comparable, the 1985 rates of turnover for CC nurses in Alberta were higher than the rates for non-CC hospital nurses (Alberta Health and Social Services Disciplines Committee, 1985).

Dear, Weisman, Alexander, & Chase (1982) indicated CCN turnover has a greater impact on patient care and the health care budget than non CCN turnover. Hansell and Foster (1980) estimated that it cost $1000 to $3000 to orientate a CC nurse in 1980. Since "it takes... at least 6 months to become totally acclimated to the demands of special care unit nursing" (Houser, 1977, p. 15), high rates of turnover result in decreased productivity. According to Millar (1980), acute shortages of CC nurses have lead hospital administrators to "offer bounties of $2000 or more, free travel, and automobiles to attract critical care nurses" (p. 801). In 1986, Dr. D. Modry indicated there was a chronic shortage of CC nurses across Canada and that this shortage was partially responsible for the halting of heart transplant surgery in Edmonton (Morningstar, 1986). In 1987, Wiebe (1987) reported a shortage in many parts of Canada.

Bryson et al. (1985) reported a significant relationship between CCN job satisfaction and job tension ($r=-.51$, $p<.05$). Norbeck (1985a) found that CCN job stress was significantly related to job satisfaction, as measured by the Nursing Job Satisfaction Scale by Atwood and Hinshaw ($r=-.24$, $p=0$). Hinshaw, Atwood, Gerber, and

Erickson (1986) determined that job satisfaction buffers the impact of job stress on turnover.

Few authors have rigorously investigated the physiological (Grout, 1980), or psychological effects (Gentry & Parkes, 1982) of CCN stress. Norbeck (1985a) found that the job stress of CC nurses was significantly related to psychological symptoms, as measured by the Brief Symptom Inventory (BSI) ($r=.33$, $p<.000$). The mean level of symptoms for this sample was clinically significant. The level of psychological symptoms, as measured by the SCL-90, a forerunner of the BSI, of CC and non-CC nurses was not found to be clinically significant (Mohl et al., 1982); however, a positive relationship was seen between work experience and psychological distress. Maloney (1982) and Gentry, Foster, and Froehling (1972) measured the responses of CC and medical surgical nurses to their environments. Maloney measured anxiety, somatic complaints, job satisfaction, and personal family problems. Gentry et al. measured self-concept, depression, hostility and guilt, and general personality patterns. Maloney found that non-CC nurses were more distressed than CC nurses, whereas, Gentry et al. found that CC nurses were more distressed; these contradictory findings must be interpreted with caution since both samples were small. Zindler-Wernet et al. (1980) determined that CC nurses' psychological symptoms were improved following participation in a stress management program.

Summary.

An interactional approach has been used most frequently to examine the phenomenon of CCN stress. Many authors have described and categorized the environmental stressors identified by CC nurses and

compared them to stressors identified by other nurses. CCN work environments appear to be significantly different from obstetrical nursing work environments and CC nurses report greater numbers of stressors than obstetrical nurses. The effects of CCN stress on health care professionals, critically ill patients, and the health care system have been identified in numerous descriptive articles. Few researchers have empirically examined the effects of CCN stress. Although authors have begun to rigorously investigate the professional orientations, personality profiles, demographic characteristics, and coping strategies of CC nurses, the personal factor or factors responsible for the resistance of some CC nurses to the stressors in their environments has yet to be identified.

Selected correlates of critical care nursing stress

Job satisfaction.

This brief overview of job satisfaction will identify relevant organizational and biographical determinants of CCN job satisfaction. According to Price (1972), "satisfaction is the degree to which members of a social system have a positive affective orientation toward membership in the system" (p. 156). Job stress has been conceptualized as a unidimensional (Brayfield, & Rothe, 1951), a two dimensional (Munson, & Heda, 1974; Ullrich, 1978), or multidimensional construct (J. Atwood, personal communication, March 1987; Everly & Falcione, 1976; Slavitt, Stamps, Piedmont, & Haase, 1979; Smith, Kendall, & Hulin, 1969). Weisman, Alexander, and Chase (1980) found that measures of job satisfaction derived from an overall indicator (eight items from Brayfield and Rothe) and from a multi facet indicator (the Job Descriptive Index) were highly correlated (.69 -

.71, p<.001), but not identical. The overall indicator was "more likely to tap differences that are systematically related to characteristics of individuals.... Multi-Facet Job Satisfaction ... specifies the criteria on which the job is evaluated and therefore limits the extent to which types of individuals may respond differently" (p. 358). Evidence of a significant relationship between CCN job stress and job satisfaction has been established and presented in the previous section.

Numerous investigators have studied CCN job satisfaction. Bryson et al. (1985) surveyed 110 CC licensed practical and registered nurses and determined that work experience and job satisfaction were significantly related (r=.24, p<.05). Duxbury et al. (1984) surveyed 283 NICU nurses and found significant moderate sized relationships among burnout, satisfaction, and perceived headnurse consideration. The strongest determinants of job satisfaction, according to Dear et al. (1982), were: sense of autonomy, internal locus of control, and not being in one's first job. Brubakken (1983) surveyed 358 CC nurses and determined that variance in job satisfaction was significantly predicted by feelings about the profession, administration, work schedule, interactions with patients' families, and interactions with physicians. Job satisfaction was significantly related to years practicing in CC, feelings about the profession (r=.47, p<.001), administration (r=.41, p<.001), work schedule (r=.37, p<.001), interactions with patients' families (r=.37, p<.001), and interactions with physicians (r=.35, p<.001). Working permanent shifts was related to greater satisfaction. Kosmoski and Calkin (1986) found that CCN job satisfaction was positively correlated with having an internal locus

of control, perceiving the ability to use discretion in work related activities, intent to stay on the job, and working on a unit which was perceived to be standardized; aspects of job satisfaction were negatively related to having a higher education, and being involved in work related educational activities.

Other investigators have studied the job satisfaction of nurses from different specialties. Perceptions of jobs and working environments were found to be the most important predictors of job satisfaction by Weisman et al. (1980). Price and Mueller (1981) found that perceived low job routinization, high instrumental communication, high promotional opportunity, and high participation in decision making contributed to the job satisfaction of 1091 nurses. The type of shift worked by nurses was found to affect their job attitudes and perceptions of work stressors (Parasuraman, Drake, & Zammuto, 1982). Slavitt et al. (1979) determined that nurses who worked the night shift were more satisfied, whereas Blegen and Mueller (1987) found nurses who worked the day shift were more satisfied. Findings regarding the effect of education on job satisfaction have been equivocal. Kosmoski and Calkin (1986) and Slavitt et al. found that nurses with degrees tended to be less satisfied than nurses with diplomas; however, Weisman, Alexander, and Chase (1980) did not find a relationship between type of education and job satisfaction. Amount of work experience and age were found to have an impact on satisfaction (Bryson et al., 1985; Slavitt et al.; Weisman et al.). Weisman et al. and Slavitt et al. suggested that age and experience have a nonlinear effect on satisfaction. Slavitt et al. found that nurses with less than a year of experience reported the most satisfaction, nurses with

greater than seven years of experience reported the second most, and nurses with one to seven years of experience reported the least.

Significant differences in satisfaction have been found for nurses from different specialties (Benton, & White, 1972; Dear et al., 1982; Godfrey, 1978; Slavitt et al., 1979). Dear et al. compared 234 CC with 868 non CC nurses and found CC nurses expressed greater satisfaction with their work, but equivalent levels of satisfaction with their overall job. Slavitt et al. determined that CC nurses were generally more satisfied than other nurses and Godfrey determined that CC nurses were more satisfied than obstetrical nurses. Administrators have been found to be more satisfied than general duty nurses (Benton, & White; Slavitt et al.).

Psychological symptoms.

Studies and anecdotal articles concerning the psychological symptoms of stress have been described in previous sections. The relationships between stress and psychological symptoms, and stress and somatic symptoms have been established. Shinn, Rosario, Morch, and Chestnut (1984) have determined that "patterns of stress and strain vary markedly among different types of human service workers and workers in different settings, just as they do among different occupations in general" (p. 870).

Few instruments have been used to measure the psychological effects of occupational stress specific to nursing. The Brief Symptom Inventory (BSI) (Norbeck, 1985a, 1985b) and the SCL-90 (Mohl et al., 1982) have been used recently to measure the psychological symptoms of CC nurses. Norbeck (1985a) analyzed the responses of 180 CC nurses to the BSI. She found that nurses with greater numbers of psychological

symptoms had higher levels of job stress ($r=.33$, $p<.000$) and lower levels of job satisfaction ($r=-.40$, $p<.001$). She also found that nurses with higher levels of job stress were less satisfied with their jobs ($r=-.24$, $p<.001$).

Absenteeism

According to Price (1972), "absenteeism is the degree to which the members of a social system fail to report for work at the time they are scheduled to work" (p. 14). For the purpose of this study, only absenteeism due to illness will be considered. Measures of length of absence (number of days or hours), and frequency (number of episodes, an episode being as short as a portion of a day or as long as several consecutive days) are used (Price). Absenteeism is a behavioral referent of perceptions of bodily dysfunction, stress, burnout, and job satisfaction (Cohen, 1979; McConnell, 1982; Price).

Since physical health is a requisite for CCN and the majority of CC nurses are less than 30 years of age, one may assume that CC nurses would have a higher than average level of health and limited absenteeism due to illness. However, the author has noted that absenteeism may be related to "minor" illnesses; the nurse may not report for work if these illnesses are perceived to jeopardize the performance of activities or be communicable to vulnerable patients.

Summary

From the preceding discussion, it is apparent CCN job stress has a negative impact on job satisfaction and psychological well-being. Evidence of the relationship between this stress and absenteeism has been published in numerous anecdotal reports.

Measurement theory.

"Measurement consists of rules for assigning numbers to objects to represent quantities of attributes" (Nunnally, 1978, p. 3). According to Anastasi (1982), "a psychological test is an objective and standardized measure of a sample of behavior" (p. 22). Its value "depends on the degree to which it serves as an indicator of a relatively broad and significant area of behavior" (Anastasi, p. 23). Standards for educational and psychological testing, published by the American Educational Association (AERA), American Psychological Association (APA), and National Council on Measurement in Education (NCME) (1985) contain criteria for the evaluation of tests, testing practices, and the effects of test use. In this section, an overview of issues related to the measurement of psychological traits will be presented.

Reliability.

According to Kerlinger (1973), "reliability is the accuracy or precision of a measuring instrument" (p. 443); or the degree to which scores are free from random or error variance (AERA et al., 1985). Knowledge of the sources of error variance enables the investigator to identify the sources of true variance and select the most appropriate procedure for establishing reliability (Anastasi, 1982; Giovannetti, 1981). Estimates of the reliability of measures are used to "correct" correlations for unreliability due to random measurement errors (Waltz, Strickland, & Lenz, 1984; Carmines & Zeller, 1979). According to Carmines and Zeller, the reliability of widely used scales should not be less than .80.

The homogeneity or internal consistency of a test "refers to the

extent to which individuals' responses to the various items or components of a measuring instrument are consistent" (Giovannetti, 1981, p. 159). According to Nunnally (1978), estimates of internal consistency consider error related to the sampling of content and situational factors associated with the administration of items.

Waltz et al. (1984) state:

> the alpha coefficient is the preferred index of internal consistency reliability because (1) it has a single value for any given set of data; and (2) it is equal in value to the mean of the distribution of all possible split-half coefficients associated with a particular set of test data. Alpha measures the extent to which performance on any one item on an instrument is a good indicator of performance on any other item in the same instrument. (p. 136)

The correlation between measures of the same individual derived from parallel forms of the same test is another estimate of reliability. This method is superior to the test-retest method for assessing the stability of a measure over a period of time. However, Carmines and Zeller (1979) note that constructing parallel forms is a difficult process.

Test-retest reliability involves the repeated administration of an instrument to the same individuals in order to determine the consistency of the measures (Giovannetti, 1981). According to Anastasi (1982), this technique is inappropriate for the large majority of psychological tests. Carmines and Zeller (1979) note the expense and impracticality of obtaining multiple measurements. Underestimations of the reliability may be attributed to reactivity and actual changes in the trait, whereas, overestimation may be due to the recall of the respondents (Anastasi; Carmines & Zeller; Nunnally, 1978).

Validity.

Validity refers to "the degree to which a test actually measures what it purports to measure" (Anastasi, 1982, p. 27). The degree of validity depends on the proportion of systematic or nonrandom error in the measurement process (Carmines & Zeller, 1979, p. 15). The generalization of validity evidence may be limited by differences in methods of measurement, types of criterion measures, populations, settings, and times (AERA et al., 1985).

According to the AERA et al. (1985), the process of test validation entails the accumulation of evidence to support the appropriateness, meaningfulness, and usefulness of specific inferences made from test scores. Anastasi (1986) indicates that

> the validation process begins with the formulation of detailed trait or construct definitions, derived from psychological theory, prior research, or systematic observation and analysis of the relevant behavior domain. Test items are then prepared to fit the most effective (i.e. valid) items for the initial item pools. Other appropriate internal analyses may then be carried out, including factor analysis or item clusters or subtests. The final stage includes validation and cross-validation of various scores and interpretative combinations of scores through statistical analyses against external, real-life criteria. (p. 3)

Traditionally, evidence concerning the validity of a test has been categorized as: face, content, criterion, and construct (Anastasi, 1982). AERA et al. (1985) indicate the ideal validation contains evidence from the latter three categories; "however, the quality of the evidence is of primary importance, and a single line of solid evidence is preferable to numerous lines of evidence of questionable quality" (p. 9). Since validation concerns the evaluation of an instrument for a particular purpose, evidence of its value for this purpose should be collected (AERA et al., 1985; Nunnally, 1978).

Cook and Campbell (1979) caution that attempts to increase the construct validity of effects may "increase the tedium of measurement and... cause either attrition from the experiment or lower reliability for individual measures" (p. 82).

According to Cronbach and Meehl (1955), "construct validation is involved whenever a test is to be interpreted as a measure of some attribute or quality which i not 'operationally defined'" (p. 282). Anastasi (1982) indicates construct validation is concerned with "a broader, more enduring, and more abstract kind of behavioral description... [than the other types of validation and] requires the gradual accumulation of information from a variety of sources" (p. 144). Loevinger (1957) believes the process entails evaluation of the existence of the proposed construct. According to Giovannetti (1981), "examination of construct validity involves validation not only of the measuring instrument but of the theory underlying it" (p. 163).

A variety of approaches to construct validation exist. Loevinger (1957) proposes that construct validity has substantive, structural, and external components. Embretson (1983) believes that a new approach to construct validation research, construct modeling, has resulted from a paradigm shift in psychological theory. This approach addresses issues related to construct representation, which "is concerned with identifying the theoretical mechanisms that underlie task performance"... [and nomothetic span,] the network of relationships of a test to other measures" (p. 180).

A variety of specific techniques contribute to the validation of a construct. The assertion that one or more constructs is measured by an instrument may be tested by assessing the intercorrelations among

items and performing a factor analysis (AERA et al., 1985; Anastasi, 1982). Moderate correlations between a new test and existing tests of the same construct provide evidence of validity. Campbell and Fiske (1959) advocate estimating convergent and discriminant validity by a multitrait multimethod approach; this approach uses "a matrix of intercorrelations among tests representing at least two traits, each measured by at least two methods" (p. 104). In addition, hypotheses concerning the construct measured can be tested (Anastasi; Waltz et al., 1984).

"Criterion-related evidence demonstrates that test scores are systematically related to one or more outcome criteria" (AERA et al., 1985, p. 11). According to Anastasi (1982), "criterion-related validity can be best characterized as the practical validity of a test in a specified situation" (p. 143). Evidence of criterion related validity is needed if one wishes to infer performance related to other variables from the test score (Waltz, et al., 1984). According to Giovannetti (1981), "concurrent validity is established by comparing the measure of interest with some other measure designed for the same purpose [and] predictive validity is established by determining how well the measure predicts some future behavior" (p. 162). The AERA et al. indicate "concurrent evidence is usually preferable for... tests used as measures of a specified construct" (p. 11). Rationale for the selection of the criterion variables should be specified by the investigator (AERA et al.).

The method of contrasted groups is frequently used in the validation of personality tests (Anastasi, 1982). This method "involves a composite criterion that reflects the cumulative and

uncontrolled selective influences of everyday life. This criterion is ultimately based on survival within a particular group versus elimination therefrom" (Anastasi, p. 140). Comparisons of measures of a particular trait are made between groups of individuals who are believed to have varying levels of this trait.

Evidence of content validity concerns the degree to which the test content represents a specified universe of content (AERA et al., 1985). According to Anastasi (1982), content validation of a personality and aptitude test "is usually inappropriate and may, in fact, be misleading" (p. 135).

Face validity is the degree to which the test 'looks like' it can measure the concept it is intended to measure (Nunnally, 1978). Anastasi (1982) believes that face validity is fundamental to rapport and public relations.

Testing.

Anastasi (1982) describes three approaches to the study of personality: application of performance or situational tests, projective tests, and self report inventories. The latter approach is relevant to this proposal. Self report questionnaires are beset with problems concerning the understanding of items, response styles, tendencies to describe oneself in a socially desirable manner, and the impact of the examiner and the environment (Anastasi; Nunnally, 1978). However, Nunnally indicates self inventories "represent by far the best approach available" (p.141).

CHAPTER III

METHODS AND PROCEDURES

Design

An ex-post facto design was used since neither manipulation nor randomization of the variables was possible (Kerlinger, 1973). Data was collected by means of a cross-sectional survey over a total period of five months; approximately 8 weeks was required for the distribution and collection of surveys for each unit. Independent and dependent (criterion related) variables were selected on the basis of findings from the literature review. The independent variables were: age; types of nursing education; stress related education or counseling; shift(s) usually worked; specialty, unit, and hospital of employment; and length of employment in nursing, in the present nursing specialty, and in the particular unit of employment. Days and episodes of absenteeism, job enjoyment, perception of well-being, and numbers and intensity of reported psychological and physiological symptoms (GSI) were the dependent or criterion related variables. Hardiness was considered an intervening variable.

Population and Sample.

The population was comprised of female general duty registered nurses employed on a full time basis in Edmonton adult critical care and obstetrical units (excluding nurses who worked in labor and delivery). The inclusion criteria were selected to promote optimal homogeneity within the two groups. Data was collected concerning the types of CC units in which the nurses worked in order to determine whether significant differences between CC nurses was related to their different specialties. The following CCN specialties were included in

the sample: neurological ICU (an ICU designated for the provision of care to critically ill neurological patients), coronary surgical ICU (an ICU designated for the provision of care to critically ill coronary surgical patients), coronary ICU (an ICU or CCU designated for the provision of care to critically ill coronary patients undergoing non-surgical treatment), general ICU (an ICU designated for the provision of care to critically ill patients who usually have more than one health problem) and general ICU-CCU (an ICU designated for the provision of care to critically ill patients, including those with cardiac problems). Obstetrical nurses were included in the sample because of the contrasting nature and numbers of environmental stressors they reportedly perceived in comparison to the stressors perceived by critical care nurses. Obstetrical nurses working in labor and delivery were excluded since the investigator believed that more stressors were inherent to this environment; the obstetrical group consisted of nurses who worked in the newborn nursery and/or the ante/postpartum area.

Respondents from a total of four acute care hospitals participated in the study. Nurses from the one remaining acute care hospital in the city were excluded because the obstetrical nurses did not meet the inclusion criteria; they all worked in labor and delivery. A large representative sample was needed to address the research questions. According to Crocker and Algina (1986), "a common rule of thumb for the minimum sample size in factor analysis is to use the larger of the following: 100 examinees or 10 times the number of variables" (p. 296). Consideration of limitations in the numbers of the population within the city and in the resources that restricted

the scope of the survey led to the decision to gain an approximation of the factor analysis using a smaller sample, 80 obstetrical and 80 CC nurses, a total of 160 nurses. Given this sample size, an alpha of .05, and a small to moderate effect size, t-tests and correlations would have sufficient power to yield statistically significant results (Cohen, 1977). With a proposed alpha of .05 and an effect size of .40 (small to moderate), the power of one tailed t-tests would be .80 for groups of 78 with equal variance and .60 for groups of 81. Product moment correlations with an alpha of .05 and an effect size of .20 (small to medium for this test) would have a power of .80 with a sample size of 153 (Cohen).

An overall response rate of 78.7% resulted in a sample of 214 respondents. Response rates from the obstetrical and critical care groups groups, 75% and 80% respectively, yielded samples of 54 obstetrical nurses and 160 critical care nurses. A larger number of obstetrical nurses was unattainable since only 72 nurses met the criteria for inclusion; the number of nurses that did not meet the inclusion criteria, unregistered and part-time nurses, was greater than expected. Response rates ranged from 55% to 100% per unit and 68.4% to 89.5% per hospital (see Tables 1 and 2). Since the responses were completely anonymous, it was not possible to identify the characteristics of nonrespondents in an attempt to determine reasons for nonresponse. Information provided by unit supervisors concerning the number of beds in the unit, the usual nurse patient ratio, and factors which they perceived may have influenced the responses or response rates did not appear associated with response rate. The timing of the surveys did not appear to be influential. Overlapping

Table
Response Rates by Hospital and Unit

Hospital	Number of Possible Respondents	Number of Actual Respondents	Response Rate
1	76	68	89.5
2	119	90	75.6
3	38	26	68.4
4	39	30	76.9

Table 2
Response Rates by Nursing Specialty and Unit

	Number of Possible Respondents	Number of Actual Respondents	Response Rate
Obstetrics			
1	8	7	87.5
2	9	7	77.8
3	9	7	77.8
4	24	15	62.5
5	14	10	71.4
6	8	8	100.0
Total	72	54	75.0
Critical Care			
1	50	47	94.0
2	40	32	80.0
3	25	20	80.0
4	17	12	70.6
5	13	11	84.6
6	24	16	66.7
7	20	11	55.0
8	11	11	100.0
Total	200	160	80.0

surveys of subjects at two hospitals during the summer resulted in response rates of 89.5% and 75.6%. During this time, a natural disaster had a significant impact on many subjects and the workload of the CCN group. The remaining surveys which overlapped during the late summer and fall resulted in response rates of 68.4% and 76.9%. Data collection methods did not vary significantly between units and therefore, did not explain the variation in response rates. In addition, comments from nurses about anonymity and confidentiality, the nature of individual items, and the purpose of the study did not appear related to response rates.

Table 3 provides an overview of the characteristics of the respondents and reveals significant differences between the groups of nurses. Closed-ended items were used to increase the efficiency of response, acceptance of the questionnaire, and anonymity of the respondents, some of whom were known by the investigator. Calculations for items such as, age, years of nursing experience, and length of time worked in the present unit and in the specialty utilized the value of the midpoints of each category. The uppermost category for the latter three variables "15 years or more" was given the value 25 years based on extrapolations from Alberta Association of Registered Nurses data (J. Smith, personal communication, May 1988).

