1995

A Study of the Relationship Between Registered Nurse Time Spent in Direct Care Activities, Nursing Skill Mix and Patient Perceptions of Nurse Caring

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A STUDY OF THE RELATIONSHIP BETWEEN REGISTERED NURSE TIME SPENT IN DIRECT CARE ACTIVITIES, NURSING SKILL MIX AND PATIENT PERCEPTIONS OF NURSE CARING

By

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A THESIS

Submitted to
Grand Valley State University
in partial fulfillment of the requirements for the
degree of

MASTER OF SCIENCE IN NURSING

Kirkhof School of Nursing

1995

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ABSTRACT

A STUDY OF THE RELATIONSHIP BETWEEN REGISTERED NURSE TIME SPENT IN DIRECT CARE ACTIVITIES, NURSING SKILL MIX AND PATIENT PERCEPTIONS OF NURSE CARING

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There is a need for nurse administrators to understand how the use of nursing resources impacts the quality of patient care. A descriptive correlational research design was used to examine the relationship between R.N. time spent in direct care activities, nursing skill mix and patient perceptions of nurse caring. A secondary analysis was conducted using data previously collected as part of a large-scale data set from a 529 bed community teaching hospital. The data consisted of 76,491 activity samples obtained through work sampling of 16 nursing units, 2 categories of unit skill mix measurements, and a Caring Behaviors Inventory completed by 313 patients. A significantly positive relationship was found between the percentage of time R.N.s spent in direct care activities and patient perceptions of nurse caring ($r=.6874$, $p<.01$). A significantly positive relationship was also found between the percentage of R.N.s in the skill mix and patient perceptions of nurse caring ($r=.50$, $p<.05$).

Dedication

This thesis is dedicated to the memory of my late sister, Mary L. Peterson, L.P.N. who inspired my career in nursing and taught me the true meaning of courage.

Acknowledgments

I am most appreciative of my thesis chairperson, Dr. Jean Nagelkerk who provided me with excellent guidance throughout this momentous endeavor. Her research expertise, editorial proficiency, high energy, and prompt reviews were invaluable to me. I am also grateful to Dr. Linda Urden who encouraged and supported my participation in the work sampling study and stimulated my interest in research. Her enthusiasm for nursing research was a source of inspiration for me. I am also thankful to Dr. Donna VanIwaarden for her time, interest, and participation as a committee member.

I would also like to thank Dr. Cynthia Coviak for her assistance with data analysis and her contagious excitement for statistics. I am also grateful to the study hospital for sharing their data base with me. Dave Langin is to be commended for his talent in extracting the data needed for this study. I appreciate the tremendous effort involved in the collection of the large data base and acknowledge the numerous participants who made this study possible.

Finally, I give thanks to my parents, sister, and friends who patiently supported my efforts and encouraged my persistence. Their love and belief in my abilities has made all the difference.

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CHAPTER ONE

INTRODUCTION

The challenge for hospitals to reduce costs while providing high quality patient care is a significant economic and quality issue. Nurse administrators are being faced with difficult decisions regarding nursing staff productivity and skill mix as they seek to use the least costly combinations of human and physical resources (Buerhaus, 1986; Minyard, Wall, & Turner, 1986). Nursing activities are expected to yield a cost-measurable outcome that can be reported in facts and figures (Leininger, 1986) such as activities believed to reduce patient length of stay. The value of nurse caring is receiving less attention and less financial value than meeting the physical and technical needs of patients (Leininger, 1986). It is essential for nursing leaders to develop an understanding of the economic dimensions of nurse caring to ensure the continuation of humanistic care (Buerhaus, 1986).

Threats to the existence of humanistic caring in nursing stem not only from external economic forces, but also from internal nursing forces. Internal forces include the inability of nurses to articulate their caring practices (Leininger, 1986), the depersonalization of the hospital environment by a procedure oriented staff (Watson, 1979), and the ineffective use of nursing personnel (Prescott, Phillips, Ryan, & Thompson, 1991). In addition, caring in nursing is a difficult concept to measure

(Valentine, 1989). If the relevance of caring to practice and to the patient cannot be clearly explicated, or if it is claimed that caring cannot be reduced to measurable tasks, and if caring is the essence of nursing, then nursing no longer will be a practice discipline (Morse, Bottorff, Neander, & Solberg, 1991). There is a need to measure and demonstrate the impact of economic decisions such as those involving nursing productivity factors on patient outcomes, particularly in relation to nurse caring.

A strongly held belief among nursing theorists is that nurse caring produces positive patient outcomes. Nurse caring is believed to promote health and individual or family growth (Watson, 1979), exert a healing effect on patients (Valentine, 1989), and is an essential ingredient for health, human development, human relatedness, well-being and survival (Leininger, 1980). The impact of nurse caring on patient perceptions of being cared for has also been linked to patient satisfaction with their hospital experience (Buerhaus, 1986; Larson & Ferketich, 1993; Valentine, 1991a). Furthermore, patient satisfaction is an important concept from a marketing and economic perspective in a competitive health care environment (Buerhaus, 1986). Patient perceptions of nurse caring can be viewed as a quality outcome indicator in determining the effectiveness of nursing care provided.

Nurse administrators have a clear imperative to balance the delivery of quality services with efficient and effective utilization of resources (Linden & English, 1994). It is essential for nursing decision-makers not only to possess knowledge of healthcare from a business perspective, but to support the human side of nursing practice as well (Ray, 1989). There is a critical need for nurse administrators to understand how their economic

decisions about the use of nursing resources impact the quality of patient care. Previously used practices for achieving short term cost savings, such as substituting nursing assistants for registered nurses (R.N.s), or decreasing numbers of nursing personnel may actually undermine the hospital's competitive edge by affecting the quality of nursing care delivered. Cost cutting and system efficiency alone will not be sufficient for survival. Hospitals will have to convince consumer groups, based on outcomes data about services important to patients and families, that the quality of these services equals or exceeds those offered by competing institutions (Prescott, 1993).

Scant research exists examining the impact of nursing resource utilization on patient perceptions of nurse caring (Duffy, 1992; Valentine, 1991a). Furthermore, relationships between nursing resource utilization measures such as nursing workload and patient outcomes have not been consistently supported (Duffy, 1992; Taunton, Kleinbeck, Stafford, Woods, & Bott, 1994; Valentine, 1991a). Studies to date, have not used clear operational definitions of workload which are sensitive to patient ratings of nurse caring (Valentine, 1991a). Continued research is necessary using more sensitive nursing resource utilization measures to examine potential relationships with patient perceptions of nurse caring.

The purpose of this study is to compare the percentage of time registered nurses spend in direct care activities and nursing skill mix data with patient perceptions of nurse caring. Work sampling measurements and nursing skill mix provide objective data on the amount of time spent with patients, types of activities, and category of care provider. A critical variable that can be measured simultaneously with the work sampling effort is

patients' perceptions about nursing care (Scherubel & Minnick, 1994). Contrasting work sampling measures with patient perceptions of nurse caring serves as a useful tool for nursing decision-makers in balancing the cost of nursing resource utilization with the quality outcome of nursing caring. Watson (1988) describes human caring in nursing as a moral ideal. Nursing decision-makers who place emphasis on caring as a moral imperative where management and caring exist side by side will lead the way in transforming health care organizations to benefit humankind (Ray, 1989).

CHAPTER TWO

CONCEPTUAL FRAMEWORK AND LITERATURE REVIEW

Conceptual Framework

Caring is believed to be the essence and heart of nursing (Leininger, 1980). Caring has been defined as a human trait, a moral imperative, an affect, an interpersonal interaction, and a therapeutic intervention (Morse et al., 1991). Watson's (1988) theory of human caring defines caring as the moral ideal of nursing whereby the end is protection, enhancement, and preservation of human dignity. According to Watson, human caring involves values, a will and a commitment to care, knowledge, caring actions, and consequences. Watson suggests that the nurse has a caring consciousness in mind during every nursing transaction, as an ideal that will help point the way toward certain human caring actions.

Watson (1979, 1988) identifies 10 primary carative factors that form the structure for studying and understanding nursing as the science of caring. The first factor is the formation of a humanistic-altruistic system of values including kindness, empathy, concern, and love for others. The second factor describes the nurse's role in nurturing faith and hope in one's self and one's potential, and the one cared for. The third factor is a cultivation of sensitivity to one's self and others to learn about another's view of the world increasing others' comfort, recovery and wellness. The fourth factor is the

development of a helping-trusting, human caring relationship including a reunion and high regard for another person. The fifth factor is the promotion and acceptance of the expression of positive and negative feelings. The sixth factor is the use of creative problem-solving processes using all domains of knowledge, including empirical, aesthetic, intuitive, affective, and ethical knowledge. The seventh factor is promotion of transpersonal teaching-learning including active coparticipation. The eighth factor is the provision of a supportive, protective, or corrective mental, physical, sociocultural, and spiritual environment. The ninth factor is assisting one with gratification of their human needs. The tenth factor emphasizes understanding another's internal human predicament with a focus on transcending personal struggles and achieving meaning.

According to Watson (1988), all carative factors become actualized in the moment-to-moment human caring process in which the nurse is "being-with" the other person. Watson describes an actual caring occasion as involving action and choice both by the nurse and the individual. The moment of coming together in a caring occasion presents the two persons with an opportunity to decide how to be in the relationship. The actual caring occasion has a field of its own that is greater than the occasion itself. The concept of caring occasion emphasizes the importance of patient perception in identifying that a caring event has occurred. A caring occasion must be perceived as such by the patient to be defined as caring. The measurement of caring is accomplished by the measurement of patient's perception of nursing activities.

The metaphysical nature of Watson's (1979, 1988) theory of human caring as a moral ideal presents difficulty in measuring caring as behavioral tasks. Measuring

productivity variables such as nursing time spent in direct care activities with caring concepts necessitates a more concrete task-oriented approach. Three of Watson's carative factors lend themselves to a less abstract, more concrete evaluation. They are: the promotion of interpersonal teaching-learning; the provision for a supportive, protective, and (or) corrective mental, physical, sociocultural, and spiritual environment; and the assistance with the gratification of human needs. Using a task measurement approach strengthens the importance of Watson's metaphysical concepts related to human caring.

