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The Effect of a Change in Patient Care Delivery on Nurse Satisfaction and Cost of Care

Kathleen M. Allen
Grand Valley State University

THE EFFECT OF A CHANGE IN PATIENT CARE DELIVERY ON NURSE SATISFACTION AND COST OF CARE

By

Kathleen M. Allen

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Thesis Committee Members:

Andrea C. Bostrom, Ph.D., R.N.

Virginia Keck, Ph.D., R.N.

Donna VanIwaarden, Ph.D.

ABSTRACT

THE EFFECT OF A CHANGE IN PATIENT CARE DELIVERY

ON NURSE SATISFACTION AND COST OF CARE

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This quasi-experimental study was designed to compare the satisfaction of nurses assigned to a medical-surgical unit on which care delivery was changed to a Dyad model (combining elements of team nursing and case management) to nurses on similar units utilizing total patient care delivery. A convenience sample of nurses from the Dyad model unit was compared to a control group comprised of nurses from three similar medical-surgical units. Nurse satisfaction was measured using an instrument developed by Wade and Degerhammar (1991). Cost per case and length of stay on selected diagnoses, and labor cost per patient were compared across units. Satisfaction improved in all groups but when submitted to MANOVA analysis this was not statistically significant for type of care delivery system. Greater decreases in cost per case, length of stay and labor cost per patient occurred on the experimental unit.

Dedication

This work is dedicated to my parents, Jack and Mary Cochrane. They both encouraged me to fulfill my desire to enter the nursing profession. My mother provided the support I needed to complete my Associate Degree in Nursing. My father, who died before then, taught me the value of perseverance in all worthwhile pursuits. That attribute has served me well in all my professional endeavors.

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CHAPTER 1

INTRODUCTION

Multiple patient care delivery models have been developed and implemented in attempts to improve quality of care and nurse satisfaction. Of these, both primary and team nursing have been extensively scrutinized for effectiveness. Neither model seems to have provided an acceptable solution to the problem of nurse satisfaction with care delivery (Weeks, Barrett, & Snead, 1985; Reed, 1988; McPhail, Pikula, Roberts, Browne, & Harper, 1990; MacLeod & Sella, 1992). During this period of intense health care reform, nursing also has had the responsibility to provide cost effective quality care (Zander, 1988; Cohen, 1991; Stillwaggon, 1989). No evidence exists that either model has been proven superior for cost effectiveness.

Increased patient acuity and reduced lengths of stay since the advent of Diagnosis Related Groups (DRGs) have led to nurses' perception of role strain and job related stress. According to Zander (1988), prospective payment has driven care from "high tech" to "high speed." She suggests that in traditional organizational structures, roles and practice patterns of clinicians are not adaptive to the pressures and concerns being experienced within the health care industry. Zander (1988) proposes a system of care delivery called "Nursing Case Management" which establishes the nurse as a case manager. She describes this as a technology that resolves the cost/quality puzzle through a restructuring

of the roles and relationships of clinicians and the clinical production process of care delivery at the nurse provider-patient level. Nursing satisfaction is enhanced in this model through the built-in predictability that adds control over care and reduces the isolation of the clinician.

Various models of nursing case management have been implemented in different hospital settings. There are few studies in the literature that evaluate the effect of this model of care delivery on nurse satisfaction and cost. With cost identified as a crucial component of health care, nursing plays a pivotal role in determining which model of care delivery will facilitate the ability to meet the demands of cost effectiveness and quality in a manner that is satisfying to the profession (Stillwaggon, 1989; Cohen, 1991; Harkness, Miller, & Hill, 1992; Koerner, Bunkers, Nelson, & Santema, 1989).

Problem Statement

A patient care delivery model called a Dyad Model, based on a modification of the nursing case management model, was implemented on a medical-surgical unit in a moderate sized Midwest hospital. The Dyad Model incorporates principles of case management and team nursing. This model replaced the current delivery system of total patient care which is similar to a primary nursing delivery model but lacks the accountability and continuity features. Therefore, it was necessary to determine the effect implementation of a Dyad Model of care delivery had on nursing satisfaction and cost of care.

Purpose

The purpose of this study was to compare the satisfaction of all nurses assigned to the medical-surgical unit on which the Dyad Model was implemented to similar units that employ the total patient care delivery model. Comparison of cost per case for specific DRGs within each model was also evaluated. This study was an extension of a study (Koerner et al., 1989) in which both nurse satisfaction and cost were measured following the implementation of care delivery systems that incorporated elements of team nursing and case management models.

CHAPTER 2

LITERATURE AND CONCEPTUAL FRAMEWORK

Introduction

To date, several models of care delivery have been prevalent in nursing and recently an innovative model has emerged. Cohen (1991) states that present nursing care delivery systems are based on traditional industrial models and have not met the multitude of changes occurring in the health care environment.

Nursing models. One of the first models, functional nursing or task allocation, evolved during World War II in response to economic and political factors that required a redistribution of registered nurses (RNs) in United States hospitals. This model focused on getting the greatest amount of task work done with the least cost in time or training. These concepts led to the creation of the licensed practical nurse (LPN) and nurse aides (Beckman & Sims, 1992). Tasks were categorized by degree of difficulty and importance to patient well-being and then assigned to the appropriate personnel according to skill level. The employment of multiple levels of personnel to provide elements of patient care required a formal unit structure and a well defined hierarchy. Functional nursing has been criticized for placing completion of tasks above consideration of individual patients and has done nothing to further the professional status of the registered nurse (Thomas, 1992).

Team nursing is based on the premise that a small group of nurses working together guided by a nurse leader can more efficiently provide care to a group of patients (Reed, 1988). This model, according to Beckman and Sims (1992), represented another method of adjusting care to the influx of auxiliary workers. The authority for decision making and responsibility for care delivered by the team was given to the RN. It was designed to improve patient care by utilizing the diverse skills of the team members under the guidance of the RN. This also placed decision making at a lower level in the nursing hierarchy.

Primary nursing emphasizes a one to one nurse-patient relationship for the patient's entire length of stay. The primary nurse assumes 24 hour accountability and in her/his absence delegates the patient care to an associate nurse (Reed, 1988). This requires the role of the nurse to change from that of care manager and personnel organizer to care manager/implementer (Beckman & Sims, 1992). The LPN role is not employed in the model and the nurse aide activities revolve around equipment and supplies.

Modifications of these main types of care delivery models have emerged since none seemed to satisfy nurses with their practice (Beckman & Sims,1992). Total patient care is a care delivery system that contains some of the principles of primary nursing but is devoid of continuity, consistency or nurse accountability for outcomes (Beckman & Sims, 1992). Another model, primary partners, is the subject of several studies evaluating nurse satisfaction with combining elements of the original models of care delivery (Weeks, Barrett, & Snead, 1985; Degerhammar & Wade, 1991; Eriksen et al., 1992).

Nursing Case Management (NCM) was developed and pioneered at New England

Medical Center Hospitals in Boston in the mid 1980s (Zander, 1988). It is described as both a model and a technology for restructuring the clinical production process and roles that facilitate cost/quality outcomes (Zander, 1988). Nurses in this model progress from established primary nursing roles to that of Nurse Case Manager. "Accountability for very specific clinical and financial outcomes is placed at the staff nurse level, working in collaboration with the attending level physician and, when appropriate, a nursing group practice that transcends units" (Zander, 1988, p. 509). Nursing Case Management models are generally believed to be associated with reductions in cost per case as well as increases in nurse satisfaction (Zander, 1988; Stillwaggon, 1989; Koerner et al.,1989; Cohen, 1991; Harkness et al., 1992).

Since the introduction of NCM, other institutions have implemented case management-managed care principles in a variety of ways. Some hospitals have chosen to alter the role of the Clinical Nurse Specialist (CNS) to include case management activities (Green, 1990). Various settings utilize the nurses in discharge planning or utilization management rather than direct care givers to manage care (Marschke & Nolan, 1993). Other hospitals have implemented Differentiated Practice Models that combine elements of NCM and team nursing according to educational preparation of RNs (Harkness et al., 1992; Koerner et al., 1989). These models have incorporated elements of team and nursing case management similar to that described by Cohen (1991). This consists of introducing a new role, Patient Care Manager (PCM) and an associate role either assumed by an RN or LPN. The two individuals work together assuming accountability of care for a group of primary patients utilizing assistive personnel assigned to the unit as needed.

The effect of care delivery models on satisfaction and cost. The work of Slavitt, Stamps, Piedmont and Haase (1978) addressed the issue of work satisfaction from the theoretical perspectives of Maslow and Herzberg. The Index of Work Satisfaction (IWS) developed at that time and later revised by Stamps and Piedmont (1986), identified the following components as relevant in measuring job satisfaction: pay, autonomy, task requirements, organizational requirements and interaction. A study by McCloskey (1990) investigated the interaction of autonomy (control over work activities) and social integration (relationships with co-workers) as measures of job satisfaction in a sample of 320 nurses. The findings supported the notion of feminist psychologists that what women nurses want is "autonomy with connectedness."

A study by Wade and Degerhammar (1991) measured nurses' satisfaction after a change in the care delivery model on a surgical ward in Sweden. An instrument was developed by the researchers based on comments during interviews with a sample of 121 nurses from three district general hospitals. Aspects of satisfaction considered important to measure in response to the care delivery model utilized were labeled "Intrinsic Job Satisfaction" and "Patient Focus."

Review of the literature has found dissatisfaction to be closely linked with high absenteeism and turnover rates both contributing to increased hospital costs (McCloskey, 1990; Stamps & Piedmont, 1986; Eriksen et al., 1992; Harkness et al., 1992; Blegen & Mueller, 1987; Dennis, 1991). Changes in care delivery in the past seemed to be with regard to low levels of nurse satisfaction.

Another variable has gained importance: cost of care. Cost has become a variable

that nursing cannot ignore in the process of redesigning care delivery. The advent of a prospective payment system by Medicare in 1983, based on Diagnosis Related Groups (DRGs), has challenged the health care industry to "reinvent itself" (Olivas, Del Togno-Armanasco, Erickson, & Harter, 1989). What was once a fee for service reimbursement system has been radically shifted to a fixed cost per case reimbursement determined by the DRG a patient is assigned to. The financial constraints imposed by this type of reimbursement have forced hospitals to look for ways to cut costs (Bower, 1990). According to Olivas et al. (1989) nurse executives have the challenge of "reinventing" hospital-based nursing via alternative care delivery models while meeting the challenge of the financial constraints and existing nursing shortages. Nurses and physicians allocate approximately 80% of resources utilized within hospital settings. Because of this nurses can have a significant impact on the cost of care (Bower, 1990). The emerging care delivery model described in the literature, Nursing Case Management, seems to contain the elements necessary to address both cost and nurse satisfaction issues successfully.

Conceptual Framework

The Neuman Systems Model provided the framework for this study. This model is a comprehensive system based conceptual framework which represents the client wholistically and multidimensionally. It is based on stress and the client's reaction to stressors or potential stressors within the environment. The Neuman Systems Model has been segmented into four major nursing concepts: man, environment, health and nursing (Neuman, 1989). Man is termed client or client system and the model will be explained in

terms of the four nursing concepts as they relate to the Neuman Systems Model diagram illustrated in Figure 1.

Client/client system. Neuman (1989) conceptualized the client as a system with a core structure that is surrounded by a series of concentric rings as depicted in Figure 1. The client system includes five variables; physiological, psychological, sociocultural, developmental, and spiritual. The interrelationship of these variables determines the nature and degree of the client's reaction to stress. Each line of defense and resistance, according to Neuman, contain similar protective elements related to the five variables. In this study the client is defined as the nursing staff assigned to any one of four medical-surgical units in a moderate size Midwest hospital. Each of these units is a subsystem within the larger hospital system (see Figure 2). The central core of the client is composed of basic survival factors that are common to the species such as genetic or innate characteristics, and the strengths and weaknesses of the system parts. For purposes of this study, the basic core is represented by the individual patient care units. It is comprised of the culture and philosophy of the unit, the staffing mix, the average age and years of experience of the staff, and the various levels of educational preparation.