The CC group was significantly younger ($t_{2=}-9.98$, df=66.21, $p<.0005$), had fewer dependents ($t_{2=}-4.64$, df=67.48, $p<.0005$), and had worked a shorter time in their present unit of employment ($t_{2=}-4.71$, df=63.75, $p<.0005$), in their specialty ($t_{2=}-5.52$, df=66.53, $p<.0005$), and in nursing ($t_{2=}-8.98$, df=72.14, $p<.0005$) than the obstetrical group. It may be speculated that the attributes of youth are a greater

Table 3
Respondents' Characteristics by Nursing Specialty

Characteristic	Actual Number (Percentage) Obstetrics	Critical Care	Total
Length of Time Worked in Present Unit (years)			
< 6 mos (0.25)*	4 (7.4)	27 (16.9)	31 (14.5)
6 mos - < 1 yr (0.75)	2 (3.7)	47 (29.4)	49 (22.9)
1 - < 3 (2)	14 (25.9)	51 (31.9)	65 (30.4)
3 - < 5 (4)	6 (11.1)	14 (8.7)	20 (9.3)
5 - < 7 (6)	7 (13)	8 (5.0)	15 (7.0)
7 - < 9 (8)	6 (11.1)	6 (3.7)	12 (5.6)
9 - < 11 (10)	7 (13)	4 (2.5)	11 (5.1)
11 - < 13 (12)	1 (1.9)	1 (0.6)	2 (0.9)
13 - < 15 (14)	3 (5.6)	0 (0.0)	3 (1.4)
15 or more (25)	4 (7.4)	2 (1.2)	6 (2.8)
Mean	6.824	2.487	3.58
Median	6.0	2.0	2.0
Mode	2.0	2.0	2.0
Standard deviation	6.453	3.486	4.795
($t_{2=-4.71}$, df=63.75, p<.0005)			
Length of Time Worked in Nursing Specialty (years)			
< 6 mos (0.25)	2 (3.7)	18 (11.3)	20 (9.4
6 mos - < 1 yr (0.75)	1 (1.9)	30 (18.9)	31 (14.6)
1 - < 3 (2)	7 (13)	56 (35.2)	63 (29.6)
3 - < 5 (4)	8 (14.8)	19 (11.9)	27 (12.7)
5 - < 7 (6)	4 (7.4)	13 (8.2)	17 (8)
7 - < 9 (8)	8 (14.8)	7 (4.4)	15 (7)
9 - < 11 (10)	6 (11.1)	8 (5.0)	14 (6.6)
11 - < 13 (12)	5 (9.3)	1 (0.6)	6 (2.8)
13 - < 15 (14)	3 (5.6)	2 (1.2)	5 (2.3)
15 or more (25)	10 (18.5)	5 (3.1)	15 (7)
Mean	10.134	3.736	5.358
Median	8.0	2.0	2.0
Mode	25	2.0	2.0
Standard Deviation	8.038	4.842	6.435
($t_{2=-5.52}$, df=66.53, p<.0005)			

Characteristic	Actual Number (Percentage) Obstetrics	Critical Care	Total
Total Length of Nursing Experience (years)			
< 6 mos (0.25)	0 (0)	0 (0)	0 (0.3)
6 mos - < 1 yr (0.75)	0 (0)	5 (3.1)	5 (2.3)
1 - < 3 (2)	3 (5.6)	25 (15.6)	28 (13.1)
3 - < 5 (4)	2 (3.7)	47 (29.4)	49 (22.9)
5 - < 7 (6)	2 (3.7)	26 (16.2)	28 (13.1)
7 - < 9 (8)	1 (1.9)	19 (11.9)	20 (9.3)
9 - < 11 (10)	8 (14.8)	11 (6.9)	19 (8.9)
11 - < 13 (12)	3 (5.6)	9 (5.6)	12 (5.6)
13 - < 15 (14)	3 (5.6)	6 (3.7)	9 (4.2)
15 or more (25)	32 (59.3)	12 (7.5)	44 (0.6)
Mean	18.370	7.198	10.018
Median	25.0	6.0	6.0
Mode	25.0	4.0	4.0
Standard Deviation	8.441	6.033	8.28
(t_2=-8.98, df=72.14, p<.0005)			
Age (years)			
< 25 (23)	2 (3.7)	30 (18.9)	32 (15)
25 - 29 (27)	3 (5.6)	71 (44.7)	74 (35)
30 - 34 (32)	4 (7.4)	32 (20.1)	36 (17)
35 - 39 (37)	9 (16.7)	13 (8.2)	22 (10)
40 - 44 (42)	11 (20.4)	10 (6.3)	21 (10)
45 - 49 (47)	11 (20.4)	2 (1.3)	12 (6)
50 or more (57)	14 (25.9)	1 (0.6)	15 (7)
Mean	43.796	29.453	33.089
Median	42	27	32
Mode	57	27	27
Standard Deviation	9.974	5.939	9.502
(t_2=-9.98, df=66.21, p<.0005)			
Number of Dependents			
0	23 (42.6)	117 (73.1)	140 (65.7)
1	6 (11.1)	20 (12.5)	26 (12.2)
2	10 (18.5)	15 (9.4)	25 (11.7)
3	13 (24.1)	7 (4.4)	20 (9.4)
4	2 (3.7)	0 (0)	2 (0.9)
5 or more	0 (0)	0 (0)	0 (0)
Mean	1.352	0.447	0.676
Median	1.0	0	0
Mode	0	0	0
Standard Deviation	1.348	0.839	1.065
(t_2=-4.64, df=67.48, p<.0005)			

Characteristic	Actual Number (Percentage) Obstetrics	Critical Care	Total
Education			
R.N. diploma x^2=0.29685, df=1, p=.5859	50 (92.6)	143 (89.4)	193 (90.2)
Bachelor of Nursing x^2=0.00101, df=1, p=.9747	7 (13)	23 (14.4)	30 (14)
Nursing Specialty Education Certificate Program x^2=0.15707, df=1, p=.6919	10 (18.5)	24 (15)	34 (15.9)
Other x^2=4.74122, df=1, p=.0294	4 (7.4)	35 (21.9)	39 (18.2)
Stress Education/Counseling x^2=0.0, df=1, p=1.0	3 (5.6)	7 (4.4)	10 (4.7)
R.P.N. diploma			2 (.9)
Other Post Basic Nursing Education			14 (6.5)
Shifts Usually Worked			
8 hour day x^2=70.03850, df=1, p<.00005	29 (53.7)	6 (3.8)	35 (16.4)
8 hour night x^2=23.69272, df=1, p<.00005	15 (27.8)	6 (3.8)	21 (9.8)
8 hour evening x^2=41.94955, df=1, p<.00005	17 (31.5)	2 (1.3)	20 (8.9)
12 hour day x^2=81.42621, df=1, p<.00005	22 (40.7)	154 (96.3)	176 (82.2)
12 hour night x^2=89.05934, df=1, p<.00005	23 (42.6)	157 (98.1)	180 (84.1)

requisite for CCN than for obstetrical nursing.

The CC group was less likely to work 8 hour day (x^2=70.0385, df=1, p<.00005), 8 hour night (x^2=23.69272, df=1, p<.00005), or 8 hour evening shifts (x^2=41.94955, df=1, p<.00005), and more likely to work 12 hour day (x^2=81.42621, df=1, p<.00005), or night shifts (x^2=89.05934, df=1, p<.00005), than the obstetrical group. The increased likelihood of the CC group working longer shifts may be associated with their younger age and fewer dependents. Likewise, the length of this shift may be a limiting factor for older nurses with more dependents.

Although no significant differences were found between the groups in the numbers having a registered nursing diploma (x^2=0.29685, df=1, p=.5859), bachelor in nursing degree (x^2=0.00101, df=1, p=.9747), or a certificate program in their present nursing specialty (x^2=0.15707, df=1, p=.6919), the CC group was more likely to have attended a course, lecture, seminar or workshop concerning their specialty (x^2=4.74122, df=1, p=.0294). The total number of positive reports for this category (39 or 18.2%) was remarkably low considering the group mean for length of time worked in the specialty (5.358 years). At least two explanations may be proposed for this finding: firstly, the two categories, "certificate program" and "courses lectures seminars or workshop" may have been perceived to be mutually exclusive; and secondly, educational offerings provided within the workplace may not have been enumerated by the respondents. It was also unexpected that only 10 respondents or 4.7% of the sample had participated in stress management education/counseling and that the percentage of participants in each group was approximately equal (x^2=0.0, df=1,

p=1); the reputed stressful environment of CCN led to the expectation that a significantly greater percentage of CC nurses would have had exposure to stress management.

Analysis of responses to "other type(s) of nursing education" yielded nine miscellaneous categories and a total of fourteen responses. The one respondent with an associate of science in nursing, an American non-degree nursing program, was categorized with the registered nurse diploma group. Two respondents reported having registered psychiatric nursing diplomas (R.P.N.) in addition to registered nursing diplomas. None of the respondents reported having a Masters in Nursing degree. Three respondents did not indicate their level of education.

Data Collection

Instruments

The questionnaire, included in Appendix C, consisted of 125 items: items 1-8 concerned biographical data, 9-58 consisted of the Hardiness Test, 59-69 consisted of the Job Enjoyment Scale, 70-122 consisted of the Brief Symptom Inventory, 123 concerned the respondent's perception of their well-being, 124 and 125 questioned the numbers of episodes and days of absenteeism due to illness. The respondent was invited to write comments in the remaining space available.

The questionnaire was edited by the investigator to ensure the questions had been transcribed accurately and then evaluated for clarity by the chair of the research committee. Since the questionnaire consisted of tests that had been used extensively, the decision was made to limit pretesting to six nurses. They provided

feedback about the clarity of the questions and recorded the length of time required to complete the questionnaire. The length of time required to complete the questionnaire ranged from 15 to 25 minutes, the mean being approximately 20 minutes; this was less than the time limit of 30 minutes recommended by critical care administrators. Two spelling mistakes were detected and one subject reported the questions "were depressing."

1. Biographical data. Biographical data was collected concerning: shift(s) usually worked, length of employment in present unit and the particular specialty, total length of nursing experience, type of nursing education, education related to stress management, education related to the particular nursing specialty, age and number of dependents living in the same residence. The particular hospital and unit of employment was also noted.

2. The Hardiness Test. The third edition of the Hardiness Test was described in the literature review. Copies of the test were purchased from and scored by the Hardiness Institute. At the request of the investigator, the Institute computed the scores on two separate occasions to ensure their accuracy (Skip Dane, personal communication, May 1988). Additional scores were calculated following the reversal of selected items.

3. The Job Enjoyment Scale from the Nursing Job Satisfaction Scale. The Job Enjoyment Scale (JES) is an adaptation of the Brayfield and Rothe Job Satisfaction Scale (Brayfield & Rothe, 1951) and is one of the scales included in the Nursing Job Satisfaction Scale (Atwood & Hinshaw, in press). Items from the Brayfield and Rothe Scale have been used by Weisman et al. (1980) and Price and Mueller (1981). According

to Weisman et al., the eight item overall indicator of satisfaction was more sensitive to differences in characteristics of individual nurses than a multi-facet indicator. Price and Mueller measured the job satisfaction of 1091 nurses using seven items from the original scale. The coefficient alpha for the index was .87. Five items are identical to items in the JES; the factor loadings of these items range from .69 to .78.

The JES is an 11 item self report indicator of enjoyment of one's job. The respondent indicates level of agreement with the item by selecting one of five options, ranging from strongly agree to strongly disagree. Cronbach's alpha for this scale is .85 (unstandardized) and .86 (standardized). According to Atwood and Hinshaw (Atwood, personal communication, March 1987), a test composed of this scale and two others, functioned as predicted in causal modeling predictions; job satisfaction was found to buffer the effects of stress on turnover. The minimum factor coefficient was .45 for each of the three subscale factors. Norbeck (1985a) measured the job satisfaction of 180 CC nurses with a test that included this scale and reported a coefficient alpha of .86 for the test. Significant relationships were found between this measure of job satisfaction and job stress and psychological symptoms, as measured by the Brief Symptom Inventory.

The JES score was the mean value of items with non-missing values after the negative items had been reversed. A scale of 0-4, with 0 being low job enjoyment and 4 being high job enjoyment was assigned to responses. Although the test's authors used a 1-5 scale, the 0-4 scale would facilitate comparisons with the other tests which used 0.

4. Brief Symptom Inventory. The Brief Symptom Inventory (BSI) is a brief form of the SCL-90-R and the most recent revision of the Hopkins Symptom Checklist (HSCL) (Mitchell, 1985) . The 53 item, 5 point Likert self report rating scale is sensitive to low levels of psychologic symptoms in normal populations (Derogatis & Melisaratos, 1983). Estimated time for completion of the BSI less than 10 minutes (Derogatis & Spencer, 1982). Although the BSI measures 9 primary dimensions and three global indexes of psychologic distress, only the Global Severity Index, a measurement combining the intensity and number of symptoms or psychological distress, will be calculated (Derogatis & Melisaratos). Derogatis and Spencer report the test-retest reliability for the Global Severity Index is .90 and the internal consistency (coefficient alpha) ranges from .71 to .85 on the nine subscales. They also indicate the establishment of convergent validity with parallel constructs from the Minnesota Multi-phasic Personality Inventory (MMPI), construct validity with factor analysis, and predictive validity with in clinical studies.

Folkman, Lazarus, Gruen, and DeLongis (1986) found that measures from the HSCL were highly correlated with measures from the CES-D (a measure of depression) and the Bradburn Morale Scale. Norbeck (1985a) found the BSI measurement of the level of psychological distress in a sample of 180 female critical care nurses reached clinically significant levels.

5. Perception of Well-being. As an additional measure of health, subjects were asked to rate their level of well-being for the past week by circling a number from 1 to 10, 1 being low level and 10 being high level well-being.

6. Absenteeism. Subjects were asked to report the total number of days and episodes of absenteeism due to illness within the last 6 months of employment.

Procedures

Prior to approaching the subjects, the investigator gained approval to conduct the study from representatives of the respective hospitals. Information about the study was shared with these representatives and plans were made for the distribution and collection of questionnaires. Supervisors were unable to provide time for the completion of questionnaires in a controlled setting within working hours; administration of the questionnaire to groups in a controlled setting outside working hours was discouraged because of the potential for a poor response rate. Selected supervisors believed the following strategies would promote the honest voluntary cooperation of subjects: assuring subjects of anonymity and confidentiality, promising to communicate results, timing the survey to avoid conflicts with work and other research studies, distributing questionnaires personally in the work setting, collecting the completed questionnaires frequently, and placing the questionnaire collection box in a secure, yet visible location. Supervisors provided the investigator with the names of nurses who met the inclusion criteria and the dates they were working. The investigator made plans to meet each subject to deliver the questionnaire and a letter about the study (see Appendix D), to briefly reiterate this written information, and to respond to questions with information that would not bias responses. Subjects were informed about the study in advance of their contact with the investigator by notices posted in each unit.

In the majority of cases, the investigator was able to meet with groups of subjects prior to the beginning of their shift. Individual contacts were made when the setting was not conducive to group meetings or when only one subject was working a particular shift. Completed questionnaires were removed from the box designated for their placement by the investigator on a frequent basis. These questionnaires were immediately coded with a subject, unit, and hospital identification number. Several weeks after the distribution of questionnaires to a group of subjects, a notice was posted on the unit and a letter sent to subjects to thank those who had responded and remind those who had not responded to this opportunity (included in Appendix D); additional questionnaires were made available to those who had misplaced their initial copies. A period of approximately eight weeks was required for this process due to shiftwork and holidays. During this time, supervisors were intermittently solicited for feedback.

Ethical Considerations

The investigation was carried out in accordance with standards set forth by ethics committees of the University of Alberta Faculty of Nursing and each of the hospitals in which subjects were employed. Participation of subjects was voluntary. The confidentiality of individual responses was maintained by reporting pooled and not individual responses. Subjects were asked not to write their names on the questionnaire to maintain their anonymity. In addition, attempts were made to conceal the identities of units and hospitals in the report. Completed questionnaires were kept in a locked compartment and were destroyed upon completion of the study.

Data Analysis

Data was analyzed using the SSPX Information Analysis System. Given the sampling technique, the high response rate, the large sample number, and the assumption the variables were normally distributed in the population, it was assumed variables in the sample were normally distributed as well. Descriptive statistics were computed for all of the variables. Comments written on the questionnaire were collected, coded, and tabulated.

The biographical characteristics of the respondents were analyzed using chi-square tests and t-tests. Chi-square tests were used to test the independence of the type of nursing specialty and the nominal variables (the type of shifts worked and nursing education attained). T-tests for independent groups were used to determine the equivalence of the specialty groups in relation to mean age, number of dependents, length of employment in the present unit and nursing specialty, and length of nursing experience.

Prior to the factor analysis of the Hardiness Test, missing values and patterns of non-response were identified. The responses to selected items were recoded so all high scores would reflect a high level of hardiness. Factor analysis was performed to determine the number of factors derived from the measure, the characteristics and weights of the factors, and the relationship between each factor and the total test. Substantial loadings (.40) on each of the three factors and the general factor was desired. Principal components analysis with listwise deletion of cases with missing values was performed with Varimax rotation not specifying a specific factor solution and then specifying a 3 factor solution. Further factor

analyses were undertaken with items that had minimum loadings of .40 on the first three factors. Comparisons were made between the factor solutions derived from the shorter questionnaire and from the original questionnaire; the latter was compared with a solution from the Hardiness Institute.

The content of the three factors was analyzed and compared with descriptions of the components of Hardiness and with selected scales. Scores derived from the shorter test were compared with scores calculated by the Hardiness Institute using Pearson correlation coefficients. Descriptive statistics were also computed. Estimates of the homogeneity of the original test, the shorter test, and the three factor scales were made using Cronbach's alpha.; a level of .80 was deemed desirable (Nunnally, 1978).

Prior to estimating the homogeneity of the JES and GSI, the missing values and patterns of non-response of the two tests were identified. Selected items of the JES were recoded so that a high score would be indicative of a high level of enjoyment of one's job; recoding of the GSI was not necessary. Cronbach's alphas were calculated and compared with the values calculated by the tests' authors. Scores for the JES and GSI were then calculated. Descriptive statistics were computed for all the dependent variables and compared with data from other studies. The relationship among the dependent variables was estimated by Pearson product moment correlation coefficients.

T-tests for independent groups and analysis of variance were used to determine the equivalence of the dependent variables between the two specialties and amongst the fourteen units, respectively. Scheffe

and Newman-Keuls tests were used to make a posteriori comparisons between sample means while maintaining the type I error rate at alpha between comparisons. Tests were performed using the Scheffe method to determine whether significant differences would be found with "the most conservative [a posteriori test] with respect to type I error" (Winer, 1971, p. 210). Since Winer indicates this test "yields too few significant differences" (p. 210), the more powerful Newman-Keuls method was also used. The risk of greater type I error was considered justified given the consequences of Type I error and the benefits of increased power.

The magnitude and direction of relationships between the dependent variables and the biographical factors were estimated with Pearson product moment correlation coefficients. One-tailed t-tests for independent groups were used to determine the equivalence of the groups' levels of hardiness and thus evaluate validity by the method of contrasted groups. Criterion related validity was estimated by determining the relationship between hardiness and the dependent variables with Pearson product moment correlation coefficients. Construct validity was estimated by evaluating the stress buffering functions of hardiness. Two-way analysis of variance was used to determine the direct and interaction effects of high and low levels of hardiness and two nursing specialties (conceptualized as two levels of occupational stress) on the dependent variables.

CHAPTER IV

RESULTS AND DISCUSSION

Analysis of the Hardiness Test

The factorial composition of the Hardiness Test was examined to determine the extent to which it measured the proposed construct; that is, (1) whether three factors could be derived from the measure, (2) whether the characteristics of these factors corresponded to those of commitment, challenge, and control, and (3) whether a positive relationship existed between each factor and the total test. Since a conservative approach had been adopted towards missing data, factor analysis was performed on the 184 cases which had non-missing data on all variables; cases with missing values had been deleted listwise. Examination of the data for patterns of non-response yielded the following information: item 56 had 6 reports of missing values, items 17 and 45 respectively had 5 reports, items 40 and 41 respectively had 3 reports, and the remainder of the items had less than 3 reports each. All these items, except for item 41, loaded on factor 1 with loadings less than .40; item 41 loaded on factor 3 with a loading greater than .40. No other patterns for non-response could be detected.

Prior to analyses, selected items were recoded so that high scores would be awarded to responses perceived by the investigator to be indicative of high level hardiness and so all items loading on a factor would be related in the same direction; the latter criterion was employed when the nature of an item was not clear. Thirty-four items were recoded; recoded items from the 26 item version of the test are noted in Table 4. According to Kim and Mueller (1978), this

process should be undertaken prior to factor analysis.

To determine whether three factors could be derived from the test, a correlation matrix was computed, estimates of initial factors were obtained by principal components analysis, and factors were rotated. Rotation was used to redistribute the explained variance for each factor to achieve a solution comprised of items with loadings on one factor only (Norusis, 1985). Anastasi (1982) indicates support has been provided for both orthogonal, uncorrelated factor solutions, and oblique, correlated factor solutions, for the portrayal of trait relationships. The former provides a simpler and clearer factor solution with the imposition of orthogonality, rotation axes which are fixed at right angles, whereas, the latter allows for the correlation of factors at the expense of simplicity (Anastasi, Harmon, 1976). Although Nunnally (1978) believes both types of rotations usually "lead one to essentially the same major conclusions" (p. 417), he indicates the latter method is beset with conceptual and statistical problems (p. 387). "The conceptual problem concerns the difficulties in making sense out of reference vectors, factor patterns, factor structures, and correlations among factors. The statistical problems arise from the much greater complexity that occurs in seeking an oblique solution" (Nunnally, p. 387). Given this information and information concerning the similarities between oblique and orthogonal varimax factor solutions of the Hardiness Test (Hardiness Institute, personal communication, May 1988), the decision was made to employ orthogonal varimax rotation.

Varimax rotation, a rotation that "attempts to minimize the number of variables that have high loadings on a factor" (Norusis,

1985, p. 142), resulted in a 17 factor solution which explained 65.8% of the total variance of the measure. Since the factors had eigenvalues ranging from 1.01172 to 5.98698 and factors with eigenvalues greater than one are usually retained (Kim & Mueller, 1978; Nunnally, 1978), the number of factors emerging from the solution was far greater than originally hypothesized. Increasing the minimum eigenvalue to 2.0, resulted in the emergence of five factors. In contrast, the Hardiness Institute derived only three factors with eigenvalues of 2.0, each with variances similar to those determined in this investigation (personal communication, May 1988). The solution derived in this investigation differed from that of the Hardiness Institute and was incompatible with their proposed three factor construct.

Varimax rotation was undertaken to determine a three factor solution. The resulting solution explained 24.8% of the variance and the factors had respective eigenvalues of 5.98698, 3.53768, and 2.85602. Factor 1 explained 12% of the variance in the test scores. Twenty-nine items loaded on this factor with 11 items having loadings greater than .40. Factor 2 explained 7.1% of the variance. Nine items loaded on this factor with 7 items having loadings greater than .40. The third factor explained 5.7% of the variance. Twelve items loaded on this factor with 8 items having loadings greater than .40. The three factor solution derived by the Hardiness Institute explained a similar amount of variance; factors 1, 2, and 3, respectively, explained 15.7%, 6.9%, and 4.4% of the variance. Fourteen items loaded on factor 1, 7 items loaded on factor 3, and an undisclosed number loaded on factor two (personal communication, May 1988).