The interpersonal teaching-learning carative factor can be measured by direct observation of time spent in direct care activities by nurses in assessing, teaching, reinforcing, and evaluating learning. The provision for a supportive, protective, and (or) corrective mental, physical, sociocultural, and spiritual environment can be measured by observation of time spent by nurses in all types of direct care activities. In this factor, Watson elaborated by describing variables external or internal to the person. External variables are physical or social environmental activities and manipulations that the nurse uses to provide support, protection, and safety for the patient. These are also observable and measurable direct care activities. More difficult to measure are the internal variables described as supportive, protective, and (or) corrective activities that the nurse provides for a person's mental, spiritual, and sociocultural harmony and well-being. Assistance with gratification of human needs is classified according to lower order and higher order needs. The lower order needs are described as the biophysical food and fluid need, the elimination need, and the ventilation need. Lower order needs can be measured in part by observing the types of direct care activities nurses perform. The higher order needs are

designated as psychosocial. Watson believes the major function of the practice of caring is dependent on the success or failure of helping others in their efforts to gratify their human needs. Success or failure can be measured in part by examining the patient's perception of nurse caring.

Watson (1988) described cross-cultural data on caring in nursing in which patients perceived nurse caring to include the concepts of nurse presence and nurse time. Nurse presence included touch and physical felt presence from the nurse across time. Nurse time included giving time and taking time such as follow-up checks, presence, and visitation. While the concept of presence as described by Watson includes much more than physical presence, it is important to note that physical presence in and of itself is a component described by patients experiencing nurse caring. Measuring nursing time spent in direct care activities provides insights into patient perceptions of nurse caring.

In summary, Watson's (1979, 1988) theory of human caring integrates humanistic, existential, and transpersonal psychological perspectives. Caring as a moral imperative and moral ideal is viewed as the central focus. Primary carative factors incorporate the humanistic, biopsychosocial, and spiritual aspects of caring. An actual caring moment is said to occur when the nurse is with the individual making use of carative factor interventions. Watson's theory, while highly metaphysical in nature, also recognizes the more concrete aspects of nurse caring and nurse time in relation to patient perceptions of nurse caring. Figure 1 is a pictorial representation of Watson's model.

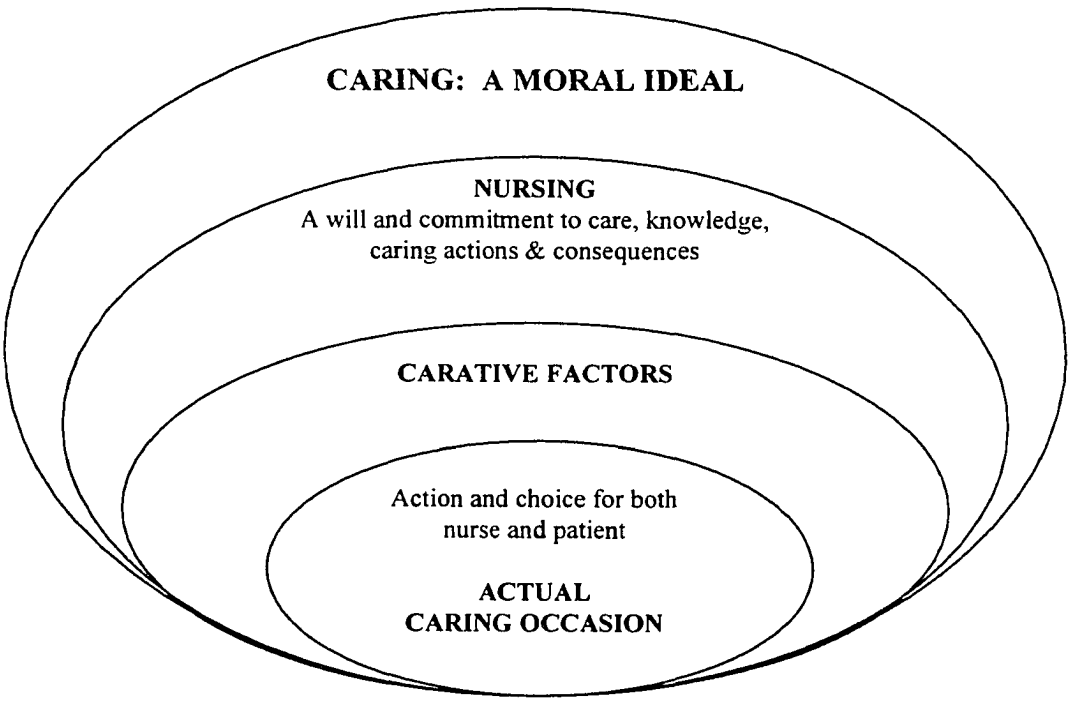

Figure1. Pictorial representation of Watson's (1979, 1988) model.

Literature Review

Research on caring in nursing has seldom been described in the context of nursing resource utilization and rarely have measures such as nursing workload, R.N. time spent in direct care activities, and skill mix been examined in the context of patient perceptions of nurse caring (Valentine, 1991a). Most research on caring in nursing focuses on patient and nurse perceptions of caring for purposes of defining caring concepts (Brown, 1986; Gooding, Sloan, & Gagnon, 1993; Larson & Ferketich, 1993) and research on nursing resource utilization concentrates on readily quantifiable patient outcome measures such as length of stay (Flood & Diers, 1988), nosocomial infection rates, and patient falls (Taunton et al., 1994). A review of salient nursing research will be organized according to the categories of nurse caring, R.N. time spent in direct care activities, and skill mix.

Nurse Caring

Patient perceptions of nurse caring. Brown (1986) asked 50 patients to describe an experience in which they felt cared for by a nurse. Using a phenomenological analysis approach, eight care themes were found: recognition of individual qualities and needs, reassuring presence, provision of information, demonstration of professional knowledge and skill, assistance with pain, amount of time spent, promotion of autonomy, and surveillance. Brown further analyzed combined themes to identify and describe patterns of patient needs and nurse responses that make up the experience of care. Time spent was described as an underlying theme in the majority of incidents. Receiving more time from the nurse than the patient expected emerged as an important element in the feeling of being cared for.

In contrast, Riemen (1986) used phenomenological methodology to explore patient perceptions of noncaring behaviors and attitudes. Ten patients described events they perceived as noncaring. Five categories emerged: being in a hurry and efficient, doing a job, being rough and belittling patients, not responding, and treating patients as objects. Rieman observed that when patients were asked to describe a caring and noncaring interaction with a nurse, the patients consistently and immediately described the noncaring interaction first. Rieman attributes this phenomenon in part to be the results of vividly recalled experiences of feeling humiliated, frightened, and out of control of the situation.

Behaviors reflecting technical competency of the nurse caregiver were given greatest emphasis by patients in a replication study of caring in emergency departments (Huggins, Gandy, & Kohut, 1993). A sample size of 288 patients treated in 2 emergency departments were interviewed using a pre-established caring behaviors assessment tool. They were asked to rate caring behaviors on a four-point scale ranging from unimportant to an absolute must. Patients classified as emergent identified fewer caring behaviors that the nurse must perform to demonstrate caring compared with patients classified as non-urgent. Technical aspects of care were also rated highly in a study of cancer patients (Mayer, 1986). Patients ranked: knows how to give shots, I.V.s, etc., and how to manage the equipment like I.V.s, suction machines, etc. as the most important nurse caring behavior. Mayer also examined nurses' perceptions of caring and found a significant correlation between the nurses' and patients' perceptions.

Congruence of nurse-patient caring perceptions. A number of studies in the caring literature reflect limited congruence between how nurses and patients rate the importance of caring behaviors. Valentine (1991b) studied 91 hysterectomy patients and their nurses to test for congruence between how patients and nurses rated the same events. Valentine found a significant but low-moderate relationship between the patients' and nurses' total scores ($r = .31$, $p < .05$). While the score correlations are statistically significant, neither the total caring score nor the congruence score indicate strong relationships between nurses' and patients' perceptions of caring. Valentine did not report which caring behaviors were most highly scored by either group.

Using a descriptive correlational study design, Gooding et al. (1993) compared nurse caring behavior rankings or 42 oncology patients and 46 oncology nurses. Patients ranked nurses' technical skills, giving a quick response, and giving treatments and medications on time as the most important while nurses ranked listening to the patient, allowing for expression of feelings, and including the patient in care planning as the most important. Two-tailed t-tests revealed that there were statistically significant differences ($p < .001$) between the patients and nurses with respect to their ranking of clinical caring behaviors (e.g., gives the patient's treatments and medications on time), disposition of the nurse caring (e.g., is cheerful), and continuity of caring (e.g., tells the patient of support systems). Gooding et al. postulate that high patient rankings of technical care given may be due in part to the recognition by patients that other aspects of caring are not appreciated until the basic physical needs are met.

Similar findings were reported in a study of 81 Swedish hospital patients and 105 nursing staff (von Essen & Sjoden, 1991). Significant differences (t-test, $p<.05$) were found between patients and nurses for 29 of the 50 ranked caring instrument items. Again, the results suggest that patients perceive technical aspects of care to be more important, while nurses gave more value to expressive/affective items. The literature is reflective of findings that nurses and patients view the process of nurse caring in a variety of ways. Wolf, Giardino, Osborne, and Ambrose (1994) note that few studies describe the dimensions of nurse caring. Using a sample of 263 patients and 278 nurses, the authors administered a 75-item Caring Behaviors Inventory for the purposes of instrument development and validation. Combined nurse and patient responses led to the emergence of 5 factors through factor analysis which explained 56.8% of the total variance. The five factors included: respectful deference to the other, assurance of human presence, positive connectedness, professional knowledge and skill, and attentiveness to the other's experience. A limitation of the study is that a combined sample of patients and nurses was used to generate the five nurse caring dimensions even though previous studies report differences between both groups.

Nurse caring and patient outcomes. Few studies exist on the relationship between nurse caring and patient outcomes. Using a phenomenological approach, Sherwood (1993) asked 10 patients to share their responses to demonstrations of nurses' caring in order to examine the impact of caring. Eight themes emerged from the data analysis: a positive mental attitude, movement toward recovery and healing or rehabilitation, physical comfort, gratitude, reassurance, dignity and acceptance, trust, and satisfaction.

Duffy (1992) measured the relationships between patient perceptions of nurse caring behaviors and the outcomes of patient satisfaction , health status, length of stay, and nursing care costs in hospitalized patients. A descriptive correlational research design was used with a sample size of 86 patients. A significantly positive relationship between nurse caring behaviors and patient satisfaction was reported ($r=.4627$, $p<.001$). A step wise multiple regression analysis showed 19% of the variance of patient satisfaction was explained solely by the variable: nurse caring behaviors. The existence of a positive relationship between nurse caring behaviors and perceived health status was not supported. The existence of inverse relationships between nurse caring behaviors and total length of stay and nursing care costs were not found to be statistically significant. A weakness of the study may stem from the use of data to measure nursing costs based on the hospital patient classification system. This type of measurement may not be sensitive to nurse caring.

