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PERCEPTIONS OF STRESS AMONG HOSPITAL

NURSING STAFF

by

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A THESIS

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The undersigned certify that they have read, and
recommend to the Faculty of Graduate Studies and Research,
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ABSTRACT

The purpose for this research was to investigate the perceived sources of stress for hospital nursing staff and to explore the relationships between stress and nurses' age, level of education, length of nursing experience, job satisfaction and the type of nursing specialty in which the nurses worked. One thousand, two hundred and sixty-four nurses from 24 Alberta hospitals were included. The nine types of nursing specialties from which nurses were selected were: medical, surgical, intensive care, rehabilitation, auxiliary, pediatric, psychiatric, obstetric and rural. Data collection was by questionnaire.

A variety of techniques was used in the data analysis, including factor analysis which was applied to identify the major types of stress being measured. A four factor oblique solution was obtained which included stress factors related to patients, physicians, workload and relieving on other nursing units. Some correlations between factors were present. Factor scores were obtained and analysis of variance employed to examine differences between various groups of nurses on stress factor scores. Significant differences were found on all four stress factors between nurses in different types of specialties. Some differences were also observed between nurses of different ages concern-

ing physician-related stress. Nurses of different educational levels and nurses of different lengths of experience were found to differ in terms of stress related to patients and physicians. Stepwise multiple regression analysis was performed to examine the possibility of predicting nurses' scores on the four stress factors. The type of nursing specialty in which the nurses worked appeared to be the best predictor, overall, of nurses' stress scores, with the exception of scores for physician-related stress, which were best predicted by age and level of education.

The relationship between stress and job satisfaction was examined using correlation and analysis of variance. Some significant ($\alpha = .05$) inverse relationships were observed between certain aspects of job satisfaction and stress related to patients, physicians and workload.

Because of limitations related to sampling and measurement, the results of this study must be considered as descriptive only of the population of nurses who participated.

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CHAPTER I

INTRODUCTION

In recent years, stress has been the subject of con-
siderable research, by investigators from a variety of
disciplines. Several different perspectives have been
taken in the study of stress, including physiological
(e.g., Selye, 1956), psychological (e.g., Lazarus, 1971),
and social psychological approaches (e.g., McGrath, 1970).
These varied perspectives have involved a number of ways
of conceptualizing and measuring stress, and have resulted
in considerable confusion and controversy about what the
phenomenon is and how it can best be measured. In the
view of Mason (1975), this confusion will not be resolved
by critique, argument, or logical analysis alone, but
requires further systematic research to help evaluate the
premises upon which prevailing concepts of stress are based.

The social psychological approach has often been
applied to the study of work-related stress, since this
approach encompasses both situational and individual
aspects of the stress experience. In addition, this
approach seems particularly appropriate for the study of
stress as it occurs within organizational settings. The
present research, which comprised the investigation of
work-related stress among hospital nursing staff, was con-

ducted within a social psychological conceptual framework.
For the purposes of this study, stress was conceptualized
as being a subjective experience resulting from an inter-
action between certain situational characteristics and
certain demographic attributes of the individual (House,
1974).

Scope and Objectives

This research was conducted as part of a larger on-
going project by P. Overton and R. Schneck entitled "An
Enquiry into the Relationships Among Environment, Technology,
Structure, Process and Behavior Within Nursing Subunits."[1]
In the larger study, stress, job satisfaction, and group
cooperation were viewed as possible behavioral outcomes
which might vary between nursing subunits depending upon
certain environmental, technological, structural and process-
related characteristics of the subunits.

The study being reported by this author focuses upon
the investigation of stress among nurses working in a number
of different types of nursing specialties (types of nursing
subunits). The nursing specialties of interest were: medi-
cine, surgery, intensive care, rehabilitation, auxiliary,
pediatrics, psychiatry, obstetrics and rural.

The specific research objectives were:

1. to empirically describe levels and frequency of stress for nurses in various types of nursing subunits;

2. to examine the extent to which there are differences between the nurses working in different types of subunits on the measures of stress;

3. to explore the relationships between nurses' stress and selected personal characteristics such as age, level of education, and length of nursing experience; and

4. to explore the relationship between nurses' stress and job satisfaction.

Need for the Study

Many writers have pointed out that the conceptualization and measurement of stress is problematic, with a diversity of approaches which tends to limit the integration of knowledge from different disciplines. On a theoretical basis, then, there is a need for research which can increase the understanding of this very complex phenomenon.

While there has been some recent research on stress as it relates to nursing, much of this has emphasized the stress that patients experience during hospitalization (e.g., Volicer, 1973; Volicer and Burns, 1977). There appears to have been little empirical research into the possible stresses experienced by hospital personnel.

Although there is some literature concerning stress among hospital nurses, most of this focuses upon stress

for nurses working in intensive care units. Some examples
of such literature are: Vreeland and Ellis (1969), Hay and
Oken (1972), Reres (1972), Cassem and Hackett (1972, 1975),
Friedman (1973), Bilodeau (1973), Reichle (1975), West
(1975), and Porter (1977). While the common opinion among
these authors is that intensive care nursing is particularly
stressful, there is little evidence in the literature of
systematic attempts to describe the nature of this stress,
or to compare stress between nurses in different specialty
areas. Thus, there would seem to be a need for further
investigation of stress experienced by hospital nurses, not
only in intensive care units, but also in specialties such
as pediatrics, obstetrics, psychiatry, medicine and surgery.

Several authors (e.g., Bates and Moore, 1973; McGrath,
1970; House, 1974; Helberg, 1972) state that the stress
which an individual experiences in any given situation is
influenced by certain personal characteristics of the indivi-
dual, and particularly by previous experience in similar
situations. Since hypotheses such as this one have rarely
been rigorously tested, it seems that consideration of the
influence of individual characteristics holds some potential
for contributing to current knowledge concerning stress
among nurses.

From a practical standpoint, the study of stress among
nurses may provide information which will ultimately bene-
fit both nurses and patients. The quality of patient care
depends greatly upon the nurses providing that care, and the

effectiveness of the latter is a function of their psycho-
logical state no less than of their technical expertise
(Hay and Oken, 1972). It has been suggested that nurses,
particularly in intensive care unit settings, may at times
be under so much stress that they are unable to give support
to others (Michaels, 1971). Nash (1975) feels that stress
among nurses not only influences nurse-patient interactions
but also plays an important part in wastage from the pro-
fession and in sickness and absenteeism.

Because stress has such a range of potential effects
upon nurses and nursing, this research may have a number of
practical implications for nursing practice, administration,
and education, as well as indicating needs for future related
research.

CHAPTER II

LITERATURE REVIEW

It is beyond the purpose of this literature review to present a comprehensive discussion of the very widely studied subject of stress. Rather, the chapter is intended as an overview of the key concepts and issues which have emerged from the study of stress in the social sciences, with particular emphasis on work stress and its relevance to nurses and nursing.

Conceptualization and Measurement of Stress

In the physical sciences, where the stress concept appears to have originated, its definition and meaning have been fairly consistent. However, such consistency has not characterized the use of the term "stress" in the biological and social sciences, and the result has been considerable confusion and controversy about what stress actually is and how it can be measured. A number of authors express concern regarding the serious semantic problems in the stress field, including Mason (1975) who writes:

> Whatever the soundness of logical may be in the various approaches to defining 'stress'... the general picture in the field can still only be described as one of confusion. The disenchantment felt by many scientists with the stress field is certainly understand-

able when one views two decades in which the term 'stress' has been used variously to refer to 'stimulus' by some workers, 'response' by some workers, 'interaction' by others, and more comprehensive combinations of the above factors by still other workers. Some authorities in the field are rather doubtful that this confusion over terminology is correctable in the near future (p. 29).

Additionally, there are certain sources of confusion regarding the concept of stress which may be attributable to its popularity among researchers and among the general public. The term has come to be used almost interchangeably with anxiety, conflict, frustration, and nervous tension (Mechanic, 1962). As a result, stress is "one of those peculiar terms which is understood by everyone when used in a very general context but understood by few when an operational definition is desired which is sufficiently specific to enable the precise testing of certain relationships" (Cohen, 1967, p. 78).

Cofer and Appley (1964) suggest that the term stress has almost pre-empted a field previously shared by several other related concepts, such as conflict, frustration, and anxiety. "It is as though, when the word stress came into vogue, each investigator, who had been working with a concept he felt was closely related, substituted the word stress for it and continued in his same line of investigation" (p. 449).

The measurement of stress is also somewhat problematic, as indicated by Muhlenkamp (1978):

The process of measuring stress is difficult for many reasons. First, the nature of stress is such

that accurate assessment should logically take into account the stimulus, the mediating factors, and finally the response itself. Second, the defini- tion of what constitutes a stressor is highly indivi- dualistic. Third, the response to stress is similarly individualistic. Finally, the response to stress is holistic -- that is, one's response to stress ordinarily has bio-psychocultural components (p. 74).

Because of these problems, some authors (e.g., Mason, 1975) have advocated abandoning the term "stress" altogether, while others (e.g., Lazarus, 1971) have suggested using the term as a general label for a large, complex, interdiscipli- nary area of study. McGrath (1970) argues against abandon- ment of the term, partly because he feels that what is a "popular" area of research at a given time is not a random matter. He suggests that certain contemporary forces, which are both conceptual and practical, are responsible for the popularity of the phenomenon of stress. "On the conceptual side, the stress concept seems to hold much promise as an integrating concept through which we can make some funda- mental connections among the neighbouring but isolated fields of physiology, psychology, sociology, medicine, and so forth. On the practical side the study of stress seems, on the face of it, to be directly applicable to some of the most pressing problems of the social order, and to offer a route to understanding, if not eliminating, these pro- blems" (1970, p. 2).

Hopefully, the preceding discussion has illustrated some of the sources of difficulty in the conceptualization of stress. Attention is now turned to a brief review of

approaches to defining and measuring stress within some of
the disciplines which have made substantial contributions
in the area of stress research.

The Physiological Approach

The concept of stress was first introduced into the
biological sciences by Hans Selye in 1936, and was deve-
loped further in his subsequent writings (Appley and
Trumbull, 1967). Selye viewed stress as a unifying concept
in the theory of disease and as "the common denominator of
all adaptive reactions in the body" (Selye, 1956, p. 54).
Although originally he applied the term to stimulus condi-
tions, throughout most of his writing Selye defines stress
as "the non-specific response of the body to any demand made
upon it" and defines the stimuli which induce stress as
"stressors" (Selye, 1956, 1965).

For scientific purposes, Selye operationally defined
stress as "the state manifested by a specific syndrome which
consists of all the non-specifically induced changes within
a biologic system" (Selye, 1956, p. 54). The specific syn-
drome was termed the General Adaptation Syndrome (G.A.S.)
and was seen to consist of three stages.

1. The Alarm Reaction - In this response, an organism
either consciously or unconsciously perceives a stressor
and prepares to act.

2. The Stage of Resistance - In this stage, the
body's physiological forces are mobilized to cope with the

stressor.

3. The Stage of Exhaustion - At this stage, the organism's efforts to control stress are diminished and adaptation is ineffective (Selye, 1965).

Selye identified certain physiologic changes, such as adrenal enlargement and gastrointestinal ulceration as manifestations of the G.A.S. and, therefore, as objective indicators of the presence of stress (Selye, 1965). A number of other physiologic indicators have been employed by researchers to measure stress, including changes in pulse rate, blood pressure, muscle tension, breathing movements, galvanic skin resistance and blood hormone levels (Levi, 1967). However, as Appley and Trumbull (1967) point out, there is often a lack of intercorrelation between these physiologic measures. Such methodological problems have led some writers to question Selye's concept of stress as a "non-specific" response of the body to stressors.

Inherent in Selye's conceptual approach to stress is the notion that each organism has a finite amount of adaptation energy or ability to cope with stress, and that the organism will die when this energy has been expended (Selye, 1956). However, Selye does not view stress as a "negative" thing or something to be avoided. "Stress is part of life, a natural by-product of all our activities. One must find his own optimum stress level" (Selye, 1956, p. 299). He even suggests that, while high levels of stress can lead to disease, moderate stress levels may be instrumental in

preventing disease (Selye, 1965).

Somewhat related to Selye's theory of stress and its relation to disease are the views put forth by writers such as Levi (1967), Wolff (1953), and Rahe and Arthur (1977). In what has been termed the "psychosomatic approach" or the "life situation approach", these authors suggest that discomforting life situations (i.e., stress) play a role in the development of illness by causing alterations in the physiologic state. Related to this is the theory that the occurrence of significant changes in a person's life, either pleasant or unpleasant, can lead to stress and possible illness (Cockerham, 1978). Holmes and Rahe (1967) developed an instrument called the "Social Readjustment Rating Scale" to measure such life change events, and it has become a widely used tool in research concerned with change and stress. With this scale, a certain number of "life change units" are assigned to each of a number of life events such as death of a spouse, marriage, or change of job. Holmes and Rahe suggest that as the total value of life change units mounts, the person's likelihood of developing a serious illness also increases, particularly if too many life change units are accumulated in too short a time.

Although this has become a popular approach to the study of stress, it seems to present more than its share of problems. As Mechanic (1968, p. 311) indicates, "in the case of most diseases there are conflicting and contradictory findings concerning the role of stress as an etiological

agent." He cites problems such as inadequate control groups, small samples and the stating of claims which could not be supported by empirical findings as some of the reasons for the non-generalizability of the results of this area of stress research.

The Psychological Approach

Psychological stress concepts appear to have a relatively long history, as evidenced by the medical use of the term "stress" during the early part of this century in relation to threatening psychosocial demands upon the individual (Mason, 1975). According to Lazarus (1971), the key feature distinguishing psychological stress from physiological stress is that in the former, the reaction depends on how the individual interprets or appraises the significance of an event. This concept of appraisal or "perception" is implicit in most definitions of psychological stress including that of Cofer and Appley (1964) who viewed stress as the state which occurs when an organism perceives that his wellbeing, or integrity, is endangered and that he must divert all his energies to its protection.

Lazarus (1967) cites a 1955 study by Symington et al. which suggested that perception of danger might play a crucial role in eliciting even those stress responses which appear to be primarily physiologic in nature. The study apparently showed that patients who were dying from injury or disease had a normal adrenal cortical condition at

autopsy, as long as they had remained unconscious during the period of illness. In contrast, patients who were conscious during similar illnesses, and died, were found to have adrenal cortical stress changes (Lazarus, 1967).

It is largely in the psychological literature, rather than the physiological, that the concept of "individual differences" in regard to stress is apparent. There appears to be a consensus among writers that what is stressful for one individual is not necessarily stressful for another. This situation is seen by some as a potential source of error in stress research, particularly in the selection of stressors and determination of the stressfulness of certain events. As Appley and Trumbull (1967, p. 411) say, "because the researcher thinks a situation should be stressful does not make it so." It is consistently found that stress reactions vary in intensity from person to person under exposure to the same environmental event (p. 10). These authors conclude that "with the exception of extreme and sudden life-threatening situations, it is reasonable to say that no stimulus is a stressor to all individuals exposed to it" (p. 7).

In discussing some possible reasons for individual differences in response to stressors, Helberg (1972) suggests factors such as the individual's degree of competence, interpretation of the problem, and stress tolerance. He feels that experience with moderate levels of stress increases an individual's tolerance in regard to additional

stress. The importance of an individual's interpretation of a potentially stressful situation is also recognized by Arnold (1967, p. 126) who writes: "We cannot really speak of psychological stress without considering the subjective evaluation, for what is stress for one man may be a welcome challenge for another."

The approaches to the measurement of psychological stress have been numerous, including a range of physiological measures as well as self-report measures obtained through interviews and questionnaires. Physiological indicators have been particularly popular with researchers in psychological stress because they are believed to be relatively free of the kinds of errors and deceptions which may occur when self-report measures are employed (Lazarus, 1967).

Some researchers have attempted to measure stress using both physiological and subjective indicators, but this approach, too, seems to have certain methodological problems. "Unfortunately, when self-report and physiological measures of the same stress reaction are compared, the results are often contradictory. That is, a subject may -- and often does -- report that he found the stimulus highly stressful, and yet show no physiological reactivity. Conversely, physiological arousal may be -- and often is -- accompanied by denials of affective experience" (Averill, Opton and Lazarus, 1971, p. 116).