Since the criterion for factor loadings had been set at .40 a priori, 24 items were deleted from further analyses. Failure of the 24 variables to load highly on the three factors may be attributed to the small sample size, the possible homogeneity of the sample, or the faulty definition and/or operationalization of the construct. Listwise deletion of cases with missing values on the 26 items resulted in a sample of 202 cases and an improvement to the ratio of cases to items; in factor analysis, the number of cases should be 10 times the number of items (Crocker & Algina, 1986).

Comparisons between the solutions derived from the varimax rotations of the 50 and 26 item tests are made in Tables 4, 5, and 6. In Table 4, note the same items loaded on each of the factors in both tests; item 34 loaded on factors 2 and 3. Note that in the shorter test the factors accounted for a greater proportion of variance of nineteen items. It is also apparent the shorter test's common factor accounted for a greater proportion of variance in eighteen items (Table 5). In Table 6, the factors in the 26 item test are seen to explain 11.9% more variance than the factors in the 50 item test. In conclusion, the 26 item test solution is superior to the 50 item test solution in terms of its proportion of explained variance and ratio of cases to items.

The content of the factors was analyzed to determine whether the characteristics of the factors corresponded to the components of hardiness: commitment, challenge, and control (see Table 7). Factor content was compared to descriptions of the constructs and the content of the security, powerlessness, external locus of control, alienation from work, and alienation from self scales. Examination of the items

Table 4
Factor Loadings for Three Factor Solutions Derived by Varimax Rotation of 50 Item and 26 Item Hardiness Tests

No.	Item	50 Item	26 Item
	FACTOR 1		
22** (14)*	No matter how hard you work, you never really seem to reach your goals	.61248	.66298
27** (19)	Most of the time it just doesn't pay to try hard, since things never turn out right anyway	.60861	.62541
18** (10)	I feel that it's almost impossible to change the mind of someone with whom I am close	.58666	.62234
21** (13)	When you marry and have children you have lost your freedom of choice	.58650	.64260
15** (7)	No matter how hard I try, my efforts will will accomplish nothing	.54944	.58143
19** (11)	Most people who work for a living are just manipulated by their bosses	.53491	.50227
25** (17)	It doesn't matter if you work hard at your job, since only the bosses profit by it anyway	.51522	.50944
37** (29)	Thinking of yourself as a free person just makes you feel frustrated and unhappy	.46452	.51101
39** (31)	When I make a mistake, there's very little I can do to make things right again	.44640	.45772
55** (47)	I think people believe in individuality only to impress others	.43127	.38910
24** (16)	I believe most of what happens in life is just meant to happen	.42898	.39351
	FACTOR 2		
44** (36)	I don't like things to be uncertain or unpredictable	.72038	.74830

** Scoring of item was reversed
* First item number is from the investigator's questionnaire; the number in parentheses is from the original Hardiness Test

No.	Item	50 Item	26 Item
	FACTOR 2		
38** (30)	It bothers me when something unexpected interrupts my daily routine	.67189	.70813
51** (43)	Changes in routine bother me	.66946	.69806
14** (6)	I feel uncomfortable if I have to make any changes in my everyday schedule	.60754	.61823
10 (2)	I like a lot of variety in my work work.	.56122	.57626
35 (27)	I enjoy being with people who are are unpredictable	.54950	.54965
34 (26)	It's exciting for me to learn something about myself	.44976	.39405
	FACTOR 3		
29 (21)	I won't answer [illegible]'s questions until I am very clear as to what he is asking	.67656	.71212
12 (4)	Planning ahead can help avoid most future problems	.60696	.60368
30 (22)	When I make plans I'm certain I can make them work	.58137	.61507
48 (40)	I have no use for theories that are not closely tied to the facts	.52014	.54734
33 (25)	When performing a difficult task at work, I know when I need to ask for help	.50264	.47176
41 (33)	I respect rules because they guide me	.47625	.33598
13 (5)	I usually feel that I can change what might happen tomorrow, by what I do today	.40644	.48746
26 (18)	I don't like conversations when others are confused about what they mean to say	.40401	.48747
34 (26)	It's exciting for me to learn something about myself	.44976	.46112

Table 5
Communalities for the Three Factor Solutions Derived by Varimax Rotation of 50 Item and 26 Item Hardiness Tests

No.	50 Item Test	26 Item Test
FACTOR 1		
22 (14)	.46443	.52634
27 (19)	.39036	.40377
18 (10)	.34807	.40884
21 (13)	.35690	.43582
15 (7)	.30900	.34495
19 (11)	.28798	.25419
25 (17)	.27037	.27027
37 (29)	.23467	.26968
39 (31)	.21740	.23696
55 (47)	.22653	.24906
24 (16)	.18506	.16292
FACTOR 2		
44 (36)	.62229	.63012
38 (30)	.21740	.53066
51 (43)	.47545	.52354
14 (6)	.38485	.41545
10 (2)	.38861	.39810
35 (27)	.37915	.33922
34 (26)	.40039	.38957
FACTOR 3		
29 (21)	.49586	.26968
12 (4)	.38381	.40143
30 (22)	.42829	.45389
48 (40)	.31410	.33823
33 (25)	.30373	.26642
41 (33)	.33477	.21351
13 (5)	.18178	.25895
26 (18)	.22250	.30843
34 (26)	.40039	.38957

Table 6
Eigenvalues and Variances for the Three Factor Solutions
Derived by Varimax Rotation of 50 Item and 26 Item Hardiness Tests

	50 Item Test		26 Item Test	
	Eigenvalue	Variance	Eigenvalue	Variance
FACTOR 1	5.98698	12%	3.94284	15.2%
FACTOR 2	3.53768	7.1%	2.98212	11.5%
FACTOR 3	2.85602	5.7%	2.62877	10.1%
Total		24.8%		36.7%

loading on factor 1 revealed the content was directly related to selected scales but not exclusively related to one construct; powerlessness/control was the primary focus and alienation/commitment, the secondary. The content of all factor 2 items except one was consistent with challenge or its counterpart, security. The content of factor 3 was more difficult to interpret; although one item seemed related to commitment/alienation from self, the content appeared evenly divided between powerlessness/control and security/challenge. Responses to specific security/challenge items were recoded so all loadings for each factor would have the same direction.

Items originally presumed to be related to a single construct, but which loaded on several factors were compared. The powerlessness/control items in factor 1 were stated in a negative manner, whereas the items in factor 3 were stated in a positive manner. No distinct differences were seen between the security/challenge items loading on factors 2 and 3. In summary,

Table 7
Content Analysis of Three Factor Solutions Derived by Varimax Rotation of 50 Item and 26 Item Hardiness Tests

No.	Item	Characteristics
	FACTOR 1	
22** (14)*	No matter how hard you work, you never really seem to reach your goals	powerlessness
27** (19)	Most of the time it just doesn't pay to try hard, since things never turn out right anyway	powerlessness
18** (10)	I feel that it's almost impossible to change the mind of someone with whom I am close	powerlessness
21** (13)	When you marry and have children you have lost your freedom of choice	powerlessness
15** (7)	No matter how hard I try, my efforts will will accomplish nothing	powerlessness
19** (11)	Most people who work for a living are just manipulated by their bosses	powerlessness
25** (17)	It doesn't matter if you work hard at your job, since only the bosses profit by it anyway	alienation
37** (29)	Thinking of yourself as a free person just makes you feel frustrated and unhappy	powerlessness
39** (31)	When I make a mistake, there's very little I can do to make things right again	powerlessness
55** (47)	I think people believe in individuality only to impress others	alienation
24** (16)	I believe most of what happens in life is just meant to happen	powerlessness external locus of control
	FACTOR 2	
44** (36)	I don't like things to be uncertain or unpredictable	security

** Scoring of item was reversed
* First item number is from the investigator's questionnaire; the number in parentheses is from the original Hardiness Test

No.	Item	Characteristics
	FACTOR 2	
38** (30)	It bothers me when something unexpected interrupts my daily routine	security
51** (43)	Changes in rout e bother me	security
14** (6)	I feel uncomfortable if I have to make any changes in my everyday schedule	security
10 (2)	I like a lot of variety in my work work.	challenge
35 (27)	I enjoy being with people who are are unpredictable	challenge
34 (26)	It's exciting for me to learn something about myself	opposite of alienation
	FACTOR 3	
29 (21)	I won't answer a person's questions until I am very clear as to what he is asking	security
12 (4)	Planning ahead can help avoid most future problems	internal locus of control
30 (22)	When I make plans I'm certain I can make them work	internal locus of control
48 (40)	I have no use for theories that are not closely tied to the facts	security
33 (25)	When performing a difficult task at work, I know when I need to ask for help	opposite of powerlessness
41 (33)	I respect rules because they guide me	security
13 (5)	I usually feel that I can change what might happen tomorrow, by what I do today	opposite of powerlessness
26 (18)	I don't like conversations when others are confused about what they mean to say	security
34 (26)	It's exciting for me to learn something about myself	opposite of alienation

factor 1 was composed of negatively stated items presumed related to control and commitment, factor 2 was composed of negatively and positively stated items presumed related to challenge, and factor 3 was composed of positively stated items presumed related to control and challenge; the tone rather than the content of the items may have been responsible for the loadings on factors 1 and 3. These findings were similar to those of Rich and Rich (1987). Their varimax rotation factor analysis of a 60 item Hardiness test developed by Kobasa, Maddi, and Kahn (1982) yielded two independent factors: commitment/control and need for security.

Although the Hardiness Institute content analysis of its factor solution was dissimilar, it did not provide evidence of three distinct factors identifiable as commitment, challenge, and control. Ten of 14 items loading on factor 1 were commitment items, equal numbers of commitment, challenge, and control items loaded on factor 2, and all seven items loading on factor 3 were challenge items (personal communication, May 1988). The emergence of 17 rather than three factors from the the original test and the inability to isolate three factors, each distinctly identifiable as the hypothesized components of the construct, indicate lack of factorial confirmation of the hypothesized construct. If the test is used in the future, changes should be made to the definition and/or operationalization of the construct to improve the fit of the factorial analysis with the construct.

Scores were derived for the 26 item test and each of the three factors. F1, F2, and F3 are the means of the non-missing values for items loading on factors one, two, and three, respectively, and FHardy

is the mean of the non-missing values of all 26 items. One-tailed Pearson correlation coefficients among these scores and scores derived by the Hardiness Institute are found in Table 8. Moderate sized significant positive relationships were found between hardiness and commitment, control, and challenge; the correlations ranged from .654 to .753 ($p \leq .001$). Similar relationships were found between FHardy and the three factor scores; their correlations ranged from .581 to .650 ($p \leq .001$). The relationships among commitment, control, and challenge were smaller; correlations ranged from .216 to .286 ($p \leq .001$). Since F1, F2, and F3 were derived by orthogonal factor analysis, correlations among their scores were small or insignificant. Large sized positive relationships were not found between the two sets of scores; many relationships were negative and no relationship was seen between hardiness and Fhardy ($r=-.001$, $p \geq .05$). Each of the scores derived from the factor solution was most highly correlated with challenge. The correlation between challenge and F1 was the moderate sized ($r=.470$, $p \leq .001$), correlations with Fhardy ($r=.183$, $p \leq .01$) and F2 ($r=.210$, $p \leq .001$) were small, and the correlation with F3 was negative ($r=-.391$, $p \leq .001$). Hardiness, commitment and control correlated most highly with F3, $r=-.391$, $r=-.293$, and $r=-.209$, respectively ($p \leq .001$); and challenge correlated most highly with F1 ($r=.470$, $p \leq .001$).

Absences of strong positive linear relationships and large amounts of shared variance between the Hardiness Institute scores and the scores derived from the factor solution, led to the decision to use both sets of scores in further analyses. The Hardiness Institute scores were retained because of the Institute's assurances of their

Table 8
Pearson Correlation Coefficients for the Hardiness Variables

Hardiness Variables	2	3	4	5	6	7	8
1 Hardiness	.725***	.654***	.753***	.363***	.026	-.391***	-.001
2 Commitment		.285***	.286***	.240***	-.138*	-.293***	.098
3 Control			.216***	.005	-.058	-.209***	-.133*
4 Challenge				.470***	.210***	-.322***	.183**
5 F1					.183**	-.034	.650***
6 F2						.100	.627***
7 F3							.581***
8 FHardy							

*p≤.05 **p≤.01 ***p≤.001 (1-tailed significance)

accuracy. However, the Institute's refusal to release the method for score calculation motivated the generation of the addition[illegible]es. The latter scores were retained since they were derived from a [illegible]tor solution which was based on the hypothesized three factor c[illegible]ruct. Comparisons of the analyses of both sets of scores will be made throughout this report. Interpretations of analyses of scores calculated by the Hardiness Institute are limited by the absence of information concerning their calculation. The scores will be discussed in greater depth in the remainder of the chapter.

Cronbach's alpha reliability coefficients were calculated for the 50 and 26 item Hardiness Tests, and F1, F2, and F3; cases with missing values were deleted listwise. Reliability coefficients were not calculated by the Hardiness Institute for the measures of

Hardiness, Commitment, Challenge, and Control for the sample of nurses although this request was made. The Cronbach's alpha for the 50 item Test, 0.7703 (n=184), indicates that correlations among items are approaching the desired level set a priori, and that at least 77% of the score variance is due to true score variance. The contrasting finding reported by the Institute, 0.87 (n=1103 women), may be attributed to differences in the testing conditions and the sizes and characteristics of the samples. The Cronbach's alpha for the 26 item test, 0.6867 (n=202), indicates smaller correlations among items and a greater proportion of score variance related to random error variance. The Cronbach alpha for the 50 item test may be greater than that of the 26 item test simply because of the addition of 24 items. Regardless, the 26 item test has an unacceptably high level of random error which should be considered when interpreting findings. The Cronbach's alpha for the factors are also less than desirable; the Cronbach's alpha for F1, F2, and F3 are .7506 (11 items, n=208), 0.7321 (7 items, n=211), and 0.6810 (9 items, n=208), respectively.

The Homogeneity of the Job Enjoyment Scale and the BSI

Prior to estimation of the homogeneity, the data were examined for patterns of non-response. The 11 item JES had nine missing values; each item had 0-2 missing values. The 53 item BSI had 112 missing values; the first four items had no missing values, and the remainder of the items had 1-4. The greater number of missing values may be attributed to the greater length of the BSI, its position within the questionnaire, and the depressing nature of the content.

Selected items from the JES were then recoded so that all high scores would be indicative of a high level of job enjoyment. Recoding

of the BSI was not necessary since scores reflected the presence of symptoms.

Cronbach's alpha estimates for the Job Enjoyment Scale was 0.8943 (n=208). These findings were an improvement upon the test authors' estimate of 0.85 for a sample of 1526 nurses (Atwood, personal communication, March 1987). The BSI had the greatest homogeneity (Cronbach's alpha 0.9335, n=200); calculations of the internal reliability of the entire test had not been reported by the test's authors. Descriptive data concerning the dependent variables will be discussed in relation to hypothesis testing.

Hypothesis Testing

H1: Significant relationships among job enjoyment, psychological symptoms, perceived well-being, and absenteeism due to illness will be found.

Significant, small to moderate sized Pearson correlation coefficients provided support for the hypothesis (Table 9). The strongest relationships were between perceptions of well-being and both reports of symptoms ($r=-.484$, $p\leq.001$) and job enjoyment ($r=.404$, $p\leq.001$); nurses with higher perceived well-being were likely to be less distressed and enjoy their jobs more. These relationships were moderate in size; variance in distress and job enjoyment, respectively, accounted for 23.4% and 16.3% of the variance in perceived well-being. Weaker relationships between well-being and days ($r=-.194$, $p\leq.01$) and episodes ($r=-.264$, $p\leq.001$) of absenteeism from work due to illness suggested nurses with lower well-being were more likely to be distressed and enjoy their jobs less than be absent from work because of illness. Small relationships between job enjoyment and

Table 9
Pearson Correlation Coefficients for the Dependent Variables

	2	3	4	5
1. Job enjoyment	-.245***	.404***	-.183**	-.299***
2. GSI		-.484***	.117*	.171**
3. Well-being			-.194**	-.264***
4. Absenteeism - Days				.706***
5. Absenteeism - Episodes				

*p≤.05 **p≤.01 ***p≤.001 (1-tailed significance)

episodes of absenteeism due to illness (r=-.299, p≤.001), reports of symptoms (r=-.245, p≤.001), and days of absenteeism (r=-.183, p≤.01) indicated nurses who enjoyed their jobs more were likely to have less absenteeism from work because of illness and less distress. This supports Packard and Motowidlo (1987) findings relating the job satisfaction of nurses to reports of subjective stress (r=-.27, p≤.01), anxiety (r=-.16, p≤.05), hostility (r=-.41, p≤.01), and depression (r=-.55, p≤.01).

Distress, that is, more psychological symptoms, was related to less perceived well-being (r=-.484, p≤.001), less job enjoyment (r=-.245, p≤.001), and more days (r=.117, p≤.05), and episodes (r=.171, p≤.01) of absenteeism due to illness. Using the same measure of psychological symptoms, Norbeck (1985a) found job satisfaction accounted for 10% more variance in the psychological symptoms of CC nurses than job enjoyment did in the present study (r=-.40, p≤.001 -

2-tailed significance, n=180). Since the job enjoyment scale is a component of the job satisfaction measure Norbeck used, it is understandable the latter measure could explain greater variance. The job satisfaction measure was not used since it necessitated the addition of 24 items.

The strong relationship between episodes and days of absenteeism from work due to illness ($r=.706$, $p\leq.001$) indicates 49.8% of the variability of one variable was accounted for by the variability of the other. Episodes of absenteeism were more strongly related to other dependent variables than days of absenteeism. Nurses with greater numbers of episodes of absenteeism were more likely to experience less job enjoyment ($r=-.299$, $p\leq.001$) and perceive lower levels of well-being ($r=-.264$, $p\leq.001$), than be distressed ($r=.171$, $p\leq.01$). Nurses with greater days of absenteeism were also more likely to perceive less well-being ($r=-.194$, $p\leq.01$) and less job enjoyment ($r=-.183$, $p\leq.01$), than note distress ($r=.117$, $p\leq.05$).

In conclusion, the significant results supported findings from previous research and provided evidence of criterion related validity for the measures.

H2: Significant differences in levels of job enjoyment, psychological symptoms, perceived well-being, and absenteeism will be found between units.

Insignificant T-test values indicate levels of the dependent variables were comparable between the two nursing specialties (Table 10). The job enjoyment scores, the average rating (0 - 4) assigned to statements describing job enjoyment, ranged from 0.18, indicating strong disagreement, to 3.82, indicating strong agreement. Nurses most

frequently agreed or indicated job enjoyment (mode=3); however, the mean (2.681) suggested on the average there was slightly more agreement than indecision or disagreement with the statements. The standard T-score for the mean GSI (.395) was 59, less than the T-score indicative of a "positive diagnosis" (63) (Derogatis & Spencer, 1982) and less than the mean Norbeck (1985a) obtained for 180 American CC nurses. The nurses perceived that their well-being during the past week was relatively high; the most frequent rating on the 1 to 10 scale was 8 and the average of all ratings was 7.5333. The nurses were absent from work during the past 6 months an average of 2.257 days or 1.463 episodes. Most nurses reported only one episode of absenteeism because of illness.

Two way analysis of variance was performed to determine the direct and interaction effects of the specialty and length of time worked in the respective specialty on the dependent variables. Prior to analysis, "length of time" was dicotomized; less than 5 years of experience was classified as low level of experience and 5 years or more was classified as high level of experience. Insignificant F values ($p>.05$) indicate the values of the dependent variables were comparable across the specialties and the levels of experience. They also indicate comparable values were found across the specialties even while controlling for the effect of the length of specialty experience (tables not included).

Tables 11 and 12 indicate significant differences in levels of psychological symptoms and perceived well-being were not found between units; nurses employed in different units reported relatively equivalent amounts of distress (GSI) ($F=.5940$, $p=.8575$), as well as,

Table 10
Dependent Variables by Nursing Specialty:
Descriptive Data and T-tests

Characteristic	Obstetrics	Critical Care	Total
Job Enjoyment			
Mean	2.795	2.643	2.681
Median	2.909	2.727	2.773
Mode	2.636	3.000	3.000
Range	1.00–3.73	0.18–3.82	0.18–3.82
Standard deviation	0.582	0.594	0.593
(t_2=–1.63, df=212, p=0.104)			
GSI			
Mean	0.388	0.397	0.395
Median	0.286	0.321	0.302
Mode	0.075	0.132	0.302
Range	0.00–1.75	0.00–1.57	0.00–1.75
Standard deviation	0.355	0.307	0.319
(t_2=0.19, df=212, p=0.850)			
Perception of Well-Being			
Mean	7.815	7.437	7.533
Median	8.000	8.000	8.000
Mode	8.000	8.000	8.000
Range	4–10	1–10	1–10
Standard deviation	1.442	1.807	1.726
(t_2=–1.39, df=210, p=0.165)			
Days of Absenteeism			
Mean	2.278	2.250	2.257
Median	1.500	2.000	2.000
Mode	0.000	0.000	0.000
Range	0–7	0–7	0–7
Standard deviation	2.367	2.122	2.181
(t_2=–0.08, df=212, p=0.936)			
Episodes of Absenteeism			
Mean	1.444	1.469	1.463
Median	1.000	1.000	1.000
Mode	1.000	1.000	1.000
Range	0–6	0–7	0–7
Standard deviation	1.525	1.400	1.429
(t_2=0.11, df=212, p=0.914)			

Table 11
Mean Values of Dependent Variables by Nursing Units

Unit	Job Enjoyment	GSI	Perception Well-Being	Absenteeism Days	Absenteeism Episodes
1	2.7137	.4059	7.7021	1.5957	1.0638
2	2.8831	.3558	7.7143	4.7143	3.1429
3	2.8312	.4286	7.8571	1.7143	.7143
4	2.6299	.3181	7.5714	1.2857	1.1429
5	2.6165	.3258	7.2903	2.7813	1.6563
6	2.5000	.4305	7.3000	2.5500	2.0000
7	1.9568	.5110	6.8182	3.1667	2.3333
8	2.9752	.3622	7.6364	1.1818	.8182
9	2.7576	.4475	7.9333	2.2667	1.4000
10	2.7557	.4993	7.3125	1.6875	1.3125
11	2.9500	.3396	8.0000	2.3000	1.2000
12	2.8397	.2816	7.7273	2.7273	1.4545
13	2.7273	.3859	7.2727	3.3636	1.6364
14	2.7045	.3890	7.6250	1.5000	1.2500

perceptions of well-being (F=.4376, p=.9544). However, the F values for job enjoyment (F=2.3002, p=.0074), and days (F=2.2721, p=.0082), and episodes (F=2.1940, p=.0110) of absenteeism due to illness indicate at least one of the employment situations affects these variables differently than at least one of the other employment situations. Post hoc analysis of the job enjoyment and absenteeism data using a Scheffe test indicated no two groups were significantly different (p=.05). Analysis of the same data with the Newman-Keuls

Table 12
Analysis of Variance of Dependent Variables by Nursing Units

Source	Sum of Squares	Mean Squares	DF	F	Significance of F
Job Enjoyment					
Between groups	9.7520	.7502	13	2.3002	.0074
Within groups	65.2252	.3261	200		
Global Severity Index					
Between groups	.8062	.0620	13	.5940	.8575
Within groups	20.8831	.1044	200		
Perception of Well-Being					
Between groups	17.5607	1.3508	13	.4376	.9544
Within groups	611.2082	3.0869	198		
Days of Absenteeism due to Illness					
Between groups	130.3397	10.0261	13	2.2721	.0082
Within groups	882.5247	4.4126	200		
Episodes of Absenteeism due to Illness					
Between groups	54.3176	4.1783	13	2.1940	.0110
Within groups	380.8834	1.9044	200		

test found that the mean job enjoyment of unit 7 (1.9568, SD=.9348, n=12), a CC unit, was significantly less (p=.05) than the means of all other units except unit 4, an obstetrical unit (2.6299, SD=.5051, n=7). The comments of a nurse from unit 7, a unit which frequently has young patients with unexpected critical illnesses, may explain the low job enjoyment of these nurses:

> Up until one month ago I had decided to leave nursing and was feeling very "empty" about what I was doing. Then after much soul searching I decided that it wasn't nursing it was ICU that was the problem. I loved nursing when I was in a rural hospital and in emergency. So as of next week I am finished here. In particular, I had trouble dealing with the fact that I got no feedback from my patients and the sadness of such young people being rendered "vegetables". In my previous years I'd come to understand and accept that old people die, but young people shouldn't.