Larson & Ferketich (1993) recognized the importance of measuring not only patient perception of nurse caring behaviors but measuring whether patients actually experienced the desired caring from the nurses who provided their care. Using a descriptive correlational design, 268 hospitalized patients were surveyed using the Care Satisfaction Questionnaire (CARE/SAT) developed by the authors. Findings showed mean CARE/SAT scores were skewed positively; all patients made the assessment that they had experienced nurse caring behavior. The authors did not distinguish between patient rankings of nurse caring and patient satisfaction in their results.

Patient perceptions of nurse caring behaviors and patient satisfaction with services received were measured by Huggins et al. (1993). A positive relationship was found between the number of caring behaviors patients rated as "an absolute must" and their overall impression of care. The authors observe that as more of a patient's expectations for care are met, satisfaction tends to increase. Valentine (1991a) explored patterns of convergence and divergence between caring measures and outcome measures such as patient satisfaction with nursing. Multiple regression analysis indicated the variable that contributed most to variance in satisfaction with the hospital was the patients' scores for the affective, cognitive, and ethical attributes of the nurse. These attributes are process measures of caring and include compassion, empathy, assessment skills, and trust. Satisfaction with nursing was accounted for most often by the patients' scores for the nurses' professional vigilance which included technical competence, responsiveness, and knowledge. Valentine does note however, that the assumption cannot be made that patient satisfaction and caring are identical phenomena.

The relationship between caring and productivity factors was also examined by Valentine (1991a). Overall, patient scores on caring behaviors were relatively insensitive to productivity factors. Valentine also compared patient perceptions of caring with length of stay and post operative clinical condition. No relationship was found between caring and length of stay. A relationship was found between caring and post operative complications in that patients with more complications placed a higher value on the importance of nurse caring.

R.N. Time Spent in Direct Care Activities

Studies describing R.N. time spent in direct care activities using work sampling methodology will be reviewed in this section. Work sampling methodology is a useful method for analyzing the distribution of staff work activities in relation to how nursing staff spend their time and in relationship to the types of activities they perform. The work sampling procedure involves intermittent, random staff observations which are classified and documented according to a pre-established set of categories (Prescott et al., 1991). The categories commonly used are based on the classic work of the Department of Health, Education, and Welfare (D.H.E.W.) Division of Nursing (1978) publication in which nursing activities are classified into four major categories: direct care, indirect care, unit related, and personal. Direct care includes all nursing care activities performed in the presence of the patient and/or family such as assessment, medication administration, basic physical care, and treatments or procedures. Indirect care includes all nursing care activities done away from the patient but on a specific patient's behalf such as charting and communicating with other care providers. Unit related includes non patient specific activities pertaining to general maintenance of the nursing unit such as clerical work, ordering supplies, and attending meetings. Personal includes activities related to meals, breaks, and socializing with co-workers.

Linden and English (1994) reported findings of a work sampling study involving 6,709 random observations of nursing caregivers over a two week time period. No further definition was given for nursing caregivers so it is unclear if R.N.s were studied exclusively or if other categories of nursing personnel were also included. Study results

indicated that 27.5% of nurses' time was spent in direct care, 41.8% in indirect care, 15% in unit related activities, and 15.7% in personal time. The authors identified areas for potential productivity gains by decreasing documentation time (reported at 22.3%), decreasing time spent preparing I.V. medications, and decreasing unit travel time.

Work sampling techniques were used by Hendrickson, Doddato, and Kovner (1990) to observe R.N. activities at a large metropolitan hospital with six specialty units practicing modified primary nursing. The units' major services were medicine, surgery, orthopedics, neurology, obstetrics and gynecology, and pediatrics. The number of observations was not reported. Results indicated that 31% of nurses' time was spent in direct care, 45% in indirect care, 10% in unit related activities, and 13% in personal time. Using a chi-square analysis, the authors noted a significant difference ($p<.01$) in the percentage of time spent with patients across services. Units with fewer nurses had a lower percentage of time with patients. In addition, major variations were noted in the minutes nurses spent with each patient taking into account nurse/patient ratio as well as overall amount of time spent in the category. Nurses were found to spend the most time with patients in the services with the most favorable nurse/patient ratio. The authors recommended three strategies to decrease nurses' time spent in non-clinical activities, preparing therapies, and communication. They are: increased use of support personnel, increased support from the pharmacy department, and use of computers for clerical and communication tasks.

Watson, Lower, Wells, Farrah, and Jarrell (1991) describe the results of a work sampling study conducted at a large, midwestern teaching hospital. Data was collected in

208 3-hour sessions over 2 1/2 years. Activities of R.N.s and licensed practical nurses (L.P.N.s) were observed. The number of specific activity observations was not reported. Findings are difficult to compare with other studies as 173 activity indicators were used. The authors reported that R.N.s and L.P.N.s spent 26% of their time in direct patient care. Significant differences ($p<.05$) were found in 11 activity areas when R.N. and L.P.N. time was compared. L.P.N.s spent more time in direct care than R.N.s. The authors identified several systems problems that, if corrected, could yield more time for nurses to perform direct care (e.g., time spent by R.N.s performing non-nursing functions).

Productivity of nursing personnel was the focus of a work sampling study reported by Minyard et al. (1986). The authors defined productivity as the percentage of time spent in direct care, indirect care, and unit related activities versus time spent in personal activities. The study site was a 700 bed, general medical-surgical county hospital. The activities of all levels of nursing personnel assigned to 15 general medical-surgical, specialty and critical care units were studied. Each unit was studied for 10 shifts. Over 175,000 activity samples were recorded. Nursing personnel were found to spend 32.8% of their time in direct care, 26.9% in indirect care, 20.3% in unit related activities, and 20% in personal time. Significant differences ($p<.0000$) were found between the R.N. and L.P.N. groups in relation to the amount of time spent in personal activities. R.N.s were found to spend less time (11.4%) in nonproductive activity than the L.P.N. I (23.4%), L.P.N. II (17.4%) and nursing assistants (24.3%). The authors conclude that the costs of a higher skill mix may not be as high as it appears and may

even be considered cost-effective when the amount of productive time contributed by each staff level is taken into account.

Quist (1992) reported work sampling findings from a study of three community hospitals and two teaching hospitals. A total of 42 nursing units were evaluated, the majority in medical/surgical, critical care, perinatal and psychiatric units. The number of activity observations was not reported. All categories of nursing personnel were found on average to spend 42.1% of their time in direct care, 32.5% in indirect care, 12.3% in unit related activities, and 13% in personal time. In all hospitals, the nursing aides spent the most time being nonproductive: 23.5% or 2 hours per shift. Quist's findings are atypical of others described in the literature with an unusually high percentage (42.1%) of time spent in direct care. R.N.s were recorded as spending 47.2% of their time in direct care, 29.1% in indirect care, 12.4% in unit related activities, and 11.5% in personal time. It is unclear whether this study included more activities in the definition of direct care than did other studies. The unknown sample size coupled with questions of how interrater reliability procedures were conducted, weakens the credibility of this study.

Nine study sites within the U.S. Army Health Services Community Hospital Division were the focus of work sampling activities reported by Misener, Frelin, and Twist (1987). While the number of activity samples was not reported, the sample size was large and provided 107,700 10-minute segments of monitored time. Nursing personnel were found to spend 24.5% of their time in direct care, 60.5% in indirect and unit related activities, and 15% as unavailable for care (included 8.8% in personal time). This study did not use the four major categories reported in the studies mentioned above.

One definition difference which may have resulted in a lower than usual direct care percentage is the classification of patient transport time (10.7%) in indirect care rather than direct care as defined by the D.H.E.W. (1978) publication. Correcting for this difference would result in 35.2% of time being spent in direct care activities.

Skill Mix

Studies examining the impact of skill mix on patient outcomes have produced contradictory results. Hartz et al. (1989) examined Medicare discharges from 4 hospitals in 1986 and through regression analysis found the percentage of nursing personnel who were R.N.s to be one of 5 significant predictors of hospital mortality rates. Hospitals with a higher percentage of R.N.s had lower adjusted mortality rates. Hospitals in the top quartile of the distribution of R.N.s to all nursing personnel had 6.3 fewer deaths per 1,000 (5.4% fewer) than hospitals in the bottom quartile. In contrast, Al-Haider and Wan (1991) studied Medicare discharges from 269 hospitals in 1986 with abnormally high or low mortality rates. No significant relationship was found between R.N. ratio (R.N.s per 100 nurses in hospital) and mortality rates. The lack of statistical significance may be related to the sample of hospitals with abnormal mortality rates.

A number of studies compared the effects of all R.N. staffing or high percentages of R.N.s with lower percentages of R.N.s. Hinshaw, Scofield, and Atwood (1981) evaluated a change from mixed staffing to all R.N. staffing on one inpatient unit serving cardiac and oncology patients. Using a pretest/posttest comparison, there were no significant differences in patient perceptions of direct care quality. Posttest patient

satisfaction was as good or better than pretest satisfaction. Statistical significance was not reported.

Giovannetti (1980) compared team and primary nursing care systems in two adult surgical nursing units. While the percentages of R.N.s in each setting were not reported, it is assumed that primary nursing care systems have higher percentages of R.N.s than team or functional systems. An analysis of the indirect care work sampling revealed that the team nursing unit spent more time performing direct care functions on all three shifts. The average amount of time each nurse provided to direct patient care on the day shift was found to be approximately 3 hours on the team nursing unit and 2.4 hours on the primary nursing unit. Patients on the team nursing unit were slightly more satisfied with their care than patients on the primary nursing unit. A chi-square test comparing the responses of patients on the team nursing unit with those on the primary nursing unit revealed some significant differences. Patients on the team nursing unit were significantly more satisfied with the response of the nursing staff to their pain and discomfort. They were also significantly more satisfied with the amount of information nurses gave them about how to care for themselves at home. The primary nursing unit patients were significantly more satisfied that they had one particular nurse. Analysis of overall quality scores revealed no significant differences between the units.

A similar study evaluating the effects of primary nursing was reported by Ventura, Fox, Corley, and Mercurio (1982). Orthopedic units in two hospitals, one with primary nursing and one with team/functional nursing, were compared relative to patient satisfaction. The primary nursing unit had a higher percentage of R.N.s in the staff mix

than did the team/functional nursing unit. There were no significant differences between the units on the patient satisfaction scale. A great majority of participants indicated a high level of satisfaction. One explanation provided by the authors is that the instruments were not sensitive enough to measure differences within the group of those well satisfied.