The Social Psychological Approach

While many similarities exist with regard to the con-
ceptualization of stress in the disciplines of psychology
and social psychology, social psychologists have primarily
been interested in the study of stress which arises within
the context of person-to-person behavior (McGrath, 1976).
According to McGrath, a stress situation begins with some
condition in the socio-physical environment. If the situa-
tion is perceived by the individual as leading to some
undesirable state of affairs, then it becomes a stressful
situation, whether that perception is correct or not.

Inherent in most social psychological definitions of
stress is the idea that certain characteristics of the
social situation can act as mediating factors in the indivi-
dual's perception of stress. As defined by House (1974),
the experience of stress is a subjective response resulting
from the interaction of particular objective social condi-
tions and certain personal characteristics; "characteristics
of social situations may also condition the degree to which
a potentially stressful condition actually results in per-
ceived stress." (p. 14). McGrath's view is similar, in that
he sees "a potential for stress when an environmental situa-
tion is perceived as presenting a demand which threatens
to exceed the person's capabilities and resources for meet-
ing it, under conditions where he expects a substantial
differential in the rewards and costs from meeting it
versus not meeting it" (1976, p. 1352).

McGrath (1976) points to some evidence which seems to indicate that the presence of, and communication with, other human beings may act to reduce the experience of stress. However, enforced closeness, in a setting of fixed physical dimensions, may have the opposite effect of increasing perceptions of stress. Thus, it appears that social interaction may be a kind of stimulation which has an optimal level, with too much or too little resulting in increased stress.

Stress itself is viewed by McGrath and others as having an optimal level, that is, not necessarily being a "negative" thing. In his research on stress and performance, McGrath (1976) found that, in general, an "inverted U" relationship existed, with performance levels being low at low levels of stress, rising to optimum levels when stress was moderate, and decreasing again when stress levels were high.

Proponents of the social psychological approach to stress (e.g., McGrath, 1977; Mechanic, 1968) also recognize that there are substantial interindividual differences in terms of what stimulus situations result in the experience of stress. According to McGrath, these differences are, in part, a function of experience. "Past experience leading to successful mastery of similar situations tends to reduce the perception of threat, while experience of a negative nature may increase stress" (McGrath, 1977, p. 68).

Social psychological stress can be measured at physio-

logical, psychological, behavioral and organizational
levels, and within each of these levels various operational
types of measures can be applied, including subjective
reports and observation (McGrath, 1977). However, the
same lack of validity seems to plague the measurement of
stress in this field as was described in relation to stress
measurement in physiology and psychology. "Alternative
measures within level and type do not always agree; nor is
there always convergence of measures across types and/or
levels" (McGrath, 1977, p. 68). McGrath (1977) and Mechanic
(1968) have questioned whether these problems are the
result of methodological weakness in the measurement of a
single phenomenon, i.e., stress, or whether stress actually
represents more than one phenomenon.

Work-Related Stress

There seems to be a growing interest in the identifi-
cation of sources of stress for individuals at work and the
impact of this stress upon physical health, mental health,
and job performance. However, the variety of conceptual
approaches which characterizes the general stress field
is apparent also in the literature concerning work stress,
making it somewhat difficult for one to gain a clear pic-
ture of what is encompassed by the term "work stress."

Most of the early work in this area tended to focus
upon sources of stress arising from the physical work

environment. Conditions such as excessive noise, high temperatures, high humidity, or other environmental extremes were often examined in relation to the physiological stress and damage which might result in individuals exposed to these conditions in the workplace (Murrell, 1978). Psychological stress, when studied, was usually viewed as a possible outcome of repetitive, routine work such as work on an assembly line.

Probably the bulk of the research related to work stress has looked at particular kinds of occupations which may predispose individuals to the development of certain diseases, such as peptic ulcers or coronary heart disease (e.g., House, 1974; Russack, 1965). It is generally concluded that individuals in occupations involving decision making and responsibility for the work of others have a greater than normal risk of developing coronary heart disease. However, the obvious methodological problems in many of these studies, such as self-selection of certain types of individuals to high stress occupations, pose serious questions as to the validity of many of the results.

As one group of authors points out, knowing that a particular job is stressful is not necessarily useful (Margolis, Kroes and Quinn, 1974). More relevant, from a practical standpoint, is the identification of specific sources of stress within jobs and across job classifications. "Knowing that the job of air traffic controller is a very stressful one is, for example, not a very useful bit

of knowledge when it comes to programs for reducing job stress. All that could be done on the basis of this knowledge would be to eliminate the job, something that is hardly feasible" (Margolis, Kroes and Quinn, 1974, p. 659). Thus, there seems to be a growing emphasis, particularly in the social psychological literature, upon delineating the particular aspects of work which may represent sources of stress for individuals.

Sources of Work Stress

A wide range of potential sources of work stress have been identified in the literature, including conflicts with fellow workers, piece-work, routinization of work, shift-work, automation, rapid technological change, competition, and pressure for advancement (Kagan and Levi, 1971; de Trense, 1977). Work overload, and the feeling that one can never complete his tasks satisfactorily, are identified as frequent causes of stress (Levi, 1967; House, 1974), as is the existence of deadlines (Pepitone, 1967; House, 1974). Kahn et al. (1964) have suggested that two job characteristics which are likely to be stressful are excessive demands for innovation and problem-solving, and necessity for frequent contacts beyond the boundaries of one's department. Demand on the worker to make skilled and important decisions in a short period of time may also represent a source of considerable stress (Frankenhauser and Gardell, 1976).

In an attempt to classify the kinds of stress which

may occur within organizational settings, McGrath (1976) has suggested the following six types:

1. Task-based stress (difficulty, ambiguity).

2. Role-based stress (conflict, ambiguity).

3. Stress intrinsic to the behavior setting (e.g., crowding).

4. Stress arising from the physical environment (e.g., cold).

5. Stress arising from the social environment or interpersonal relations.

6. Stress within the person system.

The task-based stress identified by McGrath has not received much attention in the literature, with the exception of a short discussion by Gross (1970). He describes "task" as the central problem in work situations, with the overall organizational goal broken down into a set of tasks which are then assigned to individuals to perform. "It is obvious that stress would follow from assigning to persons tasks they are unable to perform... or that take place in situations where inadequate performance would have punishing consequences" (p. 77).

Role-based stress in organizations has been discussed extensively by Kahn et al. (1964), who identified two major sources of such stress: (1) role ambiguity, and (2) role conflict. Role ambiguity was viewed as "a function of the discrepancy between the information available to the person and that which is required for adequate performance of his

work" (p. 73). In their 1964 survey of the American labour force, Kahn et al. found that role ambiguity was a source of stress for a considerable number of workers. For example, 35 percent of male wage earners reported being disturbed by lack of clarity about the scope and responsibilities of their jobs; 29 percent were bothered by ambiguity about what their co-workers expected of them; and 31 percent were bothered because they were uncertain about their superior's evaluation of them (p. 64). Role conflict, also, appeared to be an important source of stress for male workers in the Kahn study, with 39 percent reporting being disturbed by thinking that they were unable to satisfy the conflicting demands of various people (p. 56).

Stress and Job Satisfaction

There is some consensus in the literature that one result of high levels of stress at work may be reduced job satisfaction. A few authors, however, have suggested that this relationship may not be as straightforward as it appears, and that certain types of work stress may be associated with improved job satisfaction.

In order to test the hypothesis that some sources of occupational stress are desirable and some are not, Burke (1976) conducted a study in which he examined 14 sources of occupational stress and 12 aspects of job satisfaction in 228 males employed as engineers or accountants. He found that the overall stress index was significantly nega-

tively related to the job satisfaction index; the greater the stress, the lower the satisfaction. However, when the results were examined more closely, it was found that certain types of occupational stress, primarily those related to responsibility and decision-making, were associated with high job satisfaction.

Stress in Hospital Personnel

While there seems to be some recent interest in stress as it occurs within hospital settings, there is little evidence in the literature of empirical research on the kinds of stress experienced by hospital personnel. One exception is an Australian study by Bates and Moore (1975). These researchers hypothesized that some jobs in hospitals involve considerably more stress than do others, and they based their study upon the conceptualization of role-based stress as developed by Kahn et al. (1964). A questionnaire was distributed to more than 800 staff members in 20 hospitals, and the sample included interns, nurses, nursing aides, and hospital administrators. The results indicated that stress scores for interns and nurses were higher than scores for nurses' aides and hospital administrators. It was concluded that it was likely the nature of the work of the interns and nurses, specifically their direct patient care responsibilities, which accounted for their higher stress levels (Bates and Moore, 1975).

Stress Among Nurses

Certainly the bulk of the literature related to stress
in nursing concerns the stress experienced by nurses work-
ing in intensive care settings. However, it seems probable
that certain sources of stress exist which could affect all
hospital nurses, regardless of their specialty area, and a
few authors have attempted to identify such sources.

It has been said that hospitals, in general, are
stressful places in which to be (Michaels, 1977), and that
hospital nurses are potentially, continuously, exposed to
stress during the course of their work (Mauksch, 1966).
This work often involves the carrying out of tasks which,
by ordinary standards, are distasteful and frightening, and
which can generate strong and mixed emotions in the nurse
(Michaels, 1977).

Being with patients on a 24-hour basis means that
nursing staff must be prepared to assist patients in coping
with the stresses of illness and hospitalization (Volicer
and Burns, 1977). Because nurses are involved in the major
crises of people's lives, and because of the life and death
nature of some of their work, a certain amount of stress
is likely inseparable from nurses' work (Nash, 1975). Car-
ing for patients who are dying, and dealing with the fami-
lies of these patients has been identified as an important
source of stress for nurses by a number of writers (e.g.,
Glaser and Strauss, 1964; Rule, 1974; Vachon, 1975; Denton
and Wisenbaker, 1977; Keck and Walther, 1977).

Because of the relatively high dependence of hospital-based nurses upon physicians for clinical decisions, medical staff can also represent a source of stress for nurses (Kalisch and Kalisch, 1977). Specific problems might occur when physicians are critical or unaccepting of the importance of nursing care for patients (Strauss, 1975), and when there are difficulties in communication with physicians (Strauss, 1975; Gaynor and Berry, 1973). Inadequate staffing and having to relieve on other units where the work is unfamiliar have also been suggested as potential sources of stress for hospital nurses (Rule, 1974).

It is implied in some of the literature that there has been a trend in recent years toward greater stress among nurses. One of the reasons cited for this trend is "change", both in society and within hospital organizations, including rapid technological advances (Nash, 1975; Vachon, 1975). Related to this is an increasing tendency toward role conflict within nurses, who are frequently required to alter their attitudes and ideas to fit a role that is no longer static, but is changing to meet the demands of a society and organization in flux. Nash (1975, p. 476) describes this as "conflict with other professions, with differing branches within our own, as we, and they, attempt to find agreement on who is responsible for what aspect of treatment, patient care."

It has also been suggested that nurses may experience stress because of the pressure upon them to live up

to their role as professionals, in a society which has
increasing expectations of nurses in terms of performance
and accountability (Vachon, 1975). Stress may occur because
of "the differences between the job we do, its respons-
ibilities and the resources we have available, and the job
that the public and other professions think we do, the
resources of staff and time and facilities that they think
we have" (Nash, 1975, p. 476).

While possible effects of stress among nurses are
not widely discussed in the literature, a few have been
suggested. These include sickness and absenteeism (Nash,
1975), coming on duty late, omitting assignments, with-
drawing from patient contact, and focusing on equipment
and paperwork (Rule, 1974). Unfortunately, the prevalence
of these "effects" and whether or not they actually repre-
sent reactions to stress do not appear to have been investi-
gated.

Stress in Intensive Care Nursing

Holsclaw, in her 1965 article, was among the first
to suggest that nurses working in certain areas are exposed
to more stress than are hospital nurses generally. She
called these "high emotional risk areas" and identified,
as belonging in this group, areas in which nurses must care
for patients undergoing experimental therapies, patients
with severe physical disability, patients being rehabili-
tated, and psychiatric patients. Working with patients who

die or otherwise do not return to normal is proposed as one common denominator in these areas, i.e., a source of stress for nurses who work there. "In our culture the health professions are symbolic of cure, of restoration of health, of healing of disease, and of triumph over death.... Though as nurses we claim that a large part of our work is care rather than cure, we nevertheless identify with our medical fellows in progressing the patient to health" (Holsclaw, 1965, p. 38).

Believing that patients who do not support a nurse's concept of herself as restorer represent a source of stress for the nurse, Holsclaw identifies some possible effects of this stress. One of these is withdrawal from the situation, which may be manifested by ignoring the patient as a person or engaging in ritualistic procedures. Another effect may be anger toward patient, family, or other staff members, which Holsclaw suggests are manifestations of the nurse's feelings of hopelessness about her ability to help.

It has been suggested by one author that the reason why intensive care unit nurses may experience more stress than other nurses is that people who elect to enter this specialized field of nursing are often self-directed, aggressive and determined, predisposing them to personal conflict or stress (Reichle, 1975). However, this idea is not supported by Gentry, Foster and Froehling (1972), who conducted a study comparing intensive care nurses with nurses in non-intensive care settings. They found that

intensive care unit nurses, although they did not show any distinctive personality patterns on psychological tests, reported more depression, hostility, and anxiety than did non-intensive care unit nurses.

In outlining the nature of stress experienced by nurses in intensive care settings, Vreeland and Ellis (1969) state:

> Nursing in the intensive care unit encompasses stressful events related directly to patient needs and indirectly to pressures within the environment. The stresses in the minute-to-minute, day-by-day contact with patients whose lives depend upon the nurse's knowledge, alertness, and skill are compounded by problems encountered in working with a wide range of technical equipment purported to be lifesaving or labor saving or both. Moreover, maintaining smooth working relationships and effective communications with many different members of the health team and visitors moving through a relatively small physical space creates other tensions (p. 332).

These authors indicate that insecurity in knowledge or skills could be a major source of stress for intensive care unit nurses, since often the urgency of the situation allows no time for nurses to confirm the accuracy of their knowledge. Another source of stress may be the necessity of performing painful treatments on patients, including turning, suctioning, and changing dressings, often amidst protests from the patient. "The position of the nurse is paradoxical. On the one hand, she is expected to be objective and firm; on the other, she is expected to emanate warmth and feeling. Maintenance of an appropriate balance in these opposing attitudes is itself a stress" (Vreeland and Ellis, 1969, p. 333).

Physicians, also, have been identified as a possible source of stress for intensive care unit nurses, particularly during emergencies when physicians may demonstrate their own anxiety by being hypercritical of the nursing staff. Unavailability of physicians may result in considerable role-related stress for the intensive care unit nurse, since emergency situations may require her to make decisions which would normally be the physician's responsibility (Vreeland and Ellis, 1969).

Reres (1972) identifies the anxiety of families as a major source of stress for intensive-care unit nurses. She relates this anxiety to the fact that the general public has come to equate intensive care with the possibility of death. "Preparing themselves to deal with grief, they are also confronted with maintaining hope in the loved one, and they constantly seek support and direction from the staff" (Reres, 1972, p. 29).

Hay and Oken (1972) have provided a fairly comprehensive review of sources of stress for nurses in intensive care units, based upon observations of nurses in a 10-bed intensive care unit over a period of one year as well as information gained from interviewing nurses. They cite the intensive care unit environment itself as being stressful, the greatest initial impact coming from the intricate machinery with its flashing lights, buzzing and beeping monitors, gurgling suction pumps, and whoosing respirators. Ever-present stimuli of this nature can decrease the nurses'

stress threshold and contribute to anxiety at times of crisis (Hay and Oken, 1972, p. 110). These authors further describe the stimuli to which an intensive care unit nurse is exposed, including the moaning and crying of patients, and the sight of blood, vomitus, excreta, mutilated bodies, and unconscious, helpless people.

> Unceasingly, the intensive care unit nurse must face these affect-laden stimuli with all the distress and conflict they engender. As part of her daily routine, the nurse must reassure and comfort the man who is dying of cancer; she must change the dressings of a decomposing, gangrenous limb; she must calm the awakening disturbed overdose patient; she must bathe the genitalia of the helpless and comatose; she must wipe away the bloody stool of the gastrointestinal bleeder; she must comfort the anguished young wife who knows her husband is dying. It is hard to imagine any other situation that involves such intimacy with the frightening, repulsive and forbidden (p. 110).

