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Formative Evaluation: Implementation of Primary Nursing

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Les infirmiers(ières) ont initié le changement d'un système de soins global vers un système de soins intégral. Les effets du changement ont été mesurés selon les critères suivants: la perception des infirmiers(ières) de leur environnement de travail; la communication et la collaboration avec les autres professionnels(les) de la santé; la satisfaction des parents, la qualité des soins et les activités directes ou indirectes de l'infirmier(ière). Les critères ont été mesurés avant l'implantation, six mois et douze mois après l'implantation. Les résultats ont guidé le choix des actions à entreprendre pour faciliter le changement.

Staff nurses initiated the change from a total patient care to a primary nursing delivery system. The effects of the change were measured on the following: nurses' perceptions of their work environment; communication and collaboration with other health care professionals; parent satisfaction and quality of care provided, and direct and indirect nursing activities. The measurements were taken prior to, six months and twelve months post implementation. Action was taken based on the findings of this evaluation process which enabled the facilitation of the change process.

A task force to study the implications of changing from a total patient care nursing delivery system to a primary nursing system was initiated by a core group of Neonatal Intensive Care Unit (NICU) nurses at the Children's Hospital of Eastern Ontario (CHEO) with the approval of nursing administration. In the total patient care system, the team leader manages nurse-patient assignments, reports, rounds and referrals, and coordinates care. The NICU nurses involved in the task force were concerned that the system does not promote optimum continuity of care, maximum support for parents, or opportunities for establishing rapport prior to teaching infant care. They also sought greater recognition for their responsibility and accountability as NICU nurses. The nurses wanted to implement a primary nursing system whereby comprehensive, continuous, coordinated, and individualized nursing care is delivered through a primary nurse who has the autonomy, accountability, and authority to act as the chief nurse for her/his patients (Manthey, 1980; Zander, 1985).

The task force grew to include nurses from other areas of the hospital who had an interest in primary nursing. In order to familiarize themselves

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with the theoretical, practical, and research issues pertinent to primary nursing, the group prepared an annotated bibliography of more than 90 articles and books. The entire group supported the recommendation made by the NICU nurses to nursing administration that primary nursing be implemented and monitored to evaluate the change process.

This manuscript provides an overview of the literature that evaluates the primary nursing system, describes briefly the change process adopted, and reports on the formative evaluation of the change process and its usefulness.

Literature Review

Although the literature on primary nursing is extensive, almost 80% is not based on research, and a number of design flaws have been identified in the empirical studies (Rafferty, 1991). These flaws have included differences in implementation and/or definition of primary nursing on comparison units (Alexander, Weisman & Chase, 1981; Babington, 1986; Thomas & Bond, 1991); non reporting of the reliability and validity of measures (La Forme, 1982); absence of pre-implementation measures (Shukla & Turner, 1984); selective application of measures (Kent & Larson, 1983); and inadequate sample size (Reed, 1988). A cost effectiveness study did not take patient acuity levels into account (Marram, Flynn, Abaravich & Carey, 1976).

Thomas and Bond (1991) reviewed the primary nursing research literature that addressed outcome measures, grouping these according to patient and nursing staff outcomes, cost, and structural factors. They concluded that despite the large number of studies, there is little consensus as to whether primary nursing improves outcomes for patients and nurses. This is due in part to the lack of operational definitions and the failure to recognize that the primary nursing concept is multidimensional. For example, Daeffler (1975) found that patients reported fewer omissions in care under the primary nursing mode, but when Shukla and Turner (1984) replicated Daeffler's study controlling for the variable of nurse competence, no statistical difference was found between team and primary nursing care.

McPhail, Pikula, Roberts, Browne and Harper (1990) conducted a randomized crossover trial to compare primary and team nursing systems with respect to nurses' perceptions of their work environment, patient satisfaction with nursing care, nurse absenteeism, and the quality of patient care as perceived by physicians and allied health colleagues. No differences were found, but this may be attributable to the small sample size used in the study. Thomas (1992) found that qualified nurses and nursing auxiliaries in primary nursing wards perceived greater supervisor support, autonomy, physical comfort, and decreased work pressure than did their counterparts in team or functional nursing environments.

Staff turnover rates on primary nursing units have been variously reported as increased (Betz, 1981), unchanged (Wilson & Dawson, 1989), and decreased (Alexander, Weisman & Chase, 1981; La Forme, 1982). Decreased sick leave (La Forme, 1982), decreased absenteeism (Alexander et al, 1981), no differences (Wilson & Dawson, 1989), and increased sick leave (Chavigny & Lewis, 1984) have been reported for nurses on primary nursing units as compared to those on team nursing units.

Overall findings indicate that primary nursing is not more costly than team nursing (Chavigny & Lewis, 1984; Marram et al, 1976; Wilson & Dawson, 1989). Wolf, Lesic and Leak (1986) controlled for the acuity level and found a lower cost per patient day on a primary as compared to a team nursing unit.