More recently, a study examining the impact of decreasing percentages of R.N.s in the skill mix with the introduction of nurses' aides was reported (Bostrom & Zimmerman, 1993). The authors used a pretest/posttest design to evaluate this nursing care redesign intervention. Data was collected from 3 units immediately prior to introducing the intervention and again 9 to 12 months later. Work sampling revealed a realignment of tasks in the posttest study with the change in staff mix shifting non-professional patient care activities from R.N.s to nurses' aides. The proportion of R.N. time spent in many non-professional care areas declined (e.g., nutrition/elimination, patient hygiene, patient movement, specimen collection, and clerical). The largest proportional increases in R.N. time were noted in treatments and procedures, documentation, talking with others, and the category of "could not find". No statistically significant changes in levels of patient satisfaction were noted in the study. The authors suggest that the instrument used to assess patient satisfaction was not particularly sensitive to variations in staffing levels.

Skill mix changes were reported by Barter, McLaughlin, and Thomas (1994) in a survey of 102 California hospitals examining the use of unlicensed assistive personnel by hospitals. Unlicensed assistive personnel were employed in 94 of the 102 hospitals. In addition, the percentage of R.N.s in the nursing personnel skill mix dropped from

approximately 78% in 1990 to 73% in 1992. Most unlicensed assistive personnel were used in simple bedside care (84%) and were not consistently supervised by the same R.N. (97%). Patient satisfaction data related to unlicensed personnel use was not collected by the majority of respondents. The authors emphasize the importance of putting in place evaluative measures which assess the efficacy of cost-containment strategies before implementation of patient care delivery system restructuring. Well designed studies which measure patient outcomes and cost-effectiveness are needed to understand the impact of skill mix variation.

Summary

Caring research was found to focus primarily on patient and nurse perceptions of nurse caring for the purposes of concept development. Scant literature exists to support a relationship between patient perceptions of nurse caring, R.N. time spent in direct care activities and skill mix. Similarly, research on R.N. time spent in direct care activities does not describe relationships with patient outcomes and research findings on the effects of skill mix are inconclusive. There is a need to conduct nursing research on nurses' time and skill mix as it relates to patient perceptions of nurse caring. Research in this area is urgently needed to assist nursing decision makers in making informed nursing resource decisions that strengthen the essence of caring in nursing.

Research Questions

The research questions posed for this study are:

1. Is there a relationship between the percentage of time, measured by work sampling, R.N.s spend in direct care activities and patient perceptions of nurse caring?
2. Is there a relationship between skill mix and patient perceptions of nurse caring?

Definition of Terms

Work sampling is a methodology used to measure the percentage of time spent in nursing activities.

Direct care activities are comprised of the ten direct care activities (see Appendix A) which are defined as all nursing activities performed and explanation given in the presence of the patient and/or family and include assessing patient needs, administering medications, performing treatments and procedures, obtaining specimens and performing basic physical care associated with bathing and grooming, eating , toileting, and ambulating.

Patient perceptions of nurse caring is defined as the patient response scores on the Caring Behaviors Inventory (Wolf et al, 1994). The 43 item inventory was derived from the nurse caring literature incorporating theoretical constructs (Leininger, 1980; Watson, 1988) and caring research (Brown, 1986; Larson, 1987; Mayer, 1986; Riemen, 1986).

Skill mix is defined as the percentage of R.N.s in the direct patient care count as compared with the percentage of nurse extenders who also provide direct patient care. The category R.N. extenders refers to L.P.N.s and non-licensed direct care givers.

CHAPTER THREE

METHODOLOGY

Research Design

A descriptive correlational design was selected to describe the relationship between R.N. time spent in direct care activities and skill mix measures and patient perceptions of nurse caring. An advantage of this design is the efficiency of data collection in the natural setting. Disadvantages include the inability to actively manipulate the variables of interest and the danger of faulty interpretation of study findings (Polit & Hungler, 1987) due to multiple extraneous variables that may also impact patient perceptions of nurse caring.

A secondary analysis was conducted using data previously collected as part of a large-scale data set. The data set was collected to establish baseline data to evaluate changes in the work environment on nursing and organization culture (Urden, 1994).

Threats to internal validity of this study design included the potential existence of multiple extraneous variables such as severity of patient condition or nursing attitudes toward patients. Another threat to internal validity is the potential inaccuracy of work sampling data collection due to the large number of data collectors. Nursing care is a complex process, involving critical thinking skills and ongoing assessment and evaluation occurring through direct and nondirect care activities. A multiplicity of

thought processes and interventions may occur at any one moment during care giving activities. It is understood that these processes may not be captured in the work sampling methodology (Urden, 1994). A threat to external validity is the Hawthorne Effect in which study participants behave in a particular manner because they are aware of being observed (Polit & Hunger, 1987). Another threat is patient choice in returning the Caring Behaviors Inventory. The patient sample may not be generalizable to other settings.

Measures taken to control threats to validity focused primarily on the work sampling methodology. Data collectors received two hours of standardized training and were tested to assure at least 80% interrater reliability. Unit nursing staff were informed about the work sampling process and assured that data collected would not be used to evaluate their individual performance. Patients and families were informed by their nurses of the work sampling study and that data collectors were observing how nurses spent their time in various activities.

Sample and Setting

The data to be used in this study were collected from September-December, 1994 at a 529 bed, community teaching hospital in the midwest. The work sampling data, collected over a six week period beginning September 25, 1994 includes 76,491 activity samples. All inpatient and outpatient nursing units were studied. The sample size of activity observations was calculated based on the average number of staff per unit in relation to the total number of nursing activity indicators to observe. Unit demographics including skill mix were also collected.

The patient survey sample size was calculated through power analysis using a 15% margin of error for the 95% confidence interval. An estimated sample size of 470 admissions or cases was needed for a 15% margin of error (Urden, 1994). Approximately 1900 surveys were sent out and 361 were received for a 19% return rate. A disproportionate stratified random sample design was used to guarantee that the margin of error was the same for each unit to allow for comparisons between units. The actual survey sampling was distributed over the 30 days in October, 1994 during which patients were admitted to avoid systematic biases such as samples based only on one day or one weekday.

Characteristics of Participants

Work sampling, skill mix, and the Caring Behaviors Inventory (CBI) data were collected on 16 units. (See Appendix B for the departments and corresponding inpatient and outpatient units included in the work sampling and patient survey study.) A total of 313 patients returned the CBI on the study units.

Instruments

Three instruments were used to collect the data elements of interest for this study:

1. Work Sampling Instrument
2. The Caring Behaviors Inventory (CBI)
3. Demographic Questionnaire

The work sampling instrument provided data for the percentage of time and type of activities nurses performed and data on skill mix. The CBI (Wolf et al., 1994) provided data about patient perceptions of nurse caring. The demographic questionnaire provided

information to link patient perceptions of nurse caring with specific nursing units as well as to describe the respondents.

Work Sampling Instrument

The work sampling instrument was based on the four major categories defined by the D.H.E.W. (1978) publication and a fifth one added by the research team. The four major D.H.E.W. categories were direct care, indirect care, unit related, and personal and the fifth category was documentation. The direct care category was the focus of this study. The ten direct care activity definitions were then developed based on the D.H.E.W. publication by the research team conducting the original research and consisted of Clinical Nurse Specialists, Staff Educators, and Nurse Administrators under the direction of a doctorally prepared principal nurse investigator. The research team defined a direct care activity as any observable process or action that nursing staff conducted during the course of their shift (Scherubel & Minnick, 1994). Using a phenomenological observational approach, the research team observed nurse activities occurring on nursing units and developed the definitions over a period of six months to fit the observed activities and to be comprehensive, clear, and mutually exclusive. A two week work sampling pilot study was conducted and definitions were again refined and revised. The ten direct care activity definitions were collapsed to achieve one score for direct care in this study.

Part of the tool elicited skill mix data to determine actual numbers of direct care providers present on the unit at the time each observation was counted according to job category. The job categories consisted of R.N. and R.N. extender which included L.P.N.s

and non-licensed direct care givers. The work sampling instrument has both face and content validity (Urden, 1994). (See Appendix C for the Work Sampling Instrument.)

Caring Behaviors Inventory (CBI)

Wolf et al. (1994) developed a 43 item instrument to measure dimensions of nurse caring. Items are scored on a 5 point Likert-like scale used to elicit responses: 1= strongly disagree through 5= strongly agree. The instrument was derived from a review of the nurse caring literature incorporating theoretical constructs (Leininger, 1980; Watson, 1988) and caring research (Brown, 1986; Larson, 1987; Mayer, 1986; Riemen, 1986). The authors report test-retest reliability (r= .96, p= .000; rho= .88, p= .000) on a nurse sample. The alpha coefficient was .83. Internal consistency reliability resulted in an alpha coefficient of .96 on a combined nurse and patient sample. The alpha coefficient was .98 for the patient sample in this study. Content validity was established by a panel of four nurse experts. The instrument has construct validity as the authors relate a fit between the dimensions of nurse caring and Watson's theory of human care.

Wolf et al. (1994) noted that the initial factor analysis of the CBI revealed five dimensions of the process of nurse caring. The 5 dimensions and alpha coefficients are: respectful deference to other, .89; assurance of human presence, .92; positive connectness, .85; professional knowledge and skill, .82; and attentiveness to other's experiences, .82. The alpha coefficients for the patient sample in this study were: .95, .97, .95, .93, and .93 respectively. (See Appendix D for the Caring Behaviors Inventory.)

Demographic Questionnaire

The patient demographic data collected included unit or department, age, sex, number of times as patient in department, and number of times as patient at the study hospital. This data will be used to match patient perceptions of nurse caring with the appropriate nursing unit/department where work sampling and skill mix data have also been collected. In addition, information on patient age and sex will assist in describing the sample. (See Appendix E for the demographic questionnaire.)

Procedure

Two procedures were utilized to collect the data for this study. The work sampling process obtained data on R.N. time spent in direct care activities and skill mix. The Caring Behaviors Inventory survey process obtained data on patient perceptions of nurse caring and the Demographic Questionnaire.

Work Sampling

The work sampling process consisted of data collector training, interrater reliability testing, data collection, and ongoing clarification of activity definitions. The research team at the study hospital developed a data collector training/interrater reliability testing plan. The plan included sending written materials explaining the study purpose and indicator definitions to the data collectors, providing a two hour training session, and requiring a one hour clinical interrater reliability check with a trainer. A subgroup of five research team members conducted data collector training sessions.