The outermost ring, the flexible line of defense, is a dynamic buffer system to protect the normal line of defense from invasion by stressors. Because it is dynamic it can be altered over a short period of time, as in emergent situations (i.e., higher patient acuity, staffing shortages, etc.), in order to protect the system. The staffing ratios and skill mix, like the line of defense, ideally are flexible and can be altered as needed to meet the acuity demands of the unit The flexible line of defense in this study is defined as the patient care

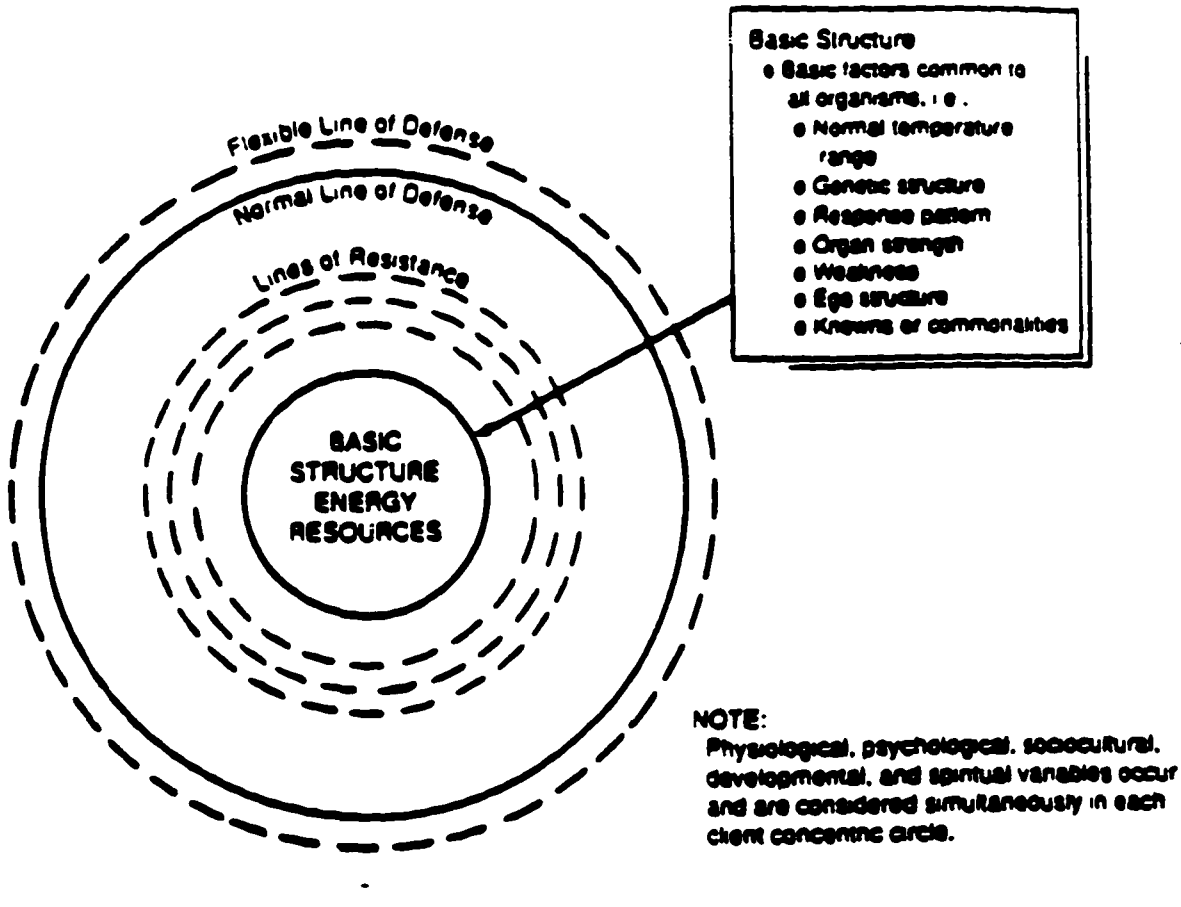


Figure 1. Neuman's Systems Model showing the flexible line of defense, normal line of defense, and the lines of resistance.[Note. From The Neuman Systems Model, (2nd Ed.) (p. 28) by B. Neuman, 1989, Norwalk, CT: Appleton & Lange.] Copyright 1989 by Appleton and Lange. Reprinted with permission. (see Appendix A).

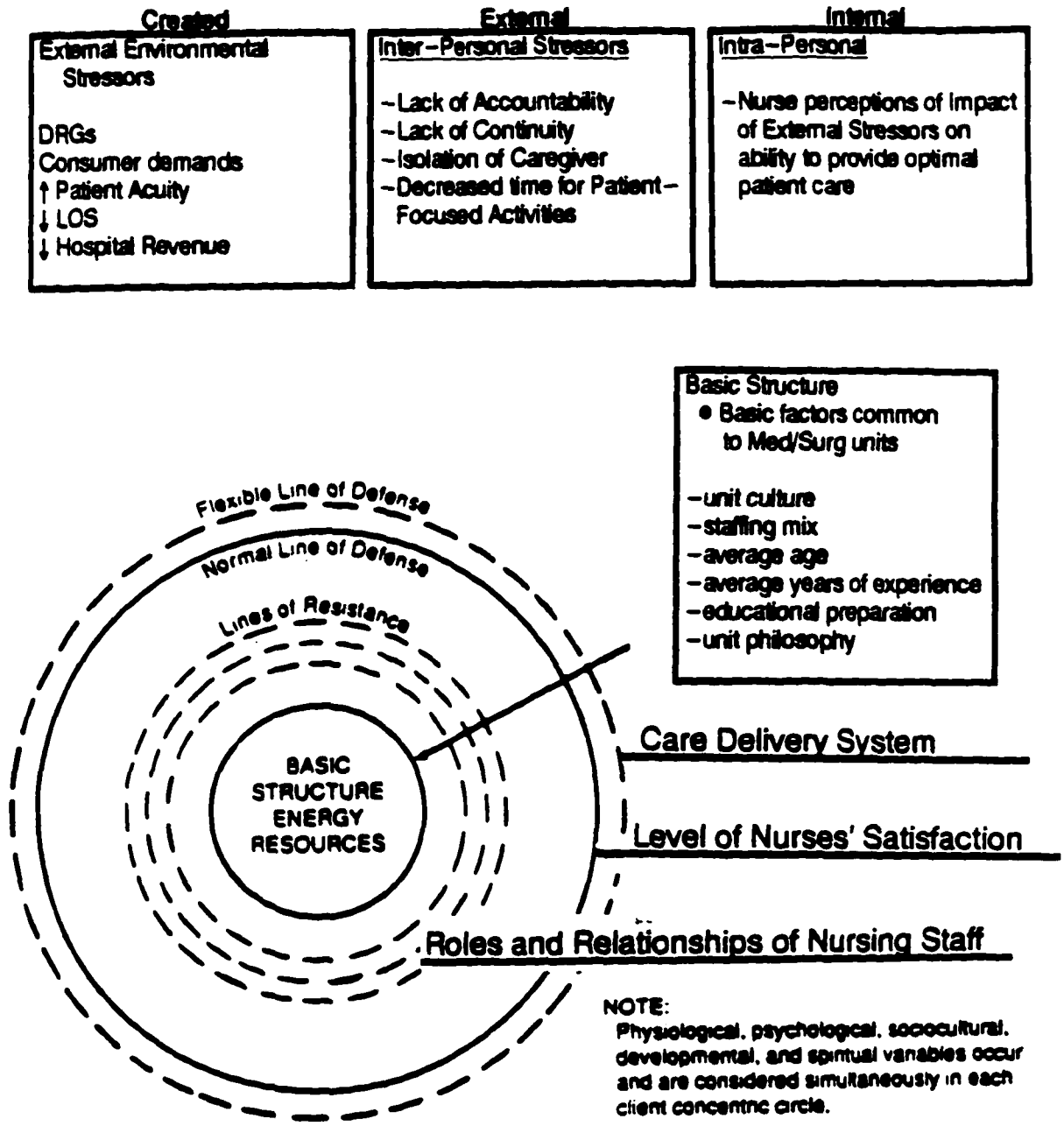


Figure 2. Application of the concepts from the Neuman Systems Model depicting the various lines of defense and stressors and how they are related to the medical-surgical units in this study.

delivery system utilized to provide quality cost-efficient care for patients. The manner in which roles are defined and the effect on staff relationships lay the foundation for a particular patient care delivery system.

The normal line of defense is defined as the usual wellness state of the client. The normal defense line is a standard against which deviancy from the usual wellness state can be determined. Stressors can invade this line when it is insufficiently protected by the flexible lines of defense and symptoms may begin to appear. The level of nursing satisfaction on each of the medical-surgical units is considered the normal line of defense. Each of these units is identified as a separate client system in this study. Their individual wellness states may vary dependent upon their overall nurse satisfaction.

The lines of resistance are a series of broken circles surrounding the central core. These lines contain known and unknown factors which protect system integrity and are activated following invasion by stressors of the normal line of defense. Effectiveness of the lines of resistance for reversing the reaction to stressors allows the system to reconstitute. The lines of resistance of interest in this study are identified as the roles and relationships inherent to the nursing staff on a patient care unit. How they interrelate and react to invading stressors will determine whether the core will be penetrated and break down or the system will reconstitute. Core deterioration is evidenced by high absenteeism and turnover rates, documented dissatisfaction, decreased quality care and inefficient resource utilization leading to higher cost per case.

Environment. "The environment is broadly defined as all internal and external factors or influences surrounding the identified client or client system" (Neuman, 1989, p. 31).

The client interacts with the environment by adjusting itself to the environment or making necessary adjustments of the environment. This response pattern consists of input, output, and feedback. A stressor is anything that has the potential to disrupt the harmony of the system. Several stressors can occur simultaneously. Stressors arise from either the external (inter or extrapersonal in nature) environment, the internal (intrapersonal in nature) environment, or from a created (intra-inter or extrapersonal in nature) environment. The created external environmental stressors are identified as both the hospital and national health care arenas, which include consumer demand for cost effective quality care. Another external stressor identified is the change in the reimbursement system, in particular the advent of Medicare DRGs and the increasing use of other prospective payment systems. This has contributed to shortened lengths of stay and reduced hospital revenues. The end result of these external stressors has been increased patient acuity producing stress within the hospital environment and on the nursing staff. Internal stressors are identified as those arising from each nurse's perception of the impact of the external environmental stressors on his or her ability to provide patient care. Present care delivery systems do not allow for continuity of care, lack clearly defined accountability for outcomes, promote isolation of the providers and do not allow time for patient education and care planning (Reed, 1988; Beckman & Sims, 1992). These factors are identified as external/interpersonal stressors.

Health. Health is viewed by Neuman as being on a continuum. "Optimal wellness represents the greatest possible degree of system stability at a given point in time" (Neuman, 1989, p. 25). A state of wellness or illness is a dynamic composite of the five

interacting variables that are always present. Health is viewed in this study as a well functioning system with satisfied nurses delivering cost effective quality care and able to react in an adaptive manner to environmental stressors.

Nursing. Neuman's model (1989) describes the major concern for nursing as keeping the client system stable through accuracy in the assessment of effects and possible effects of environmental stressors. Nursing actions aim to retain, attain, and maintain optimal client health. Three levels of prevention are identified. Primary prevention as an intervention is aimed at wellness retention by strengthening the flexible line of defense or reducing the reaction to the stressors encountered. Secondary prevention consists of early case finding and the treatment of symptoms. This level of intervention is aimed at wellness attainment and protection of the basic structure by strengthening the internal lines of resistance. Tertiary prevention can begin at any point in client reconstitution following treatment. It is aimed at the maintenance of stability, rehabilitation and re-education to prevent future occurrences. Stressors that are allowed to penetrate through the flexible and normal lines of defense, activating the lines of resistance, have the potential to disrupt the core leading to energy depletion and death. Interventions are aimed at whatever level is appropriate once a stressor is identified.

A major assumption of this study is that the present care delivery system, total patient care, is associated with poorly defined roles and accountability systems as well as a lack of cohesive team relationships among the nursing staff. Care providers are isolated from each other and there is little communication or team effort. Accountability for patient outcomes is poorly defined. The LPNs assume total patient care with little or

no supervision from the RN staff. In the event of a crisis they are often unsure of whom to call upon for help. Conflict over the utilization of patient care assistants (PCAs) is a source of tension on most units. These factors prevent the formation of a cohesive work group and serve as a deterrent to both quality and cost efficiency. The present system is adynamic and unable to flex adequately to meet the demands of high acuity patient care. This represents a weakened flexible line of defense. Nurses verbalize dissatisfaction with the present system and this represents a weakened normal line of defense or wellness state. Environmental stressors can easily penetrate to the core structure. The redefinition of roles and establishment of relationships into a Dyad model is accomplished by incorporating elements of team nursing and nursing case management. Accountability for both cost and quality patient outcomes are assigned to the Dyad team leader known as a patient care manager (PCM). This is considered a secondary intervention aimed at strengthening the lines of resistance through role definition and promotion of team relationships. The change in roles and relationships will ideally reconstitute the system of care delivery and improve the level of nurse satisfaction. By providing structure that clearly defines the roles within the organization and supports the relationship of the Dyad Team, role stress should be alleviated and increased role satisfaction recognized (Hardy & Conway, 1978). Improved levels of nurse satisfaction within a patient care unit should contribute to adaptive responses to internal/external stressors.

The external environmental stressors of providing cost effective care delivery will be reduced through use of Clinical pathways/careplans by the Dyad Team. Clinical pathway/careplans provide the team with the clinical guidelines for care of specific case

types along a timeline. The clinical pathway concept was first introduced at New England Medical Center by Zander and colleagues in 1986 (Zander, 1988). "Care that is expected to be delivered by every department throughout the entire system wide hospitalization is planned and managed with blue prints called case management plans and their shorter versions, 'Critical Paths' (Zander, 1988, p. 509). The Clinical pathway/careplan provides for consistency of interventions and clearly identifies expected patient outcomes.

Literature Review

Recent studies of functional and team nursing that discuss their effectiveness as single care delivery models were not found. Two studies were found on primary nursing and the majority of others focused on comparisons of past delivery models or on new models that are emerging.

Primary nursing. A descriptive study by MacLeod and Sella (1992) utilized Role Theory to provide a framework to measure nurse satisfaction with primary nursing. An evaluation survey was distributed to a convenience sample (N=37) one year following a change to primary nursing on four medical/surgical units. Mean scores or level of significance were not reported. The researchers stated that those in primary nurse roles gave responses on the survey indicating a higher level of role satisfaction than those in associate nurse roles. The results cannot be generalized because of the weak design, the use of a convenience sample and the survey used was not tested for reliability.

A qualitative study by McCormack (1992) also looked at nursing satisfaction with a primary nursing delivery model. A convenience sample of nurses from one surgical ward was used, however, the number of subjects was not indicated. The unit had

implemented a primary nursing model two years prior to the study. Data collection tools utilized were diary keeping and interviews. An independent researcher was contracted to conduct the interviews. Data from the diaries and the interviews were then analyzed by both the researcher and the interviewer. The researcher reported overall positive responses about the practice of primary nursing. The results of interviews were not quantified for this study. The researcher noted that results cannot be generalized because of the small sample and her position on the unit in a managerial capacity could have influenced responses.