No study was found that addressed inter-professional collaboration and communication as it relates to primary nursing, although this is an important aspect of the multidisciplinary health team delivery of care.

Purpose

The purposes of this study were as follows:

1. To examine the effects of changing from a total patient care nursing delivery system to a primary nursing system at CHEO by monitoring the following:
   - 1.1 The nurses' perceptions of their work involvement, peer cohesion, supervisor support, autonomy, task orientation, work pressure, clarity, control, innovation, and physical comfort;
   - 1.2 The physicians' perceptions of nurse-physician communication and collaboration;
   - 1.3 The allied health professionals' perceptions of nurse-allied health communication and collaboration;
   - 1.4 The parents' perceptions of nurse-parent communication and of care provided;
   - 1.5 The proportion of time nurses spend on direct and indirect patient care activities;
   - 1.6 The extent to which the objectives of the General Nursing Audit are met.
2. To implement changes in practice based on the results of the evaluation.

The Change Process

The NICU nurses on the task force who perceived themselves as the agents of change reviewed some of the related literature (Bennis, Benne, Chin & Core, 1976; Brooten, Hayman & Naylor, 1978; Olson, 1979; Reinkemeyer, 1970). The three phases of Lewin's change theory (Olson, 1979) were implemented: *unfreezing, moving* and *refreezing.*

During the first phase in the change process, *unfreezing,* the NICU nurses identified problems in the total patient care system and built an awareness of the need for change. In order to choose the most appropriate nursing delivery system, it was essential that a critical mass of nurses on the unit share the same beliefs and values pertaining to nursing practice. Therefore, the initial meetings centered on discussions around personal philosophies of nursing and value clarification. The nursing administration supported decentralized decision making and the nurses became more outspoken in their requests for input into decision making. Ideally the assistant head nurses would become facilitators and consultants and the staff nurses would assume responsibility and accountability for the patient care rendered. Nurses wanted to provide comprehensive care and expressed concern that the total patient care system contributed to fragmented care, parent teaching, and support. The driving forces that would support primary nursing as well as the restraining forces that would resist its implementation were examined.

During the next phase, *moving,* plans were made to implement primary nursing. This was the longest and most active phase of the process. A nurse with expertise in primary nursing was consulted. Binders containing articles on the subject were made available, and literature review discussions helped the NICU nurses understand the concepts of primary nursing and the roles and responsibilities of primary and associate nurses. Inservices and workshops were held for the staff. Considerable time was spent addressing the mechanics of the new system, such as the assignment of a primary and an associate nurse along with any potential problems. Communication is key to the success of primary nursing. Information exchange processes were reviewed in detail and revised or developed as necessary. Care plans based on nursing diagnosis were developed, card indexes were revised, nurse-directed bedside rounds and patient care conferences were instituted, discharge planning tools were updated, and a centrally located display was mounted of the primary nurse/patient assignments.

After these supporting mechanisms had been integrated into the routine functioning of the unit, primary nursing was implemented. This began a period of *refreezing,* during which time the staff became comfortable in the new system. Primary nursing was internalized and integrated into this unit's approach to nursing.

Method

Design of the Formative Evaluation

Comparison studies across units present difficulties in matching organizational factors, environmental factors, and nurse competencies. The formative evaluation employed in the current study therefore used a before, during, and after implementation design to monitor the effects of changing from a total patient care system to a primary nursing system and to identify problems resulting from the change. This type of design permits the change in nursing system to be examined without the difficulties inherent in comparing across different organizational and structural environments, unit staff, and competency levels. It also helps to identify issues that need to be addressed early in the change process.

Baseline measures were taken prior to the implementation of the primary nursing delivery system, then repeated at six and 12 months post implementation.

Participants

Thirty-one nurses completed the Work Environment Scale at all three testings (pre-, six, and 12 months post implementation). The 12 NICU physicians (neonatologists and consulting specialists) and seven allied health professionals were interviewed for the three repeated measures of the communication and collaboration scale. Thirty-six parents (12 randomly selected parents of neonates present on the NICU during each of the three data collection periods) were interviewed.

Measures

Work Environment Scale. The Work Environment Scale (WES) is comprised of 10 subscales that measure the social climate of a work environment, including: involvement (the extent to which employees are concerned about and committed to their jobs); peer cohesion (the extent to which employees are friendly with and supportive of fellow employees); supervisor support (the extent to which management is supportive of employees and encourages them to be supportive of one another); autonomy (the extent to which employees are encouraged to be self sufficient and make their own decisions); task orientation (the degree to which the pressure of work and time urgency dominate the job milieu); work pressure (the degree to which the press of work and time urgency dominate the work milieu); clarity (how explicitly employees' daily routines, rules, and policies are communicated); control (the extent to which management uses rules and pressures to keep employees under control); innovation (the degree of emphasis on variety, change, and

new approaches); and physical comfort (the extent to which the physical surroundings contribute to a pleasant work environment) (Moos, 1986).