Data collector training included practice in coding activities using sample written vignettes and administration of an interrater reliability test using a 49 item videotape of

nursing activities developed by the subcommittee. Interrater reliability reached or exceeded the pre-established minimum of 80% with the mean score of 91%.

One hundred data collectors who were nurses holding non-direct care positions such as Unit Directors, Clinical Nurse Specialists, Staff Educators, and Clinical Coordinators were trained and tested for interrater reliability. Each unit had approximately five to six data collectors with one person assigned as team leader. Data collectors on each unit were pre-assigned to 43 4-hour blocks of time. The blocks of time were randomly assigned around the clock, seven days per week over a six week period.

Each data collector sampled the activities of up to 8 nursing caregivers including R.N. and non R.N. staff every 10 minutes for a 4 hour block of time. Data collectors were instructed to begin each 10 minute observation by randomly starting with a different care giver each time. Once the random selection was made, the data collectors were required to record the activities of the other care providers in sequential order as they were listed on the data collection tool.

Several activities were implemented to reduce the Hawthorne Effect. A letter was sent to all nursing staff informing them of the study purpose (see Appendix F). The principal nurse investigator described the study purpose and methodology in presentations to all nursing division committees. Unit Directors also discussed the study purpose and work sampling methodology at unit team meetings. A script was given to data collectors to assist them in explaining the study to the staff and to assure those observed that individual observations were confidential and would not be used for

evaluation purposes. Data collectors also wore lab coats in an effort to blend in with the nursing staff.

Unit data collectors met weekly during the six week data collection period to clarify activity definitions and work sampling procedures. Trainers were available 24 hours/day to answer questions and clarify definitions. The study team also analyzed any items recorded by data collectors as miscellaneous and assigned them to the appropriate category.

Caring Behaviors Inventory and Demographic Questionnaire

A random sample of patients admitted during October, 1994 to all inpatient units; including emergency room visits; Ambulatory Care visits; Same Day Stay, pre-admission testing, A.M. admission units (now known collectively as the Outpatient Centre), and outpatient surgery visits was obtained. Names and addresses were obtained from the Medical Records department and surveys were mailed to the subjects' homes. The research packets included a cover letter explaining the purpose of the study, the maintenance of the responder's confidentiality, and provided instructions to return the completed surveys in the addressed stamped envelopes. Data collection was considered completed by January, 1995. (See Appendix G for the patient survey cover letter.)

Approval Process

Permission to use the data needed for this study was obtained from the principal investigator. (See Appendix H.) Approval for the large data-set study was obtained via the study hospital Research and Human Rights Committee. (See Appendix I.) Approval was also obtained from the Grand Valley State University Human Research Review Committee. (See Appendix J.)

CHAPTER FOUR

DATA ANALYSIS

Results

Characteristics of Participants

A total of 313 patients returned the Caring Behaviors Inventory (CBI). Table 1 provides CBI sample size by unit. Sample size per unit ranged from a high of 46 patients (14.70%) in Outpatient Surgery to a low of 4 patients (1.28%) in Neonatal Intensive Care.

Table 1

CBI Sample Size by Unit

Unit	n	% of total
7 North: GI/GU	21	6.70
6 North: Neuroscience	24	7.67
5 South: Oncology	9	2.88
4 South: Cardiovascular	9	2.88
2 South: Orthopedics	25	7.98
5 North: Medical Critical Care	17	5.43
4 North: Surgical Critical Care	9	2.88
3 West: Neonatal Intensive Care	4	1.28
7/9 Center: Pediatrics	25	7.99
8 Center: Pediatric Intensive Care	6	1.92
6 Center: Women's Health	30	9.58
4 Center: Mother-Baby/OB Special Care	12	3.83
2 Center: Labor, Delivery, and Recovery	33	10.54
Outpatient Surgery	46	14.70
Same Day Stay/ B-West	29	9.27
Emergency Department	14	4.47

Table 2 provides patient demographic data by age, gender, number of times as a patient in this department, and number of times as a patient at the study hospital. The average patient was 43.7 years of age. 27.51% of the patients were 0-30 years of age, 43.96% were 31-60 years of age, and 28.80% were 61-91 years of age. As indicated in Table 2, the majority were female (67.64%). Slightly over half of the patients (53.45%) had not been a patient previously in the same department however, the majority (72.76%) had been a patient previously at the study hospital.

Table 2

Patient Demographic Data

	n	% of total
Age		
0-10	31	10.03
11-20	22	7.12
21-30	32	10.36
31-40	59	19.09
41-50	39	12.62
51-60	37	11.98
61-70	44	14.24
71-80	36	11.65
81-91	9	2.91
Gender		
female	209	67.64
male	100	32.36
Number of times as patient in this department		
0	155	53.45
1	62	21.38
2	31	10.69
3-5	32	11.03
6-30	10	3.45
Number of times as patient in this hospital		
0	23	7.64
1	59	19.60
2	60	19.94
3	46	15.28
4	32	10.63
5	23	7.64
6-10	50	16.61
11-30	8	2.66

Description of Study Variables

The mean percentage of R.N. time spent in direct care activities as measured by work sampling, the mean percentage of R.N.s in the skill mix, and the mean scores on the Caring Behaviors Inventory (CBI) were calculated by unit as presented in Table 3.

Table 3

Unit Means for Work Sampling, Skill Mix, and CBI

Unit	% RN time in direct care	% RN in skill mix	CBI Score
7 North: GI/GU	28.64	79.14	4.10
6 North: Neuroscience	33.43	76.27	4.54
5 South: Oncology	32.78	77.82	4.54
4 South: Cardiovascular	31.27	83.25	4.24
2 South: Orthopedics	36.53	74.06	4.32
5 North: Medical Critical Care	39.29	80.73	4.50
4 North: Surgical Critical Care	38.61	88.24	4.87
3 West: Neonatal Intensive Care	46.37	96.31	4.91
7/9 Center: Pediatrics	37.92	81.08	4.58
8 Center: Pediatric Intensive Care	41.74	92.62	4.73
6 Center: Women's Health	32.24	88.92	4.40
4 Center: Mother-Baby/OB Special Care	29.02	82.50	4.57
2 Center: Labor, Delivery, and Recovery	40.31	94.50	4.65
Outpatient Surgery	37.89	64.13	4.43
Same Day Stay/B-West	34.07	87.71	4.62
Emergency Department	38.22	54.78	4.44

The work sampling data revealed a wide range between the 16 units in the percentage of time R.N.s spent in direct care activities. R.N.s in Neonatal Intensive Care spent a high of 46.37% while medical/surgical GI/GU nurses spent a low of 28.64% in direct care activities. Percentages for the intensive care units were above the mean, while

medical/surgical units were at or below the mean. The percentage range, mean, and standard deviation are shown in Table 4.

Table 4

Percentage of Time Spent by R.N.s in Direct Care Activities

	Range (low-high)	M	SD	N
% RN time in direct care	28.64-46.37	36.14	4.82	16 units

The skill mix data also revealed a wide range between the 16 units in the percentage of R.N.s in the skill mix. The Labor, Delivery, and Recovery unit had the highest percentage of R.N.s in the skill mix (94.50%) while the Emergency Department had the lowest (54.78%). The percentage range, mean, and standard deviation are shown in Table 5.

Table 5

Percentage of RNs in the Skill Mix

	Range (low-high)	M	SD	N
% RN in skill mix	54.78-94.50	81.38	10.87	16 units

The distribution of scores achieved by patients on the CBI is presented in Table 6. The overall mean score reflects that patients' perceived a high level of nurse caring with little variation between scores. Mean scores for intensive care units were at or above the mean while medical/surgical units were at or below the mean.

Table 6

CBI Scores

	Range (1=strongly disagree-5= strongly agree)	M	SD	N
Scores for patient perceptions of nurse caring	4.10-4.91	4.55	.21	16 units

Research Question Number One

1. Is there a relationship between the percentage of time, measured by work sampling, R.N.s spend in direct care activities and patient perceptions of nurse caring?

A Pearson correlation coefficient (two-tailed) revealed a significantly positive relationship between the percentage of time R.N.s spent in direct care activities and patient perceptions of nurse caring ($r=.6874$, $p<.01$). Figure 2 displays a graphic representation of the two variables on a scatter plot.

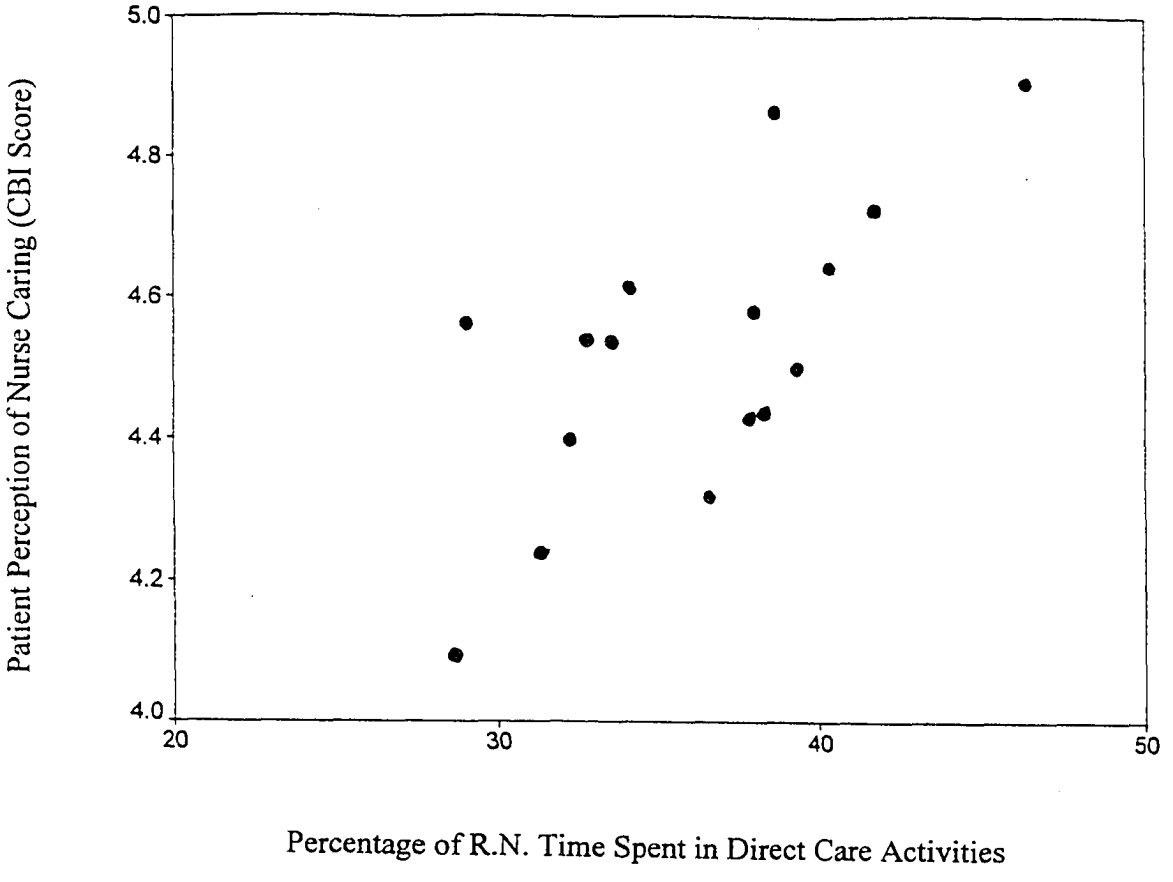

Figure 2. Scatter plot depicting the relationship between variables: percentage of R.N. time spent in direct care activities and patient perceptions of nurse caring.