Hay and Oken also cite excessive workload as a source of stress for intensive care unit nurses, particularly the incessant repetitive routine of frequent monitoring, treatment and recording. The plight of the nurse in these situations is equated to that of a hampster on a treadmill: "She finishes the required tasks on one patient just in time to start them on another;... constantly aware of her race with the clock" (p. 111). Scheduling and staffing may represent another source of stress, since the workload in intensive care units does not decrease on night shifts, weekends or holidays, as it does in some other areas of a hospital. These authors indicate that fear of making mistakes may be the cause of considerable stress for nurses

in intensive care units, where any error may be life-
endangering for a patient. "The new nurse, particularly,
begins to view the never ending life-dependent tasks as a
spector of potential mistakes and their imagined dreadful
sequelae" (Hay and Oken, 1972, p. 113). Other sources of
stress which they mention are difficulties with supervisory
staff, physicians being critical or unavailable, and caring
for dying patients.

The possible effects of stress upon nurses in intensive
care units which Hay and Oken describe are similar to those
outlined by Holsclaw, particularly, emotional withdrawal
on the part of the nurses and relating more to the machines
than to the patients.

In a questionnaire and interview survey of 23 nurses
working in an intensive care unit, Michaels (1971) identi-
fied possible sources of nurses' stress as being related
to: physical aspects of the intensive care unit (for example,
limited workspace), special equipment, traffic, patient-
related problems, communication problems (particularly
between nurses and physicians), emergency situations, and
patients' families. In describing their reactions to
emergency situations such as cardiac arrest, 19 of the
nurses studied used expressions indicating overt anxiety
(for example, "my heart pounds"). Other interesting find-
ings related to nurses' reactions to visitors. Although
the majority of nurses believed that families should be kept
out of the unit to a greater extent, they also believed that

families were important and expressed a desire to help them.

Michaels concluded that, although the nurses in her study felt that they should be giving support and reassurance to patients and families, they frequently were not doing so. She suggests that the obstacle lies in the many stressful situations affecting the nurse in an intensive care unit. "A nurse in such a situation needs support because of the stressful nature of her work. Lacking support for herself, she then becomes unable to give full support to others" (Michaels, 1971, p. 1935).

In a 1972 study, Cassem and Hackett investigated sources of stress for 16 nurses working in a Coronary Care Unit (C.C.U.). A 44 item questionnaire was used to assess the types of stress for nurses, and included such possible sources as: scheduling difficulties, C.C.U. environment, patients, physicians, families, other nurses, research studies, nursing procedures, administration, and subjective feelings of the nurses themselves. Nurses were asked to rate the items according to frequency and magnitude of stress, and these scores were added before items were ranked on the basis of their total stress scores. Cassem and Hackett found that, of the 44 items, heavy lifting ranked first as a source of stress, followed by research with patients in cardiogenic shock, and difficulties in scheduling. Some other sources of stress identified were (in descending rank order): family being anxious, severity of a patient's illness or prognosis, patient's behavior or

personality being troublesome, personality conflicts with
other nurses, working with elderly patients, unavailability
of physicians, performing painful treatments, family being
uninformed, work overload, crowding in the C.C.U., and
physicians being hypercritical or impatient.

In discussing nurses' reactions to critical-care nurs-
ing, Bilodeau (1973) suggests that the sources of stress
for nurses can logically be grouped into five categories:
(1) the patient and his care, (2) personnel, (3) environment,
(4) families, and (5) other. Specific sources of patient-
related stress may be related to the patient's physical
care, his inability to communicate, his need for emotional
support, the need for intensive watching, and the possibi-
lity of death (Bilodeau, 1973).

Personnel-related sources of stress might include
conflicts between nursing staff, conflicts with supervisors,
and difficulties with physicians, particularly communica-
tion problems and unavailability of physicians. Families
are viewed as a source of stress because of their constant
need for reassurance, information and guidance. In addi-
tion, they may cope with their feelings of anxiety in ways
which are threatening or overwhelming to the nurse (for
example, crying, or blaming staff for the patient's condi-
tion). Emergency situations may heighten the family's
reactions and need for support at a time when nurses are
most pressed for time or are emotionally drained (Bilodeau,
1973).

As sources of environment-related stress, Bilodeau cites physical aspects of the unit (such as crowding), complex equipment, and research activities which may be going on in the intensive care unit. Staffing and emergencies in other areas of the hospital are described as "other" sources of stress for critical-care nurses.

West (1975) classifies the stress experienced by intensive care unit staff in terms of primary and secondary stress. He suggests that primary stress comes from three main sources: the repetitive exposure to suffering, death, and dying; the constant threat of object loss; and feelings of personal failure. "The constant threat of object loss is the main reason that these personnel avoid closeness with patients; it is much easier to accept the death of a stranger than that of a friend" (p. 63).

As sources of secondary stress, West cites work overload, lack of gratification from obtunded patients, and communication problems with physicians, families of the patients, or hospital administrators.

Possible sources of stress for intensive care nurses are outlined by Porter as including: the continual attention and need for meticulous routine, the need to respond to crises competently, problems in communicating with patients, repetitive exposure to death and dying, providing support to relatives, staff communication problems and difficulty in dealing with physicians (Porter, 1977, p. 102).

A recent South African study compared Black and White

intensive care unit nurses on the basis of their reported
stress. The researchers found that there were few differ-
ences between these two groups of nurses in terms of stress,
and they identified the following situations as potential
sources of stress for nurses working in intensive care unit
settings:

1.   Death of a patient in the intensive care unit.

2.   Caring for a dying patient.

3.   Pressure of time (a sense of working against
the clock).

4.   Having to make decisions, often rapidly and with-
out assistance.

5.   Acute crisis.

6.   Coping with relatives.

7.   Enormity of consequences of making a mistake.

8.   Threat of an alarm sounding at any time.

9.   Incomplete understanding of instruments and
machines.

10.   Danger to the staff (Lochoff et al., 1977).

A much larger study of stress in intensive care nurs-
ing was conducted in 1977 as part of a stress management
project at the School of Nursing, University of California,
San Francisco. The researchers surveyed 1,238 nurses work-
ing in 89 intensive care units in the San Francisco area,
as well as 500 nurses throughout the United States who were
members of the American Association of Critical Care Nurses.
The purpose of the research was to identify stressors affect-

ing intensive care unit nurses.

When the nurses in that study were asked to list the three sources of greatest stress in the intensive care unit, ranking the most stressful first, they indicated that they were most distressed by the management of the unit, particularly by inadequate and unqualified staffing. Interpersonal conflict was identified as the second greatest source of stress. This category included disagreement with physicians over their orders and the treatment of patients, as well as personality conflicts with other staff members. A third source of considerable stress for nurses was found to be the nature of direct patient contact (Partridge, Claus and Bailey, 1978).

Much less stressful to the nurses surveyed were the factors of: inadequate knowledge and technical skills, physical environment of the intensive care unit, personal life events, and lack of administrative rewards (Partridge, Claus and Bailey, 1978).

The researchers also asked nurses 43 forced-choice questions related to five broad categories of possible stressors, and their conclusions regarding these data are summarized as follows:

Knowledge and Skills. Nurses felt confident that their knowledge was current, that they were able to keep up with technological advances, and that they had sufficient preparation to operate special equipment.

Patient Care. Nurses felt that they could provide

quality nursing care under pressure, could meet patients'
physical and emotional needs, and could make decisions
concerning patient care. Though the pace in the unit was
sometimes too rapid, they felt that there was adequate time
to give good patient care. However, nurses were occasion-
ally distressed by caring for dying patients, by unnecessary
prolongation of life, and when patients had major setbacks
or died.

Physical Work Environment. Nurses reported high
levels of noise in the unit to be more distressing than
lack of work space.

Management. The respondents indicated that physicians
were almost always available and that there was usually
adequate staffing for the unit. It was generally felt that
opportunities for job-advancement were not readily available.

Interpersonal Relationships. Nurses felt that their
knowledge and judgment was respected by co-workers, super-
visors and physicians, especially during emergencies
(Partridge, Claus and Bailey, 1978).

The San Francisco study also included an examination
of some personal characteristics of the nurses, such as age,
sex, experience, education and position. However, the
report gives no indication of any attempt to examine poss-
ible relationships between these characteristics and the
sources of stress reported by nurses.

Conclusions from the Literature

From the literature reviewed, it would appear that stress is a popular but extremely complex phenomenon which has been conceptualized and measured in a variety of ways. This variety in approaches has resulted in considerable confusion about the concept of stress and, unfortunately, has made the integration of knowledge from various disciplines somewhat difficult.

There seems to be a trend toward a broadening approach to the study of stress, particularly in the fields of psychology and social psychology. This is evident in the work of authors such as House (1974) and McGrath (1976), who view stress as having both individual and situational components. It would appear that the study of work stress in general, and of stress among nurses, logically falls within this kind of broad conceptual framework. Therefore, for the purposes of this study, stress was viewed as a subjective experience resulting from the interaction of particular objective social conditions and certain personal characteristics of the individual. For a given situation to be stressful for an individual, the following conditions were viewed as necessary: (1) it must be perceived, (2) it must be interpreted as presenting a demand which threatens to exceed the individual's capabilities and resources for meeting it, and (3) the individual must expect a differential in the rewards and costs from meeting the demand versus

not meeting it.

The concept of individual differences in stress response pervades the stress literature, but there seems to be little empirical evidence as to the possible reasons for these differences. It seems clear, though, that few situations, if any, represent sources of stress for all individuals exposed to them.

A wide range of possible sources of stress which can arise in the workplace have been identified in the literature, and most of these can be grouped under task-based or role-based difficulties. From the nursing literature, it would appear that some potential sources of stress for nurses are related to patients, patients' families, physicians, co-workers, supervisors, staffing, knowledge, environment, and workload. Although the literature concerning stress in nurses consistently emphasizes that nurses in intensive care units experience particularly high levels of stress, little attempt seems to have been made to compare intensive care nurses with other nurses in terms of their sources and levels of stress. Moreover, there is no evidence of research which has considered possible relationships between nurses' stress and individual characteristics of the nurses, such as their age, education, or experience.

CHAPTER III

METHODOLOGY

In this chapter, the research design and the study population are described. Then the methods of measurement of the variables are outlined, followed by an explanation of the procedures used in data collection and data analysis.

Design

As indicated in the first chapter, this research was conducted as part of a larger study. Because the data were initially collected for the larger study, the study reported here was considered mainly exploratory in nature. The major variables under consideration for this study were nurses' stress, job satisfaction, age, education, experi-, ence, and the type of nursing subunit in which the nurses were employed.

Population

The population of interest for this study consisted of nurses employed in selected types of nursing subunits (i.e., types of nursing specialties) in hospitals in Alberta. In contrast to the larger study, in which the nursing sub-

unit was the level of analysis, the level of analysis for
this thesis was the individual nurse. A nurse was defined
as any full-time or permanent part-time member of the nurs-
ing staff (excluding head nurses) of a selected nursing sub-
unit. This definition, therefore, included nurses of a
variety of educational levels, including registered nurses,
registered psychiatric nurses, certified nursing aides,
nursing orderlies and ward aides.

The type of nursing subunits (specialties) were
selected because the technologies (i.e., the nature of the
tasks) were expected to be relatively distinct and because
the nursing specialties were common enough to generate a
reasonably large population. The nine types of nursing sub-
units selected were:

1. paediatric units (PEDS): comprising of children
under the age of 16 years with general medical-surgical
disorders;

2. obstetrical units (OBS): comprising of both anti-
and post-partum patients but not including delivery room
and nurseries;

3. rehabilitation units (REHAB): comprising of adult
patients with primarily physical disabilities requiring an
active rehabilitation program;

4. intensive care units (ICU): comprising of patients
with a variety of diagnoses admitted for "general" intensive
care, and/or comprising of patients with one specific dis-
ease requiring "specialized" care;

5. auxiliary care units (AUX): comprising of patients requiring long-term care, including the chronically disabled and the aged;

6. psychiatric units (PSYCH): comprising of adult patients requiring active psychiatric treatment;

7. surgical units (SURG): comprising of adult patients admitted for general surgical procedures, but not for specialized surgery such as cardiac surgery, neuro-surgery, orthopaedic, or ear, nose, throat and eye surgery;

8. medical units (MED): comprising of adult patients admitted for care of general medical conditions;

9. rural units (RURAL): comprising of patients with a range of conditions and ages, cared for in relatively small hospitals in rural settings.

The hospitals were selected on the basis of obtaining a range of sizes (less than 100 beds, 101 to 499 beds, and 500 or more beds), rural and urban location, willingness of the director of nursing to permit nurses to participate, and convenience of location for data collection. Thirty-four hospitals were initially selected, but due to circumstances outside the control of the researchers (e.g., pending nurses' strikes), ten hospitals did not participate. Therefore, a total of 24 hospitals in Alberta, Canada were included in the study.

Since the level of analysis was the individual nurse, responses to questionnaires were required from nurses within each type of nursing subunit. The particular subunits

from which the nurses were drawn were chosen at the discretion of the nursing administrator in each hospital. In the interest of obtaining a large number of nurses for the study, each nursing administrator was encouraged to permit the participation of as many subunits as feasible for the hospital.

The study population consisted of 1,264 nursing staff members, from 156 nursing subunits. Of these respondents, 17.0 percent were employed in medical subunits, 22.8 percent in surgical, 7.5 percent in intensive care, 8.0 percent in rehabilitation, 8.5 percent in auxiliary, 12.4 percent in pediatric, 9.6 percent in psychiatric, 7.4 percent in obstetric, and 6.8 percent in rural. The majority (54.2 percent) were employed as staff nurses, while the second largest group (29.6 percent) were certified nursing aides; relatively few held positions as team leaders (4.8 percent), assistant head nurses (2.5 percent), nursing orderlies (5 percent), or ward aides (2.5 percent).

Fifty-seven percent of the respondents were 20 to 29 years of age, 22 percent were 30 to 39 years, and the remainder were 40 to 49 years (12.6 percent), 50 years or over (7.3 percent), or less than 20 years of age (1.0 percent).[1] With regard to level of education, only 4.5 percent

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[1] Because of the small number of nurses who were less than 20 years old, these were grouped together with nurses 20-29 years old, resulting in a category of nurses less than 30 years of age.

had university preparation, including three respondents with
master's degrees and 54 with bachelor's degrees. The larg-
est group of respondents (58 percent) was educated at the
diploma level; 55 percent were registered nurses and 3 per-
cent were registered psychiatric nurses. For the purposes
of this study, 37 percent of the respondents were classified
as having non-professional education, such as nursing aide,
nursing orderly, or on-the-job training. In terms of length
of nursing experience, those with nine years' experience or
more comprised the largest group (28.3 percent), while 24.4
percent had one to three years, 22.3 percent had three to
six years, 13.8 percent had six to nine years, and 11.2 per-
cent had less than one year's experience.

Measurement

Stress

For the purposes of this study, nurses' stress was
operationally defined as comprising two dimensions: the
level of stress perceived by nurses in relation to the vari-
ous possible sources of stress, and the frequency of occurr-
ence of each of the potentially stressful situations. In
addition, composite measures of stress were used which
reflected the levels of stress times the frequency of occurr-
ence of the situations. The derivation of these composite
stress measures was seen as important, since it was a way
of determining the total amount of stress reported by nurses

in relation to each potential source of stress. (For example, a nurse might perceive a high level of stress to be associated with a particular situation, but if the situation did not occur, it would not truly represent an important source of stress for that nurse.)

Some potential sources of stress, as identified primarily from the literature, included insufficient resources, conflicting demands, unclear responsibilities, personality conflicts, insufficient knowledge, staffing, workload, unfinished work, crisis, and relieving on other units. These sources of stress seemed to relate to the nature of the nurse's role. Other potential sources of stress were viewed in relation to patients and physicians. Indicators of patient-related stressors were if the patient's behavior was troublesome, prognosis poor, the patient was elderly, the patient was dying, or nursing care painful. Also, patients' families being upset or not informed of patients' conditions were seen as patient-related stressors. Indicators of physician-related stressors were if the physician was critical, unavailable, or non-communicative.

As part of the larger study designed to examine a range of organizational variables in nursing subunits, a questionnaire was developed to attempt to measure levels of stress and frequency of occurrence of stressful situa-

tions as perceived by nurses.[1] After pretesting with 20 nurses, a 21 items questionnaire was used (see Appendix A).