Vachon (1987) indicates caring for very ill young patients and caring for patients with unexpected illnesses are major stressors; the latter may cause caregivers to question their competence and identify with their patients.

The mean days of absenteeism due to illness for unit 2 (4.7143, SD=2.3604, n=7), an obstetrical unit, was significantly greater than the means of two CC units, unit 1 (1.5957, SD=1.8843, n=47), and unit 8 (1.1818, SD=.9816, n=11) (p=.05). Likewise, the mean episodes of absenteeism due to illness for unit 2 (3.1429, SD=2.2678, n=7), was significantly greater than the means of unit 1 (1.0638, SD=1.2922, n=47), and unit 8 (.8182, SD=.7508, n=11) (p=.05). No explanation could be proposed to explain these differences.

In summary, selected dependent variables differed by unit and not by specialty. In contrast, Maloney (1982) and Gentry et al. (1972) found differences in psychosomatic profiles and job satisfaction between CC and non-CC nurses. However, more recently, McCranie et al. (1987) noted the burnout of a larger more representative sample was not associated with clinical work setting (CC versus non-CC).

H3: Relationships between hardiness and biographical factors will not be significant

A large number of insignificant relationships provided support for the hypothesis (Tables 13, 14, 15). Since the Cronbach's alpha correlation coefficients of several tests were less than .80, significant correlations were corrected for attenuation, unreliability due to measurement error. According to Carmines and Zeller (1979), observed correlations may be low because of the unreliability of measures. The actual correlation is the observed correlation divided

by the square root of the product of the internal reliabilities (Carmines & Zeller).

The greatest number of relationships were with scores derived from the factor solution. The strongest were with F2, the characteristic of perceiving change as challenge. Nurses with an increase in this ability worked 12 hour night ($r=.201$, $p\leq.01$) or 12 hour day shift ($r=.202$, $p\leq.01$). Nurses with decreased ability to

Table 13
Pearson Correlation Coefficients between Hardiness Variables and Age, Number of Dependents, and Length of Time Worked in Present Unit, Specialty, and Nursing

Hardiness Variables	Time Unit	Time Specialty	Time Nursing	Age	Number of Dependents
Hardiness [.87]	.000	-.111	-.206** (-.220)	-.083	-.125
Commitment	.081	-.063	-.097	-.009	-.083
Control [.68]	.023	.004	-.159* (-.193)	-.077	-.058
Challenge [.74]	-.087	-.156* (-.181)	-.181** (-.210)	-.088	-.118
F1	.020	-.126	-.112	-.045	-.124
F2 [.73]	-.163* (-.191)	-.173* (-.202)	-.246*** (-.288)	-.269*** (-.315)	-.030
F3 [.68]	.098	.114	.146* (.177)	.135* (.164)	.168** (.204)
FHardy	-.011	-.095	-.102	-.079	.014

*$p\leq.05$ **$p\leq.01$ ***$p\leq.001$ (2-tailed significance)

[ ] Cronbach's correlation coefficient

( ) Pearson correlation coefficient corrected for attenuation

Table 14
Pearson Correlation Coefficients between Hardiness Variables and Shift

Hardiness Variables	8 Hour Days	8 Hour Evenings	8 Hour Nights	12 Hour Days	12 Hour Nights
Hardiness	-.020	-.129	.012	.030	.048
Commitment	.009	-.106	.056	-.011	-.017
Control	.012	-.075	.013	.066	.066
Challenge	-.040	-.094	-.034	.015	.025
F1 [.75]	-.133* (-.154)	-.077	-.158* (-.182)	.131	.134* (.155)
F2 [.73]	-.179** (-.210)	-.087* (-.102)	-.031	.173** (.202)	.172** (.201)
F3 [.68]	.091	.125	.075	-.114	-.145* (-.175)
FHardy	-.105	-.023	-.058	.092	.076

*p≤.05 **p≤.01 ***p≤.001 (2-tailed significance)

[ ] Cronbach's correlation coefficient

( ) Pearson correlation coefficient corrected for attenuation

perceive change as a challenge worked 8 hour day (r=-.210, p≤.01) or 8 hour evening shift (r=-.102, p≤.05), were older (r=-.315, p≤.001), and had more experience in nursing (r=-.288, p≤.001), the specialty (r=-.202, p≤.05), and their unit (r=-.191, p≤.05). Similarly, a decrease in Challenge was associated with increased experience in nursing (r=-.181, p≤.05), and the specialty (r=-.210, p≤.01). Younger less experienced nurses may have increased ability to look upon change as a challenge because their habits and beliefs are less firmly established.

Table 15
Pearson Correlation Coefficients between Hardiness Variables and Nursing Education

Hardiness Variables	Bachelor of Nursing	Nursing Specialty Program	Other	Stress Education/ Counseling
Hardiness	-.035	.011	-.088	.016
Commitment	.027	-.069	.010	-.045
Control	-.103	-.013	-.094	.029
Challenge	-.009	.069	-.101	.045
F1	.063	-.030	.085	.051
F2	-.086	.028	.004	-.007
F3	.038	.035	.039	-.021
FHardy	.011	.019	.068	.015

*$p \leq .05$ **$p \leq .01$ ***$p \leq .001$ (2-tailed significance)

Nurses with increased perceptions of control over and commitment to their lives, F1, worked 12 hour night shift ($r=.155$, $p \leq .05$), whereas, those with decreased perceptions worked 8 hour day ($r=-.154$, $p \leq .05$) or 8 hour evening ($r=-.102$, $p \leq .05$) shifts. Similarly, Control was negatively related to experience in nursing ($r=-.193$, $p \leq .05$); however, Commitment was not significantly related to any biographical factors. In contrast nurses with increased F3, a factor thought to be positively related to control and challenge, were older ($r=.164$, $p \leq .05$), had more dependents ($r=.204$, $p \leq .01$), and more experience in nursing ($r=.177$, $p \leq .05$); and nurses with decreased F3 worked 12 hour night shift. These conflicting findings cast suspicion upon the interpretation of F3.

Of the total hardiness scores, only Hardiness was significantly related to a biographical variable; increased resistance to stress was associated with less experience in nursing ($r=-.220$, $p \leq .01$). In contrast, Rich and Rich (1987) found hardiness was significantly and positively related to nurses' ages ($r=-.20$, $p<.05$) but not their years of experience ($p>.05$).

The biographical variables with the most relationships were those measuring years of experience. Greater experience in nursing, the specialty, and the unit was primarily associated with significant decreases in some hardiness variables; and more dependents was significantly associated with an increase in one hardiness variable. Working 12 hour night or 12 hour day shifts was primarily associated with significant increases in some variables, whereas, working 8 hour day, 8 hour evening, or 8 hour night shifts was primarily associated with decreases in others. No significant relationships were found with education variables; hardiness was not significantly associated with any particular type of education.

In summary, some hardiness variables were influenced to a small significant degree by selected biographical variables. Comparisons will be made with other correlations with hardiness variables.

H4: The mean level of hardiness in nurses who work in high stress areas (CC nurses) will be significantly higher than the mean level of hardiness in nurses who work in low stress areas (obstetrical nurses)

As indicated in Table 16, small insignificant differences in the hypothesized direction were found for the values calculated by the Hardiness Institute. Support was not found for the hypothesis nor for the expectation that high level hardiness is a requisite for employment in CC. The levels of hardiness variables for the CC group were less than the levels obtained for a sample of 1103 women (Hardiness Institute, personal communication, May 1988); the differences in values of Hardiness, Commitment, Control and Challenge were, respectivel 9.35 (mean=73.33, SD=9.59), 5.23 (mean=38.58, SD=5.62), 8.63 (mean=38.84, SD=5.18), and 0.133 (mean=32.37, SD=6.49). Interpretations must be made cautiously since the scores were not calculated by the investigator and the comparison group is not representative of the population; 59% were salaried professionals and 41% were students.

Analysis of the scores derived from the factor solution provided some support for the hypothesis. The difference between the group means of the scores of F1, F2, and FHardy approached or attained significance in the hypothesized direction. The largest and most significant difference in the hypothesized direction concerned levels of F2, which was composed of challenge items (t_1=3.10, df=75.95, p=.0005). F1, which was composed of control and commitment items, was also greater for the CC group (t_1=1.78, df=212, p=.039). FHardy was greater for the CC group, but the difference only approached significance (t_1=1.52, df=212, p=.065). However, F3, which was

Table 16
Hardiness Variables by Nursing Specialty:
Descriptive Data and T-tests

Hardiness Variables	Obstetrics	Critical Care	Total
Hardiness			
Mean	63.232	63.98	63.789
Median	63.380	64.09	64.070
Mode	61.4	63.44	63.440
Range	50.61-72.83	40.77-73.41	40.77-73.41
Standard deviation	4.255	4.12	4.155
($t_{1=1.14}$, df=212, p=0.128)			
Commitment			
Mean	32.963	33.350	33.252
Median	33.000	33.000	33.000
Mode	33.000	34.000	33.000
Range	23-40	22-40	22-40
Standard deviation	3.022	2.624	2.727
($t_{1=0.90}$, df=212, p=0.184)			
Control			
Mean	30.000	30.212	30.159
Median	30.000	30.500	30.000
Mode	29.000	32.000	32.000
Range	23-35	20-37	20-37
Standard deviation	2.720	2.566	2.601
($t_{1=0.52}$, df=212, p=0.303)			
Challenge			
Mean	31.722	32.237	32.107
Median	32.000	32.500	32.000
Mode	33.000	34.000	34.000
Range	25-38	19-42	19-42
Standard deviation	3.417	3.390	3.396
($t_{1=0.96}$, df=212, p=0.168)			
FHardy			
Mean	2.135	2.191	2.177
Median	2.115	2.231	2.192
Mode	2.115	2.231	2.231
Range	1.54-2.73	1.58-2.77	1.546-2.77
Standard deviation	0.248	0.230	0.236
($t_{1=1.52}$, df=212, p=0.065)			

Hardiness Variables	Obstetrics	Critical Care	Total
F1			
Mean	2.501	2.593	2.569
Median	2.545	2.636	2.636
Mode	2.455	2.8182	2.818
Range	1.55-3.00	1.18-3.00	1.18-3.00
Standard deviation	0.342	0.325	0.331
(t_1=1.78, df=212, p=0.039)			
F2			
Mean	1.862	2.103	2.043
Median	1.857	2.143	2.000
Mode	2.000	2.000	2.000
Range	0.14-2.86	0.57-3.00	0.14-3.00
Standard deviation	0.521	0.406	0.449
(t_1=3.10, df=75.95, p=0.0005)			
F3			
Mean	1.926	1.780	1.817
Median	1.889	1.778	1.882
Mode	1.889	1.889	1.889
Range	1.13-2.78	0.78-2.67	0.786-2.78
Standard deviation	0.438	0.400	0.414
(t_1=-2.27, df=212 p=0.012)			

composed of control and challenge items, was significantly greater for the obstetrical group (t_1=-2.27, df=212, p=.012). Since the content analysis and the coding of this factor had been subject to question, the meaning of this finding was unclear. Despite this finding, the size and significance of the difference concerning F2 indicated the CC group was more likely to look upon change as a challenge. Since the findings concerning F1 and F3 are contradictory, they less easily interpretable. Based on this data, it is debatable which nurses truly perceive greater committment to and control over their lives.

In summary, analysis of the scores indicate all, except F3, are greater for the CC group. Increasing the power of the statistical

tests by increasing the numbers of obstetrical nurses may improve the significance of the results (Cohen, 1977). It is notable the CC group did not report a higher level of distress, ill health, or absenteeism, despite the level of their hardiness scores. If hardiness is significant to stress resistance and stress is related to health, one may assume this level of hardiness is appropriate for CC nursing, and that other factors distinguish CC nurses from obstetrical nurses. The additional equivalence in perceived health may indicate equivalent levels of stress were experienced by both groups. The stress of the work settings may have been equivalent; one obstetrical unit supervisor reported high risk cases and changes in methods of care delivery were stressors for her staff. Although CC nurses contended with these stressors, as well as many others, they may have perceived an equivalent amount of stress. On the other hand, CC nurses may have more stressors in their work setting, but fewer in their non-work setting; that is, nurses may balance "stressloads" in their non-work life with those in their work life. As one CC unit supervisor indicated, many CC nurses do not work full-time when they begin child-rearing because of the workload and the amount of shiftwork involved. Since the obstetrical group was significantly older and had more dependents, obstetrical nursing may be more conducive to taking on non-work demands that potentially produce stress. If this is true, the demands of CC nursing should be altered to accommodate a larger population of nurses, a population with greater work and life experiences.

In contrast, Maloney and Bartz's (1983) findings, using the Hahn California Life Goals evaluation Schedules, the Rotter Internal vs

External Locus of control Test, and the Alienation Vs Commitment Test, indicated CC nurses were more alienated, sensed more external control, and sought more challenges than non-CC nurses. However, Keane et al. (1985) found comparable levels of hardiness in CC and non-CC groups. As stated in the literature review, limitations of these studies indicate findings should be interpreted with caution. Future studies should include a larger non-CC group, questions concerning non-work stress, and investigator calculated hardiness scores with Cronbach's alpha reliability coefficients of at least .80.

H5: Nurses with higher levels of hardiness are more likely to have lower levels of psychological symptoms, and absenteeism and higher levels of perceived well-being and job enjoyment.

Partial support was provided for the hypothesis; one-half of the Pearson correlation coefficients indicated significant relationships between the dependent variables and the hardiness scores (Table 17). These correlations were corrected for attenuation to evaluate their actual size.

The greatest number of relationships were with the scores derived from the factor solution. Nurses with increased FHardy, total hardiness, enjoyed their jobs more ($r=.262$, $p\leq.001$), perceived their well-being to be higher ($r=.299$, $p\leq.001$), had less psychological distress ($r=-.269$, $p\leq.001$), and had fewer days ($r=-.163$, $p\leq.05$), and episodes ($r=-.208$, $p\leq.05$) of absenteeism because of illness. Similarly, a significant moderate sized negative relationship was found between increased Hardiness and psychological distress ($r=-.331$, $p\leq.001$), but no other variables.

Nurses with increased ability to perceive change as a challenge,

increased F2, also perceived their well-being to be higher (r=.208, $p \leq .01$), had less psychological distress (r=-.202, $p \leq .01$), and had fewer days (r=-.146, $p \leq .05$), and episodes (r=-.145, $p \leq .05$) of absenteeism because of illness; a significant relationship was not seen with job enjoyment. Increased Challenge was solely related to decreased psychological distress (r=-.200, $p \leq .01$). Nurses with perceptions of increased control over and commitment to their lives, increased F1, enjoyed their jobs more (r=.169, $p \leq .01$), perceived their well-being to be higher (r=.189, $p \leq .01$), had less psychological distress (r=-.373, $p \leq .001$), and had fewer days (r=-.151, $p \leq .05$), but not necessarily episodes ($p \geq .05$) of absenteeism because of illness. The same relationships were seen between Commitment and Control and psychological distress (r=-.232, $p \leq .01$; r=-.200, $p \leq .01$); however, an opposite relationship was found between Control and job enjoyment (r=-.274, $p \leq .001$). A survey of 214 CC nurses by Kosmoski and Calkin (1986) indicated support for the previous findings; job satisfaction was positively related to control. Relationships between F3, a factor including items related to control and challenge, and job enjoyment (r=.176, $p \leq .05$) and perception of well-being (r=.148, $p \leq .05$) were congruent with the majority of findings.

These findings supported those of Rich and Rich (1987) and Keane et al. (1985). Rich and Rich found days of illness was negatively related to hardiness (r=-.43, $p < .001$) and positively related to alienation from self (r=.27, $p < .01$), but not significantly related to alienation from work, security, powerlessness, or locus of control. Keane et al. found burnout was not significantly related to challenge ($p > .05$), but was positively related to alienation from work

Table 17
Pearson Correlation Coefficients for the
Hardiness and Dependent Variables

Hardiness Variables	Job Enjoyment [.89]	GSI [.93]	Perception Well-Being	Absenteeism Days	Absenteeism Episodes
Hardiness [.87]	-.067	-.298*** (-.331)	.043	-.066	-.016
Commitment [.78]	-.061	-.197** (-.232)	-.012	-.004	.001
Control [.68]	-.214*** (-.274)	-.160** (-.200)	-.020	-.032	.029
Challenge [.74]	.090	-.267*** (-.322)	.109	-.096	-.053
F1 [.75]	.169** (.206)	-.313*** (-.373)	.164** (.189)	-.132* (-.151)	-.109
F2 [.73]	.071	-.166** (-.202)	.177** (.208)	-.124* (-.146)	-.123* (-.145)
F3 [.68]	.137* (.176)	.091	.123* (.148)	-.001	-.092
FHardy [.69]	.205*** (.262)	-.215*** (-.269)	.248*** (.299)	-.135* (-.163)	-.173** (-.208)

*$p \leq .05$ **$p \leq .01$ ***$p \leq .001$ (2-tailed significance)

[ ] Cronbach's alpha correlation coefficient

( ) Pearson correlation coefficient corrected for attenuation

Table 18
Pearson Correlation Coefficients for the Biographical and Dependent Variables

Biographical Variables	Job Enjoyment [.89]	GSI [.93]	Perception Well-Being	Absenteeism Days	Absenteeism Episodes
Age	.200** (.212)	.016	.159*	.031	-.110
Number of dependents	.079	-.008	.061	-.056	-.126
Length of Employment					
In Unit	.143* (.152)	.102	.104	-.009	-.055
In Specialty	.162* (.172)	-.006	.164*	.085	.001
In Nursing	.178* (.189)	-.001	.124	.081	-.029
Shift					
8 Hour Day	.087	-.070	.047	-.023	-.117
8 Hour Night	.069	.049	-.057	-.032	-.085
8 Hour Eve	-.016	.039	.056	-.022	-.078
12 Hour Day	-.085	.045	-.070	.066	.151
12 Hour Night	-.101	.008	-.051	.087	.150*
Education					
Bachelor of Nursing	.001	.056	-.086	-.011	.020
Nursing Specialty Certificate Program	-.052	-.003	-.046	.019	.038
Other	-.028	-.091	.030	-.022	-.119
Stress Education/ Counselling	.004	-.126	-.004	-.016	.021

*$p \leq .05$ **$p \leq .01$ ***$p \leq .001$ (2-tailed significance)

[ ] Cronbach's correlation coefficient

( ) Pearson correlation coefficient corrected for attenuated

(r=.43, p<.01) and from self (r=.26, p<.01), external locus of control (r=.41, p<.01), and powerlessness (r=.42, p<.01).

Evidence of criterion related validity was found in relationships between psychological distress and all variables except F3; significant relationships ranged from -.200 ($p \leq .01$) to -.373 ($p \leq .001$). Perception of well-being was significantly associated with only the scores derived from the factor solution. Job enjoyment was significantly related to F1, F3, Fhardy, and Control. Days of absenteeism was significantly associated with F1, F2, and FHardy and episodes of absenteeism with just F2 and FHardy.

The majority of significant correlations indicated a small to moderate sized association between specific hardiness variables and higher level health. In addition, the scores derived from the factor solution provided greater evidence of criterion related validity than the Hardiness Institute scores. The size of relationships was not surprising given the nature of the variables. According to Anastasi (1982), correlations "as low as .20 or .30 may justify inclusion of the test in a selection program.... Consideration must be given to other ways of evaluating the contribution of a test, which take into account the types of decisions to be made from the scores (p. 160)." Selecting potential CC nurses on the basis of Hardiness test results could be justified if the results predicted performance on significant dependent variables. Longitudinal testing using the dependent variables included in this study, as well as others such as, competence in providing nursing care and longevity in CC nursing, would aid this evaluation. Since assumptions of causality cannot be based on correlational data, it cannot be determined whether hardiness

is a cause or a manifestation of improved health. It also cannot be determined without regression analysis whether these relationships are due to hardiness or other variables related to hardiness.

The relationships between dependent variables and biographical factors were evaluated following calculation of Pearson correlation coefficients (Table 18). Older nurses enjoyed their jobs more ($r=.212$, $p\leq.01$) and perceived their well-being to be better ($r=.159$, $p\leq.05$). Nurses with more experience in their unit, their specialty, and nursing had more job enjoyment ($r=.152$, $p\leq.05$; $r=.172$, $p\leq.05$; $r=.189$, $p\leq.01$), and those with more experience in their specialty had better perceived well-being ($r=.164$, $p\leq.05$). This supported Rich and Rich's (1987) study which noted older more experienced nurses reported fewer days of illness. Norbeck (1985a) also found older more experienced nurses had greater job satisfaction ($r=.23$, $p\leq.01$) and less psychological distress ($r=-.19$, $p\leq.01$). These findings demonstrate the value of recruiting and retaining older more experienced nurses as role models and mentors for younger colleagues. They also demonstrate the vulnerability of younger nurses and the need for strategies to promote their health and job satisfaction. Although Norbeck found working shifts was significantly associated with less job satisfaction ($r=-.27$, $p\leq.001$), this study found one shift, 12 hour night shift, significantly associated with more episodes of absenteeism due to illness ($r=.150$, $p\leq.05$). Further investigations of the influence of shift work is warranted.

In summary, the complexity of the relationships among biographical, hardiness, and dependent variables (Tables 13 - 15, 17 - 18) indicate the need for regression and path analysis.