Research Question Number Two

2. Is there a relationship between skill mix and patient perceptions of nurse caring?

A Pearson correlation coefficient (two-tailed) revealed a significantly positive relationship between the percentage of R.N.s in the skill mix and patient perceptions of nurse caring ($r=.50$, $p<.05$). Figure 3 displays a graphic representation of the two variables on a scatter plot.

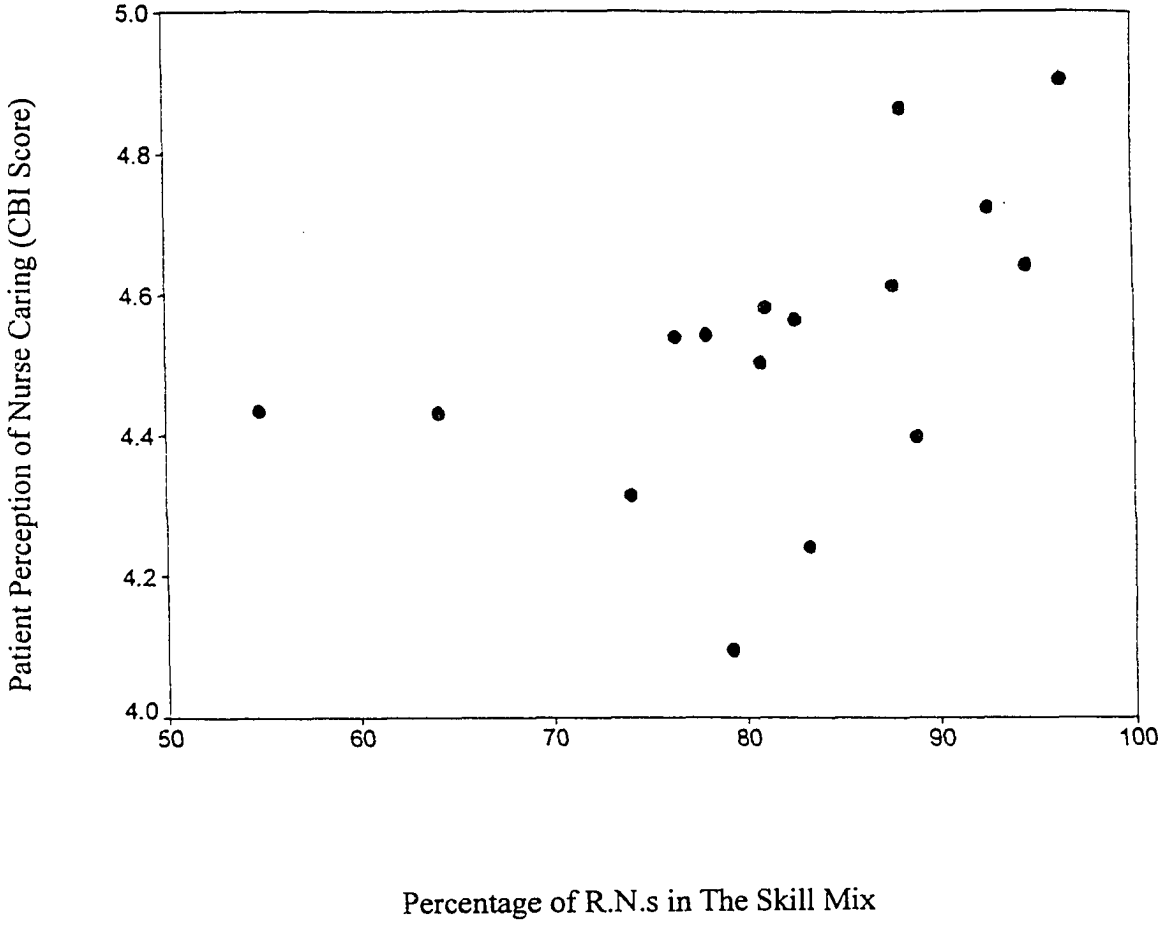

Figure 3. Scatter plot depicting the relationship between variables: percentage of R.N.s in the skill mix and patient perceptions of nurse caring.

CHAPTER FIVE

DISCUSSION AND IMPLICATIONS

Discussion

The focus of this study was to examine the relationship between the percentage of time R.N.s spent in direct care activities, nursing skill mix, and patient perceptions of nurse caring. The study findings support a strong positive relationship between the percentage of time R.N.s spent in direct care and patient perceptions of nurse caring. In addition, a moderate positive relationship was found between the percentage of R.N.s in the skill mix and patient perceptions of nurse caring.

Watson's (1979, 1988) theory of human caring provided the conceptual framework for this study. Three of Watson's carative factors are closely associated with nurse presence and time spent with the patient. They are: the promotion of interpersonal teaching-learning; the provision for a supportive, protective, and (or) corrective mental, physical, sociocultural, and spiritual environment; and the assistance with the gratification of human needs. Watson also describes an actual caring occasion as involving both action and choice by the nurse and the individual. The concept of caring occasion emphasizes the importance of patient perception in identifying that a caring event has occurred. Figure 4 portrays a pictorial representation of Watson's model depicting fit of research variables.

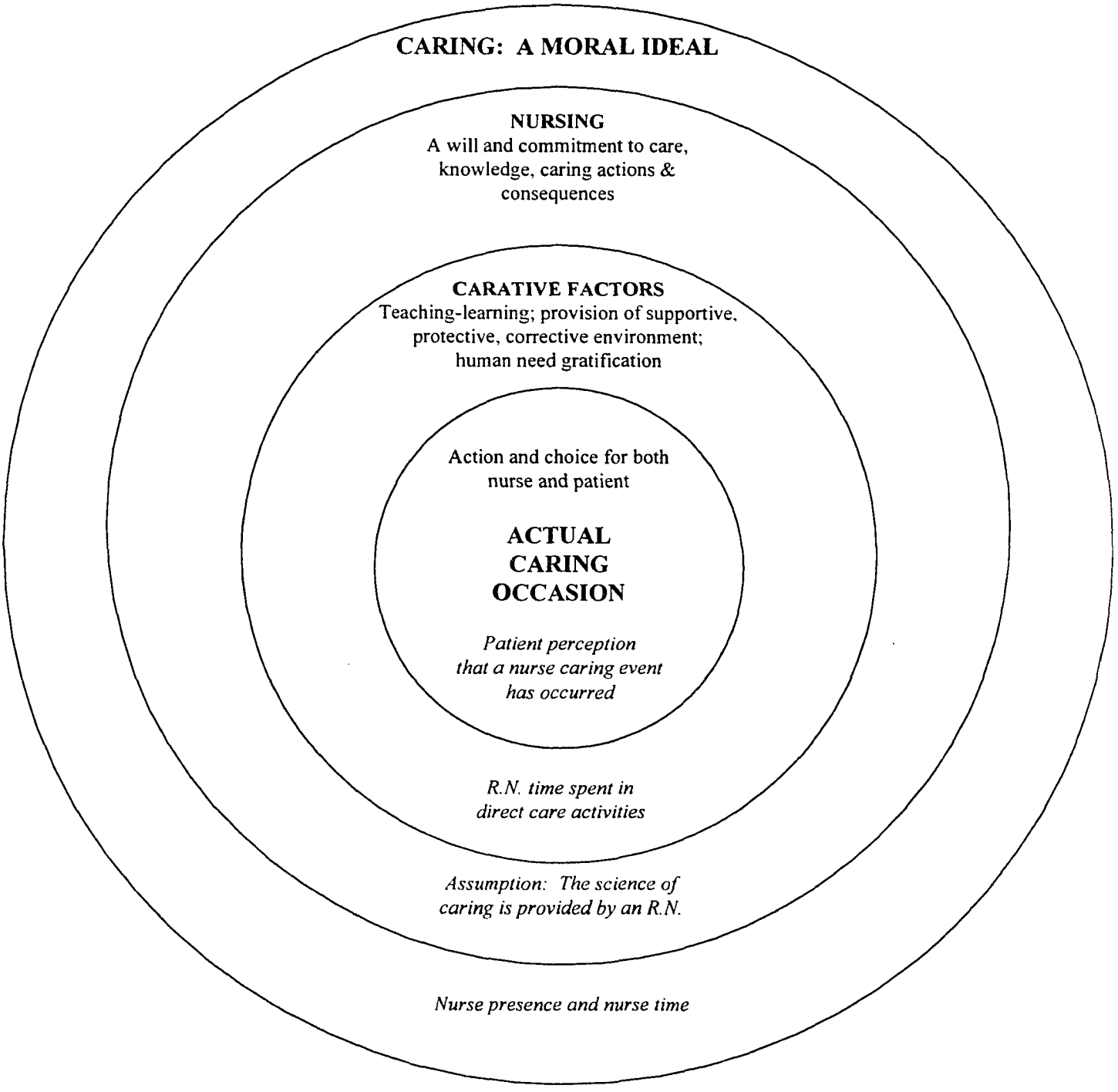

Figure 4. Pictorial representation of Watson's (1979, 1988) model depicting fit of research variables: R.N. time spent in direct care activities and patient perceptions of nurse caring.