For each item, the nurses were asked to indicate how stressful the described situation was by answering "very little", "a little", "some", "quite a bit", or "very much", and to indicate how often the situation occurred on their unit by answering "never", "rarely", "sometimes", "often", or "always".

Job Satisfaction

Nurses' job satisfaction was operationally defined as the extent to which nurses report satisfaction with their jobs in terms of intrinsic, extrinsic and interpersonal satisfiers (Munson and Heda, 1974). The instrument to measure job satisfaction, a modification of Munson and Heda's instrument, is shown in Appendix B. Items 88, 89 and 90 were designed to measure intrinsic satisfaction, items 92 and 93 related to interpersonal satisfiers and item 96 to extrinsic satisfaction. The instrument also included questions about satisfaction with types of patients (item 94), with physical conditions of the workplace (item 97), with workload (item 98), and with overall work (item 91).

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[1] The original draft of the questionnaire to measure stress was developed by Sister Sheila Spooner. The face and content validity of the items was examined by Sister Spooner as part of the course requirements for HSA 531, Division of Health Services Administration, University of Alberta, Edmonton, 1977.

The instrument developed by Munson and Heda was tested
by them with 351 nurses to determine its reliability and
validity. The researchers concluded that it was reliable
and demonstrated sufficient construct validity to justify
its usefulness for measuring satisfaction as an organization
variable (Munson and Heda, 1974).

Other Variables

The instrument used to collect information about the
type of nursing subunit and biographic information concern-
ing the nurses is shown in Appendix C. Item 102 identified
the type of nursing subunit and items 100, 103 and 104
requested information about the nurses' age, educational
level, and experience, respectively.

Data Collection

The data were collected by research assistants over a
period of six weeks in May and June, 1977. For each hospital
selected, the nursing administrator was interviewed to
obtain general information regarding the nursing subunits
selected for inclusion in the study.

Data collection was scheduled for a given day(s) in
each hospital, at the convenience of the hospital staff.
All nurses on duty on a given day in each subunit included
in the study were asked to participate. The assumption was
made that the staffing pattern and the opinions of the nurses

on the data collection day(s) were representative of staff-
ing pattern and the opinions of the nurses on other days.
The types of nurses included were equivalent to the propor-
tion of professional to other categories of nursing staff
(nursing aides, orderlies and ward aides). An attempt was
made to obtain at least 50 percent of the registered nurses
and 50 percent of the other category of nurses allocated to
each unit.

For the nurses on each subunit, explanation sessions
lasting 45 to 60 minutes were conducted before data were
collected. These sessions included a five to seven minute
presentation describing the overall study and the five
classes of variables under investigation (technology,
environment, structure, process, and outcomes). The pre-
sentation was facilitated by the use of visual aids illust-
rating key words and concepts. Following the presentation,
nursing staff members were asked to complete the question-
naires. At this time, clarification of items was given as
requested by participants.

Participation in the project was on a completely volun-
tary basis, both in regard to the hospitals approached and
the individual nurses. Confidentiality of responses was
assured, that is, neither the individual nurse nor the
particular institution would be identified.

Data Analysis

Sources of stress for the nurses were delineated by examining the 21 items in terms of: (1) reported levels of stress, (2) reported frequency of occurrence of the situations, and (3) composite measures comprised of both level and frequency of occurrence of stress.

The levels of stress were determined by analyzing responses to the first half of the questions, which asked "How stressful is it if...". A score of one to five was assigned, depending upon the nurse's response to each question, with a score of one representing the lowest level of stress. In order to identify how stressful each situation was perceived to be, overall, in relation to the other situations, mean response scores were calculated for each item. The items were then rank ordered according to the level of stress they seemed to represent to the nurses. The same procedure was carried out using responses to the second half of the items, also scored on a scale from one to five, and the items were ranked according to their reported frequency of occurrence.

In order to obtain measures of stress which would take into account both the perceived levels of stress and the reported frequency of occurrence associated with each situation, composite stress scores were derived for each nurse on each of the 21 items. This was accomplished by multiplying the nurse's response score for the first half of each item

by her response score for the second half of the item. Mean composite stress scores were calculated for each item, and the 21 items were rank ordered accordingly. All further data analyses were performed using the nurses' composite stress scores.

Factor analysis of the composite stress scores was carried out in an attempt to identify the major types of stress being measured and to summarize the 21 items into categories. This is a descriptive technique which can serve to reduce an original set of variables to a smaller number of variables (factors) which are amenable to interpretation (Ferguson, 1971). Both orthogonal and oblique factor solutions were obtained, since it was not known whether or not the factors might be interrelated (Ferguson, 1971).

Once the most interpretable factor solution was obtained, factor scores were calculated for each nurse. F tests based on analysis of variance were performed on the factor scores to examine possible differences between groups of nurses on their stress factor scores. The use of this type of inferential technique necessitated the following assumptions, which underlie the statistical model associated with the F test:

1. that the scores or observations are independent;

2. that the scores are drawn from normally distributed populations;

3. that the populations have the same variance;

4. that the means in the normally distributed popula-

tion are linear combinations of "effects" due to rows and columns, i.e., that the effects are additive;

5. that the scale of measurement of the variables is at least interval. (Siegel, 1956, p. 19.)

For the F tests, grouping of the nurses was done according to the type of subunit in which the nurses worked, age, education, and experience. Where F tests were significant (α = .05), multiple comparison tests were carried out in an attempt to identify the source of each difference. As Ferguson (1971) points out, the problem of choosing a particular multiple comparison procedure to apply to a particular set of experimental data can be a difficult one. A major consideration is the relative importance attached to the possibility of making Type I and Type II errors. Type I error is the probability of asserting that a difference exists when it does not, while Type II error is the probability of asserting that there is no difference when a difference does in fact exist.

In terms of the likelihood of leading to Type I errors, available multiple comparison procedures can be ranked from least to greatest as follows: Scheffé, Tukey, Newman-Keuls, and Duncan. For Type II errors, the situation is reversed, with the Duncan procedure leading to the least number of errors and the Scheffé procedure the greatest number (Ferguson, 1971). The multiple comparison procedure used in this study was the Newman-Keuls (α = .05), as it seemed to represent a compromise between the chance of Type I and

and Type II errors. Also, according to Winer (1971), this
method is appropriate for testing differences when sample
sizes are unequal but not markedly different.

In order to test for possible effects upon stress fac-
tor scores due to interaction of nurses' age, education or
experience with the type of subunit where they worked, two-
way analysis of variance was also carried out.

Step-wise multiple regression analysis was performed
in an attempt to identify the best predictors of nurses'
scores on the stress factors. Possible predictors considered
were: type of subunit, age, education, experience, and inter-
action effects of type of subunit with age, education and
experience. The step-wise regression procedure seemed to
offer the most appropriate method for determining how the
variables (type of subunit, age, education, experience)
might be ranked as to their strength of relationship with
stress. Because the technique is based upon correlations,
an assumption had to be met regarding the data, i.e., that
the variables are quantitative in nature (of interval or
ratio scale) (Ferguson, 1971, p. 98). In order to meet this
criterion, dummy variables were created to replace type of
subunit and education, which were both categorical variables
(i.e., nominal scale).

In order to explore the relationship between stress
and job satisfaction, correlation and analysis of variance
were used. Pearson product-moment correlation coefficients
were calculated as measures of the relationship between nurses'

scores on each of the job satisfaction items and scores on each of the stress factors. For this technique to be appropriate, it had to be assumed that the variables were quantitative in nature and that the relationship between stress and job satisfaction could be expected to be a linear one.

On the basis of the literature, however, it was suspected that the relationship between stress and job satisfaction might not be linear. Rather, it seemed feasible that the greatest job satisfaction might occur in association with moderate levels of stress (an inverted-U type of relationship). For this reason, a second type of analysis was performed, which involved grouping nurses into three groups (lower than average stress, average stress, and higher than average stress), on the basis of their scores on each of the stress factors. Analysis of variance was then carried out to test for differences in scores on the job satisfaction items by stress.

CHAPTER IV

RESULTS AND DISCUSSION

This chapter is divided into five sections. First,
a description of the sources of stress is presented,
followed by the results of the factor analysis of stress
scores. Third, differences between groups of nurses on mean
stress factor scores are discussed, including prediction of
stress scores. Fourth, relationships between nurses' stress
and job satisfaction are examined. The final section repre-
sents a discussion of the key results.

Description of Sources of Stress

Reported Levels of Stress

The levels of stress associated with each of the 21
potentially stressful situations (items 67 to 87) were
determined by analyzing responses to the first half of the
questions, which asked "How stressful is it if...". The
percentages of nurses[1] responding "very little", "a little",
"some", "quite a bit", and "very much" to each item are
shown in Table 1. When modal responses are examined for

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[1] The reader is reminded that the definition of "nurse"
for this study included personnel with a range of educational
backgrounds (see Chapter III).

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TABLE 1

PERCEIVED LEVEL OF STRESS ASSOCIATED WITH EACH

SOURCE, AS INDICATED BY PERCENTAGE RESPONSES

TO FIRST HALF OF STRESS ITEMS

Item Number	Item Content	Responses (Level of Stress)				
		Very Little	A Little	Some	Quite a Bit	Very Much
67.	Insufficient resources	4.2	7.0	29.6	39.8[1]	19.4
68.	Conflicting demands	3.9	9.5	32.8	38.3	15.5
69.	Scope or resp. unclear	5.9	12.1	29.9	34.8	17.3
70.	Personality conflicts	4.4	7.4	22.8	36.7	28.6
71.	Insecure in knowledge or skills	4.3	8.8	26.2	42.2	18.5
72.	Physicians impatient or critical	5.1	10.5	28.5	33.2	22.8
73.	Physicians not available	2.3	5.9	24.1	38.7	29.0
74.	Physicians do not communicate	3.4	8.7	31.6	40.1	16.2
75.	Patient's behavior troublesome	4.7	11.7	37.9	32.7	13.0
76.	Patient very ill - prognosis poor	3.5	10.5	38.5	34.7	12.7
77.	Mostly elderly patients	18.2	19.6	36.7	18.8	6.6
78.	Painful treatments	7.2	13.9	39.6	28.7	10.6
79.	Family not informed	4.5	10.1	31.5	37.3	16.5
80.	Family upset	3.8	12.5	42.7	33.3	7.3
81.	Schedule and staffing unpredictable	7.5	11.0	31.3	32.7	17.4
82.	Workload heavy	3.8	7.3	18.5	40.9	29.4
83.	Suffering and death	4.4	7.4	27.1	38.3	22.9
84.	Unfinished work	7.2	13.9	37.8	29.7	11.3
85.	Crisis	5.3	9.8	32.0	39.9	13.0
86.	Relieving (same specialty)	26.0	22.8	31.5	14.1	5.5
87.	Relieving (different specialty)	10.9	13.6	23.6	31.1	20.8

[1] Modal category of response underlined.

each item, 14 of the 21 situations apparently suggested quite a bit of stress to the largest number of nurses. The remaining seven situations suggested some stress to the largest number of nurses. The highest agreement was for item 80 relating to a patient's family being upset, which represented some stress to 42.7 percent of the respondents. It is interesting to note that the majority of nurses reported either "some stress" or "quite a bit of stress" in relation to all 21 situations.

In order to determine how stressful each situation was perceived to be, overall, in relation to the other situations, mean responses of all the nurses were calculated for each item. The items were then rank ordered according to their mean responses, as shown in Table 2. Although no statistical testing was carried out on these means to determine whether the items differed from each other significantly, it appears that the highest level of stress for nurses was generated by physicians not being available (item 73), while relieving on the same specialty (item 86) suggested the lowest level of stress.

Frequency of Occurrence of Stressful Situations

Information regarding the frequency of occurrence of each potentially stressful situation was obtained from responses to the second half of the stress items, "How often does this situation occur on your unit?" The percentages of nurses answering "never", "rarely", "sometimes", "often",

TABLE 2

RANK ORDERING OF SOURCES OF STRESS BY AVERAGE

LEVEL OF STRESS REPORTED

Item Number	Item Content	N	Mean Response[1]
73.	Physicians not available	1243	3.862
82.	Workload heavy	1253	3.848
70.	Personality conflicts	1249	3.777
83.	Suffering and death	1236	3.680
67.	Insufficient resources	1255	3.632
71.	Insecure in knowledge or skills	1246	3.618
72.	Physicians impatient or critical	1243	3.582
74.	Physicians do not communicate	1244	3.572
68.	Conflicting demands	1253	3.520
79.	Family not informed	1245	3.513
69.	Scope or resp. unclear	1252	3.456
85.	Crisis	1236	3.455
76.	Patient very ill + prognosis poor	1248	3.426
81.	Schedule and staffing unpredictable	1249	3.414
75.	Patient's behavior troublesome	1244	3.377
87.	Relieving (different specialty)	1227	3.372
80.	Family upset	1251	3.286
84.	Unfinished work	1256	3.239
78.	Painful treatments	1232	3.216
77.	Mostly elderly patients	1173	2.759
86.	Relieving (same specialty)	1214	2.502

[1] Possible responses and assigned scores were: "very little stress" (1), "a little stress" (2), "some stress" (3), "quite a bit of stress" (4), "very much stress" (5).

and "always" are shown in Table 3. Considering modal response categories, the largest percentage of respondents reported that 12 situations (items) occurred "sometimes" on their unit, and eight situations occurred "rarely"; one situation was reported to occur "often" by the largest number of nurses.

As with the levels of stress, mean response scores of all nurses were calculated for the second half of each item. The situations (items) were then rank ordered according to their reported frequency of occurrence, as indicated in Table 4. It seems that a patient's behavior or personality being troublesome (item 75) was the most frequently occurring situation, overall, while being asked to relieve on a different specialty (item 87) occurred least frequently. Again, no significance testing was performed on these response means.

Composite Stress Scores

In order to obtain measures of stress which would take into account both the perceived levels of stress and the reported frequency of occurrence associated with each situation, composite stress scores were derived for each nurse on each of the 21 items. As explained in Chapter III, this was accomplished by multiplying the nurse's response score for the first half of each item by her response score for the second half of the item, that is, the level of perceived stress times the frequency of occurrence of the situation.

TABLE 3

PERCEIVED FREQUENCY OF OCCURRENCE OF SITUATIONS,

AS INDICATED BY PERCENTAGE RESPONSES TO

SECOND HALF OF STRESS ITEMS

Item Number	Item Content	Frequency of Occurrence (% Responses)				
		Never	Rarely	Some-times	Often	Always
67.	Insufficient resources	1.0	22.0	54.3[1]	21.5	1.1
68.	Conflicting demands	1.0	24.0	55.2	18.8	0.9
69.	Scope or resp. unclear	4.5	50.7	37.5	6.9	0.5
70.	Personality conflicts	2.6	36.3	46.5	12.3	2.3
71.	Insecure in knowledge or skills	2.0	40.2	51.9	5.8	0.1
72.	Physicians impatient or critical	3.1	45.4	45.3	6.0	0.2
73.	Physicians not available	1.6	25.5	53.3	18.8	0.3
74.	Physicians do not communicate	2.5	30.7	53.7	12.4	0.8
75.	Patient's behavior troublesome	0.6	13.7	56.4	27.1	2.2
76.	Patient very ill - prognosis poor	2.4	24.7	40.7	30.3	1.8
77.	Mostly elderly patients	20.9	14.9	23.4	29.7	11.1
78.	Painful treatments	6.7	41.2	37.1	13.6	1.3
79.	Family not informed	9.2	55.3	31.7	3.5	0.2
80.	Family upset	0.7	17.4	52.5	27.9	1.4
81.	Schedule and staffing unpredictable	4.8	33.3	39.6	20.2	2.2
82.	Workload heavy	3.8	24.5	44.7	24.1	2.8
83.	Suffering and death	10.3	36.0	30.6	21.1	1.9
84.	Unfinished work	1.4	38.7	51.4	8.0	0.6
85.	Crisis	6.7	57.2	30.4	5.3	0.4
86.	Relieving (same specialty)	16.9	41.1	32.7	8.6	0.7
87.	Relieving (different specialty)	19.5	44.9	27.1	7.5	1.1

[1] Modal category of response underlined.