H6: The interaction of level of hardiness and level of work stress will have a significant effect on nurses' job enjoyment, psychological symptoms, perceived well-being, and absenteeism.

Prior to analyzing the data, variables measuring high level and low level hardiness were created by dividing each of the hardiness variables at the median. Two-way analysis of variance was used to determine the direct and interaction effects of CC and obstetrical nursing, which were respectively conceptualized as high and low stress environments, and high and low hardiness on the dependent variables.

Only one significant interaction was noted. As indicated in Tables 19 and 20 and Figure 1, the effect of Hardiness on psychological symptoms was different for obstetrical nurses than for CC nurses. Using a Scheffe a posteriori test, it was determined the interaction occurred within the obstetrical group and that it led to a significant increase in the distress of those nurses with low level hardiness (required difference=0.24, observed difference=0.27, S.E.=0.09, D.F.=210, Scheffe=2.82, $p<.05$). Nurses with low Hardiness who worked in CC noted less distress than nurses who worked in obstetrics. However, nurses with high Hardiness who worked in obstetrics noted less distress than nurses who worked in CC. According to Kerlinger (1973), interactions occur because of chance, because of some "extraneous, unwanted, uncontrolle effect operating at one level" (p. 268), or because of an actual interaction. No explanation could be proposed for this interaction. Using analysis of variance, Kobasa and Puccetti (1983) also found significant interactions. The illness scores of middle and upper level executives were significantly influenced by interactions between stressful life events and

hardiness; hardiness and family support; stressful life events and boss support; and stressful life events, hardiness, and family support. In contrast, McCranie et al. (1987) used hierarchical multiple regression analysis and found the interaction of hardiness and individual stressors had an insignificant effect on nurses' burnout scores. Using analysis of variance, Rich and Rich (1987) also found the interaction of hardiness and age had an insignificant effect on nurses' burnout scores.

Again, the greatest number of significant effects were due to the scores derived from the factor solution. Nurses with high FHardy, total hardiness, had significantly less distress (F=11.753, D.F.=1, p=.001), and greater perceived well-being (F=6.608, D.F.=1 p=.011), and job enjoyment (F=8.238, D.F.=1, p=.005); in the latter test, obstetrical nurses were also noted to have more job enjoyment than CC nurses (Table 24). Nurses with high ability to perceive change as a challenge, F2, had less distress (F=8.789, D.F.=1, p=.003) and higher perceived well-being (F=7.368, D.F.=1, p=.007) (Table 26). Similarly, nurses with a high level of Challenge had less distress (Table 23). In addition, the effect of the interaction of Challenge and type of nursing specialty on psychological symptoms (GSI) approached significance (F=3.830, D.F.=1, p=.052). Upon inspection, it appeared again that the interaction occurred within the obstetrical group. The GSI scores for low and high Challenge obstetrical nurses were .50 and .26, respectively; whereas, they were .42 and .37 for low and high Challenge CC nurses, respectively. This unexpected finding could also not be explained.

Nurses with perceptions of high control over and commitment to

their lives, F1, had less distress (F=10.962, D.F.=2, p=.001), and greater job enjoyment (F=4.935, D.F.=1, p=.027); the direct effect of nursing specialty approached significance when considered with the latter test (F=3.652, D.F.=1, p=.057) (Table 25). The direct effect of F1 on perceived well-being also approached significance (F=3.744, D.F.=1, p=.054). Likewise, nurses with high Control had greater job enjoyment (F=8.648, D.F.=1, p=.004) and less distress (F=4.847, D.F.=1, p=.029) (Table 21). Neither Commitment nor F3 (Tables 22 & 27) had significant direct effects on the dependent variables. The main effect of the specialty on a dependent variable was significant once and approached significance twice.

In summary, only one hardiness variable significantly interacted with the type of nursing specialty (conceptualized as levels of work stress) on one dependent variable, psychological symptoms. Although significant interactions have been documented for male executives, none have been previously documented for nurses. This interaction calls attention to the vulnerability of nurses with low Hardiness who work in obstetrics. In addition, psychological distress was directly effected by more hardiness variables than other dependent variables. Job enjoyment and perceptions of well-being were also effected by hardiness variables, unlike absenteeism due to illness. Again, the majority of significant effects were due to variables derived from the factor solution. Findings must be interpreted cautiously given the difficulties posed by the use of analysis of variance with unequal group sizes (Kerlinger, 1973).

Table 19
Analysis of Variance of Hardiness and Nursing Specialty on Dependent Variables

Source of Variation	Sum of Squares	Mean Square	DF	F	Significance of F
Job Enjoyment					
Main effects					
Hardiness	0.000	0.000	1	0.000	0.985
Nursing specialty	0.933	0.933	1	2.655	0.105
Two-way interaction	0.274	0.274	1	0.780	0.378
Residual	73.770	0.351	210		
GSI					
Main effects					
Hardiness	0.667	0.667	1	6.812	0.010
Nursing specialty	0.009	0.009	1	0.093	0.761
Two-way interaction	0.454	0.454	1	4.636	0.032
Residual	20.565	0.098	210		
Perception of Well-Being					
Main effects					
Hardiness	0.101	0.101	1	0.034	0.855
Nursing specialty	5.688	5.688	1	1.899	0.170
Two-way interaction	0.005	0.005	1	0.002	0.969
Residual	622.910	2.995	208		
Days of Absenteeism due to Illness					
Main effects					
Hardiness	4.467	4.467	1	0.930	0.336
Nursing specialty	0.007	0.007	1	0.002	0.969
Two-way interaction	0.000	0.000	1	0.000	0.993
Residual	1008.366	4.802	210		
Episodes of Absenteeism due to Illness					
Main effects					
Hardiness	0.122	0.122	1	0.059	0.808
Nursing specialty	0.029	0.029	1	0.014	0.906
Two-way interaction	2.977	2.977	1	1.447	0.230
Residual	432.078	2.058	210		

Table 20
Mean GSI Scores Resulting from the Interaction of Hardiness and Nursing Specialty

	Obstetrical Nurses	Critical Care Nurses
Low Level Hardiness	0.51 (n=29)	0.42 (n=78)
High Level Hardiness	0.24 (n=25)	0.36 (n=82)

Figure 1

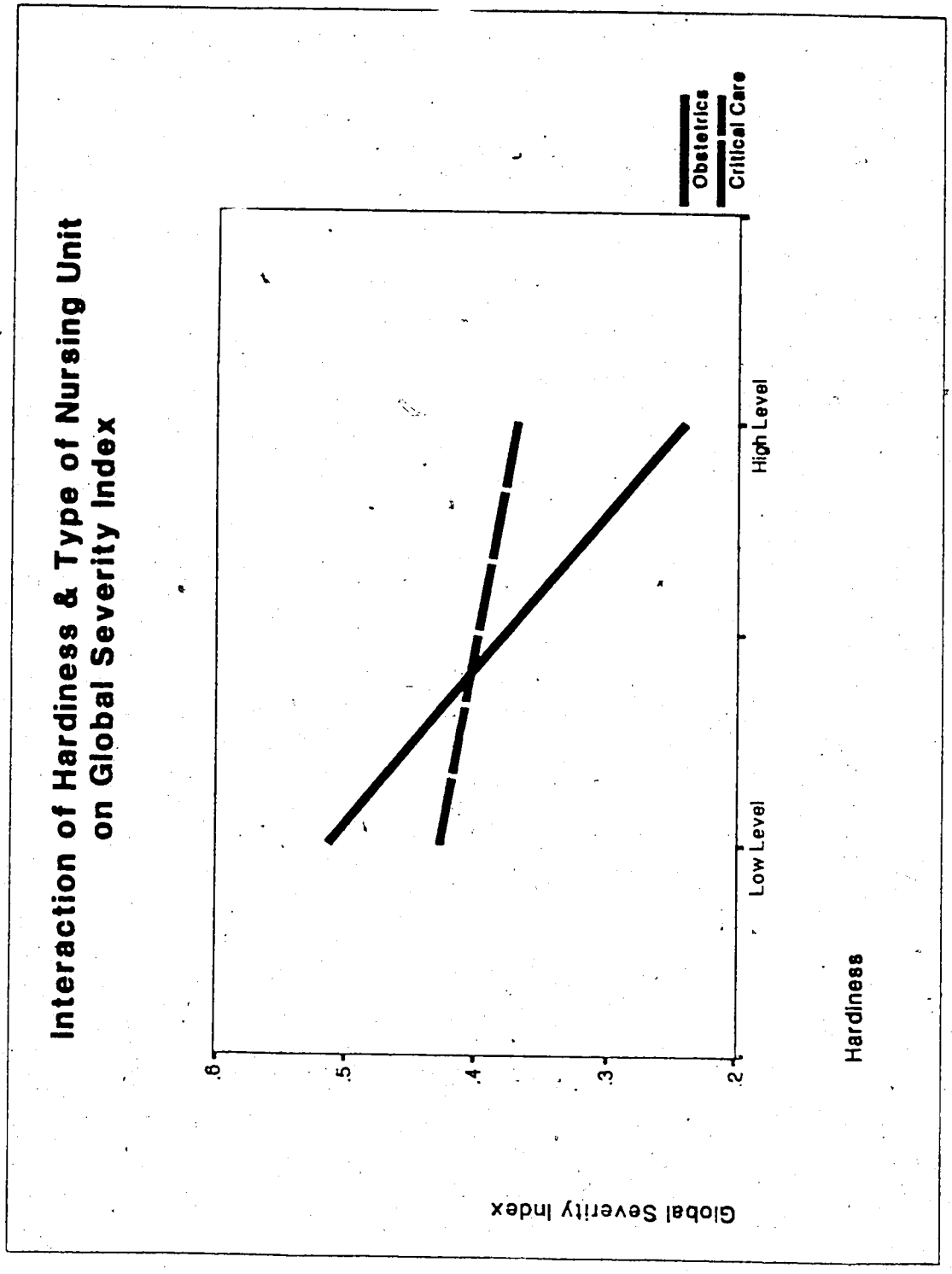

Interaction of Hardiness & Type of Nursing Unit
on Global Severity Index
Obstetrics
Critical Care
Global Severity Index
.6
.5
.4
.3
.2
Low Level
High Level
Hardiness

Table 21
Analysis of Variance of Control and
Nursing Specialty on Dependent Variables

Source of Variation	Sum of Squares	Mean Square	DF	F	Significance of F
Job Enjoyment					
Main effects					
Control	2.923	2.923	1	8.648	0.004
Nursing specialty	0.829	0.829	1	2.453	0.119
Two-way interaction	0.131	0.131	1	0.388	0.534
Residual	70.989	0.338	210		
GSI					
Main effects					
Control	0.486	0.486	1	4.847	0.029
Nursing specialty	0.007	0.007	1	0.068	0.794
Two-way interaction	0.152	0.152	1	1.513	0.220
Residual	21.048	0.100	210		
Perception of Well-Being					
Main effects					
Control	0.006	0.006	1	0.002	0.964
Nursing specialty	5.760	5.760	1	1.936	0.166
Two-way interaction	4.235	4.235	1	1.424	0.234
Residual	618.774	2.975	208		
Days of Absenteeism due to Illness					
Main effects					
Control	1.497	1.497	1	0.314	0.576
Nursing specialty	0.019	0.019	1	0.004	0.950
Two-way interaction	8.610	8.610	1	1.803	0.181
Residual	1002.726	4.775	210		
Episodes of Absenteeism due to Illness					
Main effects					
Control	0.764	0.764	1	0.374	0.542
Nursing specialty	0.016	0.016	1	0.008	0.930
Two-way interaction	5.277	5.277	1	2.582	0.110
Residual	429.136	2.044	210		

Table 22
Analysis of Variance of Commitment
and Nursing Specialty Dependent Variables

Source of Variation	Sum of Squares	Mean Square	DF	F	Significance of F
Job Enjoyment					
Main effects					
Commitment	0.156	0.156	1	0.444	0.506
Nursing specialty	0.862	0.862	1	2.455	0.119
Two-way interaction	0.125	0.125	1	0.356	0.552
Residual	73.763	0.351	210		
GSI					
Main effects					
Commitment	0.285	0.285	1	2.806	0.095
Nursing specialty	0.011	0.011	1	0.111	0.740
Two-way interaction	0.077	0.077	1	0.763	0.384
Residual	21.323	0.102	210		
Perception of Well-Being					
Main effects					
Commitment	4.152	4.152	1	1.396	0.239
Nursing specialty	4.904	4.904	1	1.648	0.201
Two-way interaction	0.025	0.025	1	0.009	0.927
Residual	618.838	2.975	208		
Days of Absenteeism due to Illness					
Main effects					
Commitment	0.135	0.135	1	0.028	0.866
Nursing specialty	0.043	0.043	1	0.009	0.
Two-way interaction	18.812	18.812	1	3.975	0.0
Residual	993.886	4.733	210		
Episodes of Absenteeism due to Illness					
Main effects					
Commitment	0.068	0.068	1	0.033	0.856
Nursing specialty	0.031	0.031	1	0.015	0.902
Two-way interaction	3.865	3.865	1	1.882	0.172
Residual	431.244	2.054	210		

Table 23
Analysis of Variance of Challenge
and Nursing Specialty on Dependent Variables

Source of Variation	Sum of Squares	Mean Square	DF	F	Significance of F
Job Enjoyment					
Main effects					
Challenge	0.031	0.031	1	0.088	0.767
Nursing specialty	0.939	0.939	1	2.664	0.104
Two-way interaction	0.021	0.021	1	0.060	0.807
Residual	73.992	0.352	210		
GSI					
Main effects					
Challenge	0.513	0.513	1	5.179	0.024
Nursing specialty	0.005	0.005	1	0.052	0.820
Two-way interaction	0.379	0.379	1	3.830	0.052
Residual	20.794	0.099	210		
Perception of Well-Being					
Main effects					
Challenge	0.001	0.001	1	0.000	0.984
Nursing specialty	5.751	5.751	1	1.920	0.167
Two-way interaction	0.077	0.077	1	0.026	0.873
Residual	622.937	2.995	208		
Days of Absenteeism due to Illness					
Main effects					
Challenge	2.355	2.355	1	0.490	0.485
Nursing specialty	0.023	0.023	1	0.005	0.945
Two-way interaction	0.568	0.568	1	0.118	0.731
Residual	1009.910	4.809	210		
Episodes of Absenteeism due to Illness					
Main effects					
Challenge	0.079	0.079	1	0.039	0.844
Nursing specialty	0.025	0.025	1	0.012	0.912
Two-way interaction	4.912	4.912	1	2.398	0.123
Residual	430.186	2.049	210		

Table 24
Analysis of Variance of FHardy and
Nursing Specialty on Dependent Variables

Source of Variation	Sum of Squares	Mean Square	DF	F	Significance of F
Job Enjoyment					
Main effects					
FHardy	2.795	2.795	1	8.238	0.005
Nursing specialty	1.381	1.381	1	4.070	0.045
Two-way interaction	0.004	0.004	1	0.012	0.913
Residual	71.245	0.339	210		
GSI					
Main effects					
FHardy	1.149	1.149	1	11.753	0.001
Nursing specialty	0.040	0.040	1	0.405	0.525
Two-way interaction	0.000	0.000	1	0.000	0.988
Residual	20.536	0.098	210		
Perception of Well-Being					
Main effects					
FHardy	19.181	19.181	1	6.608	0.011
Nursing specialty	8.715	8.715	1	3.002	0.085
Two-way interaction	0.061	0.061	1	0.021	0.885
Residual	603.773	2.903	208		
Days of Absenteeism due to Illness					
Main effects					
FHardy	11.372	11.372	1	2.403	0.123
Nursing specialty	0.069	0.069	1	0.015	0.904
Two-way interaction	7.788	7.788	1	1.646	0.201
Residual	993.672	4.732	210		
Episodes of Absenteeism due to Illness					
Main effects					
FHardy	6.436	6.436	1	3.154	0.077
Nursing specialty	0.233	0.233	1	0.114	0.736
Two-way interaction	0.201	0.201	1	0.099	0.754
Residual	428.540	2.041	210		

Table 25
Analysis of Variance of F1 and
Nursing Specialty on Dependent Variables

Source of Variation	Sum of Squares	Mean Square	DF	F	Significance of F
Job Enjoyment					
Main effects					
F1	1.700	1.700	1	4.935	0.027
Nursing specialty	1.258	1.258	1	3.652	0.057
Two-way interaction	0.014	0.014	1	0.041	0.839
Residual	72.330	0.344	210		
GSI					
Main effects					
F1	1.075	1.075	1	10.962	0.001
Nursing specialty	0.036	0.036	1	0.366	0.546
Two-way interaction	0.009	0.009	1	0.088	0.767
Residual	20.602	0.098	210		
Perception of Well-Being					
Main effects					
F1	11.007	11.007	1	3.744	0.054
Nursing specialty	7.832	7.832	1	2.664	0.104
Two-way interaction	0.528	0.528	1	0.180	0.672
Residual	611.480	2.940	208		
Days of Absenteeism due to Illness					
Main effects					
F1	6.333	6.333	1	1.322	0.252
Nursing specialty	0.019	0.019	1	0.004	0.949
Two-way interaction	0.411	0.411	1	0.086	0.770
Residual	1006.089	4.791	210		
Episodes of Absenteeism due to Illness					
Main effects					
F2	3.110	3.110	1	1.518	0.219
Nursing specialty	0.140	0.140	1	0.068	0.794
Two-way interaction	1.960	1.960	1	0.957	0.329
Residual	430.108	2.048	210		

Table 26
Analysis of Variance of F2 and
Nursing Specialty on Dependent Variables

Source of Variation	Sum of Squares	Mean Square	DF	F	Significance of F
Job Enjoyment					
Main effects					
F2	0.762	0.762	1	2.214	0.138
Nursing specialty	1.239	1.239	1	3.600	0.059
Two-way interaction	0.985	0.985	1	2.862	0.092
Residual	72.296	0.334	210		
GSI					
Main effects					
F2	0.871	0.871	1	8.789	0.003
Nursing specialty	0.055	0.055	1	0.557	0.456
Two-way interaction	0.011	0.011	1	0.112	0.738
Residual	20.804	0.099	210		
Perception of Well-Being					
Main effects					
F2	21.206	21.206	1	7.368	0.007
Nursing specialty	10.265	10.265	1	3.567	0.060
Two-way interaction	3.195	3.195	1	1.110	0.293
Residual	598.614	2.878	208		
Days of Absenteeism due to Illness					
Main effects					
F2	13.100	13.100	1	2.757	0.098
Nursing specialty	0.258	0.258	1	0.054	0.816
Two-way interaction	1.914	1.914	1	0.403	0.526
Residual	997.819	4.752	210		
Episodes of Absenteeism due to Illness					
Main effects					
F2	2.100	2.100	1	1.031	0.311
Nursing specialty	0.180	0.180	1	0.088	0.767
Two-way interaction	5.126	5.126	1	2.515	0.114
Residual	427.951	2.038	210		

Table 27
Analysis of Variance of F3 and
Nursing Specialty on Dependent Variables

Source of Variation	Sum of Squares	Mean Square	DF	F	Significance of F
Job Enjoyment					
Main effects					
F3	0.183	0.183	1	0.520	0.472
Nursing specialty	0.857	0.857	1	2.440	0.120
Two-way interaction	0.101	0.101	1	0.288	0.592
Residual	73.760	0.351	210		
GSI					
Main effects					
F3	0.153	0.153	1	1.496	0.223
Nursing specialty	0.009	0.009	1	0.086	0.770
Two-way interaction	0.046	0.046	1	0.454	0.501
Residual	21.486	0.102	210		
Perception of Well-Being					
Main effects					
F3	3.207	3.207	1	1.076	0.301
Nursing specialty	4.993	4.993	1	1.676	0.197
Two-way interaction	0.023	0.023	1	0.008	0.930
Residual	619.785	2.980	208		
Days of Absenteeism due to Illness					
Main effects					
F3	1.396	1.396	1	0.291	0.590
Nursing specialty	0.077	0.077	1	0.016	0.899
Two-way interaction	4.298	4.298	1	0.896	0.345
Residual	1007.139	4.796	210		
Episodes of Absenteeism due to Illness					
Main effects					
F3	2.897	2.897	1	1.407	0.237
Nursing specialty	0.000	0.000	1	0.000	0.996
Two-way interaction	0.049	0.049	1	0.024	0.878
Residual	432.232	2.058	210		

CHAPTER V

SUMMARY AND RECOMMENDATIONS

Summary of the Findings

The internal reliability of the measures was estimated with Cronbach's alpha reliability coefficients. The alphas for the measures derived from the factor analysis solution ranged from .6810 to .7506, indicating a less than acceptable level of random error. The small number of items and the homogeneity of the sample may have contributed to these low values. Cronbach's alpha reliability coefficients were not calculated by the Hardiness Institute for measures of Hardiness, Commitment, Challenge, and Control for the sample of nurses although this request was made. Values calculated by the Institute for a sample of 1103 women were used in the interpretation of these scores. The alpha calculated by the investigator for the 50 item test, .77, was less than the alpha calculated for a sample of 1103, .87.

Factor analysis of the Hardiness Test using principle components analysis and varimax rotation provided minimal evidence of construct validity. Since 17 factors emerged from the factor solution, support was not found for the contention the test measured 3 distinct factors, commitment, control, and challenge. Elimination of all items which did not have factor loadings of at least .40 on the first three factors, resulted in a test composed of 26 items. Only the second factor, F2, emerged as one of the distinct components. F2 was composed of challenge items, the first factor, F1, was composed of commitment and control items, and the third factor, F3, was composed of control and challenge items. Scores were derived for the three factors and the total test; the latter entitled FHardy. Absences of strong significant

relationships between factor solution based scores and Hardiness Institute scores led to the decision to analyze both sets of scores.

Construct validity was further estimated by evaluating the stress buffering functions of hardiness. A series of analyses of variance was performed to determine the main and interaction effects of the two specialties (conceptualized as having two levels of work stressors) and two levels of the hardiness variables on the dependent variables. One interaction, between levels of Hardiness and work stressors on psychological symptoms, attained significance, and another, between Challenge and work stressors on psychological symptoms, approached significance. Psychological distress was directly affected by more hardiness variables than other dependent variables. Again, the majority of significant effects were due to variables derived from the factor solution. Findings must be interpreted cautiously given the difficulties posed by the use of analysis of variance in samples with unequal group sizes.

Criterion related validity of the measures was estimated by evaluating the relationship between hardiness and variables significantly related to stress resistance. Significant associations amongst the dependent variables provided evidence of the criterion related validity of these measures and Cronbach's alpha correlation coefficients greater than .80 were evidence of the internal reliability of the job enjoyment and psychological symptoms measures. Two dependent variables, job enjoyment and episodes of absenteeism, differed by unit, but none differed by nursing specialties which had been conceptualized as having high and low stress environments. Again, findings must be interpreted cautiously given the unequal group sizes.

Small to moderate sized significant associations between some hardiness and dependent variables provided evidence of criterion related validity. Greater evidence of criterion related validity was seen in relation to the factor solution derived scores, rather than the Hardiness Institute scores; the former had a greater number of significant associations with the dependent variables. The complexity of relations among the biographical, hardiness, and dependent variables indicated the need for regression and path analysis.