Comparisons of various models. In a comparative analysis conducted by Thomas (1992) the perception of nurses (N=70) under three delivery models (functional, team and primary) was evaluated. The Work Environment Scale (WES) was distributed to a convenience sample of nurses. The WES was developed by Moos in 1974 to measure the social environment of work settings. The scale is organized into three underlying domains dealing with relationships, personal growth and goal orientation, and system maintenance and change. It is divided into ten subscales that relate to these dimensions. The RNs and auxiliaries on nine different units were included in the study. The units were placed into groups of three, each utilizing one of the mentioned delivery models. Because of the skewed distribution of the data, it was not possible to use parametric analysis of variance to compare the three ward types. Instead, Kruskal Wallis tests were performed for each subscale. The level below which findings were deemed significant was set at p=.05. Mean scores were not reported but responses indicated that RNs in primary models perceived significantly greater levels of autonomy, supervisory support and physical comfort than

their team and functional counterparts ($p < .05$).

Reed (1988) conducted a quasi-experimental study to compare nurse related behavior, philosophy of care and job satisfaction in both team and primary nursing models. One unit from each of two different hospitals was used to form an experimental group ($n=7$) of primary nursing in one hospital and a control ($n=14$) of team nursing in the second hospital. Job satisfaction was measured using the Cornell Job Description Index. The index measures satisfaction in five areas: work, supervision, pay, promotion and co-workers. The higher the score the higher the satisfaction. The mean scores for those in the control group ranged from 2 to 30 and for the experimental from 8 to 49 in each of the five categories. The scores were compared using a Mann-Whitney U test (the value of the u statistic was not reported). The differences in all scores except pay were significant ($p < .05$). These findings demonstrate a higher level in job satisfaction for those nurses in the primary model. Reed states that the overall results of the study did not negate the benefits of team nursing, i.e., nurses were still satisfied in team nursing just not as satisfied. She suggests combining key elements of primary and team nursing models for further study.

A similar study by McPhail, Pikula, Roberts, Browne and Harper (1990) evaluated the effect of primary versus team nursing on job satisfaction. In a randomized cross over trial ($N=21$), one half of the nurses on a medical-surgical unit practiced primary nursing, the other half practiced team. Over a period of ten months the groups switched models on two occasions. Job satisfaction was measured using the Work Environment Scale prior to randomization and after each of the two five month periods. Only eleven of the original

number of subjects completed the questionnaire during the study. The combined mean scores of the primary group totaled 65.73 and for the team group 63.59. The difference in job satisfaction during practice in either model was not significant between groups as determined by a paired t-test for cross over groups (t value = 0.64). In anecdotal comments following the trial, most of the nurses surveyed indicated a preference for team nursing.

The results of the above studies have limited generalizibility because of the small convenience samples used. Another problem is the likelihood of contamination of the subjects in the second study as a result of crossing over between different care delivery models on a single unit. However, results indicate a need for further studies on combinations of various elements of these care delivery models in practice settings.

Primary partners. Several studies have been conducted at institutions that have implemented care delivery models that contain various combinations of those described earlier (Weeks et al.,1985; Eriksen et al., 1992; Wade & Degerhammar, 1991). The study by Weeks et al. (1985) utilized a quasi-experimental design with a pretest and posttest to evaluate the satisfaction of nurses (N=9) on a unit in which elements of team and primary nursing were combined. The authors reported the following observations of primary nursing prior to project implementation: feelings of isolation, role confusion, poor communication between nurses, inadequate documentation time, and insufficient time for patient education. The job satisfaction survey completed by the staff measured the following areas: task requirements of the job, salary and benefits, organizational constraints, social interaction during work time, autonomy, job prestige (Stamps &

Piedmont, 1986). The researchers added several questions thereby altering the reliability and validity of the tool. The mean scores on the posttest satisfaction survey increased for RNs in five of the six categories and from 2.63 to 3.2 in overall job satisfaction on a scale of one to five. The scores of the LPNs and nurse attendants stayed the same or dropped in the various categories. The results of the study demonstrated an increase in nurse satisfaction of RNs but neither statistical testing nor the level of significance was reported. Other limitations of this study include the very small convenience sample, lack of a control group and use of an instrument with altered reliability and validity.

Two studies (Wade & Degerhammar, 1991; Eriksen et al.,1992) measured nurse satisfaction in redesign projects that paired an RN with an LPN or nurse aide to deliver care to a group of primary patients. The Wade and Dergerhammer (1991) study employed a small (N=23) convenience sample without a control group. A pretest posttest design method was utilized. A job satisfaction survey was developed to measure satisfaction of all grades of nursing staff in response to a change in care delivery. The instrument developed measured aspects of satisfaction relating to two categories: Intrinsic Job Satisfaction and Patient Focus. The survey was issued just after a few initial changes were made on the unit and at two intervals post implementation of all redesign plans. The RN mean scores changed from 31.9 pretest to 36.5 and 36.7 on the posttests in the category labeled Intrinsic Job Satisfaction and from 22.7 to 27.9 and 26 respectively in the aspects categorized under Patient Focus. The changes in score were significant with t-test values of 2.88 and 2.87 ($p < .05$) respectively for the two types of satisfaction. Increases in mean score for other grades of nurses were significant under Intrinsic Job Satisfaction

($t=2.3$ $p<.05$, $t=1.7$ $p<.10$) but were minimal and nonsignificant in the Patient Focus category.

The study by Eriksen et al.(1992) also used a pretest posttest design with a small convenience sample (n=34) in two critical care units. The RNs were paired with an LPN to provide patient care. The Index of Work Satisfaction developed by Stamps and Piedmont (1986) was used to measure changes in RN job satisfaction. Of the seven categories on the questionnaire, change in five of the mean scores were significant after being submitted to the t-test ($p < .05$).

Both of these studies are limited because of small convenience samples and lack of control groups. They, therefore, cannot be generalized. However, one implication from all three studies is the need to continue to study innovative care delivery models that seem to enhance nurse satisfaction in a more successful manner.

Nursing case management. A study by Stillwaggon (1989) used a quasi-experimental design with a control group (n=50 in both groups) to measure changes in nurse satisfaction and cost per case when implementing a Nursing Case Management model in a women/child health unit. A five question Likert-type scale was developed by the investigator to measure the degree of satisfaction with the present delivery system and the NCM model. The instrument was designed to evaluate the nurses' perception of Freedom and Control over their practice. Reliability and validity testing were not mentioned. Increases in nurse satisfaction were reported but the level of significance or statistical testing was not reported. The mean cost in the investigational model was

$61.71 less per case for the entire length of stay. The researcher reported this as being significant at the 5% level of confidence on a two-tailed t-test.

Cohen (1991) used a quasi-experimental design to compare the difference in cost per case between two groups (n=64 per group) of patients admitted for Cesarean section. The experimental group was treated by nurses implementing a NCM model that incorporated a team nursing approach involving all levels of nursing personnel. A nonrandom assignment method was used for both the nursing provider and patient subject population. Cost data were measured by analyzing the following variables: direct nursing care hours, resource utilization for specific revenue centers, length of stay, and average cost per case. Results of the study favored the NCM model with a significant ($p<.0001$) decrease in length of stay by 1.16 days coupled with a significant increase ($p<.0001$) in direct nursing care hours by 4.56 hours per patient. Cost and expenditure analysis demonstrated the increase in direct nursing care hours and greater intensification of ancillary services as occurring during the early phase of hospitalization in the NCM group. This resulted in a shorter length of stay and more efficient resource utilization as a result of the case management. A savings of $930.40 per case was realized. A limitation of the study is the nonrandom, convenience sampling method which decreases the ability to generalize and interpret the results.

Differentiated practice. A study by Koerner et al. (1989) utilized a quasi-experimental, pretest posttest design, to measure nurse satisfaction and cost per case after the implementation of a type of Differentiated Practice Model. The study consisted of two control units and four project units in a large Midwest tertiary care hospital. The initial

pretest was distributed to all employees in the Department of Patient Services. Of the 1,113 questionnaires distributed 522 were returned for a response rate of 47%. The same test, Index of Work Satisfaction survey previously described (Stamps & Piedmonte, 1986), was again distributed to nurses on the project units only (n=165 experimental, n=131 control) one year later. Fifty-one percent of the sample responded (n=151). The weighted values for all six components of the IWS were summed and divided by six for both testing intervals. Increased job satisfaction was measured on all of the project units and in the control groups. Changes in group mean scores were submitted to the t-test. The change in score was significant in two project groups and one control group (p value was not reported). The increased satisfaction in the one control group was felt to be a result of other pilot projects occurring concurrently. Length of stay and cost reductions were found to have occurred on a series of cases but the figures were not reported and changes were not submitted to statistical testing. Limitations of the study include a lack of random sampling, low response rate and absence of statistical testing of changes in cost.

In summary, past care delivery models have limited documentation about their effects on nurse satisfaction and cost of care. Few true experimental studies exist demonstrating either the positive or negative effects of the various models of care delivery. Those studies that are in the literature are flawed by poor designs, small samples and utilization of a variety of tools to measure satisfaction. A standard measurement of nurse satisfaction has not been developed that could consistently be employed by those who desire to measure existing levels of satisfaction or responses to a change in work environment. Those tools tested for reliability and validity, and most frequently used,

measure a combination of extrinsic and intrinsic factors of job satisfaction. Extrinsic factors include salary, benefits, shift work, security and status (Wade & Degerhammar,1991). Some of the intrinsic components identified by Wade and Degerhammar relate to the nurse's perception of quality of care given, feedback or knowledge of the results of one's efforts, and a sense of autonomy and responsibility. It seems to make sense in measuring nurse satisfaction to look at those elements that relate directly to role performance. Measuring the perception of the ability to provide quality care or patient focused care (from which nurses derive an intrinsic satisfaction) demonstrated significant results in the Wade and Dergerhammer (1991) study.

Measurement of cost of care is now becoming an added dimension in the evaluation of patient care services. Designing care delivery models that address both nurse satisfaction and cost effective quality care is one of the challenges facing the nursing profession. Nursing Case Management seems to contain the elements necessary to achieve improved satisfaction and reduced cost. However, the model as it was originally designed at New England Medical Center may not "fit" in other organizations because of the differences in academic preparation of the nursing staff and the organizational culture. Therefore various replications of this model are being implemented and studied.

Hypotheses

The following hypotheses were tested:

1. The nurses on the experimental unit who directly experience the role changes in the Dyad Model will demonstrate a difference in job satisfaction when compared to other nurses on the unit whose role or care delivery design does not change.

2. The nurses on the unit for which the Dyad Model is implemented will demonstrate a difference in job satisfaction when compared to nurses on similar medical-surgical units that have a total patient care delivery model.

3. The case management functions described in the role of the Patient Care Manager (PCM) will impact cost of care and length of stay when compared to similar medical-surgical units that have a total patient care delivery model.

Operational Definitions. A Dyad Model was defined as a simple two person team of care givers. One role within the model was titled Patient Care Manager and the other, Care Partner. This represents one aspect of the lines of resistance described within the Neuman Model. The Dyad laid the groundwork for a new care delivery system which was correlated to the flexible line of defense described within the Neuman Model.

The Patient Care Manager (PCM) occupied the focal position in the Dyad and was responsible for performing the case management functions. This individual was a licensed RN, with at least two years of experience. Educational preparation varied. This position represented an aspect of the core structure as well as another aspect of the lines of resistance described within the Neuman Model. The Clinical Pathway/Careplan provided a guideline of care for a specific DRG and served as a tool for the PCM in role performance. This plan of care added structure to the care delivery system, defined as the flexible line of defense in the Neuman Model.

The Care partner was the role counterpart who occupied an interdependent position with the PCM. This individual could either be a licensed RN or LPN.

The partner usually worked with the same PCM when on duty. This role and the relationship represented an aspect of the lines of resistance.

Satisfaction was defined as the intrinsic level of contentment an individual perceived to experience from the nurse patient relationship and with his/her overall work situation. In this study it included "Intrinsic Job satisfaction" and "Patient Focus satisfaction" (Wade & Degerhammar, 1991). The level of nurse satisfaction represents the normal line of defense described within the Neuman Model.

Cost per case referred to the average cost based on a ratio of cost to charge and was obtained from software available at the study institution. Length of stay (LOS) was the actual number of days a patient remained an inpatient after admission to the acute care setting. Overall length of stay per unit was calculated from the Admission, Discharge, Transfer report. Length of stay per DRG was obtained from software available at the study institution.

The following DRGs were analyzed for cost per case and length of stay;

1. DRG 089 Pneumonia with Complications and Comorbidities (CC) age > 17, and
2. DRG 014 Cerebral Vascular Accident (CVA).

Nursing hours per patient day and total salary expense per patient were calculated from each of the medical-surgical units budget responsibility reports.

CHAPTER 3

METHODOLOGY

Design

The study used a quasi-experimental design. An independent variable, Patient Care Delivery, was manipulated on the adult medical-surgical unit that served as the experimental unit. A comparison was made to three similar control units that did not implement a change in care delivery. The care delivery model utilized by the three units that comprise the control group is the Total Patient Care model described in Chapter 2. In this model a nurse is assigned to a group of four to five patients each day he/she is on duty. The nurse typically works independently and the patient assignment can differ from day to day. Total Patient Care requires licensed professionals, primarily RNs, in the staffing. Each unit has Patient Care Assistants (PCAs) scheduled to assist with patient care. There is not an established system of accountability for outcomes at the staff nurse level. The charge nurse on each medical-surgical unit assumes complete accountability for the patient care activities during the shift.

Another role present in the Total Patient Care model of the three control units is the Nurse Case Manager. Nurse Case Managers are prepared at the Masters level in this setting. The primary responsibility of this nurse is that of case management for all patients admitted on Clinical Pathways. The Nurse Case Manager is accountable for both clinical

and financial outcomes of those patients within his/her caseload. This is not a direct care giver role. These individuals also have responsibility for process improvements throughout the health care system and, therefore, are not able to observe the patients within their caseload as closely as the bedside nurse. The Nurse Case Manager provides consultation to the nursing staff on practice issues and mentors the staff nurse in the concepts of Case Management.