TABLE 4

RANK ORDERING OF SOURCES OF STRESS BY AVERAGE

FREQUENCY OF OCCURRENCE REPORTED

Item Number	Item Content	N	Mean Response[1]
75.	Patient's behavior troublesome	1245	3.164
80.	Family upset	1251	3.119
76.	Patient very ill - prognosis poor	1246	3.045
67.	Insufficient resources	1253	2.997
82.	Workload heavy	1252	2.975
77.	Mostly elderly patients	1178	2.953
68.	Conflicting demands	1252	2.945
73.	Physicians not available	1241	2.916
81.	Schedule and staffing unpredictable	1249	2.816
74.	Physicians do not communicate	1245	2.783
70.	Personality conflicts	1246	2.754
83.	Suffering and death	1248	2.684
84.	Unfinished work	1254	2.677
71.	Insecure in knowledge or skills	1244	2.617
78.	Painful treatments	1246	2.616
72.	Physicians impatient or critical	1243	2.547
69.	Scope or resp. unclear	1249	2.482
85.	Crisis	1232	2.356
86.	Relieving (same specialty)	1224	2.351
79.	Family not informed	1245	2.301
87.	Relieving (different specialty)	1233	2.257

[1] Possible responses and assigned scores were: "never" (1), "rarely" (2), "sometimes" (3), "often" (4), "always" (5).

All further data analyses were done using these composite stress scores, since they seemed to best represent the total amount of stress reported by nurses in relation to each potential source of stress.

Table 5 shows the ordering of items by their mean composite stress scores. Heavy workload (item 82) seemed to be responsible for the greatest number of stress (considering both stress level and frequency of occurrence), while being asked to relieve on the same specialty (item 86) was associated with the least stress, overall.

Factor Analysis of Composite Stress Scores

Factor analysis of the composite stress scores was performed in an attempt to identify the major types of stress being measured by the items and to summarize the 21 items into categories.' Both orthogonal and oblique analyses were carried out. The most interpretable solution, while still explaining a reasonable percentage of variance (59.5 percent) was a four factor oblique solution (n = 1075). Seven items (67, 69, 70, 71, 75, 79, 85) were eliminated because of low communalities (i.e., less than .4). The final factor structure, an oblique solution, is shown in Table 6.

The four factors were described and labelled in terms of the items which loaded highly on each factor, although it is recognized that low loadings also contribute, indirectly, by saying what the factor is not.

TABLE 5   )

RANK ORDERING OF SOURCES OF STRESS BY AVERAGE

COMPOSITE STRESS SCORE[1]

Item Number	Item Content	N	Mean Composite Score
82.	Workload heavy	1251	11.782
73.	Physicians not available	1240	11.381
67.	Insufficient resources	1251	11.098
75.	Patient's behavior troublesome	1242	10.816
70.	Personality conflicts	1244	10.672
68.	Conflicting demands	1251	10.606
76.	Patient very ill - prognosis poor	1244	10.404
80.	Family upset	1249	10.320
74.	Physicians do not communicate	1242	10.072
81.	Schedule and staffing unpredictable	1248	10.021
83.	Suffering and death	1235	9.815
71.	Insecure in knowledge or skills	1241	9.637
72.	Physicians impatient or critical	1240	9.289
84.	Unfinished work	1253	8.908
69.	Scope or resp. unclear	1251	8.739
78.	Painful treatments	1228	8.401
77.	Mostly elderly patients	1171	8.369
85.	Crisis	1227	8.221
79.	Family not informed	1243	8.202
87.	Relieving (different specialty)	1225	7.701
86.	Relieving (same specialty)	1212	6.148

[1] Possible range for composite stress scores was 1 to 25.

TABLE 6

FACTOR ANALYSIS OF COMPOSITE STRESS SCORES -
OBLIQUE SOLUTION

Item Number	Item Content	Communalities	Factors[1]			
			I	II	III	IV
68.	Conflicting demands	.448	.356	.110	-.563	-.503
72.	Physicians impatient or critical	.557	.283	.252	-.740	-.180
73.	Physicians not available	.606	.248	.192	-.778	-.253
74.	Physicians do not communicate	.662	.320	.158	-.809	-.280
76.	Patient very ill - prognosis poor	.691	.831	.072	-.261	-.284
77.	Mostly elderly patients	.465	.339	-.081	-.062	-.635
78.	Painful treatments	.617	.773	.170	-.293	-.209
80.	Family upset	.532	.712	.119	-.383	-.322
81.	Schedule and staffing unpredictable	.571	.185	.362	-.377	-.688
32.	Workload heavy	.642	.366	.102	-.320	-.794
33.	Suffering and death	.649	.785	.041	-.234	-.441
84.	Unfinished work	.469	.284	.382	-.393	-.595
86.	Relieving (same specialty)	.649	.125	.817	-.147	-.229
87.	Relieving (different specialty)	.723	.123	.841	-.282	-.049

[1] Loadings of .50 or greater are underlined.

<u>Factor I: Patient-Related Stress</u>. The first factor related primarily to patients' illness and prognosis (item 76), to patients' suffering (items 78 and 83), and to patients' families (item 80).

<u>Factor II: Relieving-Related Stress</u>. Only items 86 and 97 loaded highly on the second factor, and these concerned being asked to relieve on other nursing units.

<u>Factor III: Low Physician-Related Stress</u>. Of the four items loading highly on this factor (items 68, 72, 73 and 74), the three highest loadings were for items related to physicians being critical, unavailable, or non-communicative. Because the loadings were high-negative, the direction of the factor suggested lack of stress from these sources, so the factor was labelled "low physician-related stress".

<u>Factor IV: Low Workload-Related Stress</u>. Factor IV appeared to relate primarily to workload. While only two of the high loading items specifically concerned workload (items 82 and 84), it was assumed that items such as 77 (patients mostly elderly) and 81 (scheduling and staffing unpredictable) could also represent situations of increased workload for nurses. Since all the loadings of these items were high-negative, this factor was labelled "low workload-related stress".

<u>Factor Correlations</u>. As Table 7 shows, there were some correlations among the stress factors. Factors I and III were negatively correlated (-.330). This seemed to indicate that where stress related to patients was high,

TABLE 7

FACTOR CORRELATIONS

Stress Factors	I Patient- Related	II Relieving- Related	III Low Physician- Related
II Relieving- Related	.091	–	
III Low Physician-Related	-.330	-.265	
IV Low Workload-Related	-.367	-.141	.306

physician-related stress was also high. Such a relationship is not surprising, since stress due to physicians being unavailable or non-communicative would likely be greater in situations where the patients were very ill or the family was upset.

Factor I also correlated negatively (-.367) with factor IV. This relationship suggests that where patient-related stress was high, workload-related stress was also high. One possible explanation for the relationship might be that patients who are very ill require more nursing care, thus increasing the workload for nursing staff.

Although not high, the correlation of -.265 between factors II and III suggested that stress related to relieving on other units was not completely independent of physician-related stress.

Differences Between Groups of Nurses
on Stress Factor Scores

On the basis of the factor solution shown in Table 6, factor scores[1] were calculated for each respondent on each of the four stress factors (n = 1075), and analyses of variance were then performed to see if there were differences between groups of nurses on the mean factor scores for each

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[1] Factor scores have a mean of 0 and a standard deviation of 1.

group. Grouping of the nurses was done according to the type of subunit in which they worked, age, education and experience.

It must be pointed out at this time that, when cross-tabulations of the data were performed, nurses in the different types of subunits were found to be non-equivalent on each of the demographic variables (age, education, experience), as determined by the Chi Square values shown in Table 8 (see Appendix D for complete cross-tabulations). Therefore, any apparent relationship between nurses' stress and any one of the grouping variables might include some influence of the other grouping variables upon composite stress scores. The reader is asked to keep this limitation in mind when considering the following results of analysis of variance in stress factor scores by each of the variables.

Nurses in Different Types of Subunits

Results of the analysis of variance on mean stress factor scores for nurses in the nine different types of subunits are shown in Table 9. Significant differences (α = .05) were found between nurses in different types of subunits on mean scores for all four stress factors.

Type of Subunit and Patient-Related Stress. As Table 10 indicates, the Multiple Range Test for type of subunit and patient-related stress factor scores found that nurses were divided into five distinct groups according to their mean scores on this factor. The highest mean score was for

TABLE 8

RESULTS OF CROSS-TABULATIONS[1] OF TYPE OF SUB-
UNIT BY AGE, EDUCATION AND EXPERIENCE

Variables	x^2	d.f.	Prob.
Age by type of unit	142.922	24	.000
Education by type of unit	140.856	16	.000
Experience by type of unit	141.672	32	.000

[1] See tables in Appendix D.

TABLE 9

ANALYSIS OF VARIANCE ON STRESS FACTOR SCORES

BY TYPE OF SUBUNIT[1]

Stress Factor	d.f.	Sum of Squares	Mean Squares	F Value	F Prob.
I. Patient-Related					
Between	8	238.534	29.817	38.043	.000*
Within	1066	835.495	0.784		
Total	1074	1074.028			
II. Relieving-Related					
Between	8	107.751	13.469	14.859	.000*
Within	1066	966.272	0.906		
Total	1074	1074.023			
III. Low Physician-Related					
Between	8	38.519	4.815	4.957	.000*
Within	1066	1035.523	0.971		
Total	1074	1074.041			
IV. Low Workload-Related					
Between	8	154.487	19.311	22.387	.000*
Within	1066	919.529	0.863		
Total	1074	1074.016			

[1] Scores were grouped according to the type of subunit in which the nurses worked: MED (n=181), SURG (n=250), ICU (n=79), REHAB (n=84), AUX (n=87), PEDS (n=135), PSYCH (n=101), OBS (n=84), RURAL (n=74).

* Indicates significant at 0.05 level.

TABLE 10

MULTIPLE RANGE TEST FOR TYPE OF SUBUNIT

AND PATIENT-RELATED STRESS FACTOR SCORES

Group Mean Factor Scores			
Subset 1*			
OBS			
-0.944			
Subset 2			
PSYCH	REHAB		
-0.562	-0.315		
Subset 3			
SURG	PEDS	RURAL	AUX
-0.065	0.022	0.050	0.168
Subset 4			
MED			
0.405			
Subset 5			
ICU			
1.068			

* A subset represents groups whose means did
not differ significantly (α = .05).

nurses working in ICU, which indicates that ICU nurses reported significantly more stress related to patients than did other nurses.

Nurses in medical subunits reported significantly less patient-related stress than did ICU nurses, but more than nurses in other types of subunits. The third highest group, in terms of patient-related stress factor scores, included nurses in auxiliary, rural, pediatric and surgical subunits. Next highest was a group which included nurses in rehabilitation and psychiatric units. Nurses employed in obstetric[1] units reported the lowest patient-related stress.

Type of Subunit and Relieving-Related Stress. The Multiple Range Test (Table 11) for type of subunit and relieving-related stress factor scores found that nurses in pediatrics were significantly higher than other groups of nurses on mean scores for this factor.

The other two subsets, or groups of nurses, did not represent clear-cut categories. However, nurses in auxiliary units and rural units were significantly lower than nurses in obstetric units on relieving-related stress factor scores.

Type of Subunit and Low Physician-Related Stress. As shown in Table 12, the Multiple Range Test for type of subunit and low physician-related stress factor scores identified two groups of nurses, but these were not distinct cate-

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[1] The reader is reminded that "obstetric" units included antepartum and postpartum units, but not labor and delivery or nurseries.

TABLE 11

MULTIPLE RANGE TEST FOR TYPE OF SUBUNIT AND
RELIEVING-RELATED STRESS FACTOR SCORES

			Group Mean Factor Scores			
Subset 1*						
AUX	RURAL	REHAB	PSYCH	ICU	MED	SURG
-0.308	-0.488	-0.181	-0.149	-0.125	-0.098	0.027
Subset 2						
REHAB	PSYCH	ICU	MED	SURG	OBS	
-0.181	-0.149	-0.125	-0.098	0.037	0.155	
Subset 3						
PEDS						
0.728						

* A subset represents groups whose means did not differ
  significantly ($\alpha = .05$).

TABLE 12

MULTIPLE RANGE TEST FOR TYPE OF SUBUNIT AND
LOW PHYSICIAN-RELATED STRESS FACTOR SCORES

Group Mean Factor Scores

Subset 1*

ICU	PEDS	SURG	OBS	REHAB
-0.359	-0.279	-0.061	-0.042	0.044

Subset 2

SURG	OBS	REHAB	MED	RURAL	AUX	PSYCH
-0.061	-0.042	0.044	0.115	0.168	0.252	0.256

* A subset represents groups whose means did not differ significantly (α = .05).

gories. Nevertheless, on mean scores for this factor, nurses in ICU and pediatrics were significantly lower than nurses in medical, rural, auxiliary and psychiatric units. Because of the negative direction of the factor, this finding means that ICU and pediatric nurses reported the greatest amount of stress related to physicians being unavailable, critical, or non-communicative.

Type of Subunit and Low Workload-Related Stress. The results of the Multiple Range Test (Table 13) for type of subunit and low workload-related stress show that nurses grouped into three distinct categories on the basis of mean scores on this factor. Nurses in auxiliary units scored lowest on this factor, which is negative in direction. This indicates that auxiliary nurses actually reported the greatest stress due to workload.

The group of respondents which stood apart as reporting the lowest workload-related stress included nurses in psychiatric, obstetric, and pediatric units.

Nurses of Different Ages

Results of the analysis of variance on stress factor scores for nurses of different ages are shown in Table 14. Significant differences ($\alpha = .05$) were found on factors I, III and IV.

Age and Patient-Related Stress. Although the F test had shown significant differences on mean patient-related stress factor scores for nurses in different age groups, the

TABLE 13

MULTIPLE RANGE TEST FOR TYPE OF SUBUNIT AND
LOW WORKLOAD-RELATED STRESS FACTOR SCORES

Group Mean Factor Scores

Subset 1*

AUX
-0.898

Subset 2

RURAL	MED	ICU	REHAB	SURG
-0.219	-0.197	-0.075	-0.073	-0.027

Subset 3

PSYCH	OBS	PEDS
0.304	0.494	0.564

* A subset represents groups whose means did not differ
significantly (α = .05).

TABLE 14

ANALYSIS OF VARIANCE ON STRESS FACTOR

SCORES BY AGE[1]

Stress Factor	d.f.	Sum of Squares	Mean Squares	F Value	F Prob.
I. Patient-Related					
Between	3	10.122	3.374	3.394	.017*
Within	1064	1057.668	.994		
Total	1067	1067.790			
II. Relieving-Related					
Between	3	5.817	1.939	1.944	.121
Within	1064	1061.120	.977		
Total	1967	1066.938			
III. Low Physician-Related					
Between	3	24.144	8.048	8.264	.000*
Within	1064	1036.132	.979		
Total	1067	1060.276			
IV. Low Workload-Related					
Between	3	7.814	2.605	2.631	.049*
Within	1064	1053.442	.990		
Total	1067	1061.256			

[1] Scores were grouped according to the ages of respondents: (1) less than 30 years (n=637), (2) 30-39 years (n=238), (3) 40-49 years (n=120), (4) 50 years or more (n=73).

* Indicates significant at 0.05 level.

Multiple Range Test (Table 15) identified a single subset. Therefore, nurses of different ages must be considered equivalent in terms of the amount of patient-related stress they reported.

Age and Low Physician-Related Stress. As shown in Table 16, the Multiple Range Test for age and mean factor scores for low physician-related stress indicated that nurses under 30 years of age reported significantly more physician-related stress than did other nurses.

Age and Low Workload-Related Stress. Only one subset resulted from the Multiple Range Test for age and low workload-related stress, as shown in Table 17, indicating that nurses of different ages did not differ significantly in terms of reported workload-related stress.

Nurses with Different Educational Levels

As Table 18 indicates, the analysis of variance on stress factor scors by level of education of nurses found significant differences (α = .05) for the patient-related and physician-related stress factors.

Education and Patient-Related Stress. The results of the Multiple Range Test for education and mean patient-related stress factor scores are shown in Table 19. Although the two subsets were not distinct categories, it can be said that the non-professionally educated group was significantly lower than the diploma level group on mean scores for this factor.

TABLE 15

MULTIPLE RANGE TEST FOR AGE AND PATIENT-

RELATED STRESS FACTOR SCORES

Group Mean Factor Scores			
Subset 1*			
50 years or >	40-49 years	30-39 years	< 30 years
-0.169	-0.143	-0.078	0.380

* A subset represents groups whose means did not differ
significantly (α = .05).