Criterion related validity was also tested by the contrasted groups method. Limited evidence indicated the hardiness measures were related to survival within CC nursing versus survival within obstetrical nursing; that is, a high stress versus a low stress work environment. All scores, except F3 were greater for the CC nurses, but only F1, F2, and FHardy approached or attained significance. However, the small effect size, alpha, and number of obstetrical nurses, limited the power to reject the null hypothesis. Increased likelihood of rejecting the null hypothesis would result from increasing the sample of obstetrical nurses. Various explanations were proposed for the small differences in measures between groups. It was questioned whether the work environments contained equivalent stressors. It was also questioned whether the sums of work and non-work stressors for the two groups were relatively equivalent; that is, whether "stressloads" in non-work life were balanced by those in work life.

The CC group was significantly younger, had fewer dependents, and had less experience in nursing, their specialty, and their unit than the obstetrical group. The CC group was more likely to work 12 hour shifts and less likely to work 8 hour shifts than the obstetrical

group. They were also more likely to have attended a course, lecture, seminar, or workshop concerning their specialty. It was also determined that older nurses enjoyed their jobs more, and perceived their well-being to be better. In addition, nurses with more experience in their unit, their specialty, and nursing had more job enjoyment, and those with more experience in their specialty also had better perceived well-being. One shift, 12 hour nights, was significantly associated with more episodes of absenteeism due to illness. Analysis of the dependent variables indicated most nurses expressed enjoyment of their job, did not have clinically significant levels of psychological distress, had good perceptions of their well-being, and few days and episodes of absenteeism related to illness.

In summary, although the measures derived from the factor solution had low internal reliability, they demonstrated more substantial evidence of validity than the Hardiness Institute measures. With modifications, this abridged test would probably have better reliability, as well as validity, than the original version. In addition, the shortness of the abridged version would potentially increase the response rate. The findings concerning the biographical characteristics of the CC group confirmed previous research and indicated the Edmonton group was not unlike others in North America. Respondents' comments concerning the negative influence of shiftwork and the association between 12 hour night shift and absenteeism warrant further investigation.

Limitations

The following limitations should be considered when interpreting the findings:

1. the findings are limited to the population of critical care and obstetrical post partum nurses working within Edmonton, Alberta and may not be generalizable to nurses working in other specialties or in other regions;
2. the measures of each respondent were taken once and should not be assumed to endure over time;
3. constraints in the length of the questionnaire did not permit the collection of data concerning non-occupational stressors and other potential stress buffers;
4. the measures of respondents were taken within a six month period and not at a single point in time; and
5. control over the conditions of questionnaire completion was limited.

In addition, the refusal of the Hardiness Institute to release substantial information about the test and the calculation of test scores, limited interpretations of findings and motivated the calculation of an additional set of scores.

Recommendations

Recommendations for further research do not include further testing of this version of the Hardiness Test unless greater accessibility is provided to data concerning the test by the Hardiness Institute. Limitations in this information do not optimize the development of this test nor knowledge of this construct. Other options include evaluating other versions of the Hardiness test, such

as the 36 item abridged scale used by McCranie et al. (1987), or other tests which measure stress resistance. Exploratory factor analysis could be used to improve the understanding of the dimensions of hardiness and develop a test with maximal explained variance. Future criterion related testing should include an alternative to the BSI. A shorter questionnaire with equivalent psychometric properties would optimize the response rate, minimize the number of items with missing values, and allow for the inclusion of additional items related to non-work stress. If a contrasted group method is used, attempts should be made to ensure the comparison group is larger and more equal to the size of the CC group. In addition, qualitative approaches should be used in conjunction with quantitative to validate the findings. A comparison of qualitative and quantitative research concerning CC and non-CC nurses' work related stress by Bargagliotti and Trygstad (1987), indicated differences in findings may be due to methodology rather than reality. They believe "when either approach is used alone, the data gathered may be artificially limited and incomplete, thereby limiting analysis and conclusions" (p. 170). Regression and path analysis should be used to gain additional understanding of the relations among the biographical, hardiness, and dependent variables, and estimate the stress buffering effects of hardiness measures; this would assist in the estimation and development of construct validity. Measures should also be taken to ensure a minimum of random error, that is, Cronbach's alpha correlation coefficients of at least .80.

It is also recommended that future researchers take great care in analyzing stress literature and presenting their findings. Knapp (1988) documents the confusing use of stress terminology: stress

versus strain, "distress versus eustress, stress versus depression, stress versus anxiety, and stress versus tension" (p. 183). The naming of variables can also be confusing and lead to misunderstanding. For example, measures of hardiness oft times are measures of a lack of hardiness and measures of "health status" are measures of lack of health, for example, days of illness (e.g., Rich and Rich, 1987).

Implications for Clinical Practice

Given the increasing challenges of nursing, the stress resistance of nurses warrants investigation. The present shortage of nurses who provide specialized care, highlights the significance of retaining staff already employed in these areas and recruiting those best suited to this type of work. The development of a valid and reliable hardiness test would have implications for the selection of nurses and the counseling of nurses whose resistance resources have become depleted. Since it was determined the measures had limitations in reliability and validity, particular implications concerning hardiness will not be drawn from this study. However, significant associations among the dependent variables demonstrate behavioral indicators, such as absenteeism, may provide unit supervisors with insight concerning job enjoyment, psychological distress, and perceptions of well-being. The positive association between job enjoyment and age and experience demonstrate the value of recruiting and retaining older more experienced nurses. The value of mentoring and role modeling by experienced nurses, and the causes and consequences of the paucity of older more experienced CC nurses is worthy of further investigation.

References

Alberta Health and Social Services Disciplines Committee. (1985). Summary report of survey of health and social service personnel working in Alberta, March 31, 1985. Edmonton, Alberta.

Alexander, C., Weisman, C., & Chase, G. (1982). Determinants of staff nurses' perceptions of autonomy within different clinical contexts. Nursing Research, 31, 48-52.

Allen, M., Jackson, D., & Youngner, S. (1980). Closing the gap between physicians and nurses in the intensive care unit setting. Heart and Lung, 9, 836-40.

American Educational Research Association, American Psychological Association, & National Council on Measurement in Education. (1985). Standards for educational and psychological testing. Washington, DC: Author.

Anastasi, A. (1982). Psychological testing (5th ed.). New York, NY: Macmillan Publishing Co., Inc.

Anastasi, A. (1986). Evolving concepts of test validation. Annual Review of Psychology, 37, 1-15.

Anderson, C., & Basteyns, M. (1981). Stress and the critical care nurse reaffirmed. Journal of Nursing Administration, 11 (1), 31-4.

Antonovsky, A. (1979). Health, stress, and coping. San Francisco, CA: Jossey-Bass Inc., Publishers.

Archer, R. (1979). Relationships between locus of control and anxiety. Journal of Personality Assessment, 43, 617-26.

Astbury, J., & Yu, V. (1982). Determinants of stress for staff in a neonatal intensive care unit. Archives of Disease in Childhood, 57 (2), 108-11.

Bailey, J., Steffen, S., & Grout, J. (1980). The stress audit: Identifying the stressors of ICU nursing. Journal of Nursing Education, 19 (6), 15-25.

Bailey, J., Walker, D., & Madsen, N. (1980). The design of a stress management program for Stanford intensive care nurses. Journal of Nursing Education, 6 (2), 26-30.

Bargagliotti, L., & Trygstad, L. (1987). Differences in stress and coping findings: A reflection of social realities or methodologies? Nursing Research, 36, 170-172.

Barling, J. (1986). Interrole conflict and marital functioning amongst employed fathers. Journal of Occupational Behavior, 7, 1-8.

Bartone, P. (1984). Stress and health in Chicago Transit Authority Bus Drivers. Unpublished doctoral dissertation, University of Chicago, Chicago, IL (Abstract).

Bauman, A., & Bourbonnais, F. (1984). Rapid decision making in crisis situations: a case study for nurses. Toronto: McGraw-Hill Ryerson Ltd.

Bedian, A., & Armenakis, A. (1981). A path analytic study of and consequences of role conflict and ambiguity. Academy of Management Journal. 24, 417-424.

Benner, P., & Kramer, M. (1972). Role conceptions and integrative role behavior of nurses in special care and regular hospital nursing units. Nursing Research, 21, 20-9.

Benton, D., & White, H. (1972). Satisfaction of job factors for registered nurses. Journal of Nursing Administration, 2 (6), 55-63.

Berger, H. (1984). An investigation of the relationship among burnout, hardiness, job and demographic characteristics, life event change and physical health in school psychologists. Dissertation Abstracts International, 45, 655B.

Bilodeau, C. (1973). The nurse and her reaction to crtical care nursing. Heart and Lung, 2, 358-63.

Birnbaum, M. (1984). High tech/low touch? Critical Care Medicine, 12, 1006-7.

Blegen, M., & Mueller, C. (1987). Nurses' job satisfaction: A longitudinal analysis. Research in Nursing and Health, 10, 227-237.

Bohannan-Reed, K., Dugan, D., & Huck, B. (1983). Staying human under stress: Stress reduction and emotional support in the critical care setting. Critical Care Nurse, 3 (3), 26, 28, 30.

Bouman, C. (1984). Identifying priority concerns of families of ICU patients. Dimensions of Critical Care Nursing, 3, 313-9.

Bourbonnais, F., & Baumann, A. (1982). Nursing decision making in critical care areas. Journal of Advanced Nursing 7, 435-46.

Bourbonnais, F., & Baumann, A. (1985). Stress and rapid decision making in nursing: An administrative challenge. Nursing Administrative Quarterly, 9 (3), 85-9.

Brand, R., Rosenman, R., Sholtz, R., & Friedman, M. (1976). Multivariate prediction of coronary heart disease in the Western Collaborative Group Study compared to the findings for the Framingham study. Circulation, 53, 348-55.

Brayfield, A., & Rothe, H. (1951). An index of job satisfaction.

Journal of Applied Psychology, 35 (5), 307-311.

Brubakken, K. (1983). Factors affecting job satisfaction of critical care nurses. Proceedings of the Tenth Annual National Teaching Institute of the American Association of Critical Care Nurses (p. 337). Newport, CA: American Association of Critical Care Nurses.

Bryson, R., Aderman, M., Sampiere, J., Rockmore, L., & Matsuda, T. (1985). Intensive care nurse: Job tension and satisfaction as a function of experience level. Critical Care Medicine, 13, 767-9.

Caldwell, T., & Weiner, M. (1981). Stresses and coping in ICU nursing I. A review. General Hospital Psychiatry, 3, 119-127.

Campbell, D., & Fiske, D. (1959). Convergent and discriminant validation by the multitrait-multimethod matrix. Psychological Bulletin, 56 (2), 81-105.

Campbell, S., & Leatt, P. (1982). The role of complex equipment in nurses' work. Toward the development of a measure. Nursing Papers, 14 (3), 32-45.

Caplan, R. (1983). Person-environment fit: Past, present, future. In C. Cooper (Ed.), Stress research (pp. 35-78). Chichester, England: John Wiley & Sons, Ltd.

Carmines, E., & Zeller, R. (1979). Reliability and validity assessment. Beverly Hills, CA.: Sage Publications.

Cassem, N., & Hackett, T. (1975). Stress on the nurses and therapist in the intensive care unit and the coronary care unit. Heart and Lung, 4, 252-9.

Civetta, J. (1981). Beyond technology: Intensive care in the 1980's. Critical Care Medicine, 9 (11), 763-67.

Claus, K., & Bailey, J. (Eds.). (1980). Living with stress and promoting well-being: A handbook for nurses. St. Louis, MO: C. V. Mosby.

Coehlo, G., Hamburg, D., & Adams, J. (1974). Coping and adaptation. New York, NY: Basic Books, Inc.

Cohen, F. (1979). Personality, stress and the development of physical illness. In G. Stone, F. Cohen, N. Adler, & Associates (Eds.), Health psychology - A handbook: Theories, applications, and challenges of a psychological approach to the health care system (pp.77-111). San Francisco, CA: Jossey-Bass Inc., Publishers.

Cohen, F. & Lazarus, R. (1979). Coping with the stresses of illness. In G. Stone, F. Cohen, N. Adler, & Associates (Eds.), Health psychology - A handbook: Theories, applications, and challenges of a psychological approach to the health care system (pp. 217-54). San

Francisco, CA: Jossey-Bass Inc., Publishers.

Cohen, J. (1977). Statistical power analysis for the behavioral sciences (rev. ed.). New York, NY: Academic Press.

Cohen, S., & Wills, T. (1985). Stress, social support, and the buffering hypothesis. Psychological Bulletin, 98, 310-57.

Consolvo, C. (1982). Nursing turnover in the newborn intensive care unit. In E. McConnell (Ed.), Burnout in the nursing profession: coping strategies, causes, and costs (pp. 226-9). St. Louis, MO: C.V. Mosby.

Contrada, R. (1985). Type A behavior, hardiness, and the subjective and cardiovacular response to performance challenge. Dissertation Abstracts International, 46, 1733B.

Cook, T., & Campbell, D. (1979). Quasi-experimentation: Design and analysis issues for field settings. Chicago, IL: Rand McNally College Publishing Co.

Cooper, C. (1979). Sources of managerial and white collar stress. In C. Cooper & R. Payne (Eds.), Stress at Work (pp. 81-105). Chichester, England: John Wiley & Sons, Ltd.

Cooper, C., & Marshall, J. (1976). Occupational sources of stress: a review of the literature relating to coronary heart disease and mental ill health. Journal of Occupational Psychology, 49, 11-28.

Cooper, C., & Payne, R. (Eds.). (1979). Stress at Work. Chichester, England: John Wiley & Sons, Ltd.

Cousins, N. (1985). Anatomy of an illness (as perceived by the patient). In A. Monat, & R. Lazarus (Eds.), Stress and coping: An anthology (2nd ed.) (pp. 55-66). New York, NY: Columbia University Press.

Cox, T. (1978). Stress. Baltimore, MD: University Park Press.

Crocker, L. & Algina, J. (1986). Introduction to classical and modern test theory. New York, NY: Holt, Rinehart, & Winston.

Cronbach, L. (1951). Coefficient alpha and the internal structure of tests. Psychometrika, 16, 297-334.

Cronbach, L., & Meehl, P. (1955). Construct validity in psychological tests. Psychological Bulletin, 52, 281-302.

Cronin-Stubbs, D., & Rooks, C. (1985). The stress, social support, and burnout of critical care nurses: The results of research. Heart and Lung, 14, 31-9.

Cross, D., & Fallon, A. (1985). A stressor comparison of four

specialty areas. The Australian Journal of Advanced Nursing, 2 (3), 24-38.

Cross, D., & Kelly, J. (1983). Stress and coping strategies in hospitals: A comparison of ICU and ward nurses. The Australian Nurses Journal, 13 (2), 43-5.

Cross, D., & Kelly, J. (1984). Personality typing and anxiety for two groups of registered nurses. The Australian Journal of Advanced Nursing, 2 (1), 52-9.

Cullen, D. (1981). Surgical intensive care: Current perceptions and problems. Critical Care Medicine, 9, 295-7.

Davidson, P., & Jackson, C. (1985). The nurse as a survivor: Delayed post-traumatic stress reaction and cumulative trauma in nursing. International Journal of Nursing Studies, 22 (1), 1-13.

Dear, M., Weisman, C., Alexander, C., & Chase, G. (1982). The effect of intensive care nursing role on job satisfaction and turnover. Heart and Lung, 11, 560-65.

Derogatis, L., & Melisaratos, N. (1983). The Brief Symptom Inventory: An introductory report. Psychological Medicine, 13, 595-605.

Derogatis, L., & Spencer, P. (1982). The Brief Symptom Inventory (BSI) administration, scoring, and procedures manual - I. U.S.A.: Leonard Derogatis.

Ducette, J. (1986). Authors' response [Letter to the editor]. Nursing Research, 35, 236.

Duxbury, M., Armstrong, G., Drew, D., & Henly, S. (1984). Head nurse leadership style with staff nurse burnout and job satisfaction in neonatal intensive care units. Heart and Lung, 33, 97-101.

Duxbury, M., & Thiessen, V. (1979). Staff nurse turnover in neonatal intensive care units. Journal of Advanced Nursing, 4, 591-602.

Eaton, P., & Gottselig, S. (1980). Effects of longer hours, shorter week for intensive care nurses. Dimensions in Health Services, 57 (8), 25-7.

Eisendrath, S., & Dunkel, J. (1979). Psychological issues in intensive care unit staff. Heart and Lung., 8, 751-758.

Embretson, S. (1983). Construct validity: Construct representation versus nomothetic span. Psychological Bulletin, 1, 179-197.

Endler, N. & Edwards, J. (1982). Stress and personality. In L. Goldberger, & S. Breznitz (Eds.), Handbook of stress: Theoretical and clinical aspects (pp. 36-48). New York, NY: The Free Press.

Everly, G., & Falcione, R. (1976). Perceived dimensions of job satisfaction for staff registered nurses. Nursing Research, 25, 346-8.

Folkman, S., Lazarus, R., Dunkel-Schetter, C., DeLongis, A., & Gruen, R. (1986). The dynamics of a stressful encounter: Cognitive appraisal, coping, and encounter outcomes. Journal of Personality and Social Psychology, 50, 992-1003.

Folkman, S., Lazarus, R., Gruen, R., & DeLongis, A. (1986). Appraisal, coping, health status, and psychological symptoms. Journal of Personality and Social Psychology, 50, 571-79.

Frankl, V. (1963). Man's search for meaning. New York, NY: Washington Square Press, Inc.

French, J., Jr., & Caplan, R. (1972). Organizational stress and individual strain. In A. Marrow (Eds.), The failure of success (pp. 30-66). New York, NY: AMACOM.

French, J., Jr., Rodgers, W. & Cobb, S. (1974). Adjustment as person-environment fit. In G. Coehlo, D. Hamburg, & J. Adams (Eds.). Coping and adaptation (pp. 316-33). New York, NY: Basic Books, Inc.

Friedman, E. (1982). Stress and intensive care nursing: a ten year reappraisal. Heart and Lung, 11, 26-8.

Frost, T., & Wilson, H. (1983). Effects of locus of control and A-B personality type on job satisfaction within the health care field. Psychological Reports, 53, 399-405.

Ganellen, R., & Blaney, P. (1984). Hardiness and social support as moderators of the effects of life stress. Journal of Personality and Social Psychology, 47, 156-63.

Gardner, D., Parzen, Z., & Stewart, N. (1980). The nurse's dilemma: mediating stress in critical care units. Heart and Lung, 9, 103-6.

Gentry, W., Foster, S., & Froehling, S. (1972). Psychologic response to situational stress in intensive and nonintensive nursing. Heart and Lung, 1, 793-6.

Gentry, W., & Parkes, K. (1982). Psychologic stress in intensive care units and non-intensive care unit nursing: A review of the past decade. Heart and Lung, 11, 43-7.

Giovannetti, P. (1981). Aspects of measurement. In Y. Williamson (Ed.), Research methodology and its application to nursing (pp. 145-67). New York, NY: John Wiley & Sons.

Godfrey, M. (1978) Job satisfaction - or should that be dissatisfaction? How nurses feel about nursing. Part Three. Nursing, 8 (5), 17-27.

Goldberger, L., & Breznitz, S. (Eds.). (1982). Handbook of stress: Theoretical and clinical aspects. New York, NY: The Free Press.

Gorny, D. (1985). Maintenance of sensory equilibrium for the critical care nurse. Topics in Clinical Nursing, 44-50.

Gribbins, R., & Marshall, R. (1982). Stresses and coping in the NICU staff nurse: Practical implications for change. Critical Care Medicine, 10 (12), 865-7.

Grout, J. (1980). Intensive care nurses and air traffic controllers: Review of related studies. Journal of Nursing Education, 19 (6), 8-13.

Grout, J., Steffen, S., & Bailey, J. (1981). The stresses and the satisfiers of the Intensive Care Unit: A survey. Critical Care Quarterly, 3 (4), 35-45.

Hammer, J., Jones, J., Lyons, J., Sixsmith, D., & Afficiando, E. (1985). Measurement of occupational stress in hospital settings: Two validity studies of a measure of self-reported stress in medical emergency rooms. General Hospital Psychiatry, 7, 156-62.

Hansell, H., & Foster, S. (1980). Critical care nursing orientation: a comparison of teaching methods. Heart and Lung, 9, 1066-72.

Harmon, H. (1976). Modern factor analysis (rev. 3rd ed.). Chicago, IL: The University of Chicago Press.

Harrison (1979). Person-environment fit and job stress. In C. Cooper & R. Payne (Eds.), Stress at work (pp. 175-205). Chichester, England: John Wiley & Sons.

Hay, D., & Oken, D. (1972). The psychologic stresses of intensive care nursing. Psychosomatic Medicine, 34, 109-118.

Helrich, K. (1985). The use of hardiness and other stress resistance resources to predict symptoms and performance in police academy trainees. Dissertation Abstracts International, 46, 2063B.

Hickey, J. (1982). Combating burnout by developing a theoretical framework. Journal of Neurosurgical Nursing, 14 (2), 103-7.

Hinshaw, A., & Atwood, J. (1984). Nursing staff turnover, stress, and satisfaction: Models, measure, and management. In H. Werley, & J. Fitzpatrick (Eds.), Annual review of nursing research 1983 (Vol. 1) (pp. 133-153). New York, NY: Springer Publishing Co.

Hinshaw, A., Atwood, J., Gerber, R., & Erickson, J. (1986). Contrasting models of job satisfaction and anticipated turnover among urban and rural nursing staff. In S. Stinson, J, Kerr, P. Giovannetti, P. Field, & J, MacPhail (Eds.), New frontiers in nursing research: Proceedings of the International Nursing Research

Conference (p. 177). Edmonton, Alberta, Canada

Holmes, A., Perez, I., & Duffy, C. (1981). Critical care nursing internships: a solution to the acute shortage? Critical Care Medicine, 9, 114-6.

Holt, R. (1982). Occupational stress. In L. Goldberger & S. Breznitz (Eds.), Handbook of of stress: Theoretical and clinical aspects (pp.419-44). New York, NY: The Free Press.

Houser, R. (1977). A study of nurses new to special care units. Supervisor Nurse, 8, 15-22.

Huckabay, L., & Jagla, B. (1979). Nurses' stress factors in the intensive care unit. Journal of Nursing Administration, 9, 21-6.

Hutchinson, S. (1984). Creating meaning out of horror. Nursing Outlook, 32 (2), 86-90.

Ivancevich, J., Matteson, M., & Preston, C. (1982). Occupational stress, Type A behavior, and phsyical well-being. Academy of Management Journal, 25, 373-91.

Jacobsen, S. (1981). Coping strategies of neonatal intensive care nurses. In Responding to stress: Community mental health in the 80's (NLN52-1870) (pp. 54-64). New York, NY: National League of Nursing.

Jacobsen, S. (1983). Stresses and coping strategies of neonatal intensive care unit nurses. Research in Nursing and Health, 6, 33-40.