The Caring Behaviors Inventory (CBI) unit mean scores reflected that patients perceived a high level of nurse caring. Duffy (1992) also found the overall mean score of hospitalized patients perceptions of nurse caring to be negatively skewed, or hovered toward the higher end of the scale. Despite little variation between CBI mean scores in this study, significant relationships were supported between the study variables.

The findings in this study are unusual in that no other reported studies have found significant relationships between patient perceptions of nurse caring and productivity variables such as percentage of R.N. time and skill mix. No reports were found in the literature describing the relationship between R.N. time spent in direct care activities, skill mix, and patient perceptions of nurse caring. Relationships have not been supported in studies contrasting caring with other productivity measures such as nursing care costs, number of staff available, the acuity of the patients on a unit, and the workload index (Duffy, 1992; Valentine, 1991a). Nursing productivity variables were measured by acuity data generated from a patient classification tool in both studies. The authors conclude that productivity variables derived from patient classification systems may not be sensitive to patient perceptions of nurse caring.

Findings in this study suggest that data derived from work sampling may be a more sensitive measure when examining relationships between productivity variables and patient outcomes such as nurse caring. Work sampling studies reported in the literature have not examined relationships between work sampling data and patient outcome variables. Most work sampling studies focus instead on exploring opportunities for

productivity gains by reducing the amount of time R.N.s spend in various indirect care or unit related activities (Hendrickson, Doddato, & Kovner, 1990; Linden & English, 1994). Scherubel and Minnick (1994) propose that work sampling is a sensitive measure and has the strength to identify the levels at which changes in activity patterns are associated with changes in patient perceptions. The findings in this study support this notion.

Studies examining the impact of skill mix on patient outcomes have produced contradictory results. Examination of care delivery model skill mix variation has not yielded significant findings as related to patient perceptions of care quality or satisfaction with care (Bostrom & Zimmerman, 1993; Giovannetti, 1980; Hinshaw, Scofield, & Atwood, 1981; Ventura, Fox, Corley, & Mercurio, 1982). The findings in this study suggest that the percentage of R.N.s in the skill mix is positively related to patient perceptions of nurse caring. Skill mix studies have used patient satisfaction rather than nurse caring tools to measure outcomes. It is possible that patient satisfaction tools are not sensitive to variations in nursing skill mix. Nurse caring tools may provide a more sensitive measure of actual nursing care rendered as perceived by the patient.

In summary, the results of this study support the existence of relationships between the percentage of time R.N.s spent in direct care, nursing skill mix and patient perceptions of nurse caring. Findings strengthen the concepts in Watson's (1979, 1988) theory of human caring by measuring the more concrete aspects of nurse presence and nurse time as related to patient perceptions of nurse caring.

Implications for Nursing Administration

As this study suggests, patient perceptions of nurse caring are influenced by the percentage of R.N. time in direct care and the percentage of R.N.s in the skill mix. There is a need for nurse administrators to be cognizant of these relationships and to use caution when making decisions that impact staffing and skill mix levels. It is imperative that decisions are not based solely on cost but include consideration of patient outcome measures that reflect the essence of nursing. Attention must be given to the concept of caring as a descriptor of nursing practice which can be measured.

Current nursing productivity measures such as patient classification systems rarely incorporate concepts of caring as the essence of nursing (Valentine, 1991a). Decisions based on these systems are problematic in that they may not accurately reflect actual nursing practice. It is essential for the nurse administrator to understand the limitations of current productivity measures when making important decisions about nurse staffing. These decisions should be based on a careful evaluation of patient outcome measures including patient perceptions of nurse caring.

While not identical phenomena, patient perceptions of nurse caring and patient satisfaction have been found to be related (Duffy, 1992). It supports Watson's (1979) proposition that nurse caring produces patient satisfaction. Satisfaction with care is an important element in assisting a health care institution to maintain a competitive edge. The nurse administrator must be aware of the impact caring has not only on patient satisfaction but on other patient outcomes as well (Watson, 1979).

Nurse administrators would do well to understand and value concepts of human caring (Watson, 1979) as it relates to their practice as key decision-makers. Incorporating Watson's carative factors into their own interactions would assist in developing a culture of caring within the organization. This in turn would help to balance the cost of care with human caring.

Limitations

Additional limitations of this study include the sample size on the Caring Behaviors Inventory (CBI). Some units with lesser patient participation also had higher mean CBI scores. This limits the generalizability of these findings to other settings. Another limitation may relate to the patient's perception of who the nurse was when completing the CBI. It is possible that the patient was unable to distinguish between the various caregivers (i.e., R.N., L.P.N., Nursing Assistant) when describing nurse caring. This could affect the accuracy of comparing skill mix data with patient perceptions of nurse caring. The CBI instrument may also be a limitation due to the small variation between patient mean scores. This may indicate that the tool is not sensitive enough to measure individual differences between patients.

Recommendations for Future Research

The implications for future research as a result of study findings are great. First, replication studies are needed to further validate and examine findings of this study. Research on caring in nursing should include productivity variables which can be measured simultaneously. Ongoing measurement of patient perceptions of nurse caring through hospital based quality improvement programs would provide valuable insight

into the impact of programmatic changes within the nursing division. In addition, there is a need to continue refining tools measuring caring concepts so that they are more sensitive to differences between patients.

Future researchers conducting work sampling studies should exercise great caution in making productivity decisions based on work sampling data alone. Instead they would do well to simultaneously measure outcome variables to better understand relationships between productivity and outcomes.

Finally, research is needed in the development of productivity measures such as patient classification systems to more accurately reflect the practice of caring as the essence of nursing. Nursing decision makers are in need of tools to efficiently and accurately measure the impact of staffing decisions on both cost and quality of care. Further research could help to balance the cost of care with human caring.

APPENDICES

APPENDIX A

DIRECT CARE ACTIVITY CATEGORIES

Category	Definition
1. Assessment	Evaluation/measurement of any functional health pattern/treatment modality and follow-up. Includes equipment attached to the patient but away from the bedside.
2. Hygiene	Activities which promote or restore patient cleanliness.
3. Patient Activity	Interventions which promote therapeutic movement of the patient.
4. Medications and IV Administration	Activities which involve dispensing of medications and IVs to patients.
5. Procedures	Performance of patient care skills/treatments using equipment, devices, or supplies which are applied, inserted, maintained, or removed from the patient. Includes positioning and instructions. Includes activities associated with universal precautions such as handwashing or gloving.

APPENDIX A

DIRECT CARE ACTIVITY CATEGORIES

Category	Definition
6. Specimen Collection and Testing	Collection of body fluids from any site for purposes of diagnostic evaluation. Includes specimen testing performed on the unit. Gathering and testing are recorded as one observation, even though testing may be done away from patient.
7. Nutrition and Elimination	Assisting patient with intake and output including preparation, encouragement, administration, measurement and follow-up.
8. Transporting Patients	Escorting patients to another patient care area or department within the hospital including discharge. Includes transfer to/from stretcher/wheelchair and accompanying a patient to another area for any reason.
9. Assisting with Procedures	Helping another health care provider with a patient procedure.
10. Patient and Family Interaction	Verbal interactions with the patient and family for the purpose of initiating, intervening, reviewing, revising, and evaluating the patient care plan and patient education plan.

APPENDIX B

DEPARTMENTS AND UNITS INCLUDED IN WORK SAMPLING AND PATIENT SURVEY STUDY

Department	Unit
Medical/Surgical	7 North: GI/GU
	6 North: Neuroscience
	5 South: Oncology
	4 South: Cardiovascular
	2 South: Orthopedics
Adult Critical Care	5 North: Medical Critical Care
	4 North: Surgical Critical Care
Pediatrics	3 West: Neonatal Intensive Care
	7/9 Center: Pediatrics
	8 Center: Pediatric Intensive Care
Women's Services	6 Center: Women's Health
	4 Center: Mother-Baby/OB Special Care
	2 Center: Labor, Delivery, and Recovery
Surgical Services	Outpatient Surgery
	Same Day Stay/B-West (outpatient)
Other	Emergency Department (outpatient)

APPENDIX C
WORK SAMPLING INSTRUMENT

Fixed Sampling

Revised 9/7/94--#8
NURSING PRACTICE SURVEY
RN/RN EXTENDER ACTIVITIES
(Please Circle Skill Level)

Date:______ __________
Surveyor:______________
Unit:______________
Time Period:______________
(Military)

Participants
RN (upper case) A/a__________ C/c__________ E/e__________ G/g__________
RN Extender (lower case) B/b__________ D/d__________ F/f__________ H/h__________

MILITARY	Time	A	B	C	D	E	F	G	H
	00								
	10								
	20								
	30								
	40								
	50								

MILITARY	Time	A	B	C	D	E	F	G	H
	00								
	10								
	20								
	30								
	40								
	50								

MILITARY	Time	A	B	C	D	E	F	G	H
	00								
	10								
	20								
	30								
	40								
	50								

MILITARY	Time	A	B	C	D	E	F	G	H
	00								
	10								
	20								
	30								
	40								
	50								

DIRECT CARE
1. Assessment
2. Hygiene
3. Patient Activity
4. Med/IV Administration
5. Procedures
6. Specimen Collection and Testing
7. Nutrition/Elimination
8. Transporting Patient
9. Assisting with Procedures
10. Patient/Family Interaction

INDIRECT CARE
11. Report
12. Communication/Information
13. Room/Equipment Set-up and Cleaning
14. Med/IV Preparation

UNIT RELATED
15. Errands off Unit
16. Supplies, Check, Restock
17. Meetings, Inservice
18. Clerical
19. Environmental Cleaning

PERSONAL
20. Personal

DOCUMENTATION - FORMS
21. Nursing Process/Coordination of Care
22. Meds/IVs
23. Numerical Entries
24. Kardex/Worksheet/Critical Paths
25. Unit Related Documentation
26. Miscellaneous Documentation (Please note name of form)

a. ______________
b. ______________
c. ______________
d. ______________
e. ______________
f. ______________
g. ______________
h. ______________
i. ______________
j. ______________

Workload Index	DAILY ASSESSMENT PATIENT CARE PROVIDERS		Patient Census
	# Staff		
Direct Care Providers	Bud.	Rec.	Actual
RN			
LPNs			
UAs			
PSAs			
Safety Attendants			
Other			
Support			
Safety Attendants			
Lift Team			
Monitor Tech.			
Volunteers			
Nursing Students			
US			
PSA			
Other			
Special Occurrence			

APPENDIX D

CARING BEHAVIORS INVENTORY

PART IV

The statements in Part IV refer to caring behaviors of nurses.