Changing care delivery on the experimental unit was a decision made by a group of nurses who worked on the day shift. They had met on several occasions to discuss methods to improve patient care and quality on their unit. Those nurses initially involved in the Dyad Model had worked with their management staff to design the model and define the roles they would assume during the implementation. It was decided that six of the RN day shift staff would assume Patient Care Manager (PCM) roles and the remainder of the staff would function as Care Partners. A differential was to be paid to the PCMs. Function of the PCM included aspects of discharge planning, utilization management, patient/family education, and 24 hour accountability for patient outcomes. Continuity of care was maintained through assignment of patients by the PCMs and coordination of groups of two Dyad teams to provide caseload coverage for each other during an absence. Written communication between these teams was another method for maintaining continuity for the patient. The Clinical Pathway/careplan provided the PCMs a tool for effective management of care. The role of the Case Manager in this model was essentially taken over by the PCM although the Case Manager remained available for consultation.

The Care Partner role was designed to provide most of patient care task work

with the assistance of the PCAs on the unit. This allowed the PCM to function as outlined in the above role description. The need for good communication between the PCM and partner was identified as critical to the success of the Dyad team. The PCMs were also responsible for ongoing communication about the patients within their caseload with other members of the health care team and the physicians.

A pretest measurement of nurse satisfaction was obtained for both experimental and control units prior to implementation of the Dyad Model on the experimental unit. Posttest measurements were then obtained at six months post implementation and one year. Cost per case and length of stay analysis on specific DRGs (089, Complicated Pneumonia and 014, Cerebral Vascular Accident) was conducted retrospectively in three month intervals beginning one year prior to implementation of the model and ending one year after implementation. Overall unit length of stay, hours per patient day and salary expense per patient were also analyzed in a similar manner. Three months after the end of the study period a final quarter of data was analyzed to determine if any change occurred in unit length of stay or salary expense per patient following discontinuation of the Dyad Model on the experimental unit.

Sample

A convenience sample of an accessible population of nurses employed in a Midwest hospital on four medical-surgical units was recruited. All nurses who met the following criteria were included: (a) RNs or LPNs, (b) minimum of one year experience, (c) must work at least thirty hours per week on selected medical-surgical units.

The instrument used can discriminate responses of RNs, LPNs and auxiliary staff.

Patient Care Assistants (PCAs) were not surveyed because they are never assigned to a team. Nurses with less than one year of experience might tend to have responses that are influenced by other variables related to assuming a new role. Float nurses were not included because they might have an opportunity to work on the experimental unit at times which could contaminate their responses. All the nurses (n=31) on the experimental unit were included. The control group (n=43) was recruited from all shifts of the other three units utilizing a random selection method. The nurses on the Dyad Model unit were separated into two groups for further comparison. The nurses in the experimental Dyad Model (n=16) group had volunteered to participate in the change in care delivery and worked either 7 a.m. to 3 p.m. or 7 a.m. to 7p.m. The nurses in the Non-Dyad Model (n=15) group on the experimental unit worked 3 p.m. to 11 p.m., 7 p.m. to 7 a.m. and 11p.m. to 7 a.m. The nurses in the control group worked on all five identified shifts in a fairly even distribution.

Cost per case measurements were obtained from the identified DRGs that are admitted to all four units on a regular basis.

Study Site

The site for this study is a moderate size Midwest hospital that is the result of a two hospital joint venture that occurred six years prior to data collection. One of the hospitals had a religious affiliation and the other was a community hospital setting. Both institutions are affiliated with a local community college school of nursing and provide a source of employment for a large percentage of the graduates. Each of the four units involved in this study has its own nurse manager. Each of the original sites contributed

two units to the study. The units are similar in size and patient acuity levels. They admit both medical and surgical patients while maintaining a specialty in specific populations, i.e., General Surgery, Orthopedics, Neurology/Neurosurgery, Oncology, or Pulmonary. The experimental unit specializes in the Orthopedic Neurology/Neurosurgery population. The experimental unit had been formed through a merger of two nursing units one year prior to the study. The merger included moving one nursing staff from its home unit to the other site. These nurses had been under the leadership of one director for approximately one year prior to the combination of their units.

Instruments

The instrument (Appendix B) used in this study to measure job satisfaction was developed by Wade and Degerhammar (1991). This 17 item Likert scale questionnaire was designed to measure job satisfaction in order to monitor the effect of a change in the method of care delivery. Questions were phrased to elicit responses on an ordinal, five point Likert scale ranging from always (5), often, sometimes, seldom and never (1). The survey consists of two scales, one labeled "Intrinsic Job Satisfaction" and the other "Patient Focus." The Intrinsic scale is the first ten questions having a possible score range from 10 to 50, with higher scores indicating higher satisfaction. The Patient Focus scale is the last seven questions having a score range of 7 to 35, with higher scores indicating a greater degree of patient focus satisfaction.

Comments made by nurses during interviews with the original authors were used as a basis for development of the instrument to measure job satisfaction. Principle component factor analysis of questionnaire responses by 121 nurses during a pilot yielded

the two scales. The first of these scales, "Intrinsic," is comprised of ten high loading items relating to aspects such as satisfaction with care, having time to be with patients and lack of stress. These items and their factor loadings are listed in Table 1. The Cronbach alpha reliability of this scale was 0.88.

The second factor, "Patient Focus," is comprised of seven high loading items relating to planning care, informing patients and patient participation. These items and their factor loadings are listed in Table 2. Chronbach alpha of this scale was 0.82. This factor also appears to relate to the system of care delivery (Wade & Degerhammar, 1991).

The pilot study (Wade & Degerhammar, 1991) indicated that the scales derived from these factors were both reliable and valid, with sufficient sensitivity to discriminate between different grades of staff and between different units or specialties. A one-way analysis of variance also indicated that both scales discriminate between RN and LPN classifications.

Additional evidence of validity of these scales was provided by a second series of observations coinciding with the administration of the questionnaire by the researchers (Wade & Degerhammar,1991). The researchers observed the RNs spending 55% of their time in direct patient care activities which was a two-fold increase over the first series of observations and coincided with the increase in scores on the "Patient Focus" portion of the survey. The time spent in administrative tasks was also reduced from 59% to 33%. The findings of the researchers in the development of this instrument support a relationship between higher levels of satisfaction and increased time to plan and provide quality patient care, and provide patient education. Permission to use the instrument was

Table 1

Items on the Intrinsic Job Satisfaction Scale

Item	Factor loading
1. Do you have enough time to talk to patients?	0.77
2. Are you able to give the kind of care that you prefer?	0.77
3. Have you enough time to be with patients?	0.76
4. Do you feel content with your work on the ward?	0.74
5. Are you satisfied with your work when you go home at the end of the day?	0.73
6. Are you satisfied with the way you are able to nurse patients?	0.71
7. Do you feel that you do your tasks well?	0.65
8. Do you feel stressed in your work?	-0.64
9. Do you have to rush when you are caring for patients?	-0.63
10. Are you able to talk to patients when giving care?	0.51

Note. From "The development of a measure of job satisfaction for use in evaluating change in the system of care delivery," by B. Wade and M. Degerhammar, 1991, Scandanavian Journal of Caring Science, 5, p. 198. Copyright 1991 by Barbara Wade. Reprinted with permission (see Appendix C).

Table 2

Items on the Patient Focus Scale

Item	Factor loading
1. Do you advise patients about what they should do when they go home?	0.78
2. Are you able to plan patient care?	0.75
3. Do you plan care together with the patient?	0.73
4. Do you plan patient care?	0.71
5. Do you encourage relatives to participate in patient care before patients are discharged?	0.70
6. Can you plan care in the way that you prefer?	0.61
7. Do you inform patients fully before tests and surgery ?	0.50

Note. From " The development of a measure of job satisfaction for use in evaluating change in the system of care delivery," by B. Wade and M. Degerhammar, 1991, Scandanavian Journal of Caring Science, 5, p. 198. Copyright 1991 by Barbara Wade. Reprinted with permission (see Appendix C).

obtained from the original researchers (Appendix C).

Reliability analysis was conducted on the total questionnaire and on the two individual scales in the current study. The reliability coefficients for the 17 item survey ranged from an alpha of .85 for the first measurement to .84 for the third measurement. On the intrinsic scale of ten questions, alpha scores ranged from .81 to .80, and for the seven question patient focus scales, alphas ranged from .84 to .80.

A second questionnaire that included five demographic variables was also administered (Appendix D). Job classification, shift worked, degree in nursing, number of years in nursing and number of years on present unit were surveyed. The education question identified the subjects who were prepared at the Diploma, Associate, Baccalaureate, or Masters Degree levels in nursing. This information was used to compare any differences in educational mix between experimental and control groups. The instrument discriminates nurse aide responses but since this classification at the study site is not directly assigned to a specific patient group they were not included. The shift worked identified the distribution of the nurses over the 24 hour work day. Potentially, this could identify differences in satisfaction that related to care delivery on all shifts.

Cost per case data including length of stay were obtained from the computer case mix report system at the study site. These data were obtained for a comparison of cost per case and length of stay for selected DRGs between experimental and non-experimental units. The collection of cost and length of stay data began retrospectively in December 1992 and continued in three month intervals. For the DRG specific data the intervals were measured over consecutive quarters until February 1995. This allowed for evaluation of

trends that might occur normally in this setting.

The data for overall length of stay per unit, hours per patient day, and salary expense per patient were also collected retrospectively from December 1992, in three month intervals. The quarters identified for collection of these data were as follows; Quarter A (12/92-2/93), Quarter B (8/93-10/93), Quarter C (12/93-2/94), Quarter D (8/94-10/94), and Quarter E (12/94-2/95). Length of stay per unit for all patients during selected quarters was obtained from Admission, Discharge, Transfer reports. The other elements of data were obtained from unit budget reports.

Procedure

Following approval by the Human Subjects Review Committee of Grand Valley State University (Appendix E) and permission from the Vice President of Nursing at the selected study site (Appendix F), the unit managers were approached for their approval.

Since all nurses on the experimental unit were to be surveyed, instructions that explained the purpose of the study and directions for completing the questionnaire were outlined at the top of the demographic page of the survey (Appendix D). The researcher met with all the individuals to be surveyed on each shift in order to answer questions. A verbal script was prepared (Appendix G) and utilized each time the survey was presented. The participants were reassured that questionnaires were confidential and they could refuse or discontinue at any time without any consequence. An envelope was provided to return completed questionnaires. Consent was implied by return of the completed questionnaire.

The control group was obtained using the following procedure. The names of the

nurses who met the study criteria on the three control medical-surgical units were listed (n =103). A random sample of 43 (44%) nurses was obtained using a table of random numbers. A letter was sent to each of those selected (See Appendix H) requesting their participation in the study. A follow up phone call was made to each subject and arrangements to distribute the questionnaire were made at that time. The procedure for questionnaire distribution described for the experimental group was employed for the control group.

The satisfaction data were collected during the months of March, 1994, October 1994 and April 1995. These times were selected because the first measurement took place just prior to implementation of the Dyad Model, which was the second week in March 1994. The other measurement periods were approximately six months and one year post implementation of the Dyad Model and they are times when patient census is typically high.

There were no anticipated risks to the participants. The demographic survey and Job Satisfaction Survey were both coded in order to identify which unit the subject was assigned to and to match responses on follow up surveys. The list of participants and their code numbers was known only to the researcher, not distributed for any reason and destroyed following completion of data collection.

CHAPTER 4

DATA ANALYSIS

The results reported include demographic characteristics, satisfaction scores and cost variables. The satisfaction scores of the four groups were analyzed using a repeated measures MANOVA to compare the between and the within group measurements over time. The tests for underlying assumptions, (Homogeneity, Bartlett, BoxM) were met in all but one analysis of the satisfaction scores. The most critical assumption to be met in the use of this test is that of compound symmetry. This assumption was met in the analysis of scores on all scales. Therefore the univariate approach to the analysis of the repeated measures was used in the interpretation of the data. The significance level was set at $p < .05$.

The individual cost and length of stay (LOS) for those patients admitted to and discharged from each of the medical-surgical units within the study were evaluated. Data from patients that either transferred between units or critical care were eliminated from the analysis so only those patients who remained on a study unit for their entire hospitalization were included. After aggregating the data, a t-test was used to compare the change in means for both LOS and cost from Quarter 5 (12/93-2/94) to Quarter 9 (12/94-2/95) for the experimental and control groups. The differences in mean cost and LOS during Quarter 9 between experimental and control groups was also compared utilizing a t-test.

Sample Characteristics

At the pretest measurement, 74 questionnaires were distributed and all 74 (100%) returned. The sample consisted of 61 Registered Nurses and 13 Licensed Practical Nurses. The majority of the RNs were associate degree prepared nurses. No subjects were masters or doctorally prepared. See Tables 3 and 4 for comparison of characteristics of the four groups in the study.

During the subsequent measurement periods subjects were lost from the Non-Dyad group and the Control group (see Table 5). These subjects either resigned from the institution, changed units or reduced their hours worked to below the minimum identified as necessary for inclusion in this study. Those surveys with missing data were not included in the analysis.

Hypothesis 1

The first hypothesis was: The nurses on the experimental unit who directly experience the role changes in the Dyad Model will demonstrate a difference in job satisfaction when compared to other nurses on the unit whose role or care delivery does not change.