Kakta, B. (1985). Job satisfaction and job stress characteristics of staff nurses employed on different work shifts and clinical areas. (Doctoral Dissertation, Northern Illinois University) University Microfilm International, Ann Arbor, MI No. 8503839.

Keane, A., Ducette, J., Adler, D. (1985). Stress in ICU and Non-ICU nurses. Nursing Research, 34, 231-36.

Kelly, J., & Cross, D. (1985). Stress, coping behaviors, and recommendations for intensive care and medical surgical ward registered nurses. Research in Nursing and Health, 8, 321-8.

Kerlinger, F. (1973). Foundations of behavioural research (2nd ed.). New York, NY: Holt, Rinehart, & Winston, Inc.

Kim, J., & Mueller, C. (1978). Factor analysis: Statistical methods & practical issues. Beverly Hills, CA: Sage Publications.

Knapp, T. (1988). Stress versus strain: A methodological critique. Nursing Research, 37, 181-184.

Kobasa, S. (1979). Stressful life events, personality, and health: An

inquiry into hardiness. Journal of Personality and Social Psychology, 37, 1-11.

Kobasa, S. (1982a). Commitment and coping in stress resistance among lawyers. Journal of Personality and Social Psychology, 42, 707-717.

Kobasa, S. (1982b). The hardy personality: Toward a social psychology of stress and illness. In G. Sanders, & J. Suls (Eds.), Social psychology of health and illness (pp.3-32). Hillsdale, NJ: Lawrence Erlbaum Associates, Publishers.

Kobasa, S., & Maddi, S. (1983). Existential personality theory. In R. Corsini & A. Marsella (Eds.), Personality theories, research, and assessment (pp.399-446). Itasca, IL: F.E. Peacock Publishers, Inc.

Kobasa, S., Maddi, S., & Kahn, S. (1982). Hardiness and health: A prospective study. Journal of Personality and Social Psychology, 42, 168-77.

Kobasa, S., Maddi, S., & Courington, S. (1981). Personality and constitution as mediators in the stress-illness relationship. Journal of Health and Social Behavior, 22, 368-378.

Kobasa, S., Maddi, S., Puccetti, M., & Zola, M. (1985). Effectiveness of hardiness, exercise and social support as resources against illness. Journal of Psychosomatic Research 29, 525-33.

Kobasa, S., & Puccetti, M. (1983). Personality and social resources in stress resistance. Journal of Personality and Social Psychology, 45 (4), 839-50.

Kosmoski, K., & Calkin, J. (1986). Critical care nurses' intent to stay in their positions. Research in Nursing and Health, 9, 3-10.

Kuo, W. & Tsai Y. (1986). Social networking, hardiness, and immigrant's mental health. Journal of Health and Social Behavior, 27, 133-49.

Lambert, C. & Lambert, V. (1987). Hardiness: Its development and relevance to nursing. Image: Journal of Nursing Scholarship, 19 (2), 92-3.

LaRocco, J., House, J., & French, J., Jr. (1980). Social support, occupational stress and health. Journal of Health and Social Behavior, 21, 202-218.

Lazarus, R., & Folkman, S. (1984). Stress, appraisal, and coping. New York, NY: Springer Publishing Co., Inc.

Leatt, P., & Schneck, R. (1980). Difference in stress perceived by headnurses across nursing specialties in hospitals. Journal of Advanced Nursing, 5, 31-46.

Leatt, P., & Schneck, R. (1983). Perceptions of stress by nurses in different specialties: some implications for nursing administrators. Nursing Papers, 15 (14), 19-32.

Leatt, P., & Schneck, R. (1985). Sources and management of organizational stress in nursing sub-units in Canada. Organization Studies, 6 (1), 55-79.

Lefcourt, H. (1983). The locus of control as a moderator: stress. In H. Lefcourt (Ed.), Research with the locus of control construct (Vol. 2) (pp.252-270). Orlando, FL: Academic Press Inc.

Lefcourt, H., Martin, R., & Saleh, W. (1984). Locus of control and social support: Interactive moderators of stress. Journal of Personality and Social Psychology, 47, 378-89.

Lewandoski, L., & Kositsky, A. (1983). Research priorities for critical care nursing: A study by the American Association of Critical Care Nurses. Heart and Lung, 12, 35-44.

Lewandoski, L., & Kramer, M. (1980). Role transformation of special care unit nurses: A comparative study. Nursing Research, 29, 170-9.

Lipowski, Z. (1970). Physical illness, the individual and the coping process. Psychiatry in Medicine, 1, 91-102.

Locke, E. (1976). The nature and causes of job satisfaction. In M. Dunnette (Ed.), Handbook of industrial and organizational psychology (pp. 1297-1394). Chicago, IL: Rand McNally.

Loevinger, J. (1957). Objective tests as instruments of psychological theory. Psychological Reports. 9, 635-94.

Lowe, G., & Northcott, H. (1986). Under pressure: A study of job stress. Toronto, Canada: Garamond Press.

Maddi, S., Kobasa, S., & Hoover, M. (1979). An alienation test. Journal of Humanistic Psychology, 19 (4), 73-6.

Maloney, J. (1982). Job stress and its consequences on a group of intensive care and nonintensive care nurses. Advanced Nursing Sciences, 4, 31-42.

Maloney, J., & Bartz, C. (1983). Stress tolerant people: intensive care nurses compared with non-intensive care nurses. Heart and Lung, 12, 389-94.

Marshall, R., & Kasman, C. (1980). Burn-out in the neonatal intensive care unit. Pediatrics, 65, 1161-5.

McConnell, E. (1982). Burnout in the nursing profession: Coping strategies, causes, and costs. St. Louis, MO: C.V. Mosby Co.

McCranie, E., Lambert, V., & Lambert, C. (1987). Work stress, hardiness, and burnout among hospital staff nurses. Nursing Research, 36, 374-378.

McGrath, J. (1983). Stress and behavior in organizations. In M. Dunnette (Ed.), Handbook of industrial and organizational psychology (2nd ed.) (pp. 1351-95). Chicago, IL: Rand McNally.

McLean, A. (1979). Work stress. Reading, MA: Addison-Wesley.

McMichael, A. (1979). Personality, behavioral, and situational modifiers of work stressors. In C. Cooper & R. Payne (Eds.), Stress at work (pp. 127-147). Chichester, England: John Wiley & Sons.

Mechanic, D. (1974). Social structure and personal adaptation: Some neglected dimensions. In G. Coelho, D. Hamburg, & J. Adams (Eds.), Coping and adaptation (pp. 33-44). New York, NY: Basic Books, Inc.

Millar, S. (1980). Real issues behind the critical care nursing shortage. Heart and Lung, 9, 801-2.

Mitchell, J. (Ed.). (1985). The ninth mental measurements yearbook Volume II. Lincoln, NE: University of Nebraska Press.

Mohl, P., & Denny, N., Mote, T., & Coldwater, C. (1982). Hospital unit stressors that affect nurses: Primary task vs. social factors. Psychosomatics, 23, 366-74.

Monat, A., & Lazarus, R. (1985). Stress and coping: An anthology (2nd ed.). New York, NY: Columbia University Press.

Moos, R., & Tsu, V. (1977). The crisis of physical illness: An overview. In R. Moos (Ed.), Coping with physical illness (pp. 3-21). New York, NY: Okenum Medical Book.

Morningstar, L. (1986, August 30). No room for heart patients, surgeon says. The Edmonton Journal, p.1.

Munson, F., & Heda, S. (1974). An instrument for measuring nursing satisfaction. Nursing Research, 23, 159-166.

Newlin, B. (1984). Stress reduction for the critical care nurse: A stress education program. Occupational Health Nursing, 32, 315-9.

Norbeck, J. (1985a). Perceived job stress, job satisfaction, and psychological symptoms in critical care nursing. Research in Nursing and Health, 8, 253-9.

Norbeck, J. (1985b). Types and sources of social support for managing job stress in critical care nursing. Nursing Research, 34, 225-30.

Noroian, E., & Yasko, J. (1982). Care for the critical care giver: Strategies for the prevention of burnout. Dimensions of Critical

Care Nursing, 1 (2), 97-101.

Norusis, M. (1985). SPSSx advanced statistics guide. New York, NY: McGraw Hill Book Co.

Numerof, R., & Abrams, M. (1984). Sources of stress among nurses: An empirical investigation. Journal of Human Stress, 10 (2), 88-100.

Nunnally, J. (1978). Psychometric theory. New York, NY: McGraw-Hill Book Co.

O'Brien, G. (1984). Locus of control, work and retirement. In H. Lefcourt (Ed.), Research with the locus of control construct (Vol. 3) (pp.7-72). Orlando, FL: Academic Press Inc.

Orlowski, J. (1982). Critical problem of critical care burnout. Critical Care Medicine, 10, 200.

Oskins, S. (1979). Identification of situational stressors and coping methods by intensive care nurses. Heart and Lung, 8. 953-960.

Packard, J., & Motowidlo, S. (1987). Subjective stress, job satisfaction, and job performance of hospital nurses. Research in Nursing and Health, 10, 253-261.

Parasuraman, S., Drake, B., & Zammuto, R. (1982). The effect of nursing care modalities and shift assignments on nurses' work experiences and job attitudes. Nursing Research, 31, 364-7.

Parkes, K. (1984). Locus of control, cognitive appraisal, and coping in stressful episodes. Journal of Personality and Social Psychology, 46, 655-68.

Payne, R. (1980). Organizational stress and social support. In C. Cooper & R. Payne (Eds.). Current concerns in occupational stress (pp.269-98). Chichester, England: John Wiley & Sons.

Pearlin, L. (1985). Life strains and psychological distress among adults. In A. Monat & R. Lazarus (Eds.) Stress and coping: An anthology (2nd ed.) (pp. 192-207). New York, NY: Columbia University Press.

Pearlin, L., & Schooler, C. (1978). The structure of coping. Journal of Health and Social Behavior, 19, 2-21.

Phillips, G., Chong, C., & Gordon, P. (1983). Nurses staffing in intensive care units. Anaesthesia Intensive Care, 11, 118-24.

Pines, A. & Kanner, A. (1982). Nurses' burnout: Lack of positive conditions and presence of negative conditions as two independent sources of stress. Journal of Psychiatric Nursing and Mental Health Services, 20 (8), 30-5.

Pollack, S. (1986). Human responses to chronic illness: Physiologic and psychosocial adaptation. Nursing Research, 35, 90-5.

Poster, E., & Betz, C. (1984). When the patient dies: Dealing with the family's anger. Dimensions of Critical Care Nursing, 3 (6), 372-7.

Price, D., & Murphy, P. (1985). Emotional depletion in critical care staff. Journal of Neurosurgical Nursing, 17 (2), 114-8.

Price, J. (1972). Handbook of organizational measurement. Lexington, MA: D.C. Heath & Co.

Price, J., & Mueller, C. (1981). Professional turnover: The case of nurses. New York, NY: SP Medical & Scientific Books.

Pyles, S., & Stern, P. (1983). Discovery of nursing gestalt in critical care nursing: The importance of the Gray Gorilla Syndrome. Image: The Journal of Nursing Scholarship, 15 (2), 51-7.

Rhodewalt, F., & Agustsdottir, S. (1984). On the relationship of hardiness to the Type A behavior pattern: Perception of life events versus coping with life events. Journal of Research in Personality, 18, 21-23.

Rich, V., & Rich, A. (1987). Personality hardiness and burnout in female staff nurses. Image: Journal of Nursing Scholarship, 19 (2), 63-66.

Rudy, E., & Bertram, D. (1986). AACN's Invitational Conference: Strategies for the future. Focus on Critical Care, 13 (5), 44-50.

Sagert, J. (1985). The influence of attentional self regulation on personality based hardiness. Dissertation Abstracts International, 46, 1370B.

Sande, D. (1983). Preventing burnout in intensive care nurseries. Pediatric Nursing, 9, 364-366, 394.

Sanford, S. (1985) President's message: the forest for the trees. Heart and Lung., 14 (3), 22A, 24A, 25A, 28A, 30A, 33A, 36A-38A.

Schlotfeldt, R. (1984). Nursing theory: Year 2000. In Proceedings of Nursing Theories: Sharing for Success (94-105). Montreal, Quebec, Canada: The Sir Mortimer B. Davis Jewish General Hospital.

Seger, K. (1985). The relationship between role and life events, stress, mental and physical health, and hardiness dimensions. Dissertation Abstracts International, 46, 990B.

Selye, H. (1974). Stress without distress. Scarborough, Canada: The New American Library of Canada Ltd.

Sheppard & Garland, S. (1983). Staffing the intensive care unit.

Hospital Topics, 61 (2), 16-18.

Shinn, M. Rosario, M., Morch, H., & Chestnut, D. (1984). Coping with job stress and burnout in the human services. Journal of Personality and Social Psychology, 46, 864-876.

Skinner, K. (1980). Support group for ICU nurses. Nursing Outlook, 28, 296-9.

Slavitt, D., Stamps, P., Piedmont, E., & Haase, A. (1979). Measuring nurses' job satisfaction. Hospital and Health Services Administration, 24 (3), 62-76.

Smith, P., Kendall, L., & Hulin, C. (1969). The measurement of satisfaction in work and retirement: A strategy for the study of attitudes. Chicago, IL: Rand McNally & Co.

Stehle, J. (1981). Critical care nursing: The findings revisited. Nursing Research, 30, 182-6.

Sterling-Rollheiser, E. (1983). How neurosurgical nurses cope with the "No Code" patient. Journal of Neurosurgical Nursing, 15, 274-6.

Stillman, S., & Strasser, B. (1980). Helping critical care nurses with work related stress. Journal of Nursing Administration, 10 (1), 28-31.

Stone, G., Jebsen, P., Walk, P., & Belsham, R. (1984). Identification of stress and coping skills within a critical care setting. Western Journal of Nursing Research, 6, 201-11.

Strauss, A. (1968). The intensive care unit: Its characteristics and social relationships. Nursing Clinics of North America, 3, 7-15.

Suinn, R. (1982). Intervention with Type A behaviors. Journal of Consulting and Clinical Psychology, 50, 933-49.

Summers, S. (1986). Re: 'Stress in ICU and Non-ICU nurses' [Letter to the editor]. Heart and Lung. 35, 236.

Tyson, J., Laskey, R., Weiner, M., Caldwell, T., & Sumner, J. (1984). Effect of nursing staff support on the quality of newborn intensive care. Critical Care Medicine, 12, 901-6.

Ullrich, R. (1978). Herzberg revisited: Factors in job dissatisfaction. Journal of Nursing Administration, 8 (10), 19-24.

Vachon, M. (1987). Occupational stress in the care of the critically ill, the dying, and the bereaved. New York, NY: Hemisphere Publishing Corp.

Voorman, D. (1981). [illegible]itical care nursing: An art, a science, and a spirit. In M. [illegible]ey, C. Dear, D. Packa, & D. Voorman (Eds.), AACN's

clinical reference for critical care nursing (pp.3-8). New York, NY: McGraw-Hill Book Co.

Vreeland, R., & Ellis, G. (1969). Stresses on the nurse in an intensive care unit. Journal of the American Medical Association, 208, 332.

Walker, C. (1982). Neonatal intensive care and stress. Archives of Disease in Childhood, 57, 85-8.

Waltz, C., Strickland, O., & Lenz, E. (1984). Measurement in nursing research. Philadelphia, PA: F.A. Davis Co.

Weiner, M., & Caldwell, T. (1981). Stresses and coping in ICU nursing II Nurse support groups in ICUs. General Hospital Psychiatry, 3, 129-34.

Weiner, M., & Caldwell, T. (1983). Stresses and coping in ICU nursing: Why support groups fail. General Hospital Psychiatry, 5, 179-83.

Weiner, M., & Caldwell, T. (1983-4). The process and impact of an ICU support group. International Journal of Psychiatry in Medicine, 13 (1), 47-55.

Weisman, C., Alexander, C., & Chase, G. (1980). Job satisfaction among hospital nurses: A longitudinal study. Health Services Research, 15, 341-64.

Wheaton, B. (1983). Stress, personal coping resources, and psychiatric symptoms: An investigation of interactive models. Journal of Health and Social Behavior, 24, 208-229.

Wheaton, B. (1985). Models for the stress-buffering function of coping resources. Journal of Health and Social Behavior, 26, 352-64.

Wiebe, S. (1987). Executive director's report: From the desk of Sherry D. Wiebe. Nurscene, 12 (2), 5.

Winer, B. (1971). Statistical principles in experimental design (2nd ed.). New York, NY: McGraw-Hill Book Co.

Zindler-Wernet, P., & Bailey, J. (1980). Coping with stress through an "on-site" running program for Stanford ICU nurses. Journal of Nursing Education, 19 (6), 34-6.

Zindler-Wernet, P., Bailey, J., Walker, D., & Holzemer, W. (1980). Personalogical measures to assess program effects: a case study. Journal of Nursing Education, 19 (6), 38-42.

APPENDIX A

HARDINESS: A SELECTION OF PUBLISHED STUDIES

APPENDIX A

HARDINESS: A SELECTION OF PUBLISHED STUDIES

Study/ Sample/ Design	Independent Variable	Dependent Variable	Findings
Kobasa (1979) N=161 male managers	Schedule of Recent Life Events (SRLE) & Social Readjustment Scale Hardiness Scale (HS)	Seriousness of Illness Survey (SIS)	Significant differences were found between High SRLE/Low SIS & High SRLE/High SIS groups' mean scores on specific HS subscales. Analysis of responses by individuals classified as low stress/high illness indicates that lack of hardiness is not a response to illness. Correlation SRLE & SIS: .24 $p<.025$
*Locus of control			
Kobasa, Maddi, & Courington (1981) N=259 male managers prospective	SRLE HS edition 2 Demographic data Constitutional predisposition to illness (based on information about parents' illnesses provided by medical history form)	SIS (change in illness scores from time 1 to time 2 to 3) records of medical examinations	Control & commitment scales: coefficient alpha .79-.88 test-retest correlations over 3 weeks .70-.77 Principal components factor analysis of the HS scales lead to the emergence of the first factor which accounted for 46.5% of the variance. The only other factor that emerged was defined by the cognitive structure scale. Since this scale did not share common variance with the other scales, it was dropped from the HS. The sum of weighted Z scores for the 5 scales formed the HS score. Correlation SRLE & SIS .24 $p<.05$ ANOVA: Main effect of HS on SIS F 5.04 df 1 $p<.02$ ANCOVA Main effect of HS on SIS Covariate - illness time 1 F 4.01 df 1 $p<.04$

Study/ Sample/ Design	Independent Variable	Dependent Variable	Findings
Kobasa (1982) N=157 lawyers cross-sectional	SRLE Social readjustment scale (SRS) Alienation test (2 scales) Coping (checklist of regressive coping strategies) Social support Exercise (hours spent each week in aerobic exercise) Demographic data	SIS Strain (list of symptoms associated with stress response	Correlation between life events & strain .29 p<.0003 Following the regression of stressful life events & resistance resources on strain, it was determined that: alienation (B=.28 p<.0001) regressive coping (B=.24 p<.001), & social support (B=.18 p<.001) contribute to the explanation of strain.
Kobasa, Maddi, & Kahn (1982) N=259 managers cross-sectional & prospective	SRLE HS edition 2 Demographic data	SIS	Correlation between life events & illness .23 p<.025 A principle components factor analysis of the HS scales lead to the findings reported by Kobasa, Maddi, & Courrington (1981). Correlation between SRLE & HS .07 p<.10 2 Way ANCOVA: Dependent Variable – illness summed over times 2 & 3 Covariate – illness at time 1 Independent Variables – sum of SRLE over times 2 & 3, HS Main effect of HS F 5.35 df 1 p .02 Interaction SRLE & HS F 7.84 df 1 p .00 Independent Variables – SRLE at time 1, HS Main effect of HS F 4.30 df 1 p .03 Interaction SRLE & HS F 3.48 df 1 p .05.

Study/ Sample/ Design	Independent Variable	Dependent Variable	Findings
Kobasa & Puccetti (1983) N=170 male executives cross sectional	SRLE HS 2A Environmental scale (social support) Social Assets scale Demographic data	SIS	Correlations: SRLE & SIS .43 p<.001 HS & SIS .30 p<.005 HS & Perceived boss support -.29 p<.005 HS & Social assets -.13 p<.05 SIS & Perceived boss support -.26 p<.005 3 Way ANOVA: Dependent Variable - SIS Independent Variables - Boss Support, SRLE, HS (scores of independent variables dicotomized into High & Low score groups) Significant effects: SRLE F 10.79 p<.001 HS F 12.83 p<.001 Interaction SRLE & Boss support F 5.89 p<.01 Independent Variables - SRLE HS, perceived family support Significant effects: SRLE F 10.92 p<.001 HS F 19.22 p<.001 Interaction SRLE & HS F 2.52 p<.01 HS & family support F 4.67 p<.05 SRLE & HS & family support F 3.30 p<.01 Regression of HS & SRLE on SIS: R^2 .24 F(3,150)=18.62 p<.01 SRLE (B=.38 p<.05) HS (B=.19 p<.05)
Kobasa, Maddi, Puccetti, & Zola (1985) N=70 male	SRLE HS 2 Exercise Work Environment Scale - staff support scale	SIS	HS, exercise, & social support regressed on SIS scores for 1980 & 1981: R^2 Beta F 1980 HS .22 .352 12.83 p<.01 exercise.32 -.314 11.89 p<.01

Study/ Sample/ Design	Independent Variable	Dependent Variable	Findings
business executives cross-sectional & prospective			social support .35 -.194 3.72 p<.05 R2 Beta F 1981 HS .33 .453 18.97 p<.01 exercise .39 -.232 5.26 p<.01 social support .43 -.213 4.73 p<.01
Rhodewalt & Agustsdottir (1984) N=600 college students cross-sectional	H.S. 20 items College schedule of recent life events J.A.S.* (measure of type A & B personality) Demographic data	Lagner 22 item psychiatric impairment scale	Correlation between Type A & H.S. r(599)=.16 p<.001 Personality style not associated with greater likelihood of experiencing particular events. Type A personality & hardiness influence the stress-illness relationship independently; hardy individuals appear to perceive situations more positively. Perception of life events appeared to be a better predictor of distress than number of life events.
Ganellen & Blaney (1984) N=83 female college students cross-sectional	Alienation Test Levinson LOC** Life Experiences Survey (LES) SPQ*** (social support) Demographic data	Beck Depression Inventory (BDI)	Pearson correlation between SPQ & HS subscales: (p<.001) alienation from self -.42 nihilism -.41 vegetativeness -.35 adventureousness -.42 internal LOC not powerlessness significant 3 way ANOVA Dependent variable- BDI Significant main effects LES F(1,82)=6.90 p<.01 SPQ F(1,82)=4.22 p<.05 alienation from self F(1,82)=5.22 p<.05 vegetativeness F(1,82)=6.34 p<.02 Interactions LES & alienation from self F(1,82)=5.19 p<.05 LES & SPQ not significant

*Jenkins Activity Survey

**Locus of control ***Social Perception Questionnaire

Study/ Sample/ Design	Independent Variable	Dependent Variable	Findings
Barling (1986) N=67 fathers cross-sectional	Inter-role conflict H.S. 20 items	Marital functioning	H.S. reliability alpha=.076 "Hardiness moderated the interrole conflict/ marital adjustment relationship significantly ($F(1,66)=6.63$, $p<0.01$) accounting for 6 per cent of the variance" (p.4). Analysis of subgroups supported moderating effects of hardiness.
Maloney & Bartz (1983) female army corps nurses N=34 ICU N=34 non-ICU cross-sectional	Type of nursing unit Demographic data	Hahn CLGES* (challenge) Rotter Internal vs External LOC** (control) Alienation test (commitment)	No reliability & validity information for the sample studied ICU > alienated than nonICU t=11.14 $p<0.001$ > powerlessness t=7.18 $p<0.001$ > adventureousness t=15.14 $p<0.001$ > external LOC t=4.12 $p<0.001$ > challenge t=1.74 $p<0.05$

*California Life Goals Evaluation **Locus of Control

Keane, Ducette, & Adler (1985) N=96 surgical (S), medical (M), SICU, & MICU nurses from 1 hospital cross-sectional	H.S. (1982) Type of nursing unit Demographic data	SBS-HP** Supervisor rating of adjustment job	H.S. reliability & validity not assessed Correlation with burnout -significant ($p<.01$): powerlessness .42 external locus of control .41 alienation (work) .43 (self) .26 -insignificant ($p>.05$): need for security No difference between ICU & non-ICU nurses on any factors

**Staff Burnout Scale for Health Professionals

Ducette (1986) as above			H.S. coefficient alpha "higher than those reported by Summers, but lower than the data reported by the authors of the hardiness test" (p.236).