Please circle the number which best describes your opinion regarding the nurses at Butterworth Hospital.

NURSES:	Strongly Disagree				Strongly Agree
1. Treat the patient as an individual.	1	2	3	4	5
2. Show respect for the patient.	1	2	3	4	5
3. Attentively listen to the patient.	1	2	3	4	5
4. Support the patient.	1	2	3	4	5
5. Are honest with the patient.	1	2	3	4	5
6. Give instructions or patient teaching.	1	2	3	4	5
7. Spend time with the patient.	1	2	3	4	5
8. Call the patient by his/her preferred name.	1	2	3	4	5
9. Give the patient information so that he/she can make a decision.	1	2	3	4	5
10. Include the patient/family in planning his/her care.	1	2	3	4	5
11. Make the patient physically or emotionally comfortable.	1	2	3	4	5
12. Are sensitive to the patient.	1	2	3	4	5
13. Promote independence for the patient.	1	2	3	4	5
14. Appreciate the patient as a human being.	1	2	3	4	5
15. Show concern for the patient.	1	2	3	4	5
16. Respond quickly to the patient's call.	1	2	3	4	5
17. Encourage the patient to call if there are problems.	1	2	3	4	5
18. Help to reduce the patient's pain.	1	2	3	4	5
19. Return to the patient voluntarily.	1	2	3	4	5
20. Allow patient to express feelings about his/her disease and treatment.	1	2	3	4	5
21. Treat patient information confidentially.	1	2	3	4	5
22. Meet the patient's stated and unstated needs.	1	2	3	4	5

APPENDIX D

CARING BEHAVIORS INVENTORY

23. Talk with the patient.	1	2	3	4	5
24. Help the patient.	1	2	3	4	5
25. Are hopeful for the patient.	1	2	3	4	5
26. Watch over the patient.	1	2	3	4	5
27. Use soft, gentle voice with the patient.	1	2	3	4	5
28. Trust the patient.	1	2	3	4	5
29. Are careful with the patient.	1	2	3	4	5
30. Touch the patient to communicate caring.	1	2	3	4	5
31. Are cheerful with the patient.	1	2	3	4	5
32. Are patient or tireless with the patient.	1	2	3	4	5
33. Help the patient grow.	1	2	3	4	5
34. Are empathetic or identify with the patient	1	2	3	4	5
35. Know how to perform treatments and procedures.	1	2	3	4	5
6. Manage equipment skillfully.	1	2	3	4	5
37. Demonstrate professional knowledge and skill.	1	2	3	4	5
38. Give the patient's medications and treatments on time.	1	2	3	4	5
39. Relieve the patient's symptoms.	1	2	3	4	5
40. Pay special attention to the patient during first times, i.e., hospitalization, special treatment, procedure, etc.	1	2	3	4	5
41. Put the patient first.	1	2	3	4	5
42. Give good physical care.	1	2	3	4	5
43. Provide reassuring presence.	1	2	3	4	5
44. Are confident with the patient.	1	2	3	4	5
45. Overall, you are satisfied with the nursing care at Butterworth.	1	2	3	4	5
46. Overall, you are satisfied with the medical care at Butterworth.	1	2	3	4	5
47. Overall, you are satisfied with Butterworth Hospital.	1	2	3	4	5

THANK YOU!

APPENDIX E

DEMOGRAPHIC QUESTIONNAIRE

PATIENT SURVEY

PART I

1. For which one unit or department will you be giving opinions on this survey? (please choose only one)

Medical Surgical

____ 7 North
____ 6 North
____ 5 South
____ 4 South
____ 2 South

Adult Critical Care

____ Medical Intermediate/ Medical Intensive Care
____ Surgical Intensive Care

Pediatrics

____ Neonatal Intensive Care/Newborn Intermediate/Peds. Extended Care Unit
____ Pediatric Intensive Care Unit
____ Pediatrics - 9 Center
____ Pediatrics - 7 Center

Women's Services

____ Birthing Room/LDRP
____ Labor and Delivery
____ High Risk Undelivered/ OB Special Care
____ Women's Health - 6 Center

Other

____ Emergency Department
____ Ambulatory Clinics
____ Other

Surgical Services

____ Outpatient Surgery
____ Same Day Stay
____ B-West/Pre-Admission Testing
____ Endoscopy

2. Age: _____ years

3. Sex: _____ Female
_____ Male

4. How many other times have you had patient experiences in this department? _____

5. How many total times have you been a patient in Butterworth Hospital? _____

APPENDIX F

NURSING STAFF LETTER

Butterworth
HOSPITAL

Dear Nursing Staff:

We will be conducting a major nursing research study in the Division this fall. The purpose will be to assess the professional practice environment at Butterworth Hospital. Surveys will be sent to nursing staff, physicians and patients.

In addition, we will be collecting data regarding patient care activities using work sampling methodology.

WORK SAMPLING

What? A technique in which the variability of nursing actions can be identified so that a whole range of activities on a busy unit/department can be identified. It allows for many subjects to be studied simultaneously resulting in large data sets. Data are collected by independent observers, thus eliminating potential bias from self-reports. The observations are done for data collection purposes only and have no impact on individual performance evaluations.

Why? The purpose is to describe nursing care at BWH relative to time, quality, efficiency and documentation. There is an underlying assumption for the study that nursing care is complex, involves critical thinking and ongoing assessment and evaluation that occurs throughout the direct and non-direct caregiving phases. In addition, a multiplicity of thought processes and interventions may occur at any one time during the caring episodes. It is understood that these processes are not captured in the work sampling method.

When? September 25, 1994 - November 5, 1994.

Where? All Inpatient Units, Perioperative Areas and the Emergency Department.

Who? Data collectors will be Clinical Nurse Specialists, Unit Directors, Clinical Coordinators, Unit Directors and others as appropriate.

How? Random work sample observations of all activities on all nursing units/departments will be done. Each data collector will sample the activities of 5-6 caregivers every 10 minutes for four-hour blocks. The data collected will be a sample of the defined activity variables occurring on the unit. Observations will be done on all shifts by trained observers who have attained an 80% inter-rater reliability. Activities to be observed include both direct and non-direct activities, including various documentation indicators.

Linda D. Urden, DNS, RN, CNA
Administrative Director, Quality, Education & Research

100 Michigan Street, N.E. Grand Rapids, Michigan 49503-2560 Tel. 616/774-1774 Fax 616/456-2745

APPENDIX G

PATIENT SURVEY COVER LETTER

Butterworth
HOSPITAL

RESEARCH STUDY
Nursing Division Assessment of Organizational, Management, Productivity and Quality Indicators

Research Study Information Sheet

Dear Butterworth Health Care Consumer,

The Division of Nursing at Butterworth Hospital is conducting a research study that will assist us to identify opportunities to improve the nursing care and services that we provide to our patients on all of our units and departments. The study has been approved by the Butterworth Hospital Research and Human Subjects Committee.

Although I greatly encourage you to respond, you are under no obligation to participate in the study. All responses will be held confidential and participation in the study poses no risk to your present or future treatment and care at Butterworth. The only inconvenience will be the 15-20 minutes of your time that is required to complete the enclosed survey. Completion and return of the survey implies your consent to participate in this study.

If you choose to participate, retain this information sheet for your own record of participation. Return the completed survey in the stamped envelope to me by **December 5, 1994**.

Thank you in advance for your participation and assistance in evaluating the nursing care and services that we provide to our patients. I realize that you may receive other surveys from Butterworth, but the questions of this survey are more specific to nursing and will provide invaluable information to us.

If you have any questions about the study or survey, feel free to call me at 774-1625.

Sincerely,

[redacted]

Linda D. Urden, DNSc, RN
Administrative Director
Quality, Education and Research

100 Michigan Street, N.E. Grand Rapids, Michigan 49503-2560 Tel. 616/774-1774 Fax 616/456-2745

APPENDIX H

PERMISSION FOR USE OF DATA

Butterworth
HOSPITAL

April 5, 1995

Jeanne Roode, RN, BSN
Director, Neurology/Urology Services
Butterworth Hospital
100 Michigan NE
Grand Rapids, MI 49503

Dear Jeanne:

I grant permission to you to utilize data from my research study, *"Nursing Division Assessment of Organizational, Management, Productivity, and Quality Indicators,"* in your master's thesis. Please cite my work in your thesis and share your results with me.

Sincerely,

[redacted]

Linda Urden, DNSc, RN, CNA
Administrative Director, Quality, Education, & Research

M:\NURSING\NPOOL\URDEN\L-JR.DOC 04/05/95
100 Michigan Street, N.E. • Grand Rapids, MI 49503-2560 • Tel. 616/774-1774 Fax 616/456-2745

APPENDIX I

APPROVAL FOR PRIMARY STUDY

Butterworth
HOSPITAL

August 24, 1994

Linda Urden, DNSc, R.N., CNA
Butterworth Hospital
100 Michigan, NE
Grand Rapids, MI 49503

Dear Dr. Urden:

By means of the expedited review process your project, "Nursing Division Assessment of Organizational, Management, Productivity and Quality Indicators" was given approval by the Butterworth Hospital Research and Human Rights Committee. The number assigned to your study is 94-71.

Please be advised this does not include any budgetary items. Should you require funds from the Research and Human Rights Committee at any time, you will need to present the entire project to them.

The Research and Human Rights Committee and the F.D.A. requires you submit in writing, a progress report to the committee by July 1, 1995, and you will need reapproval should your study be ongoing at that time.

If you have any questions please phone me or Linda Pool at 774-1291.

Sincerely,

[redacted]

Jeffrey Jones, M.D.
Co-Chairman, Butterworth Hospital Research and Human Rights Committee

JJ/jfn

APPENDIX J

APPROVAL FROM GRAND VALLEY STATE UNIVERSITY

1 CAMPUS DRIVE • ALLENDALE MICHIGAN 49401-9403 • 616/895-6611

May 4, 1995

Jeanne L. Roode
2104 Wyndham Hill Dr. NE Apt. 201
Grand Rapids, MI 49505

Dear Jeanne:

Your proposed project entitled "***A Study of the Relationship Between Registered Nurse Time Spent in Direct Care Activities, Nursing Skill Mix and Patient Perceptions of Nurse Caring***" has been reviewed. It has been approved as a study which is exempt from the regulations by section 46.101 of the Federal Register 46(16):8336, January 26, 1981.

Sincerely,

[redacted]

Paul Huizenga, Chair
Human Research Review Committee

LIST OF REFERENCES

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