The data from the Satisfaction Survey were first analyzed using the mean scores from the 17 question satisfaction scale at the three data collection periods (Table 6). Then each subscale (Intrinsic and Patient Focus) was analyzed (Tables 7 and 8). The independent variables in the MANOVA test are group assignment and time and the dependent variable is job satisfaction measured over time. There was an increase of satisfaction measured in the Dyad group when compared to the Non-Dyad group but

Table 3

Comparison of Personal Characteristics of Nurses

	Dyad		Non-Dyad		Experimental		Control	
Variable	n	%	n	%	n	%	n	%
Classification								
a. RN	13	(81)	13	(87)	26	(84)	35	(81)
b. LPN	2	(19)	2	(13)	5	(16)	8	(19)
Education (RN)								
a. Diploma	-----		1	(8)	1	(4)	2	(6)
b. ADN	12	(92)	9	(69)	21	(80)	25	(71)
c. Baccalaureate	1	(8)	2	(15)	3	(12)	4	(11)
d. Matriculated	-----		1	(8)	1	(4)	4	(11)
Years Nursing Experience								
M	18		11.9		15		12	
SD	9.8		11.9		11.1		10.0	
Range	7-40		1-35		1-40		1-35	

Table 4

Comparison of Unit Specific Characteristics of Nurses

	Dyad		Non-Dyad		Experimental		Control	
Variable	n	%	n	%	n	%	n	%
Shift Worked								
a. 7-3	9	(56)	-----		9	(29)	11	(26)
b. 3-11	-----		6	(40)	6	(19)	5	(11)
c. 11-7	-----		4	(27)	4	(13)	7	(16)
d. 7a-7p	7	(44)	-----		7	(23)	13	(30)
e. 7p-7a	-----		5	(33)	5	(16)	5	(16)
Years On Unit								
M	11		6.2		8.8		7	
SD	4.9		8		7.0		6.4	
Range	5-20		1-33		1-33		1-25	

Table 5

Number of Subjects during Measurement Periods

Time	Dyad	Non-Dyad	Experimental	Control
1	16	15	31	43
2	16	11	27	36
3	16	11	27	32

this was not significant. The change in Total score and the Patient Focus Scale score was significant for time but not for group assignment (see Tables 6 and 8). There was minimal change in score on the Intrinsic Scale (Table 7) therefore no significance found. In the Patient Focus scale analysis (Table 8), the multivariate test for homogeneity of dispersion matrices was significant, indicating that variance and covariance matrices were unequal in these groups. This finding represents a violation of equality of variance assumption, therefore significant results of the statistical test should be interpreted with caution. This hypothesis was not supported.

Table 6

MANOVA Analysis of Total Job Satisfaction for Dyad and Non-Dyad Nurses on Experimental Unit

	Dyad			Non-Dyad			Total		
Time	M	SD	n	M	SD	n	M	SD	n
1	53.4	5.9	13	53.2	6.7	9	53.3	6.1	22
2	54.6	5.7	13	53.4	5.0	9	54.1	5.4	22
3	57.6	5.8	13	54.6	3.5	9	56.4	5.1	22
Time		F=3.67				p =.034			
Dyad by time		F= .84				p = NS			

Note. Score range is 17-85.

Table 7

MANOVA Analysis of Intrinsic Job Satisfaction for Dyad and Non-Dyad Nurses on Experimental Unit

	Dyad			Non-Dyad			Total		
Time	M	SD	n	M	SD	n	M	SD	n
1	30.6	3.0	13	31.7	3.4	9	31.1	3.1	22
2	30.8	3.4	13	30.8	3.8	9	30.8	3.5	22
3	32.3	4.2	13	31.3	2.9	9	31.9	3.7	22
Time		F= .93				p=NS			
Dyad by Time		F=1.07				p=NS			

Note. Score range is 10-50.

Table 8

MANOVA Analysis of Patient Focus Scale for Dyad and Non-Dyad Nurses on Experimental Unit

	Dyad			Non-Dyad			Total		
Time	M	SD	n	M	SD	n	M	SD	n
1	22.7	3.8	15	22.3	4.9	10	22.5	4.1	25
2	23.9	3.0	15	23.2	3.3	10	23.6	3.1	25
3	25.5	2.9	15	23.5	2.7	10	24.7	2.9	25
Time		F=4.87				p=.012			
Dyad by Time		F= .88				p=NS			

Note. Score range from 7-35.

Hypothesis 2

The second hypothesis tested was: The nurses on the unit for which the Dyad Model is implemented will demonstrate a difference in job satisfaction when compared to nurses on similar medical-surgical units that have a Total Patient Care delivery model.

Job satisfaction (Table 9) for each group was examined, as were the Intrinsic (Table 10) and Patient Focus (Table 11) subscales. Satisfaction was measured in both groups and found to be significant for time in the Total scores and Patient Focus Scale but not significant for group assignment (see Tables 9, and 11). Again in comparison of these two groups there was no significant change in score on the Intrinsic Scale of the satisfaction survey (Table 10). This hypothesis was not supported.

Table 9

MANOVA Anaylsis of Total Job Satisfaction for Nurses on the Control and Experimental Units

	Control			Experimental			Total		
Time	M	SD	n	M	SD	n	M	SD	n
1	56.8	6.9	25	53.3	6.1	22	55.2	6.7	47
2	56.2	6.7	25	54.1	5.4	22	55.2	6.2	47
3	58.2	6.9	25	56.4	5.1	22	57.4	6.1	47
Time		F=5.40			p=.006				
Group by Time		F= .67			p=NS				

Note. Score range 17-85.

Table 10

MANOVA Analysis of Intrinsic Job Satisfaction for Nurses on the Control and Experimental Units

	Control			Experimental			Total		
Time	M	SD	n	M	SD	n	M	SD	n
1	32.2	4.5	25	31.1	3.1	22	31.7	3.9	47
2	32.1	4.7	25	30.8	3.5	22	31.5	4.2	47
3	32.6	4.1	25	31.9	3.7	22	32.3	3.9	47
Time			F=1.21			p=NS			
Group by Time			F= .11			p=NS			

Note. Score range is 10-50.

Table 11

MANOVA Analysis of Patient Focus Scale for Nurses on the Control and Experimental Units

	Control			Experimental			Total		
Time	M	SD	n	M	SD	n	M	SD	n
1	24.6	3.9	28	22.5	4.1	25	23.6	4.1	53
2	24.4	3.8	28	23.6	3.1	25	24.0	3.5	53
3	25.8	3.8	28	24.7	2.9	25	25.3	3.4	53
Time			F = 8.49			p=.000			
Group by Time			F = 1.24			p=NS			

Note. Score range is 7-35.

Hypothesis 3

The third hypothesis tested was: The case management function described in the role of the Patient Care Manager will impact cost of care and length of stay when compared to similar medical-surgical units that have a Total Patient Care delivery model (Control units).

Reductions in mean cost and length of stay were found in both the experimental and control units for the two DRGs analyzed from Quarter 5 to Quarter 9. For DRG 014 (CVA) these changes were not significant when submitted to a t-test (see Tables 12 and 13). Tables 14 and 15 contain t-test comparisons of the differences in both cost and LOS during Quarter 9 only between the experimental and control units. Both cost and LOS were lower on the experimental unit but the differences were not significant.

Table 12

Comparison of Mean Cost per Case Changes for CVA (DRG 014) from Quarter 5 to Quarter 9

	Experimental			Control		
	n	Mean Cost	SD	n	Mean Cost	SD
Quarter 5 (12/93-2/94)	11	4636	2802	21	5393	2802
Quarter 9 (12/94-2/95)	11	3985	3213	18	4498	2120
		t=.578 p=NS			t=1.11 p=NS	

Table 13

Comparison of Mean Length of Stay Changes for CVA (DRG 014) from Quarter 5 to Quarter 9

	Experimental			Control		
	n	MLOS	SD	n	MLOS	SD
Quarter 5 (12/93-2/94)	11	5.3	2.5	21	6.1	3.6
Quarter 9 (12/94-2/95)	11	4.5	3.6	18	4.9	3.7
		t=.60 p=NS			t=1.05 p=NS	

Table 14

Comparison of Mean Cost Quarter 9 Only for CVA(DRG 014) between Experimental and Control Units

Experimental			Control		
n	Mean Cost	SD	n	Mean Cost	SD
11	3986	3213	18	4498	2120
		t=.79 p=NS			

Table 15

Comparison of Mean Length of Stay Quarter 9 Only for CVA(DRG 014) between Experimental and Control Units

Experimental			Control		
n	MLOS	SD	n	MLOS	SD
11	4.5	3.6	18	4.9	3.7
		t=.28 p=NS			

Figures 3 and 4 are graphic representations of cost and length of stay trends during the designated study period (December 1992 thru February 1995). Quarter five was the time frame prior to the implementation of the Dyad Model and Quarter nine was during the last months of the implementation period.

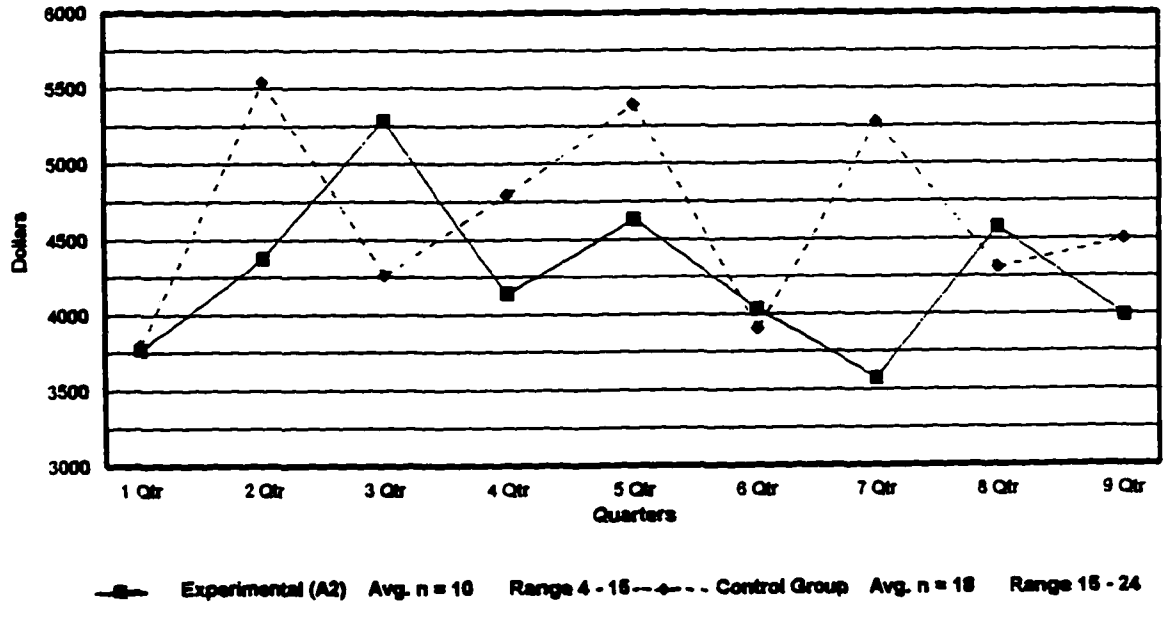


Figure 3. Cost per Case Trend for DRG 014 from Quarter 1 (12-92/2-93) to Quarter 9 (12-94/2-95) for Both Experimental and Control Groups.

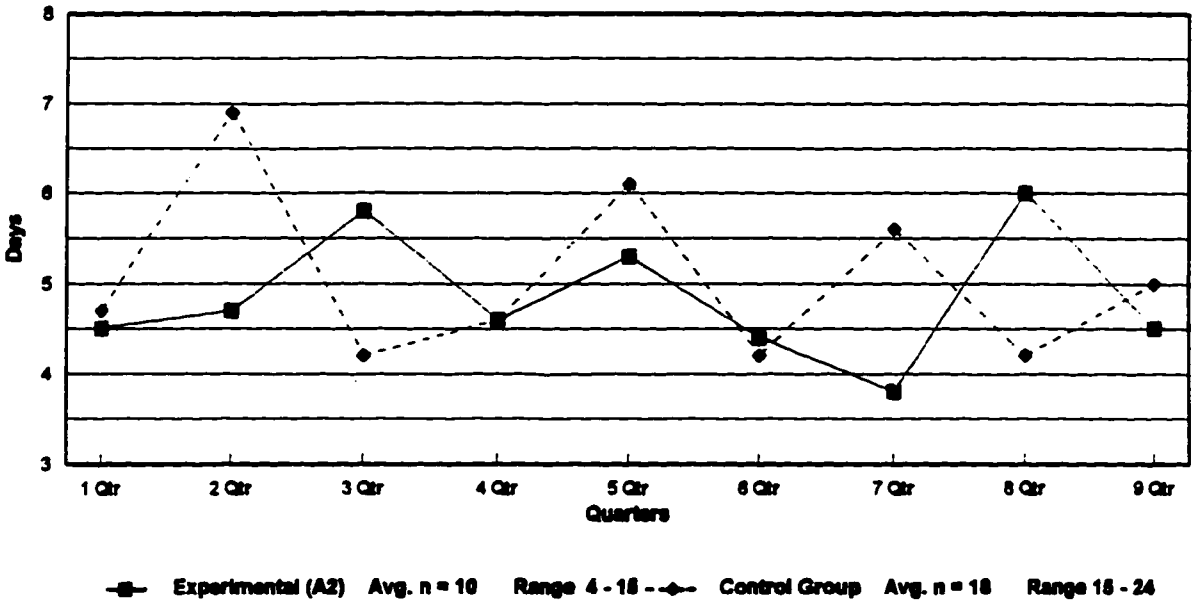


Figure 4. Length of Stay Trend for DRG 014 from Quarter 1 (12-92/2-93) to Quarter 9 (12-94/2-95) for Both Experimental and Control Groups.

The cost and LOS data for DRG 089 (Complicated Pneumonia) is depicted in Tables 16 and 17. In this case type reductions in mean cost were statistically significant when submitted to a t-test for both groups from Quarter 5 to Quarter 9, but not for mean length of stay reductions. The t-test comparison of mean cost (Table 18) and LOS (Table 19) differences during Quarter 9 only between experimental and control groups yielded a statistically significant difference for the lower mean cost on the experimental unit. Figures 5 and 6 are the graphic representations of cost and LOS trends noted for DRG 089 during the designated study time frame. As stated earlier, Quarter 5 was just prior to implementation of the new care delivery model and Quarter 9 was the last month of implementation.