TABLE 16

MULTIPLE RANGE TEST FOR AGE AND LOW

PHYSICIAN-RELATED STRESS FACTOR SCORES

Group Mean Factor Scores		
Subset 1*		
< 30 years		
-0.112		
Subset 2		
30-39 years	40-49 years	50 years or >
0.068	0.242	0.331

* A subset represents groups whose means did
not differ significantly (α = .05).

TABLE 17

MULTIPLE RANGE TEST FOR AGE AND LOW

WORKLOAD-RELATED STRESS FACTOR SCORES

Group Mean Factor Scores			
Subset 1*			
50 years or >	< 30 years	30-39 years	40-49 years
-0.128	-0.026	0.004	0.228

* A subset represents groups whose means did not differ significantly (α = .05).

TABLE 18

ANALYSIS OF VARIANCE ON STRESS FACTOR

SCORES BY EDUCATION[1]

Stress Factor	d.f.	Sum of Squares	Mean Squares	F Value	F Prob.
I. Patient-Related					
Between	2	10.076	5.038	5.059	.007*
Within	1061	1056.592	.996		
Total	1063	1066.668			
II. Relieving-Related					
Between	2	2.384	1.192	1.186	.306
Within	1061	1066.152	1.005		
Total	1063	1068.536			
III. Low Physician-Related					
Between	2	39.515	19.758	20.622	.000*
Within	1061	1016.535	.958		
Total	1063	1056.050			
IV. Low Workload-Related					
Between	2	2.527	1.263	1.275	.280
Within	1061	1051.603	.991		
Total	1063	1054.130			

[1] Scores were grouped according to the level of education of respondents:
(1) university degree, (2) professional diploma, (3) non-professional.

* Indicates significant at 0.05 level.

TABLE 19

MULTIPLE RANGE TEST FOR EDUCATION AND
PATIENT-RELATED STRESS FACTOR SCORES

Group Mean Factor Scores	
Subset 1*	
Non-Prof.	Degree
-1.1215	0.0429
Subset 2	
Degree	Diploma
0.429	0.0806

* A subset represents groups whose means
did not differ significantly ($\alpha = .05$).

Education and Low Physician-Related Stress. Table 20 shows the results of the Multiple Range Test for education and low physician-related stress factor scores. Nurses were grouped into three distinct subsets on their mean scores for this factor, with the degree level group reporting the greatest amount of physician-related stress, the diploma level group the next greatest, and the non-professionally educated group the least.

Nurses with Different Lengths of Experience

Table 21 shows the results of the analysis of variance on mean stress factor scores by length of nursing experience. As was found in the analysis related to education, the significant results were for factors I and III.

Experience and Patient-Related Stress. As indicated in Table 22, the Multiple Range Test for experience and patient-related stress factor scores identified two subsets, or groups of nurses. Because these were not exclusive categories, the only difference that can be concluded to be significant is that between nurses with nine years experience or more and nurses with one to three years experience, with the more experienced group reporting less patient-related stress.

Experience and Low Physician-Related Stress. The results of the Multiple Range Test for experience and low physician-related stress are shown in Table 23. Again, although two subsets were identified, only the difference

TABLE 20

MULTIPLE RANGE TEST FOR EDUCATION

AND LOW PHYSICIAN-RELATED STRESS

FACTOR SCORES

Group Mean Factor Scores
Subset 1*
Degree
-0.4542
Subset 2
Diploma
-0.1199
Subset 3
Non-Prof.
0.2293

* A subset represents groups
  whose means did not differ
  significantly (α = .05).

TABLE 21

ANALYSIS OF VARIANCE ON STRESS FACTOR

SCORES BY EXPERIENCE[1]

Stress Factor	d.f.	Sum of Squares	Squares	F Value	F Prob.
I. Patient-Related					
Between	4	10.774	2.694	2.723	.028*
Within	1055	1043.663	.989		
Total	1059	1054.437			
II. Relieving-Related					
Between	4	5.044	1.261	1.256	.286
Within	1055	1059.227	1.004		
Total	1059	1064.271			
III. Low Physician-Related					
Between	4	18.656	4.664	4.775	.001*
Within	1055	1030.440	.977		
Total	1059	1049.096			
IV. Low Workload-Related					
Between	4	4.129	1.032	1.044	.383
Within	1055	1043.300	.989		
Total	1059	1047.429			

Scores are grouped according to the length of nursing experience of the respondents: (1) less than one year (n=122), (2) 1-3 years (n=259), (3) 3-6 years (n=243), (4) 6-9 years (n=148), (5) 9 or more years (n=288).

* Indicates significant at 0.05 level.

TABLE 22

MULTIPLE RANGE TEST FOR EXPERIENCE AND

PATIENT-RELATED STRESS FACTOR SCORES

Group Mean Factor Scores			
Subset 1*			
9 years or >	< 1 year	6-9 years	3-6 years
-0.143	-0.039	0.002	0.068
Subset 2			
< 1 year	6-9 years	3-6 years	1-3 years
-0.0358	0.002	0.068	0.118

* A subset represents groups whose means did not differ
  significantly (α = .05).

TABLE 23

MULTIPLE RANGE TEST FOR EXPERIENCE AND LOW

PHYSICIAN-RELATED STRESS FACTOR SCORES

Group Mean Factor Scores			
Subset 1*			
1-3 years	3-6 years	< 1 year	6-9 years
-0.161	-0.067	-0.046	0.013
Subset 2			
< 1 year	6-9 years	9 years or >	
-0.046	0.013	0.192	

* A subset represents groups whose means did not differ significantly (α = .05).

between nurses with one to three years' experience and nurses with nine years or more experience can be considered to be significant. Because of the negative direction of this factor, it seems that the nurses with one to three years experience reported more physician-related stress than did the more experienced group.

Combined Effects of Type of Subunit and Demographic Variables on Stress

For all of the preceding results, differences between nurses on mean stress factor scores seemed to represent, to some degree, a combined influence of the nurses' personal characteristics (age, education, and experience) and the type of subunit in which the nurses worked. In an attempt to gain a clearer picture of any such relationships which might exist, a series of two-way analyses of variance was carried out to test for effects upon stress factor scores resulting from interactions of type of subunit with age, type of subunit with education, and type of subunit with experience.

Only one significant (α = .05) interaction effect was found from these analyses, and that concerned the effect of type of subunit with experience upon the low physician-related stress factor scores (P = 0.001). Because of this finding, it would be incorrect to draw any conclusions regarding the relationship between either experience of type of subunit and physician-related stress. One can merely say that experience influences the reported amount of physician-

related stress for nurses in certain types of subunits, or vice versa.

Predicting Nurses' Stress Factor Scores

The results of the analyses of variance on nurses' stress factor scores did not provide much indication as to how the variables (type of unit, age, education, experience) might be ranked according to their strength of relationship with stress. For this reason, it seemed appropriate to use all of these variables to predict nurses' scores on the stress factors and to attempt to identify which of the variables were the best predictors of nurses' stress.

Table 24 provides a summary of the results of the step-wise multiple regression analysis of stress factor scores with type of subunit, age, education, experience, and inter-action terms for type of unit with the other three variables. Because type of unit and education were categorical rather than continuous variables, some adjustment was necessary to make them appropriate for regression analysis. Eight dummy variables (or subunit categories) were created to replace the variable "type of unit" and nurses were scored as to their presence or absence in that category. The new variables were labelled: working in MED, working in SURG, working in ICU, working in AUX, working in PEDS, working in PSYCH,

TABLE 24

STEPWISE MULTIPLE REGRESSION - STRESS-FACTOR SCORES WITH TYPE OF UNIT,[1] AGE, EDUCATION,[2] EXPERIENCE, AND INTERACTION TERMS[3]

Stress Factor	Predictor[4]	Mult. r	r Square	r Square Change	Simple r	B	Beta
I. Patient-Related	Working in ICU	.303	.092	.092	.303	1.207	.319
	Working in OBS	.394	.155	.063	-.275	-.721	-.195
	Prof. educ. and working in MED	.444	.197	.042	.199	-.565	-.179
	Working in PSYCH	.470	.221	.027	-.189	-1.037	-.296
	Constant					-.619	
II. Relieving-Related	Working in PEDS	.275	.076	.076	.275	-.015	-.005
	Working in RURAL	.295	.087	.011	-.134	.542	.138
	Constant					.312	
III. Low Physician-Related	Prof. educ.	.175	.031	.031	-.175	-.158	-.077
	Age	.217	.047	.016	.151	-.136	-.127
	Constant					-.148	
IV. Low Workload-Related	Working in AUX	.269	.073	.073	-.269	-.420	-.114
	Working in PEDS	.328	.108	.035	.216	1.213	.406
	Working in OBS	.358	.128	.021	.142	.385	.104
	Working in PSYCH	.376	.141	.013	.094	.907	.260
	Constant					-.570	

[1] Dummy variables used for Type of Unit (since it is a categorical variable).

[2] Dummy variables used for Education (a categorical variable).

[3] Interaction terms created for each type of unit with age, education, experience.

[4] Only predictors explaining at least 1 percent of variance in stress factor scores are shown.

working in OBS, and working in RURAL.[1] Similarly, for educa-
tional level, two dummy variables were created and labelled
professional education and non-professional education.

Of the 44 possible predictors used for this analysis,
the variables which best predicted nurses' stress factor
scores were as follows.

Factor I - Patient-Related Stress. As shown in Table
24, there were only four variables which explained at least
1 percent of the variance in patient-related stress factor
scores. The best predictor was "working in ICU", which
explained 9.2 percent of the variance and was correlated
.303 with patient-related stress. This finding lends further
support to the literature which indicates that ICU nurses
are exposed to considerable stress in their jobs, at least
from patient-related sources.

"Working in OBS" explained 6.3 percent of the variance
in nurses' patient-related stress factor scores and was
correlated -.275 with this type of stress. This is consist-
ent with the results of analysis of variance which demonst-
rated that nurses in obstetric units reported the least
patient-related stress, overall.

The third best predictor represented an interaction

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[1] The use of this technique necessitates the absence
of one of the original categories as a predictor, since it
becomes the constant in the regression equation. For this
analysis, "working in REHAB" was the constant, since on a
trial run of the analysis, it was not found to be a good
predictor of any of the four kinds of stress.

effect of being professionally educated and working in a medical unit, and explained 3.9 percent of the variance. The positive correlation of this variable with patient-related stress is to be expected, since nurses in medical units were second highest on scores for this factor in the analysis of variance by type of unit, and since diploma educated nurses were the highest storing group in the analysis of variance on patient-related stress scores by educational level.

"Working in PSYCH" explained 2.7 percent of the variance and was negatively correlated with patient-related stress, indicating that nurses in psychiatric units tended to report less stress related to patients than did nurses in some other areas.

Age, experience, and working in SURG, PEDS, AUX or RURAL did not appear to be good predictors of patient-related stress reported by nurses.

Overall, it seems that the best predictability of nurses' stress due to patient-related sources was achieved by knowing the type of subunit in which the nurses worked, particularly by knowing whether they worked in ICU, obstetrics, medicine or psychiatry. This suggests that the amount of patient-related stress which nurses reported was more a function of certain types of unit where they worked than of their age, education or experience.

Factor II - Relieving-Related Stress. Only two variables explained at least 1 percent of the variance in nurses'

scores on the second stress factor. "Working in PEDS" explained 7.6 percent of the variance and was correlated .275 with relieving-related stress, confirming the analysis of variance results which indicated that pediatric nurses reported more stress of this type than did other nurses. "Working in RURAL" explained 1.1 percent of the variance and was correlated -.135 with relieving-related stress.

Age, education, experience, and working in the other types of subunits were not found to be good predictors of nurses' stress related to relieving.

Factor III - Low Physician-Related Stress. The best predictor of scores on this factor was "professional education", accounting for 3.1 percent of the variance. The correlation was -.175 which seems to indicate that professional education was associated with greater stress related to physicians.

"Age" was the second best predictor of nurses' scores on the low physician-related stress factor. The correlation was positive (.151), but since the factor represents low physician-related stress, it can be interpreted to mean that older nurses reported less stress related to physicians.

Nurses' experience and the type of subunit in which they worked did not predict the amount of physician-related stress as well as did age or educational level.

Factor IV - Low Workload-Related Stress. "Working in AUX" best predicted nurses' scores on the fourth factor, explaining 7.3 percent of the variance. The correlation of

-.269 indicates that nurses in auxiliary units reported high workload-related stress. "Working in PEDS", "working in OBS", and "working in PSYCH" were the next best predictors of stress due to workload, accounting for 3.5 percent, 2.1 percent and 1.3 percent of the variance, respectively. These variables were all positively correlated with the factor, which means that working in pediatrics, obstetrics, or psychiatry was associated with low workload-related stress. These findings are in complete agreement with the results of the analysis of variance on workload-related stress factor scores by type of subunit.

Age, education, and experience were generally not found to be good predictors of nurses' workload-related stress.

In summary, it can be said that type of subunit was the best predictor of nurses' scores on the first, second, and fourth stress factors. Thus, if one wished to estimate nurses' stress from patient-related, relieving-related, or workload-related sources, knowing which type of unit the nurses worked in would be more helpful than any information about age, education, or experience. It would be particularly useful to know if the nurses worked in ICU, obstetrics, pediatrics or auxiliary units.

It is interesting that physician-related stress stood apart from the other stress factors, being best predicted by nurses' age and educational level. It appears that stress related to physicians was determined to a greater extent by

nurses' demographic characteristics than by the kinds of specialties in which the nurses worked.

Perhaps the most important point to note when interpreting the multiple regression results is the large percentage of variance left unexplained (greater than 75 percent for each stress factor). Thus, although some of the variables in this study were useful in predicting nurses' stress, the reasons why groups of nurses reported different amounts of stress remain largely unidentified (i.e., as error variance).

Stress and Job Satisfaction

The correlations between nurses' scores on the 11 job satisfaction items and their scores on the four stress factors are shown in Table 25. Taking into account the negative direction of the third and fourth stress factors, it can be seen that all significant ($\alpha = .05$) correlations were negative. This suggests that high stress was generally associated with low job satisfaction and vice versa.

The highest correlation (.465) was between satisfaction with workload and low workload-related stress, and the second highest (.286) was between satisfaction with doctors and low physician-related stress. These findings seems to provide some evidence of validity of the measurement of stress and job satisfaction.

Although most of the correlations are not high, they

TABLE 25

CORRELATION BETWEEN SCORES ON JOB SATISFACTION
ITEMS AND STRESS FACTOR SCORES

Satisfaction Items		Stress Factors			
Number	Item Content	Patient-Related	Relieving-Related	Low Physician-Related	Low Workload-Related
88.	Oppor. to use skills	.033 P=.140	-.012 P=.345	.082* P=.003	.168* P=.001
89.	Accomplishment	-.008 P=.395	-.013 P=.335	.139* P=.001	.172* P=.001
90.	Do important things	.017 P=.292	-.026 P=.195	.108* P=.001	.178* P=.001
91.	Kind of work	.012 P=.480	.041 P=.090	.056* P=.034	.163* P=.001
92.	Head nurse	-.064* P=.018	-.066* P=.016	.133* P=.001	.244* P=.001
93.	Co-workers	.032 P=.149	-.053* P=.043	.077* P=.006	.187* P=.001
94.	Types of patients	-.059* P=.028	.039 P=.102	-.010 P=.376	.267* P=.001
95.	Doctors	-.032 P=.150	-.075* P=.007	.286* P=.001	.148* P=.001
96.	Salary	-.072* P=.009	-.090* P=.002	.115* P=.001	.148* P=.001
97.	Physical conditions	-.054* P=.038	.022 P=.236	.145* P=.001	.197* P=.001
98.	Workload	-.122* P=.001	-.021 P=.250	.144* P=.001	.465* P=.001

* Indicates correlation is significantly greater than zero (α = .05).

do tend to indicate that stress represented a "negative" thing, at least in relation to nurses' job satisfaction.