Study/ Sample/ Design	Independent Variable	Dependent Variable	Findings
Summers (1986; personal communication, February, 1987) N=181 CC nurses cross-sectional	H.S. 20 items	not reported	H.S. coefficient alphas: total: .67 control: .62 challenge: .59 commitment .64 Factor analysis: low inter-item correlations 4/20 items - insignificant factor loadings
Pollack (1986) n=60 chronically ill adults longitudinal	Health Related Hardiness Scale (HRHS) Demographic data Physiological condition	Physiological & psychological adaptation to illness	Coefficient alpha HRHS HS total: .81 .65 control: .84 .55 challenge .82 .23 commitment .78 .58 Pearson correlation between: - HRHS & psychosocial r=.42, p=.01 & physical not significant - psychosocial & physical not significant

APPENDIX B

CRITICAL CARE NURSING STRESS AND COPING: LITERATURE REVIEWS

APPENDIX B

CRITICAL CARE NURSING STRESS AND COPING: LITERATURE REVIEWS

Authors	Literature Reviewed	Conclusions and Recommendations
Grout (1980)	Research concerning occupational stresses of air traffic controllers & ICU nurses	Following the comparison of research concerning the occupational stresses of air traffic controllers & ICU nurses, the following recommendations for the study of ICU nursing stress are made: increase the number of experimental studies, investigate the long term effects of nursing stress, measure the physiological effects of ICU stress, & determine the relationship between perceptions of stressors & physiological consequences of stress.
Caldwell & Weiner (1981)	Six studies & multiple anecdotal reports concerning ICU nursing stress	Identifies categories of stressors: environment & workload, emotional issues related to death & severe illness, interpersonal relations (between the nurse & her patients, co-workers, & supervisor), responsibility for critical decisions, & personal life stress. Concludes that workload & psychosocial conflicts are the most stressful aspects of ICU nursing. Recommendations for alleviating stress: maximize the "satisfiers" & decrease the stressors, develop support groups, provide adequate resources, provide adequate time off, alternate patient assignments, improve clarity of communication from administration, provide orientation & ongoing education, recognize skills of nurses & provide special benefits.
Stehle (1981)	Periodical literature concerning ICU nursing stress	Notes variation in definitions of stress & focus of articles (e.g., descriptions of ICU environment, identification of intra-individual & extra-individual stressors, comparison of ICU & non-ICU stressors, descriptions of responses to stressors, & turnover rates). Recommendations for future study: encourage nurses to use stress models in their studies of stress so as to improve the categorization of stressors; the measurement stress; the identification of relevant personal factors, sociocultural backgrounds, & somatic responses of ICU and non-ICU nurses; the development of predictive theories; & the evaluation of stress reduction strategies.
Weiner & Caldwell (1981)	Periodical literature concerning support	Identifies characteristics of most support groups: led by a mental health professional; focus on members' perceived needs; meet once or twice each week for 1 hour; attended by 2-12 nurses; & outcome

Authors	Literature Reviewed	Conclusions and Recommendations
	groups	not formally evaluated. Evaluation criteria used: subjective feelings; questionnaires; patient mortality & length of stay; chart audits; & turnover rate. Concludes that support groups are effective in improving the morale & functioning of members if members recognize this need.
Friedman (1982)	Literature concerning ICU nursing stress (1972-1982)	Notes the development of research, especially related to the identification of: variations in nurses' perceptions of the demands of ICU nursing, significance of the characteristics of nurses (e.g., competence, communication skills, self awareness & confidence), types of stressors, (e.g., interactions between the nurse, physicians, & administrators), & the concept of job fit.
Gentry & Parkes (1982)	Literature concerning stress in ICU & non-ICU nurses (1972-1982)	Identifies: an increase in the number of research studies; categories of stressors (e.g., amount & type of workload, contact with very ill & dying patients); the need for social support; types of coping strategies (e.g., talking, & taking action), psychologic stresses of ICU & non-ICU nursing; suggested techniques for alleviating stress; & the finding that ICU nurses have greater turnover rates & more frequently drop out of the profession than non-ICU nurses. Recommendations for future study: examine the stressors in different types of ICUs & non-ICUs; determine the relationship between the demands of ICU nursing (actual & perceived) & the outcomes (e.g., psychologic distress, job satisfaction, absenteeism, & turnover); identify & evaluate coping strategies; & encourage nurses to research job stress.
Minshaw & Atwood (1983)	Literature concerning nursing turnover, job stress, & satisfaction (not specific to ICU)	Identifies categories of stressors: physical work environment; professional bureaucratic role conflict multiple expectations; interaction with nursing administration & physicians; staffing & workload negative patient outcomes; lack of participation in policy & practice decisions; & inadequate knowledge & skills. Describes types of stress reduction strategies (e.g., exercise, relaxation, imagery, self understanding & commitment, education, & changing staff patterns, workloads, & assignments). Recommendations for future study: determine the relationship of job stress to productivity; determine

whether this relationship varies with nursing specialty, type of professional socialization, or individual characteristics; identify & promote "satisfiers"; evaluate the outcome of coping strategies; determine the relationship between autonomy & control over practice on stress, satisfaction, & turnover; increase the generalizability of findings by replicating studies & improving the research designs & methods & assess whether models & solutions generated from non-nursing settings are applicable to nursing.

APPENDIX C

QUESTIONNAIRE

National Library of Canada

Canadian Theses Service

Bibliothèque nationale du Canada

Service des thèses canadiennes

NOTICE

AVIS

The quality of this microfiche is heavily dependent upon the quality of the thesis submitted for microfilming.

La qualité de cette microfiche dépend grandement de la qualité de la thèse soumise au microfilmage.

Please refer to the National Library of Canada target (sheet 1, frame 2) entitled:

Veuillez consulter la cible de la Bibliothèque nationale du Canada (microfiche 1, image 2) intitulée:

NOTICE

AVIS

APPENDIX C

QUESTIONNAIRE

NURSING STAFF QUESTIONNAIRE

INSTRUCTIONS:

1. Please do not put your name on the questionnaire.
2. Answer the questions independently; do not discuss the questions or your answers with anyone.
3. Answer the questions in order. Do not skip around.
4. Provide the best possible answer to all questions. Remember, all responses are confidential. It is important that you answer the questions as honestly as you can.
5. Please return the questionnaire to the designated box on your unit before you leave work or when you return for your next shift.

I. ABOUT YOU AND YOUR UNIT

Please check the appropriate space(s)

1. What shift(s) do you work in your present position?

_____ 8 hour day shift
_____ 8 hour night shift
_____ 8 hour evening shift
_____ 12 hour day shift
_____ 12 hour night shift
_____ other: please specify_____

2. How long have you worked in your present unit?

_____ less than 6 months
_____ 6 months to less than 1 year
_____ 1 year to less than 3 years
_____ 3 years to less than 5 years
_____ 5 years to less than 7 years
_____ 7 years to less than 9 years
_____ 9 years to less than 11 years
_____ 11 years to less than 13 years
_____ 13 years to less than 15 years
_____ 15 years or more

3. What is the major specialty of your unit? (Check one)

_____ obstetrics
_____ intensive care: Please specify type:
_____ multi system
_____ neuro ICU
_____ surgical ICU
_____ coronary surgical ICU
_____ coronary ICU

4. How long have you worked in this specialty (e.g., intensive care, rather than specific type of ICU; and obstetrics, rather than specific type of obstetrical unit)

_____ less than 6 months
_____ 6 months to less than 1 year
_____ 1 year to less than 3 years
_____ 3 years to less than 5 years
_____ 5 years to less than 7 years
_____ 7 years to less than 9 years
_____ 9 years to less than 11 years
_____ 11 years to less than 13 years
_____ 13 years to less than 15 years
_____ 15 years or more

5. How many years of nursing experience have you had since you completed your basic nursing education?

_____ less than 6 months
_____ 6 months to less than 1 year
_____ 1 year to less than 3 years
_____ 3 years to less than 5 years
_____ 5 years to less than 7 years
_____ 7 years to less than 9 years
_____ 9 years to less than 11 years
_____ 11 years to less than 13 years
_____ 13 years to less than 15 years
_____ 15 years or more

QUESTIONNAIRE

6. What types of education have you completed? (Check more than one if applicable)

_____ R.N. diploma
_____ R.P.N diploma
_____ Bachelor degree in nursing
_____ Master's degree in nursing
_____ Post graduate certificate program concerning your present nursing specialty
_____ Post graduate course, lecture, seminar, or workshop concerning your present nursing specialty
_____ Post graduate course, lecture, seminar, workshop, or counselling concerning stress management
_____ Other type(s) of nursing education: please specify _____

7. Your age is:

_____ under 25 years
_____ 25 - 29 years
_____ 30 - 34 years
_____ 35 - 39 years
_____ 40 - 44 years
_____ 45 - 49 years
_____ 50 years or more

8. How many dependent children or other people for whom you are responsible, live in your home?

_____ 0
_____ 1
_____ 2
_____ 3
_____ 4
_____ 5 or more

II. YOUR PERSONAL VIEWS

Below are some items that you may agree or disagree with. Please indicate how you feel about each one by circling a number from 0 to 3 in the space provided. A zero indicates that you feel the statement is **not at all true**; circling a three means that you feel the item is **completely true**.
As you will see, many of the items are worded very strongly. This is to help you decide the extent to which you agree or disagree.
Please read all items carefully. Be sure to answer all on the basis of the way you feel now. Don't spend too much time on any one item.

	not at all true	a little true	quite a bit true	completely true
9. I often wake up eager to take up my life where it left off the day before	0	1	2	3
10. I like a lot of variety in my work	0	1	2	3
11. Most of the time, my bosses or superiors will listen to what I have to say	0	1	2	3
12. Planning ahead can help avoid most future problems	0	1	2	3
13. I usually feel that I can change what might happen tomorrow, by what I do today	0	1	2	3
14. I feel uncomfortable if I have to make any changes in my everyday schedule	0	1	2	3

QUESTIONNAIRE

	not at all true	a little true	quite a bit true	completely true
15. No matter how hard I try, my efforts will accomplish nothing	0	1	2	3
16. I find it difficult to imagine getting excited about working	0	1	2	3
17. No matter what you do, the "tried and true" ways are always the best	0	1	2	3
18. I feel that it's almost impossible to change the mind of someone with whom I am close	0	1	2	3
19. Most people who work for a living are just manipulated by their bosses	0	1	2	3
20. New laws shouldn't be made if they hurt a person's income	0	1	2	3
21. When you marry and have children you have lost your freedom of choice	0	1	2	3
22. No matter how hard you work, you never really seem to reach your goals	0	1	2	3
23. A person whose mind seldom changes can usually be depended on to have reliable judgement	0	1	2	3
24. I believe most of what happens in life is just meant to happen	0	1	2	3
25. It doesn't matter if you work hard at your job, since only the bosses profit by it anyway	0	1	2	3
26. I don't like conversations when others are confused about what they mean to say	0	1	2	3
27. Most of the time it just doesn't pay to try hard, since things never turn out right anyway	0	1	2	3
28. The most exciting thing for me is my own fantasies	0	1	2	3
29. I won't answer a person's questions until I am very clear as to what he is asking	0	1	2	3
30. When I make plans I'm certain I can make them work	0	1	2	3
31. I really look forward to my work	0	1	2	3
32. It doesn't bother me to step aside for a while from something I'm involved in, if I'm asked to do something else	0	1	2	3
33. When performing a difficult task at work, I know when I need to ask for help	0	1	2	3
34. It's exciting for me to learn something about myself	0	1	2	3
35. I enjoy being with people who are unpredictable	0	1	2	3

QUESTIONNAIRE

-4-

	not at all true	a little true	quite a bit true	completely true
36. I find it's usually very hard to change a friend's mind about something	0	1	2	3
37. Thinking of yourself as a free person just makes you feel frustrated and unhappy	0	1	2	3
38. It bothers me when something unexpected interrupts my daily routine	0	1	2	3
39. When I make a mistake, there's very little I can do to make things right again	0	1	2	3
40. I feel no need to try my best at work, since it makes no difference anyway	0	1	2	3
41. I respect rules because they guide me	0	1	2	3
42. One of the best ways to handle most problems is just not to think about them	0	1	2	3
43. I believe that most athletes are just born good at sports	0	1	2	3
44. I don't like things to be uncertain or unpredictable	0	1	2	3
45. People who do their best should get full financial support from society	0	1	2	3
46. Most of my life gets wasted doing things that don't mean anything	0	1	2	3
47. Lots of times I don't really know my own mind	0	1	2	3
48. I have no use for theories that are not closely tied to the facts	0	1	2	3
49. Ordinary work is just too boring to be worth doing	0	1	2	3
50. When other people get angry at me, it's usually for no good reason	0	1	2	3
51. Changes in routine bother me	0	1	2	3
52. I find it hard to believe people who tell me that the work they do is of value to society	0	1	2	3
53. I feel that if someone tries to hurt me, there's usually not much I can do to try and stop him	0	1	2	3
54. Most days, life just isn't very exciting for me	0	1	2	3
55. I think people believe in individuality only to impress others	0	1	2	3
56. When I'm reprimanded at work, it usually seems to be unjustified	0	1	2	3
57. I want to be sure someone will take care of me when I get old	0	1	2	3
58. Politicians run our lives	0	1	2	3

QUESTIONNAIRE

III. YOUR FEELINGS ABOUT YOUR JOB

Below are some items you may agree or disagree with. Please indicate how you feel about each item now by circling a number from 0 to 4 in the space provided. A zero indicates you strongly disagree; a 4 indicates you strongly agree.

	strongly disagree	disagree	undecided	agree	strongly agree
59. I consider my job rather unpleasant	0	1	2	3	4
60. I enjoy my work more than my leisure time	0	1	2	3	4
61. I feel fairly well satisfied with my present job	0	1	2	3	4
62. Most of the time I have to force myself to go to work	0	1	2	3	4
63. I am satisfied with my job for the time being	0	1	2	3	4
64. I definitely dislike my work	0	1	2	3	4
65. I feel that I am happier than most other people	0	1	2	3	4
66. Most days I am enthusiastic about my work	0	1	2	3	4
67. I like my job better than the average worker does	0	1	2	3	4
68. I find real enjoyment in my work	0	1	2	3	4
69. I am disappointed that I ever took this job	0	1	2	3	4

IV. Your Well-being

Below is a list of problems and complaints that people sometimes have. Please read each one carefully. After you have done so, please circle one of the numbers to the right that best describes HOW MUCH DISCOMFORT THAT PROBLEM HAS CAUSED YOU DURING THE PAST WEEK INCLUDING TODAY. Circle only one number for each problem and do not skip any items.

HOW MUCH WERE YOU DISTRESSED BY:

	not at all	a little bit	moderately	quite a bit	extremely
70. Nervousness or shakiness inside	0	1	2	3	4
71. Faintness or dizziness	0	1	2	3	4
72. The idea that someone else can control your thoughts	0	1	2	3	4
73. Feeling others are to blame for most of your troubles	0	1	2	3	4

QUESTIONNAIRE

HOW MUCH WERE YOU DISTRESSED BY:

	not at all	a little bit	moderately	quite a bit	extremely
74. Trouble remembering things	0	1	2	3	4
75. Feeling easily annoyed or irritated	0	1	2	3	4
76. Pains in heart or chest	0	1	2	3	4
77. Feeling afraid in open spaces	0	1	2	3	4
78. Thoughts of ending your life	0	1	2	3	4
79. Feeling that most people cannot be trusted	0	1	2	3	4
80. Poor appetite	0	1	2	3	4
81. Suddenly scared for no reason	0	1	2	3	4
82. Temper outbursts that you could not control	0	1	2	3	4
83. Feeling lonely even when you are with people	0	1	2	3	4
84. Feeling blocked in getting things done	0	1	2	3	4
85. Feeling lonely	0	1	2	3	4
86. Feeling blue	0	1	2	3	4
87. Feeling no interest in things	0	1	2	3	4
88. Feeling fearful	0	1	2	3	4
89. Your feelings being easily hurt	0	1	2	3	4
90. Feeling that people are unfriendly or dislike you	0	1	2	3	4
91. Feeling inferior to others	0	1	2	3	4
92. Nausea or upset stomach	0	1	2	3	4
93. Feeling that you are watched or talked about by others	0	1	2	3	4
94. Trouble falling asleep	0	1	2	3	4
95. Having to check and double check what you do	0	1	2	3	4
96. Difficulty making decisions	0	1	2	3	4
97. Feeling afraid to travel on buses, subways or trains	0	1	2	3	4
98. Trouble getting your breath	0	1	2	3	4

QUESTIONNAIRE

HOW MUCH WERE YOU DISTRESSED BY:

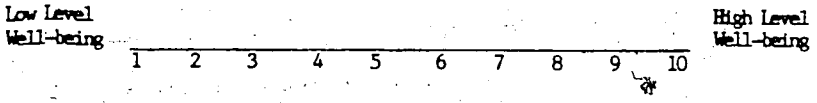
	not at all	a little bit	moderately	quite a bit	extremely
99. Hot or cold spells	0	1	2	3	4
100. Having to avoid certain things, places, or activities because they frighten you	0	1	2	3	4
101. Your mind going blank	0	1	2	3	4
102. Numbness and tingling in parts of your body	0	1	2	3	4
103. The idea that you should be punished for your sins	0	1	2	3	4
104. Feeling hopeless about the future	0	1	2	3	4
105. Trouble concentrating	0	1	2	3	4
106. Feeling weak in parts of your body	0	1	2	3	4
107. Feeling tense or keyed up	0	1	2	3	4
108. Thoughts of death and dying	0	1	2	3	4
109. Having urges to beat, injure or harm someone	0	1	2	3	4
110. Having urges to break or smash things	0	1	2	3	4
111. Feeling very self-conscious with others	0	1	2	3	4
112. Feeling uneasy in crowds	0	1	2	3	4
113. Never feeling close to another person	0	1	2	3	4
114. Spells of terror or panic	0	1	2	3	4
115. Getting into frequent arguments	0	1	2	3	4
116. Feeling nervous when you are left alone	0	1	2	3	4
117. Others not giving you proper credit for your achievements	0	1	2	3	4
118. Feeling so restless you couldn't sit still	0	1	2	3	4
119. Feelings of worthlessness	0	1	2	3	4
120. Feeling that people will take advantage of you if you let them	0	1	2	3	4
121. Feelings of guilt	0	1	2	3	4
122. The idea that something is wrong with your mind	0	1	2	3	4

QUESTIONNAIRE

-8-

123. Below is a scale of "well-being".

Please indicate how you would rate your level of well-being this past week by circling a number from 1 to 10.



Please check the appropriate space

124. During the past six months, how many separate episodes of absenteeism due to illness did you experience?

_____ 0 occasions
_____ 1 occasion
_____ 2 occasions
_____ 3 occasions
_____ 4 occasions
_____ 5 occasions
_____ 6 occasions
_____ 7 occasions or more

125. During the past six months, how many days of absenteeism due to illness did you experience?

_____ 0 days
_____ 1 day
_____ 2 days
_____ 3 days
_____ 4 days
_____ 5 days
_____ 6 days
_____ 7 days or more

Thank you for your cooperation.

Please write any comments you have concerning the questionnaire in the space below and return the completed questionnaire to the designated box on your unit.

APPENDIX D

LETTERS TO PARTICIPANTS

315 5020 Riverbend Road
Edmonton, Alberta
T6H 5J8
ph 437 4861

Dear Registered Nurse:

I am a graduate student in the Masters of Nursing Program at the University of Alberta, working under the direction of Dr. Janet Kerr, a professor in the Faculty of Nursing. Since I am especially interested in the attributes of nurses who work in obstetrical and critical care settings, I have decided to test the reliability and validity of questionnaires used to measure particular attributes related to well-being and job satisfaction.

Although your participation is voluntary, the results of this study will be most meaningful if every full time female general duty registered nurse working in your clinical setting participates. Participation simply involves completing the attached questionnaire; it should take about 30 minutes of your time. Please do not put your name on the questionnaire so that your responses can remain anonymous. Your responses will be held in the strictest of confidence. None of your completed questionnaires will ever be seen by any hospital personnel.

I appreciate how busy you are and wish to thank you in advance for your assistance. A summary of the findings will be delivered to your unit. If you have any questions or concerns about this study and/or your participation in it, feel free to contact me or my supervisor.

By completing and returning the enclosed questionnaire, you are giving your consent to participate in this study.

Sincerely,

Denise Brown, RN, BSN

315 5020 Riverbend Road
Edmonton, Alberta
T6H 5J8
ph 437 4861

Dear Registered Nurse:

Thank you for allowing me to tell you about my research study and invite you to participate. I've really enjoyed meeting you and visiting your unit.

I'd especially like to thank those of you who have taken the time to complete and return my questionnaire. Your contribution towards my study is greatly appreciated. Please be assured that your responses will be held in the strictest of confidence.

If you haven't returned your completed questionnaire and you are a full time, female general duty registered nurse working in critical care or obstetrics, please ensure your views are represented in this study by completing a questionnaire within the next weeks; it takes only 15 - 30 minutes of your time. Every completed questionnaire is important; the results of this study are only meaningful if a large number of nurses participates. If you need a questionnaire, you can obtain one from your unit supervisor, your assistant unit supervisor, or me.

I look forward to meeting with you later this year to tell you about my findings. If you have any questions or you need a questionnaire, phone me at the number listed at the top of the page and leave a message on my tape recorder; I'll get right back to you.

Sincerely,

Denise Brown, RN, BSN