Table 16

Comparison of Mean Cost Changes for Complicated Pneumonia (DRG 089) from Quarter 5 to Quarter 9

	Experimental			Control		
	n	Mean Cost	SD	n	Mean Cost	SD
Quarter 5 (12/93 -2/94)	21	4128	1347.4	86	5176	3256
Quarter 9 (12/94-2/95)	8	2690	1051.9	51	3869	2650
		t=2.71 p=.012			t=2.43 p=.017	

Table 17

Comparison of Mean Length of Stay Changes for Complicated Pneumonia (DRG 089) from Quarter 5 to Quarter 9

	Experimental			Control		
	n	MLOS	SD	n	MLOS	SD
Quarter 5 (12/93 -2/94)	21	5.2	2.0	86	6.4	4.1
Quarter 9 (12/94-2/95)	8	4.5	2.0	51	5.5	4.1
		t=.94 p=NS			t=1.34 p=NS	

Table 18

Comparison of Mean Cost Quarter 9 Only for Complicated Pneumonia (DRG 089) between Experimental and Control Units

Experimental			Control		
n	Mean Cost	SD	n	Mean Cost	SD
8	2690	1051.9	51	3869	2650.2
		t=2.24 p=.034			

Table 19

Comparison of Mean Length of Stay Quarter 9 Only for Complicated Pneumonia (DRG 089) between Experimental and Control Units

Experimental			Control		
n	MLOS	SD	n	MLOS	SD
8	4.5	2.0	51	5.5	4.1
		t=1.10 p=NS			

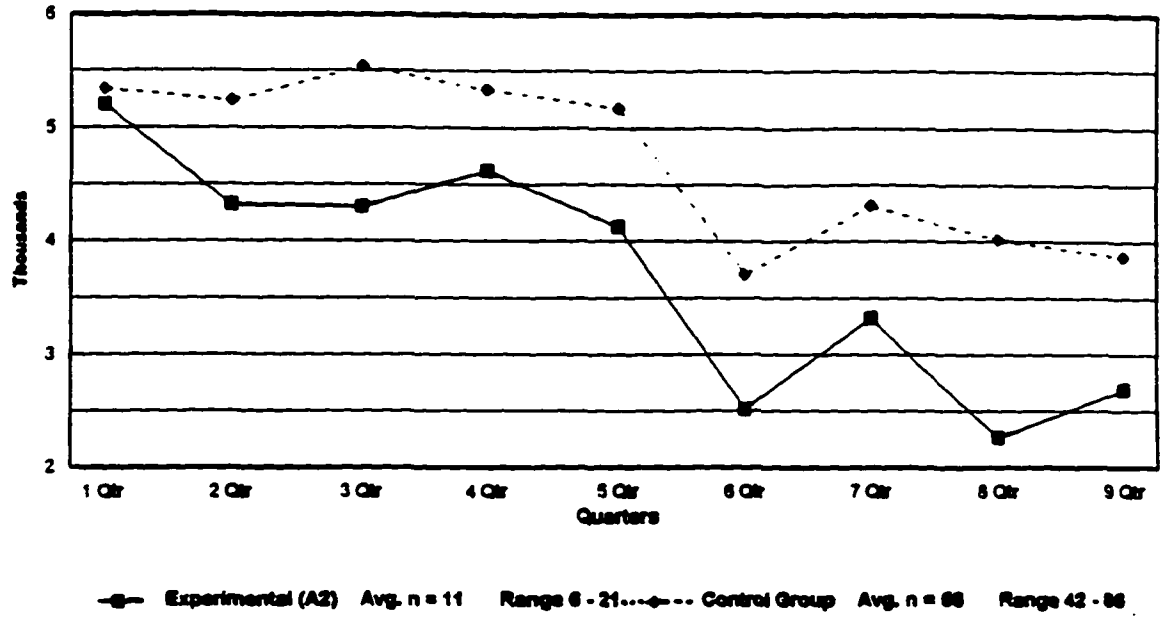


Figure 5. Cost per Case Trend for DRG 089 from Quarter 1 (12-92/2-93) to Quarter 9 (12-94/2-95) for Both Experimental and Control Groups.

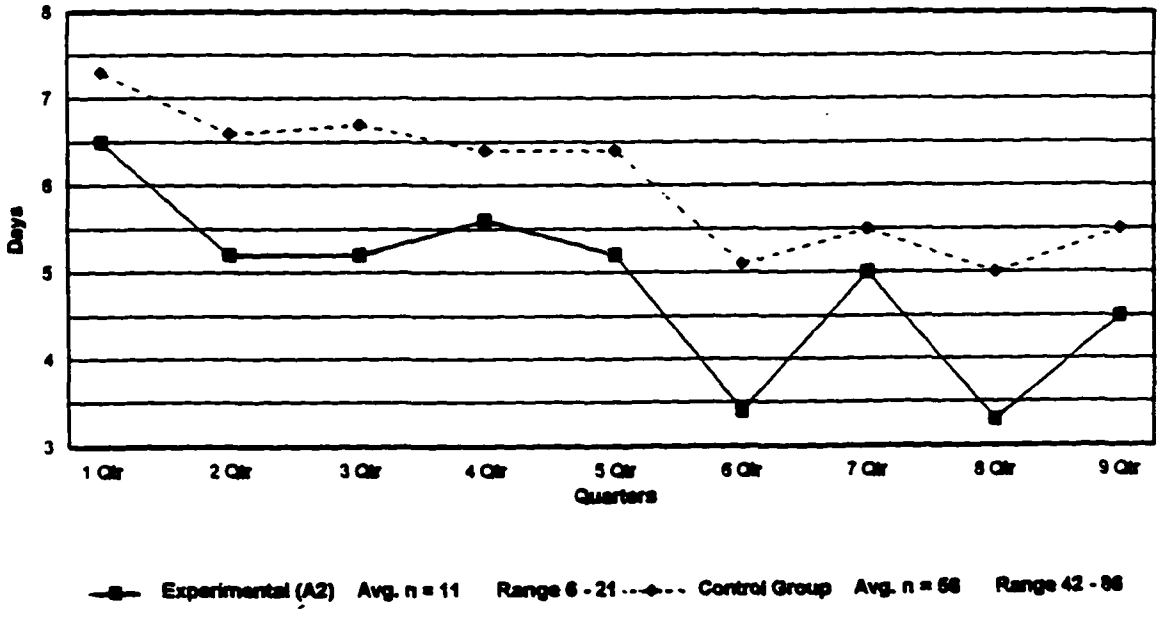
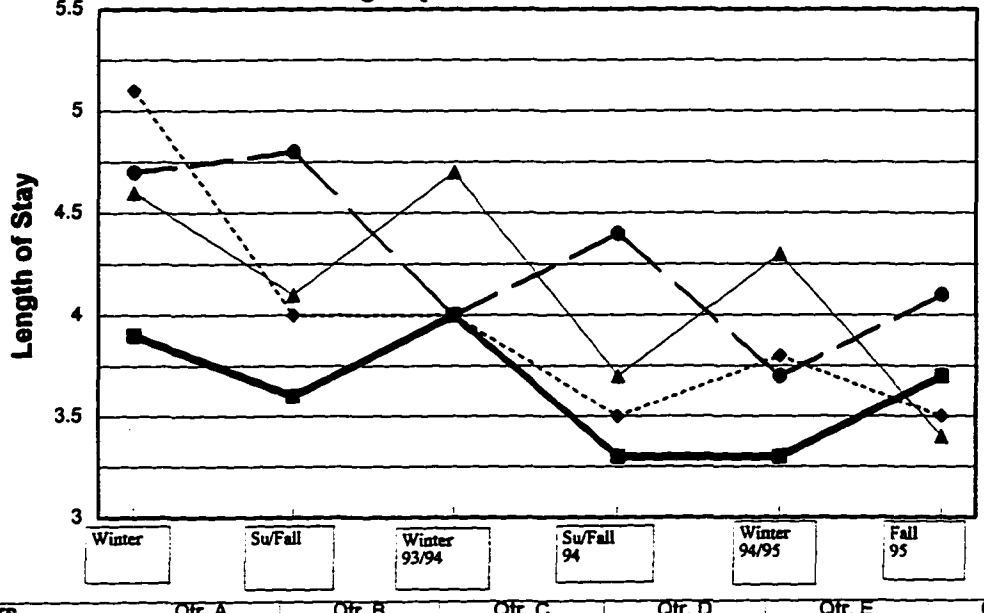


Figure 6. Length of Stay Trend for DRG 089 from Quarter 1 (12-92/2-93) to Quarter 9 (12-94/2-95) for Both Experimental and Control Groups.

Average length of stay for all patients on all units was measured for the five defined interval quarters starting with December 1992 and ending with February 1995. A sixth quarter was added to this data collection representing a time frame in which the experimental unit had gone back to the original care delivery model, Total Patient Care. This measurement quarter was August, September and October 1995. The data were plotted onto a line graph (see Figure 7). Quarters A, B and C represent time frames prior to the implementation of the Dyad Model, Quarters D and E during implementation, and Quarter F the time frame following discontinuation of the study. Average LOS for the experimental unit did drop after the implementation of the Dyad Model to 3.3 days and remained there during the study time. This represented a lower length of stay than the units that served as the control group.



UNITS	Qtr. A	Qtr. B	Qtr. C	Qtr. D	Qtr. E	Qtr. F
■ A2 Exp.	3.9	3.6	4.0	3.3	3.3	3.7
◆ A3	5.1	4.0	4.0	3.5	3.8	3.5
▲ 5C	4.6	4.1	4.7	3.7	4.3	3.4
● 6C	4.7	4.8	4.0	4.4	3.7	4.1

Figure 7. Comparison of Overall Length of Stay of the Experimental (A2) Unit to the Three Medical-Surgical Units That Were Included in the Control Group from Quarter A(12-92/2-93) to Quarter F (8-95/10-95).

Hours per patient day were calculated for each unit during the designated time frame (see Table 20). There was little difference in hours per patient day after the Dyad Model implementation between units. This is explained by the fact that the implementation of the Dyad Model did not alter staffing ratios or staff mix. This calculation included the hours of all nursing department bedside care givers.

Salary expenses per patient (labor cost) were also analyzed. These figures are calculated by multiplying the salaries per patient day times the average length of stay per unit (see Figure 8). The salary per patient expense for the experimental unit was lower than those units that were in the control group during the Dyad Model implementation period and rose following completion of the study.

Table 20

Average Hours Per Patient Day for Experimental Unit (A2) and Control Units

Quarter	A2	A3	5C	6C
A	5.7	5.6	6.1	7.1
B	6.9	6.8	7.4	7.4
C	7	7.1	7.4	7.4
D	7.1	7.3	7.6	7.6
E	7.3	7.1	7.2	7.3
F	7.9	7.7	9.4	7.7

Note. Quarters A,B and C prior to Dyad Model. Quarters D and E during Dyad Model. Quarter F after discontinuation of the Dyad Model.

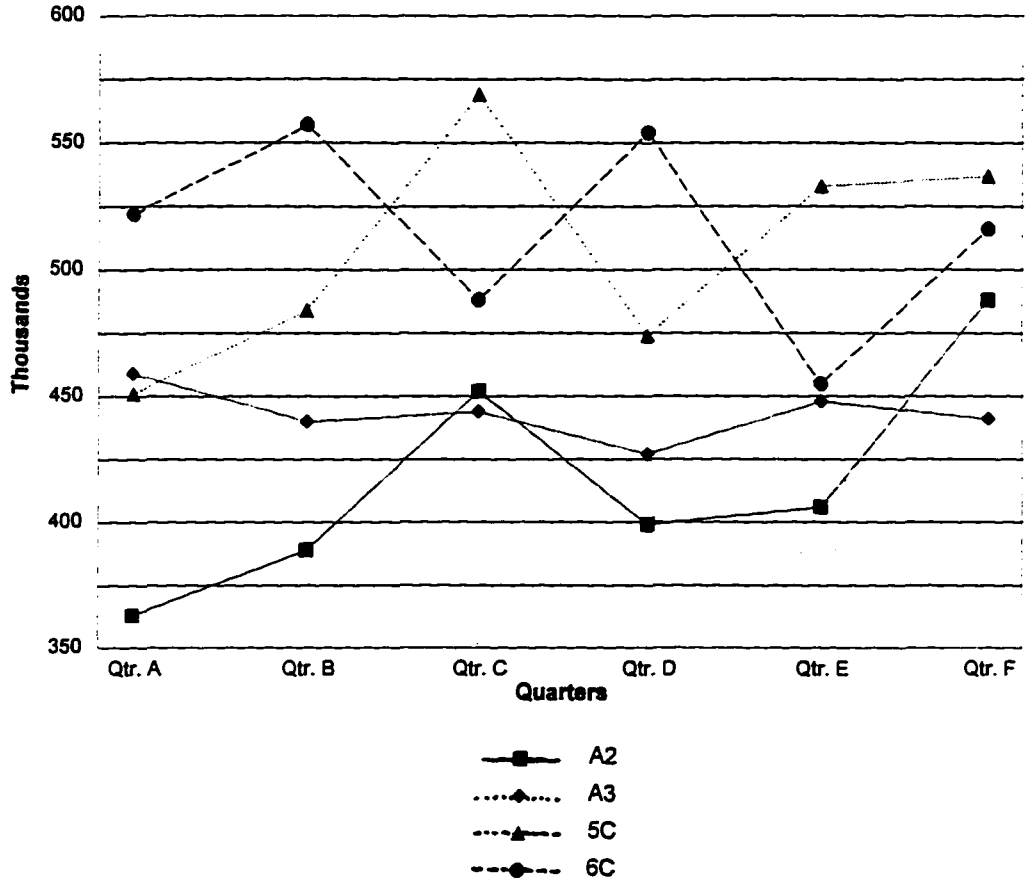


Figure 8. Comparison of Salary Expense per Patient on the Experimental Unit (A2) to the Three Medical-Surgical Units Included in the Control Group from Quarter A (12-92/2-93) to Quarter F (8-95/10-95).