The results of the analysis of variance[1] on mean job satisfaction scores by stress are shown in Appendix D. Significant differences (α = .05) between the groups of nurses (i.e., those reporting lower than average, average, or higher than average stress) were found on certain job satisfaction items. For patient-related, physician-related and workload-related stress, the multiple range tests for differences in job satisfaction scores seemed to indicate a negative linear relationship between stress and job satisfaction. Specifically, the nurses who reported higher than average stress from these sources generally reported the least job satisfaction, and the greatest job satisfaction was generally associated with lower than average stress. Because of these findings in the analysis of variance, it appears that the correlation coefficients previously reported can be considered to be appropriate indicators of the degree of relationship between nurses' job satisfaction and stress

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[1] Nurses were divided into three groups on the basis of their scores on each of the four stress factors. For factors I and II, the groups were: (1) lower than average stress group (those with factor scores of -.5 or less), (2) average stress group (factor scores between -.5 and .5), and (3) higher than average stress group (factor scores of .5 or greater). For factors III and IV (which were negative in direction) the groups were (1) lower than average stress group (factor scores of .5 or greater), (2) average stress group (factor scores between -.5 and .5), and (3) higher than average stress group (factor scores of -.5 or less).

related to patients, physicians and workload.

However the relationship between job satisfaction and relieving-related stress appears to be less clear-cut. The results of the analysis of variance indicate that nurses reporting average amounts of relieving-related stress usually reported the least job satisfaction. Since this finding is neither consistent with the assumption of a linear relationship between the two variables or with the hypothesis regarding an "inverted-U" type of relationship, it would be difficult to draw any conclusions concerning the relationship between job satisfaction and relieving-related stress.

Discussion

Type of Nursing Subunit and Stress

The results of the analysis which examined stress in relation to the type of subunit in which nurses worked generally supported the literature which describes ICU as a particularly stressful place to work. Intensive care unit nurses reported more stress from patient-related sources than did all other groups of nurses, and this finding can probably be attributed to the seriousness of conditions of ICU patients. Intensive care unit nurses also reported (along with pediatric nurses) the greatest amount of physician-related stress. This is not surprising, since ICU is often a setting for life-and-death circumstances in which unavailability of physicians or poor communication with physicians

could be extremely stressful for the nursing staff. Average amounts of stress were reported by ICU nurses in relation to workload and relieving on other units.

Nurses in medical subunits also reported a considerable amount of patient-related stress, ranking second only to ICU nurses in this regard. This might be explained by the greater likelihood of dying patients or patients with poor prognoses to be cared for in medical units than in other areas of a hospital. Nurses in medical subunits reported average stress due to workload and relieving on other units. Also, in contrast to ICU nurses, they reported little stress related to physicians.

Nurses working in surgical subunits tended to report average amounts of stress in regard to all four types of stress. This finding is probably best explained by the diversity of types of patients and conditions which characterizes general surgical units, probably resulting in a similar diversity in the kinds and amounts of stress experienced by nurses who work in these units.

Another group of nurses which tended to report average amounts of stress consists of nurses working in rehabilitation units. However, in terms of patient-related sources, these nurses reported less stress than did most other groups of nurses. This can perhaps be explained by the relatively stable condition of patients who are being cared for in rehabilitation units.

Auxiliary unit nurses, on the other hand, reported

average stress related to patients and relatively little
stress due to physicians and to relieving on other units.
In terms of workload-related sources, though, auxiliary unit
nurses reported more stress than did all other nurses. The
reason for this may be two-fold. First, the types of patients
cared for in auxiliary units usually place a high demand on
nursing staff in terms of physical care requirements.
Second, the ratio of nurses to patients is likely not as
high in these units as it is in the more acute care settings,
thus increasing the workload for each nurse in auxiliary
units.

Pediatric nurses reported greater stress related to
relieving on other units than did any other group of nurses
and, along with ICU nurses, they reported the most physician-
related stress. These findings might be reflective of high
frequency of occurrence of the physician-related and reliev-
ing-related situations on pediatric units. However, it is
also possible that, because pediatric nurses work with a
rather unique group of patients, it is particularly stress-
ful for these nurses to relieve on units where the patients
are adult. Similarly, pediatric nurses might experience
considerable stress due to unavailability of or poor communi-
cation with physicians, since hospitalized children are very
often acutely ill and prone to rapid changes in condition.
In terms of patient-related sources, pediatric nurses
reported average amounts of stress, and they were among the
lowest ranking groups in regard to workload-related stress.

Nurses in psychiatric units reported average stress due to relieving on other units, and fairly low stress related to patients, physicians and workload. Thus, they could be characterized as a fairly "unstressed" group, relative to the other nurses in this study, at least in regard to the types of stress examined in this study. It is interesting to speculate as to whether or not this is because nurses who work in psychiatry are generally more knowledgeable concerning methods of coping with stress than are nurses in general.

Another group of nurses who might be termed relatively unstressed were nurses working in obstetric units. These nurses reported average amounts of stress related to physicians and to relieving on other units, but were among the lowest scoring groups in terms of workload-related stress. Additionally, obstetric nurses reported the least patient-related stress of all groups of nurses. This finding is not surprising, since obstetric nurses likely to not often encounter situations in which the patient is very ill or is dying, or in which the family is upset.

Nurses in rural units reported average amounts of stress due to workload and patient-related sources. This might be expected, because of the wide variety of types of patients in rural hospital settings. In terms of stress related to physicians and to relieving on other units, these nurses were among the lowest ranking groups. It is possible that in rural hospitals, where relieving on other units is

often a matter of routine, such situations engender little stress among nurses.

Age and Stress

The amount of stress reported by nurses was generally found not to be related to their age, with one exception. In regard to physician-related sources, the youngest group of nurses (those less than 30 years of age) reported more physician-related stress than did any other group. One explanation for this finding might be that younger nurses are likely to work in areas such as ICU and pediatrics, where physician-related stress was found to be greatest. It is also feasible, however, that young nurses are less comfortable than older nurses in dealing with physicians who are critical or non-communicative, or that they are less confident in their ability to handle situations when physicians are not available.

Education and Stress

Level of education of the nurses was found to be related to stress due to patient-related and physician-related sources. In both cases, professionally educated nurses (i.e., degree or diploma level) reported more stress than did nurses with non-professional levels of education. In terms of physician-related sources, nurses with university degrees reported significantly more stress than did nurses with professional diplomas, and the non-professionally edu-

cated group reported the least stress. This finding is somewhat surprising, since one of the goals of professional nursing education, and of university level education in particular, is to prepare nurses to function in roles which are less dependent upon physicians than nurses' roles have been in the past. It is also recognized, however, that professionally educated nurses deal more directly with physicians than do those with non-professional education, and this may be an influencing factor in the amount of stress reported from physician-related sources.

Experience and Stress

Length of nursing experience appeared to be related only to stress due to patient-related and physician-related sources. Nurses with less than one year of experience reported average amounts of patient-related and physician-related stress, as did nurses with three to six years and six to nine years experience. The nurses who reported the most stress from both kinds of sources were those with one to three years experience. In view of the significant interaction effect that was found between experience and type of subunit on physician-related stress, it seems that at least part of the reason for this result is that nurses with one to three years experience tended to work in areas where physician-related stress was high (ICU and pediatrics). With regard to both patient-related and physician-related sources, nurses with nine years or more experience reported the least

stress, lending some support to the literature which suggests
that previous experience in similar situations tends to
reduce stress.

Stress and Job Satisfaction

The findings relative to nurses' stress and job satis-
faction generally seemed to suggest that job satisfaction
was greatest when stress was least, although the relation-
ship between job satisfaction and relieving-related stress
was not clearly established. These results would seem to
indicate that nurses' job satisfaction might be enhanced by
reducing the amounts of stress nurses encounter from certain
patient-related, physician-related and workload-related
sources.

CHAPTER V

LIMITATIONS AND CONCLUSIONS

In this chapter, the limitations of the research are
described and the conclusions presented. Also, some
implications for nursing practice, nursing administration,
nursing education, and for further research are explored.

Limitations

The nurses who participated in this research were
not randomly selected. For this reason, the results must
be considered as descriptive only of the nurses included
in the study.

There are a number of possible limitations concern-
ing the measurement of stress for this study. First,
although the face and content validity of the instrument
had been previously examined, validity had not been fully
established. Therefore, it is not known whether or not
the 21 potentially stressful situations described in the
questionnaire are truly representative of the universe of
possible sources of stress for hospital nurses. Indeed,
different results might have been obtained if other sources
of stress had been selected for inclusion. Second, the
method of measurement used was self-report of nurses'

perceptions of stress, although some of the stress litera-
ture indicates that this method may be open to consider-
able measurement error. The concurrent use of some type
of objective measure might have been helpful in regard to
determining the construct validity of the measurement of
stress.

When factor analysis was employed to identify the
kinds of stress being measured, the most satisfactory
factor solution still left 40.5 percent of the variance
in nurses' responses unexplained, which must be considered
as error. Additionally, the selection of analysis of vari-
ance as the primary technique to test for differences
between groups of nurses required that certain assumptions
be made regarding the data (see Chapter III). The extent
to which these data actually met the assumptions is not
known, and this may constitute a limitation of the research.

Conclusions

Although there were a number of limitations of this
research, some conclusions can be drawn on the basis of
the results for the particular group of nurses in the study.

From analyzing nurses' responses concerning the
stress level and frequency of occurrence of the described
situations, it appeared that four major types of stress
were reported by the nurses in this study. These types
included stress related to patients, physicians, workload

and relieving on other nursing units. The most important type of stress (stress factor), in terms of explaining variance in nurses' responses, seemed to be patient-related stress.

The findings in this research generally seemed consistent with the literature which describes ICU nursing as particularly stressful. Nurses working in ICU reported more patient-related and physician-related stress than did other nurses. In addition, though this study provided a considerable amount of new information concerning the kinds and amounts of stress experienced by nurses working in other types of nursing specialties.

The results also suggested that, for certain kinds of stress, there were differences between nurses of different ages, levels of education and lengths of nursing experience. Age and level of education seemed to be particularly related to the amount of stress nurses' reported due to physician-related sources, but, in general, nurses' demographic characteristics did not predict stress as well as did the type of subunit in which the nurses worked.

With regard to nurses' stress and job satisfaction, some evidence was provided to indicate an inverse relationship between certain kinds of stress and specific aspects of job satisfaction. Thus, high stress could be concluded to be a somewhat negative thing for the nurses in this study, at least in relation to job satisfaction.

Implications

Nursing Practice

The information gained from this study may have some
interesting implications related to the clinical practice
of nursing. As indicated by Hay and Oken (1972), the qua-
lity of patient care can often be influenced by the psycho-
logical state of the nurses who provide that care. The
description of stress for nurses in this study could form a
basis to assist practicing nurses in recognizing the kinds
of stress they experience at work and the possible effects
of this stress on the care given to patients. This research
may also serve to stimulate discussion among groups of nurses
concerning the nature and the amount of stress encountered
within their nursing units, and out of this discussion might
come effective strategies for dealing with stress.

Nurses practicing in intensive care settings may wish
to direct particular attention toward identifying stress
related to patients, families and physicians. On the other
hand, nurses working in less "acute" settings, such as auxi-
liary units, might find it more useful to concentrate upon
dealing with stress arising from workload-related sources.

Nursing Administration

The results of this study may be of interest to nurs-
ing service administrators for a number of reasons. It
appeared that several of the situations which ranked high

as sources of stress for the total group or nurses studied could fall within the control of nursing service departments. Conditions such as consistently heavy workload, unavailability of physicians, and insufficient resources could likely be modified to some degree through administrative action, and this might have some potential impact in terms of reducing stress among nursing staff.

With regard to stress arising from the nurses' interactions with patients, families and physicians, potential solutions may be more difficult to identify. However, it might be possible to provide some type of support system for nurses to assist them in dealing with the stress they encounter at work, particularly in certain specialty areas, such as ICU.

The apparent relationship between certain types of stress and job satisfaction may suggest some new approaches in regard to enhancing job satisfaction for nurses. It would also be important for nursing administrators to consider the possible effects of stress among nursing staff upon rates of sickness, absenteeism and job turnover within certain types of nursing units.

Nursing Education

The findings of this study may be of some value to those involved in basic or continuing nursing education. Although the concept of stress is usually introduced to nursing students, teaching primarily focuses upon methods for

identifying and dealing with stress in patients. Perhaps both nurses and patients could derive benefit from educational programs aimed at increasing nurses' awareness of the kinds of stress they may encounter in the course of their work and of effective ways of coping with such stress.

Continuing education, in the form of workshops or in-service programs, could provide an effective means for assisting nurses working in particular specialty areas to identify important sources of stress related to the work that they do and to determine how stress may influence the quality of care given to patients.

Further Research

As indicated in this and previous research, the measurement of stress can be somewhat problematic. For this reason, further work is required to attempt to establish reliable and valid measures of stress among nurses.

Since the potential sources of stress for this study were selected by the investigators, it might be interesting to conduct some exploratory research asking nurses to identify other aspects of their work which they find to be stressful. This kind of research could also provide information concerning what levels of stress nurses perceive to be optimal, in terms of providing them with stimulation and challenge in their work.

The literature presents a number of potential effects of nurses' stress, including withdrawal from interaction with

patients, sickness and absenteeism, but the relationship
between stress and these "effects" has not been empirically
tested. Therefore, further research is indicated in this
regard.

Considerable benefit might also be derived from
replicating this study using nurses in other kinds of prac-
tice settings, such as community health agencies, and adapt-
ing the instrument to include sources of stress most relevant
to those settings. It would be advisable to employ random
selection of nurses from within specific categories of age,
education and experience if conducting such research.

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APPENDIX A

STRESS QUESTIONNAIRE

ABOUT STRESS

Listed below are a number of situations which may or may not be stressful on nursing units.

(a) Please indicate how stressful each situation is to you on your unit by checking the appropriate space.

(b) Please indicate how often the situation occurs on your unit by checking the appropriate space in the enclosed box.

67. How stressful is it if nursing staff have insufficient resources to do all the things that should be done?

___ very little stress

___ a little stress

___ some stress

___ quite a bit of stress

___ very much stress

> How often does this situation occur on your unit?
>
> ___ never   ___ often
>
> ___ rarely   ___ always
>
> ___ sometimes

68. How stressful is it if nursing staff are unable to satisfy the conflicting demands of various people (e.g., patients, physicians, other paramedical staff, etc.)?

___ very little stress

___ a little stress

___ some stress

___ quite a bit of stress

___ very much stress

> How often does this situation occur on your unit?
>
> ___ never   ___ often
>
> ___ rarely   ___ always
>
> ___ sometimes

69. How stressful is it if the scope or responsibilities of your job are unclear?

___ very little stress

___ a little stress

___ some stress

___ quite a bit of stress

___ very much stress

> How often does this situation occur on your unit?
>
> ___ never   ___ often
>
> ___ rarely   ___ always
>
> ___ sometimes

70. How stressful is it if there are personality conflicts among nursing staff members?

___ very little stress
___ a little stress
___ some stress
___ quite a bit of stress
___ very much stress

How often does this situation occur on your unit?

___ never
___ rarely
___ sometimes
___ often
___ always

71. How stressful is it if nursing staff are insecure in their nursing knowledge or skills?

___ very little stress
___ a little stress
___ some stress
___ quite a bit of stress
___ very much stress

How often does this situation occur on your unit?

___ never
___ rarely
___ sometimes
___ often
___ always

72. How stressful is it if physicians appear impatient with or hyper-critical of nursing staff?

___ very little stress
___ a little stress
___ some stress
___ quite a bit of stress
___ very much stress

How often does this situation occur on your unit?

___ never
___ rarely
___ sometimes
___ often
___ always

73. How stressful is it if physicians are not available when they are wanted?

___ very little stress
___ a little stress
___ some stress
___ quite a bit of stress
___ very much stress

How often does this situation occur on your unit?

___ never
___ rarely
___ sometimes
___ often
___ always

74. How stressful is it if physicians do not communicate well with nursing staff?

___ very little stress
___ a little stress
___ some stress
___ quite a bit of stress
___ very much stress

How often does this situation occur on your unit?
___ never   ___ often
___ rarely   ___ always
___ sometimes

75. How stressful is it if a patient's behavior or personality is troublesome?

___ very little stress
___ a little stress
___ some stress
___ quite a bit of stress
___ very much stress

How often does this situation occur on your unit?
___ never   ___ often
___ rarely   ___ always
___ sometimes

76. How stressful is it if a patient is very ill and his prognosis is poor?

___ very little stress
___ a little stress
___ some stress
___ quite a bit of stress
___ very much stress

How often does this situation occur on your unit?
___ never   ___ often
___ rarely   ___ always
___ sometimes

77. How stressful is it if nursing staff are caring for mostly elderly patients?

___ very little stress
___ a little stress
___ some stress
___ quite a bit of stress
___ very much stress

How often does this situation occur on your unit?
___ never   ___ often
___ rarely   ___ always
___ sometimes

78. How stressful is it if nursing staff must perform painful but life-preserving treatments for patients?

_____ very little stress

_____ a little stress

_____ some stress

_____ quite a bit of stress

_____ very much stress

How often does this situation occur on your unit?