Additional Findings

A retrospective chart review of those patients admitted to the experimental unit with DRG 089 (Pneumonia) and DRG 014 (CVA) during the study time frame was conducted. Of the 69 patient charts reviewed, 28% (n=19) were admitted by a PCM, 71% (n=49) were placed on a Clinical Pathway by a PCM and 47% (n=33) of the patients were cared for during their entire length of stay by the same two Dyad groups. Evidence of care management functions by the PCMs was found in the documentation on the Clinical Pathways. Those patients not admitted by a PCM were either assigned to a nurse not in a

Dyad group or admitted on another shift. A PCM typically assumed care of those patients within 24 hours. Concurrent review of Clinical Pathways by the Nurse Case Manager on the experimental unit revealed that of the 344 patients admitted for Total Joint Replacement or Hip Fracture, 95% (317) had Clinical Pathways initiated and followed by the PCMs. Discussion with the PCMs revealed that they felt most comfortable in managing care of the orthopedic surgical case types and had more difficulty with the medical DRGs. This is not a surprising finding because of the less predictable responses of medical patients to treatment interventions. Also, all but one of the nurses who first assumed PCM roles were experts in Orthopedic nursing and had little experience with medical patients.

CHAPTER 5

DISCUSSION/LIMITATIONS/IMPLICATIONS

Discussion

The satisfaction of nurses with their work environment has been associated with a variety of factors in previous studies (Weeks et al., 1985; Stamps & Piedmont, 1986; Reed, 1988; McPhail et al., 1990; McCloskey, 1990; MacLeod & Sella, 1992). The variables identified range from rate of pay to autonomy. Studies of various care delivery models and their effect on nurse satisfaction have had conflicting results.

The primary nursing model promoted isolation of the care giver (Reed, 1988). The focus was on the relationship the nurse developed with each patient within his/her caseload. The individual responsibility and accountability of the primary nurse was believed to be a source of stress and anxiety due to isolationism and reluctance to ask for help (Reed, 1988; Weeks et al., 1985). The current health care environment has placed additional stressors on the role of the staff nurse. Patient length of stay has shortened and acuity is higher as a result of the prospective payment system.

The evolution of Total Patient Care as a delivery system has compounded these stressors. Nurses in this system are not only isolated from each other as providers but do not enjoy the ability to form a relationship with patients in an assigned caseload. The art of nursing is literally reduced to an eight hour per day task oriented job. This care delivery

system as a flexible line of defense does not protect the client system, defined as the patient care unit, from the external stressors noted earlier. The change of care delivery in this study was identified as a secondary intervention aimed at restructuring the roles and relationships of the nursing staff to strengthen the lines of resistance and the flexible line of defense. The goal was to improve the satisfaction of the nurses within the new model achieving an improved state of wellness, identified as the normal line of defense. A secondary goal was to move accountability for clinical and financial outcomes from the Nurse Case Manager to the staff nurse level through use of case management tools that promote quality care and cost reduction.

Hypothesis 1. The major finding of this study was that the staff nurses on the experimental unit were able to assume new roles and change relationships. They accomplished these changes in a manner that supported case management functions utilizing a team approach and in the process, improved overall nurse satisfaction. This finding is consistent with the Koerner et al. (1989) study which demonstrated improved nurse satisfaction and reduced cost per case after implementation of a similar care delivery model. The increase in score on the Total Job Satisfaction scale was significant for time among the two groups but not affected by group membership (Dyad and Non-Dyad), i.e, both groups improved in their level of satisfaction. This finding did not support the first hypothesis of this study. Although the greatest change in mean score was measured in the Dyad group, when submitted to the MANOVA analysis this was not statistically significant. This could be the result of the small sample size.

The greatest change in satisfaction for the Dyad group was noted by an increase in

mean score on the scale labeled "Patient Focus," which measures nurses' ability or time to plan care with their patients. The roles described in the Dyad Model were designed to support care planning within the Patient Care Manager component. There was also a small increase in mean score on this scale found in the Non Dyad group. This finding also was significant for time for the two groups together but not affected by group membership. Conclusions regarding the impact of the Dyad Model on nurse satisfaction cannot be drawn from these findings. Also, because of a violation of the assumption of homogeneity of dispersion matrices within the Patient Focus scale, this result should be interpreted with caution. This violation could be a result of the effect of the small sample size.

Despite the fact that no differences were found based on membership in a care delivery group, a significant improvement in satisfaction occurred over time on the unit. The overall improvement in nurse satisfaction on this unit could be related to improved communication between the shifts. The Patient Care Managers (PCMs) had the opportunity to become more familiar with their assigned patients as a result of the continuity of assignment and written communication between Dyad groups. They were then able to provide to the nurses on the following shift who would care for the patients more comprehensive information and recommendations for care. The role interaction of the Dyad team allowed for meeting all patient needs during their assigned shift and eliminated leaving incomplete tasks for the next shift to finish. This model also compelled people on the day shift to work together and build relationships that had not been established since the consolidation of the two units. This helped to begin eliminate the

separate identities that had not been relinquished since consolidation of the two units.

The changes noted in satisfaction can be compared to those in the Wade and Degerhammar (1991) study that measured the effects of a change in care delivery similar to the Dyad Model but without the case management role. The nurses in that study had increases in satisfaction overall but only the RNs demonstrated a significant increase on the "Patient Focus" scale. This Dyad Model study did not differentiate scores by classification of nurse but it is worth noting that greater than 80% of the subjects in the current study were Registered Nurses.

Neither group demonstrated a significant increase in satisfaction on the "Intrinsic Scale." This scale measures the nurse's perception of ability to provide quality care, receive feedback or knowledge of the results of one's efforts, perceive enough time to spend with patients and less stress. This is not surprising in that during the implementation phase of the Dyad Model it became apparent that the existing structures of the patient care unit did not support this type of care delivery. Examples of these are: the patient chart is kept at the desk rather than where it is easily accessed by the bedside care provider; there are only three computer terminals on each unit and all are in use by unit clerks and a charge nurse; the role of Patient Care Assistants was poorly defined and accountability for their performance was not assigned to any staff nurse; and the stocking of supplies and medications in the nurse servers is inconsistent by support services. These structures are also present on the other units. These variables are identified by the staff as barriers to their ability to provide care in a manner that is not rushed or stressful. The lack of easy access to the medical record reduces the ability of nurses to have complete and

current knowledge of the patients within their care. These structural barriers act as external stressors that impinge upon the flexible line of defense, identified as the care delivery system. The role of the PCA is an important aspect of the lines of resistance as well as the other roles on the unit. The lack of clarity for how this role would interact with other staff exerted a negative impact on the effectiveness of the lines of resistance in the study.

On the experimental unit the entire day shift was not involved in the Dyad Model until into the fourth month of the implementation period. At that time the remainder of the staff were given the educational time that the original group received prior to the change. However, because of staffing patterns that at times did not allow for enough Patient Care Managers on duty, nurses returned to the former care delivery model. This was viewed as a detriment to the implementation of the change because staff could go back to the comfort and familiarity of the old care delivery model.

Another factor considered to negatively impact the implementation of the model was the loss of managerial support during the change process. The unit director became ill about six months after the model was implemented and her absence from the unit and the subsequent lack of leadership created a stressful environment for this change process. As the designated implementation period came to an end, the staff, who felt that they were unable to overcome the structural barriers or resolve some existing behavioral issues with a few of their peers without manager level intervention, abandoned the Dyad Model. As a result, they reverted back to the former care delivery model and as noted in the data measurements several months after (Quarter F), unit length of stay and salary cost per

patient increased.

Hypothesis 2. Similar to the findings for the first hypothesis, the increase in mean score on the Total Job Satisfaction scale for the Experimental (Dyad and Non-Dyad combined) group was greater than that of the Control group. The changes in score were significant over time among the groups but not affected by group assignment (Experimental and Control). The findings were similar in the Patient Focus scale. Therefore the second hypothesis was not supported. This could be secondary to the small sample size. The increased satisfaction of both groups over time could be related to a greater number of Clinical Pathway/Careplans generated during the study on all the medical-surgical units which could explain the satisfaction increase in the "Patient Focus" portion of the instrument. These case management tools are designed to assist the nurse in the process of planning, implementing interventions and evaluating outcomes in collaboration with the patient/family, physician and interdisciplinary team. Nurse Case Managers assigned to these units during the study spent time educating and mentoring staff nurses in the utilization of the Clinical Pathways. The changes in the Intrinsic Scale for these two groups were nonsignificant. As detailed earlier, there are several barriers to providing efficient patient care on all the medical-surgical units.

It is important to note that the Experimental group scores were lower on the satisfaction survey prior to the implementation of the change and remained lower on the posttest scores when compared to the Control group. There may be several factors to explain this finding. In evaluation of the characteristics of the groups, it is noted that the Dyad group had both a higher mean number of years in nursing and as staff assigned to a

unit. Many of these nurses expressed difficulty in keeping pace with the changes in health care and the perceived impact on their ability to provide quality patient care. These feelings were behind their desire to implement a change to a new model of care delivery. As mentioned earlier, the experimental unit was the result of a recent consolidation of two medical-surgical patient care areas located at each site. Blending the two nursing staffs and their cultures had been a challenge and contributed to a disruption of the basic core structure of the client system. The normal line of defense, satisfaction, had been altered by the effects of these external stressors.

Hypothesis 3. The findings in regard to changes in length of stay and cost of patient care support the third hypothesis of this study. Length of stay overall on the experimental unit during the operation of the Dyad Model was reduced more than that of the Control group. Cost per case and length of stay dropped for both DRGs evaluated in this study on the Experimental and Control units. These reductions are probably related to the work of the Nurse Case Managers who are assigned to each unit in the control group. The most important finding is that in spite of the identified barriers during the implementation of the Dyad Model, the case management functions were performed by the Patient Care Managers independent of the Nurse Case Manager assigned to the Experimental unit.

The role of the Nurse Case Manager on the Experimental unit was phased down to only consultation to the staff as needed for complex patient care issues. A full time Case Manager assumes the responsibility for initiation of Clinical Pathways and management of patient care in collaboration with the bedside nurse. Prior to the Dyad Model staff nurses

did not view patient care management as part of their role because of the lack of time to perform this aspect of care. During the operation of the Dyad Model overall average length of stay for patients admitted to the unit dropped to 3.3 days and this resulted in a lower labor cost per patient. This demonstrates the fact that RNs given the opportunity to function in appropriate roles can provide more cost effective care.

Analysis of the results found in the two DRGs measured is of interest. The trended data of cost and length of stay did not reveal any seasonal related differences. After the implementation of the Dyad, following Quarter 5, there was a consistent downward trend in both cost and LOS on the experimental unit for both DRGs except during one quarter. For CVA (014) the increase occurred during Quarter 8 (Fall 94) resulting in higher cost and LOS than on the control units. For Pneumonia (DRG 089), the increase occurred during Quarter 7 (Summer 94) but remained lower than the control units. These findings could be either be the result of the number of patients admitted during these time frames or the occurrence of an outlier patient. During the month of July 1994 the remainder of the day shift received the education for the Dyad Model and two more Patient Care Managers were selected. Nurses were also taking vacation time during this period and maintaining staff levels for Dyad groups was difficult. Float and casual staff could not be used in a Dyad group since they had not had the educational preparation.

A possible explanation for the significant changes in the Pneumonia DRG is the work of the subcommittee responsible for the monitoring of the progress of that case type. Quality improvement studies were conducted leading to changes in some processes of

care. The Pulmonary physicians involved also presented several educational sessions for their colleagues encouraging more aggressive management of these patients to reduce length of stay. These efforts in combination with the care management activities by the PCMs on the experimental unit could explain both the hospital wide reductions as well as the greater reductions in cost and LOS on the experimental unit. The CVA Clinical Pathway was more recently developed and physicians were hesitant to embrace the more aggressive treatment protocols outlined in this pathway. Another variable affecting length of stay for these cases is availability of beds in extended care facilities or rehabilitation centers for those patients who require continued care once they are ready for discharge.

Limitations

There are several areas which present possible limitations to this study. The same instrument was used to measure satisfaction at three different time intervals which could have the effect of sensitizing the subjects to the instrument. The questions on the survey were changed in sequence on the third testing in order to limit this effect and the testing intervals were six months apart. Many of the subjects expressed a lack of memory of prior testing during the subsequent measurement periods.

The use of a sample limited to the accessible population is another limitation of the study because it decreases the ability to generalize the study results to other acute care settings. The sample of this study is skewed toward the Associate Degree (AD) level of nurse preparation and it is not known what results might be obtained with a random sample that included a variety of educationally prepared nurses.

Another limitation is that the Dyad participants of the experimental group were self

selected. This creates the possibility that the groups were not equivalent to begin with and the differences that occurred over time may not be the result of the independent variable. In addition to that, the sample sizes for both groups were small in the final analysis which decreases the ability to find a significant difference between groups.

Nursing Implications

This study has implications for nursing at the administrative, educational and clinical levels. This is due to the fact that in the current health care environment the profession is being driven to explore more cost effective methods to provide quality patient care. Acute care settings are faced with having fewer dollars to deliver patient care in a shorter time frame to a population that is higher in acuity. As nurse administrators explore methods to redesign the role of the nurse in order to meet the demands of the economic environment several things need to be considered. In the process of redesign the focus should be on how any transformation will change the way people work and improve outcomes as a result. Examining roles and relationships and finding ways to assist them to become more functional is also important. Assessing the structures that exist within the institution and how they impact behavior is of paramount importance in any redesign effort. Existing structures often are barriers to successful change or redesign (Porter-O'Grady & Wilson, 1995). This observation was noted at the study site.

In the process of redesign the focus should always be on the point of service (Porter-O'Grady & Wilson, 1995). Accountability for managing a change or redesign should be given to more people. Inclusion of nursing staff in the redesign of patient care

provides a sense of ownership for the change. In using the concept of each unit as a subsystem within a larger system from Neuman's Model (1989), redesign or change in care delivery should begin at the unit level. The model may look different for each unit depending on the predominant patient population. Goals to guide the redesign and desired outcomes should be articulated by the larger system but each point of service may choose a different methodology in order to achieve the outcomes.

In the realm of education the profession of nursing should evaluate preparation of the student nurse to enter into the present health care environment. Student nurses must be prepared to deal with the stressors of doing more with less. Students who are prepared to function as primary care providers are unable to work as part of a team when called upon to do so. They are often unprepared to delegate tasks to lower skilled providers and this leads to role confusion and dysfunction of the team. Nursing Case Management roles and how they are expected to relate to the health care team should be introduced at the student nurse level. Knowledge of the importance of both clinical and financial outcomes of patient care should be stressed in the course of preparation for the profession of nursing. Evaluation of the level of educational preparation that best prepares a nurse for a Case Manager role needs to occur. To provide the most cost effective health care the nursing profession should assess at what educational level a nurse is best suited for a role that demands professional accountability for outcomes. The AD nurse may be more appropriately prepared to provide direct patient care, with a Bachelors or Masters prepared Nurse Case Manager collaborating with the interdisciplinary team, coordinating the overall care and delegating responsibilities to the direct care giver.

In the clinical arena Case Management roles are becoming increasingly common. Role confusion and ambiguity often contribute to conflict for these providers. It may be necessary for the nursing profession to formally recognize the existence of this new nursing function and begin to provide a clear operational definition for those who enter into these roles. Nursing Case Management appears to be a new area of practice for clinicians and may require certification by exam. Presently an exam for Case Management is provided by a group represented by third party payers and is open to those who describe themselves as a Case Manager, regardless of educational preparation. Nurses, who are best suited for these roles, should be encouraged to take a proactive approach by advocating for regulation of this clinical practice within the profession of nursing.

Recommendations for Further Research

The findings of this study have contributed to an understanding of the impact of care delivery design on nurse satisfaction to a small degree and to a greater extent the effect on cost of care. Cost of care was lowered without a change in skill mix and most importantly, without a reduction of RN staff. Further research in the realm of care delivery and its impact on nurse satisfaction and cost of care is necessary for the profession to guide the practice in a rational manner. Similar studies are recommended using a larger sample size or conducted at multiple sites with a hope of obtaining more significant results from which conclusions could be drawn. Examining the relationship between care delivery design, shift worked and nurse satisfaction would also be of interest. Case Management roles are usually considered day shift roles but it would be interesting to study the effectiveness of this type of role on another shift.

Future studies could explore the relationship between educational preparation of the nurse and the level of satisfaction achieved in a Case Manager role. Exploration of the cost benefit of employing nurses with a higher educational level to coordinate the care of patients may be beneficial. Further research to evaluate factors contributing to satisfaction of nurses prepared at different levels of education may be of importance in determining who is best suited for the various roles in nursing.

Nurses must look for ways to demonstrate their ability to provide the most cost effective care. This is best accomplished through the scientific method. Numerous changes are occurring in the nursing profession as a result of external forces. The profession must be aware of what those forces are and how best to deal with their impact if we are to control how we survive in the future health care arena.

APPENDICES

APPENDIX A

Letter of Permission to Use Figure 1-4
from the Neuman Systems Model (2nd ed.)
by Betty Neuman (1989)

APPENDIX A

Letter of Permission to Use Figure 1-4 from the Neuman Systems Model (2nd ed). by Betty Neuman (1989)

March 3rd, 1995

Appleton & Lange
Attention Copyright Department
25 Van Zant Street
East Norwalk, Connecticut 06855

Dear Sir:

I am a graduate nursing student doing a research project for my Master's of Science in nursing degree. For the conceptual framework, I am using Betty Neuman's Systems Model. In order to clearly depict it, I would like to have permission from Betty Neuman to use the Figure 1-4 (see attachment) on page 28, from the Neuman Systems Model (2nd ed.), by Betty Neuman. Please send me information on how I may apply for permission to use the picture. Enclosed is a stamped, self addressed envelope for your convenience. Thank you in advance.

Sincerely,

[redacted]

Kathy Allen
117 Brandywood Ln.
Battle Creek, Mich.
49017
Home: 616 962-7580
Work: 616 966-8198

Appleton & Lange holds the Copyright on this figure. And therefore they can grant it.

PERMISSION GRANTED

[redacted]

BY

DATE 3/17/95

APPLETON & LANGE

APPENDIX B

Job Satisfaction Survey

APPENDIX B

Job Satisfaction Survey

Please rate the following questions:	1 Never	2 Seldom	3 Sometimes	4 Often	5 Always	
1. Do you feel content with your work on the unit?						
2. Do you feel stressed in your work?						
3. Are you able to plan patient care?						
4. Can you plan care in the way that you prefer?						
5. Do you have enough time to talk to patients?						
6. Are you satisfied with your work when you go home at the end of the day?						
7. Do you have to rush when you are caring for patients?						
8. Do you plan patient care?						
9. Have you enough time to be with patients?						
10. Do you feel that you do your tasks well?						
11. Do you advise patients about what they should do when they go home?						
12. Do you encourage relatives to participate in patient care before patients are discharged?						
13. Are you satisfied with the way you are able to nurse patients?						
14. Are you able to talk to patients when giving care?						
15. Do you inform patients fully before tests or surgery?						
16. Are you able to give the kind of care that you prefer?						
17. Do you plan care together with the patient?						

APPENDIX C

Letters of Permission to Use and Publish the Wade & Degerhammar Job Satisfaction Survey

APPENDIX C

Letters of Permission to Use and Publish the Wade & Degerhammar Job Satisfaction Survey

General Secretary:
Christine Hancock
BSc(Econ) RGN

Patrons:
Her Majesty the Queen
Her Majesty Queen Elizabeth
the Queen Mother
Her Royal Highness
the Princess Margaret
Countess of Snowdon

20 Cavendish Square
London W1M 0AB
Telephone 071-409 3333
Fax: 071-355 1379

29 November 1993

ROYAL COLLEGE OF NURSING

Ms Kathy Allen
117 Brandywood Lane
Battle Creek
Michigan 49017
USA

Dear Kathy

Thank you for your enquiry. The paper you refer to describes a measure which was devised in Swedish, it may have lost a little in translation. I do not have a copy of the original measure but there are sufficient details in the paper for you to be able to reconstruct it. The response format is given on page 197; items 8 and 9 should be reverse scored and the items should be randomly ordered. I enclose a copy of a paper which describes the study in which the measure was used.

I also enclose a copy of a measure that has been designed for use with community nurses here in the UK. There are two papers to accompany this and a scoring key. This is a more comprehensive measure which is user friendly and quick to complete. The personal satisfaction scale probably equates with the intrinsic satisfaction scale in the Swedish measure.

If either of these scales is to be used in a different culture they should first be validated but I am happy for you to use them if you wish. There is no fee involved. I should be most interested in receiving a copy of your results.

Yours sincerely

[redacted]

Dr Barbara Wade
Director
Daphne Heald Research Unit

APPENDIX C

General Secretary:
Christine Hancock

Patrons:
Her Majesty the Queen
Her Majesty Queen Elizabeth
the Queen Mother
Her Royal Highness
the Princess Margaret
Countess of Snowdon

20 Cavendish Square
London W1M 0AB
Telephone 0171 409 3333
Fax 0171 355 1379

27 November 1995

ROYAL COLLEGE OF NURSING

Ms Kathy Allen
Nurse Case Manager
Clinical Integration
Battle Creek Health System
300 North Avenue
Battle Creek, MI 49016
USA

Dear Kathy

Thank you for your recent letter. I am happy for you to include the measure of job satisfaction for use in evaluating change in the system of care delivery in your thesis/publications, provided it is acknowledged. I would be very interested in receiving a copy of your findings.

With best wishes

Yours sincerely

[redacted]

Dr Barbara Wade
Director
Daphne Heald Research Unit

APPENDIX D

Explanation of Study Purpose
Demographic Variables Questionnaire

APPENDIX D

Explanation of Study Purpose and Demographic Variables Questionnaire

The delivery of quality patient care is a concern for all nurses. The satisfaction a nurse derives from the care they feel they are providing for patients is a concern for the nursing profession.

The purpose of this study is to measure your job satisfaction with how care is given. The following survey is designed to measure your perception of the level of care you are able to provide patients. It is also the intent of this study to measure your satisfaction at other intervals over a one year time frame as we experience further changes in health care.

Every effort will be made to maintain the confidentiality of your responses, so please answer the questions freely. The identification number at the top of the survey is for the purpose of assuring all surveys are returned and for matching responses from the subsequent surveys you will be asked to complete. All results will be reported as group data. The results of this study will assist nursing in their efforts to address the issue of care delivery systems at BCHS. Your participation in this study is greatly appreciated, however, you may withdraw at any time without any consequence. The return of the completed survey indicates your consent to participate.

DEMOGRAPHICS

Please answer the following questions so that the sample can be described. Place a check mark by the blank that best describes your answer or fill in the blank if asked.

1. Name of Unit you are assigned to: _____

2. Shift normally worked:_____

3. Job Classification: R.N._____
   L.P.N._____
4. For R.N.'s; Nursing Education(Mark highest level reached)
   - Diploma _____
   - Associate Degree _____
   - Baccalaureate _____
   - Masters _____
   - Doctorate _____
   - Presently in school (describe) _____
5. Number of years in nursing: _____

6. Number of years on this unit:_____

APPENDIX E

Letter from Human Subject Review Committee of
Grand Valley State University

APPENDIX E

Letter from Human Subject Review Committee of
Grand Valley State University

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

March 14, 1994

Kathy Allen
117 Brandywood Lane
Battle Creek, MI 49017

Dear Kathy:

The Human Research Review Committee of Grand Valley State University is charged to examine proposals with respect to protection of human subjects. The Committee has considered your proposal, "*The Effect of a Change in Patient Care Delivery on Nurse Satisfaction and Cost of Care*", and is satisfied that you have complied with the intent of the regulations published in the Federal Register 46 (16): 8386-8392, January 26, 1981.

Sincerely,

[redacted]

Paul Huizenga, Chair
Human Research Review Committee

APPENDIX F

Signed Permission from Study Site

APPENDIX F

Signed Permission from Study Site

GRAND VALLEY STATE UNIVERSITY
KIRKHOF SCHOOL OF NURSING

STANDARD RELEASE FORM

I, [redacted], hereby give permission to the Grand Valley State University, Kirkhof School of Nursing,

____ 1. To utilize photographs, films, video or audio taped segments of self for educational purposes.

____ 2. To copy or reproduce the following material(s) for educational purposes by faculty and/or students within said institution:

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_____

X 3. To conduct survey research related to Kathy Allen's study concerning patient care delivery system and nurse satisfaction. *

Date: 2/16/94 Signature: [redacted]

Name Printed: VIRGINIA E. KECK, PhD, RN

Institution/Agency: Battle Creek Health System

Address: 300 North Avenue

City: Battle Creek

State: MI Zip: 49017

Witness: [redacted]

Date: 2/16/94

*Provided approval is received by Human Subjects Review Committee at GVSU.

APPENDIX G

Verbal Script

APPENDIX G

Verbal Script

Hello. I am Kathy Allen and am currently a graduate student at Grand Valley State University. I am involved in a research project concerned with the level of job satisfaction nurses perceive from patient care delivery. As changes in health care are experienced both internally and externally I am interested in evaluating the effect of these changes on nurses' satisfaction.

I am asking for your participation on a voluntary basis by completing the following survey. It contains six questions that are demographic in nature followed by seventeen survey questions and should take about ten minutes to complete. In order to participate, you must be a licensed RN or LPN, be assigned to only one patient care unit and work at least 30 hours per week.

Please fill out the forms and put them into the brown envelope that has my name on the outside when you are finished. Do not write your name or address on any of the material. Every effort will be made to maintain confidentiality of your responses and the results obtained will be reported in my thesis as group data only.

I will be contacting you again in six months and in one year asking you to complete another survey at each time. You may withdraw at anytime without any consequences. After the results are analyzed, a summary report will be available for participants upon request. Feel free to ask questions regarding the study or the survey at any time. I can be reached at BCHS, beeper 313 or my office phone and pager number are listed in the BCHS directory.

APPENDIX H

Letter to Random Sample Control Group Requesting Study Participation

APPENDIX H

Letter to Random Sample Control Group
Requesting Study Participation

6C
Battle Creek Health System
300 North Ave.
Battle Creek, Mi. 49016

Dear

I am writing to seek your assistance in a research project I am presently involved in. This particular study is part of my work as a graduate student at Grand Valley State University. I am asking nurses to complete a survey that is designed to measure their perception of satisfaction they feel with patient care delivery. The purpose of the study is to measure changes in satisfaction that may occur as we continue to experience changes in health care as nurses. I am asking you to participate in this study by completing an initial survey and then again at six months and one year for a total of three. The survey is seventeen questions long and should take about ten minutes of your time to complete. Every effort will be made to maintain the confidentiality of your responses. You may feel free to withdraw from the study at any time without any consequences.

I will be on your unit sometime during the last two weeks of March with the survey and discuss with you at that time whether you desire to be involved or not. I would greatly appreciate your participation in this study. Thank you in advance.

Sincerely,

Kathy Allen RN, BSN, Nurse Care Manager
Nursing, Clinical Resources
BCHS
300 North Ave.
Battle Creek, Mich. 49016

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