_____ never   _____ often

_____ rarely   _____ always

_____ sometimes

79. How stressful is it if a patient's family is not informed of the condition of one of their members?

_____ very little stress

_____ a little stress

_____ some stress

_____ quite a bit of stress

_____ very much stress

How often does this situation occur on your unit?

_____ never   _____ often

_____ rarely   _____ always

_____ sometimes

80. How stressful is it if a patient's family is upset or anxious about one of their members?

_____ very little stress

_____ a little stress

_____ some stress

_____ quite a bit of stress

_____ very much stress

How often does this situation occur on your unit?

_____ never   _____ often

_____ rarely   _____ always

_____ sometimes

81. How stressful is it if scheduling and staffing are unpredictable or there are irregularities in the way time-off is scheduled?

_____ very little stress

_____ a little stress

_____ some stress

_____ quite a bit of stress

_____ very much stress

How often does this situation occur on your unit?

_____ never   _____ often

_____ rarely   _____ always

_____ sometimes

82. How stressful is it if the workload is so consistently heavy that
the nursing staff lack energy for leisure activities?

___ very little stress

___ a little stress

___ some stress

___ quite a bit of
stress

___ very much stress

How often does this situation occur on your unit?	
___ never	___ often
___ rarely	___ always
___ sometimes	

83. How stressful is it if the nursing staff are exposed repetitively
to suffering, death and dying?

___ very little stress

___ a little stress

___ some stress

___ quite a bit of
stress

___ very much stress

How often does this situation occur on your unit?	
___ never	___ often
___ rarely	___ always
___ sometimes	

84. How stressful is it if the previous shift leaves unfinished work
that should have been handled during their shift?

___ very little stress

___ a little stress

___ some stress

___ quite a bit of
stress

___ very much stress

How often does this situation occur on your unit?	
___ never	___ often
___ rarely	___ always
___ sometimes	

85. How stressful is it if the nursing staff are frequently faced with
crisis situations which are not considered normal work?

___ very little stress

___ a little stress

___ some stress

___ quite a bit of
stress

___ very much stress

How often does this situation occur on your unit?	
___ never	___ often
___ rarely	___ always
___ sometimes	

86. How stressful is it if nursing staff are asked to relieve on other units of the same specialty?

___ very little stress

___ a little stress

___ some stress

___ quite a bit of stress

___ very much stress

> How often does this situation occur on your unit?
>
> ___ never   ___ often
>
> ___ rarely   ___ always
>
> ___ sometimes

87. How stressful is it if nursing staff are asked to relieve on other units of a different specialty?

___ very little stress

___ a little stress

___ some stress

___ quite a bit of stress

___ very much stress

> How often does this situation occur on your unit?
>
> ___ never   ___ often
>
> ___ rarely   ___ always
>
> ___ sometimes

APPENDIX B

JOB SATISFACTION QUESTIONNAIRE

ABOUT SATISFACTION

Beside each of the statements listed below, please indicate whether you are strongly satisfied, satisfied, sometimes satisfied, dissatisfied, or very dissatisfied.

	Strongly Satisfied	Satisfied	Sometimes Satisfied	Dis-Satisfied	Very Dis-Satisfied
88. How satisfied are you with your opportunity on the job to fully use your skills and abilities?	( )	( )	( )	( )	( )
89. Are you satisfied with the feeling of accomplishment you get from the work you are doing?	( )	( )	( )	( )	( )
90. Are you satisfied with the opportunity your job allows you to do important and worthwhile things?	( )	( )	( )	( )	( )
91. Overall, how satisfied are you with the kind of work you do?	( )	( )	( )	( )	( )
92. How satisfied are you with your present Head nurse?	( )	( )	( )	( )	( )
93. How satisfied are you with your fellow co-workers?	( )	( )	( )	( )	( )
94. How satisfied are you with the types of patients you must deal with?	( )	( )	( )	( )	( )

	Strongly Satisfied	Satisfied	Sometimes Satisfied	Dis-Satisfied	Very Dis-Satisfied
95. How satisfied are you with the doctors you normally work with?	( )	( )	( )	( )	( )
96. How satisfied are you with your present salary?	( )	( )	( )	( )	( )
97. How satisfied are you with the physical conditions of the work place?	( )	( )	( )	( )	( )
98. Are you satisfied with your workload?	( )	( )	( )	( )	( )

APPENDIX C

NURSE CHARACTERISTICS QUESTIONNAIRE

126

ABOUT YOURSELF

100. How old are you?

___ under 20 years   ___ 40 to 49 years

___ 20 to 29 years   ___ 50 years or more

___ 30 to 39 years

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

___ medical   ___ auxiliary

___ surgical   ___ paediatric

___ intensive care   ___ psychiatric

___ rehabilitation   ___ other: specify

___ nursing home   _____

103. What level of nursing education have you completed?
(Check more than one if necessary.)

___ Master's degree

___ Bachelor's degree

___ R.N. Diploma

___ R.P.N. Diploma

___ C.N.A. Certificate

___ Nursing Orderly Certificate

___ Other: specify _____

___ Clinical post graduate course: specialty _____

104. How many years of nursing experience have you had since
completion of your basic education program? (Check one.)

___ less than 1 year   ___ 6 to 9 years

___ 1 to 3 years   ___ 9 years or more

___ 3 to 6 years

THANK YOU VERY MUCH FOR YOUR COOPERATION

APPENDIX D

CROSS-TABULATION OF TYPE OF SUBUNIT BY

AGE, EDUCATION AND EXPERIENCE

128

TYPE OF SUBUNIT BY AGE

(Number of Respondents in Each Category)

	< 30 Years	30-39 Years	40-49 Years	50 Years and >	Total	
MED	137	43	10	9	199	(15.9%)
SURG	175	49	25	20	269	(21.5%)
ICU	77	18	10	1	106	(8.5%)
REHAB	22	42	23	7	94	(7.5%)
AUX	40	23	22	16	101	(8.1%)
PEDS	132	33	20	6	191	(15.2%)
PSYCH	69	20	14	10	113	(9.0%)
OBS	41	26	19	12	98	(7.8%)
RURAL	35	21	15	11	82	(6.5%)
Total	728	275	158	92	1,253	(100.0%)
	(58.1%)	(21.9%)	(12.6%)	(7.3%)		

TYPE OF SUBUNIT BY EDUCATION

(Number of Respondents in Each Category)

	Degree	Diploma	Non-Professional	Total
MED	11	128	67	201 (16.1%)
SURG	7	173	89	269 (21.5%)
ICU	10	88	7	105 (8.4%)
REHAB	1	33	59	93 (7.4%)
AUX	0	31	71	102 (8.2%)
PEDS	12	106	71	189 (15.1%)
PSYCH	11	66	31	108 (8.6%)
OBS	4	61	35	100 (8.0%)
RURAL	1	43	38	82 (6.6%)
Total	57 (4.6%)	724 (58.0%)	468 (37.5%)	1,249 (100.0%)

TYPE OF SUBUNIT BY EXPERIENCE

(Number of Respondents in Each Category)

	< 1 Year	1-3 Years	3-6 Years	6-9 Years	> 9 Years	Total
MED	33	62	36	32	36	199 (16.0%)
SURG	33	76	62	41	56	268 (21.5%)
ICU	11	27	28	19	21	106 (8.5%)
REHAB	3	7	18	5	61	94 (7.6%)
AUX	10	16	21	17	35	99 (8.0%)
PEDS	20	58	46	26	40	190 (15.3%)
PSYCH	17	26	30	7	27	107 (8.6%)
OBS	5	14	22	12	47	100 (8.0%)
RURAL	7	17	15	13	29	81 (6.5%)
Total	139	303	278	172	352	1,244 (100.0%)
	(11.2%)	(24.4%)	(22.3%)	(13.8%)	(28.3%)	

APPENDIX E

RESULTS OF ANALYSIS OF VARIANCE ON JOB
SATISFACTION ITEMS BY STRESS

ANALYSIS OF VARIANCE ON JOB SATISFACTION ITEMS BY STRESS[1]

No.	Satisfaction Items Content	Patient-Related Stress		Relieving-Related Stress		Low Physician-Related Stress		Low Workload-Related Stress	
		F Value	Prob.	F Value	Prob.	F Value	Prob.	F Value	Prob.
88.	Oppor. to use skills	1.506	0.222	0.936	0.392	2.632	0.072	8.707	0.000*
89.	Accomplishment	0.683	0.505	4.983	0.007*	11.733	0.000*	11.030	0.000*
90.	Do important things	1.479	0.228	4.380	0.013*	6.996	0.001*	13.251	0.000*
91.	Kind of work	0.449	0.638	3.654	0.026*	1.212	0.298	8.649	0.000*
92.	Head nurse	1.958	0.142	2.424	0.089	8.106	0.000*	30.257	0.000*
93.	Co-workers	1.964	0.141	1.499	0.224	2.516	0.081	10.874	0.000*
94.	Types of patients	1.249	0.287	3.365	0.035*	0.435	0.647	29.643	0.000*
95.	Doctors	2.726	0.066	3.511	0.030*	25.497	0.000*	10.679	0.000*
96.	Salary	1.247	0.288	2.482	0.084	8.139	0.000*	6.460	0.002*
97.	Physical conditions	4.376	0.013*	0.148	0.862	4.062	0.002*	15.686	0.000*
98.	Workload	5.555	0.004*	1.383	0.251	9.858	0.000*	87.596	0.000*

[1] Nurses were divided into three groups on the basis of their scores on each of the four stress factors. For factors I and II, the groups were: (1) lower than average stress group (those with factor scores of -.5 or less), (2) average stress group (factor scores between -.5 and .5), and (3) higher than average stress group (factor scores of .5 or greater). For factors III and IV (which were negative in direction) the groups were (1) lower than average stress group (factor scores of .5 or greater), (2) average stress group (factor scores between -.5 and .5), and (3) higher than average stress group (factor scores of -.5 or less).

* Indicates significance at .05 level.

97. Satisfaction with Physical Conditions by Patient-
Related Stress

Group Mean Satisfaction Scores	
Subset 1	
Higher Stress	
3.2495	
Subset 2	
Lower Stress	Average Stress
3.4017	3.4399

98. Satisfaction with Workload by Patient-Related Stress

Group Mean Satisfaction Scores	
Subset 1	
Higher Stress	Average Stress
3.4406	3.4904
Subset 2	
Lower Stress	
3.6396	

Multiple Range Tests for Differences on Job
Satisfaction Items by Relieving-Related Stress

89. Satisfaction with Accomplishment by Relieving-
Related Stress

Group Mean Satisfaction Scores	
Subset 1	
Average Stress	
3.7078	
Subset 2	
Lower Stress	Higher Stress
3.8595	3.8737

90. Satisfaction with Opport. to do Important Things by
Relieving-Related Stress

Group Mean Satisfaction Scores	
Subset 1	
Average Stress	
3.5274	
Subset 2	
Higher Stress	Lower Stress
3.6888	3.6919

91. Satisfaction with Kind of Work by Relieving-Related Stress

Group Mean Satisfaction Scores	
Subset 1	
Average Stress	Lower Stress
3.9095	3.9568
Subset 2	
Lower Stress	Higher Stress
3.9568	4.0538

94. Satisfaction with Types of Patients by Relieving-Related Stress

Group Mean Satisfaction Scores	
Subset 1	
Average Stress	Lower Stress
3.7933	3.8351
Subset 2	
Lower Stress	Higher Stress
3.8351	3.9206

95. Satisfaction with Doctors by Relieving-Related Stress

Group Mean Satisfaction Scores	
Subset 1	
Average Stress	Higher Stress
3.7391	3.7674
Subset 2	
Lower Stress	
3.8679	

Multiple Range Tests for Differences on Job Satis-

faction Items by Low Physician-Related Stress

89. Satisfaction with Accomplishment by Low Physician-Related Stress

Group Mean Satisfaction Scores	
Subset 1	
Higher Stress	
3.6201	
Subset 2	
Average Stress	Lower Stress
3.8363	3.9127

90. Satisfaction with Opport. to do Important Things by Low Physician-Related Stress

Group Mean Satisfaction Scores	
Subset 1	
Higher Stress	
3.4723	
Subset 2	
Average Stress	Lower Stress
3.6562	3.9127

92. Satisfaction with Head Nurse by Low-Physician-Related Stress

Group Mean Satisfaction Scores	
Subset 1	
Higher Stress	Average Stress
3.8078	3.8874
Subset 2	
Lower Stress	
4.0758	

95. Satisfaction with Doctors by Low Physician-Related Stress

Group Mean Satisfaction Scores
Subset 1
Higher Stress
3.5649
Subset 2
Average Stress
3.7873
Subset 3
Lower Stress
3.9273

96. Satisfaction with Salary by Low Physician-Related Stress

Group Mean Satisfaction Scores		
Subset 1		
	Higher Stress	
	2.6688	
Subset 2		
	Average Stress	Lower Stress
	2.9774	2.9782

97. Satisfaction with Physical Conditions by Low Physician-Related Stress

Group Mean Satisfaction Scores		
Subset 1		
	Higher Stress	
	3.1916	
Subset 2		
	Average Stress	Lower Stress
	3.3618	3.4493

98. Satisfaction with Workload by Low Physician-Related Stress

Group Mean Satisfaction Scores	
Subset 1	
Higher Stress	
3.3453	
Subset 2	
Average Stress	Lower Stress
3.5112	3.6091

Multiple Range Tests for Differences on Job Satis-
faction Items by Low Workload-Related Stress

88. Satisfaction with Opport. to Use Skills by Low
Workload-Related Stress

Group Mean Satisfaction Scores	
Subset 1	
Higher Stress	
3.4682	
Subset 2	
Average Stress	Lower Stress
3.6308	3.7372

89. Satisfaction with Accomplishment by Low Workload-
Related Stress

Group Mean Satisfaction Scores	
Subset 1	
Higher Stress	Average Stress
3.6555	3.7726
Subset 2	
Lower Stress	
3.9309	

90. Satisfaction with Opport. to do Important Things by Low Workload-Related Stress

Group Mean Satisfaction Scores
Subset 1
Higher Stress
3.4295
Subset 2
Average Stress
3.6127
Subset 3
Lower Stress
3.7650

91. Satisfaction with Kind of Work by Low Workload-Related Stress

Group Mean Satisfaction Scores
Subset 1
Higher Stress
3.8322
Subset 2
Average Stress
3.9560
Subset 3
Lower Stress
4.0712

92. Satisfaction with Head Nurse by Low Workload-Related Stress

Group Mean Satisfaction Scores	
Subset 1	
Higher Stress	
3.5690	
Subset 2	
Average Stress	Lower Stress
4.0000	4.1041

93. Satisfaction with Co-Workers by Low Workload-Related Stress

Group Mean Satisfaction Scores
Subset 1
Higher Stress
3.9497
Subset 2
Average Stress
4.0880
Subset 3
Lower Stress
4.1851

94. Satisfaction with Types of Patients by Low Workload-
     Related Stress

Group Mean Satisfaction Scores
Subset 1
Higher Stress
3.5920
Subset 2
Average Stress
3.8505
Subset 3
Lower Stress
3.9964

95. Satisfaction with Doctors by Low Workload-Related
     Stress

Group Mean Satisfaction Scores	
Subset 1	
Average Stress	Higher Stress
3.7020	3.7128
Subset 2	
Lower Stress	
3.8932	

96. Satisfaction with Salary by Low Workload-Related
Stress

Group Mean Satisfaction Scores	

Subset 1

Higher Stress	Average Stress
2.7215	2.8750

Subset 2

Average Stress	Lower Stress
2.8750	3.0200

97. Satisfaction with Physical Conditions by Low Workload-
Related Stress

Group Mean Satisfaction Scores

Subset 1

Higher Stress

3.1003

Subset 2

Average Stress

3.3358

Subset 3

Lower Stress

3.5082

98. Satisfaction with Workload by Low Workload-Related Stress

Group Mean Satisfaction Scores
Subset 1
Higher Stress
3.0134
Subset 2
Average Stress
3.5526
Subset 3
Lower Stress
3.7473