Internal consistencies (Cronbach's alpha) for each of the 10 subscales ranged from .69 to .86. The test-retest reliabilities at a one-month period ranged from .69 to .83. The individual profile stability for 90 people who had not changed work settings was measured 12 months apart and had a mean of .61 (Moos, 1986). A template is provided for scoring this instrument. Both individual subscale scores and group averages can be converted to standard scores using the stated conversion values for the health care work setting. These scores are standardized to a mean of 50 for each subscale. This instrument has been used extensively to monitor the impact of change (Griffin, Alcock, Emmerson & Quintero, 1989; Moos, 1986, p. 18-9).

Communication and collaboration scales. Weiss and Davis (1985) define collaborative practice as a synergistic interaction between nurse and physician that enables the knowledge and skills of both to influence the patient care being provided. The key features of collaboration are: (a) the active and assertive contribution of each party; (b) the receptivity to and respect of each for the other party's contribution; and (c) a negotiating process that builds upon the contributions of both parties to form a new way of conceptualizing the problem. Collaborative practice requires open and clear communication between the parties.

Table 1

Nurse-Physician Communication and Collaboration Interview

1. Nurses are available when I wish to discuss my patients with them.
2. Nurses are knowledgeable about the health care status of their patients.
3. Nurses communicate information about patients clearly.
4. I take the nurses' comments and suggestions into consideration when making treatment decisions.
5. I discuss with the nurses the degree to which I think they should be involved in planning and implementing patient care.
6. I acknowledge to nurses those aspects of health care where they have more expertise than I do.
7. I clarify whether the nurse or I will have the responsibility for discussing different kinds of information with patients.
8. How do you rate nurse-physician communication on NICU?
9. How do you rate nurse-physician collaboration in NICU?

Table 2

Nurse-Allied Health Communication and Collaboration

1. My patients' nurses are accessible to me.
2. The nurses provide medical information which is useful.
3. The nurses recognize the need for my service.
4. I consider nurses' opinions when developing a treatment plan.
5. I discuss areas of agreement and disagreement with nurses in an effort to develop mutually agreeable health goals.
6. I work toward consensus with nurses regarding the best approach to caring for a patient.
7. How do you rate nurse-allied health professional communication?
8. How do you rate nurse-allied health professional collaboration?

Two interview tools were developed, modelled upon the Collaborative Practice Scales, which are of established validity and reliability (Weiss & Davis, 1985). These were: the nurse-physician communication and collaboration interview (Table 1), and the nurse-allied health communication and collaboration interview (Table 2). Response choices for all but the final two questions were: *always, most of the time, some of the time* or *never.* The last two questions offered a 6-point Likert scale response choice. Two physicians and two senior nurses who were not study participants examined these tools for face validity. It is a limitation of this study that the reliability and validity of the adapted tools were not established.

Proportion of time nurses spend on direct and indirect patient care activities. Work sampling is a means of measuring and analyzing work activities. It consists of random observations to determine the proportion of predefined elements of work to the total number of observations. The accuracy of the estimate depends on the total number of observations with preset precision limits and confidence levels. The total number of observations was determined using Buffa's (1980, p.632) chart to maintain precision at the 95% confidence level with a ±2.5% error level. Rounds were made at randomly chosen times in the NICU to observe the activities of the nursing staff. The observers were staff not assigned to the NICU, but who were oriented and trained by the nursing department project officer responsible for work sampling studies. Prior to beginning work sampling, sample observations were carried out simultaneously by the trainer and the observer as a routine measure. Observers could proceed with work sampling only after 100% congruence between the trainer and the observer was achieved.

Activities were recorded and coded according to the following definitions: *Direct care:* Any nursing activity performed in physical or communicative contact with the patient or parent; *Indirect care:* Any nursing activity that is performed away from the patient or parent but which is in preparation for or in completion of direct nursing care (e.g. charting, consulting with the physician or another health care professional); *Non-nursing:* Constructive work activities that are not nursing functions (e.g. delivering specimens, stocking shelves); *Non-productive:* Activities not related to nursing or other constructive work activities (e.g. personal time, meal breaks, social interactions). Comparisons were made between the work sampling results taken five months prior to, and seven months after the implementation of primary nursing. It was possible to determine the total amount of time spent on each of the nursing activities.

Nursing audit including parent satisfaction. The Medicus Quality Assurance Audit Tool, which had been in use in the CHEO NICU since early 1984, was used to evaluate the quality of care to infants, and the parents' perceptions of nurse-parent communication and the quality of care provided. The tool was developed by the Medicus Company in conjunction with Rush-Presbyterian/St. Luke's Medical Center in Chicago, Illinois.

The audit tool was used in two ways. Firstly, 12 charts were retrospectively reviewed at each of the three phases: before, during, and after implementation of primary nursing. In order to evaluate the quality of care, the tool measured the degree of compliance with four of the six established standards of care that are routinely audited: (a) the formulation of a nursing care plan; (b) the attendance to the physical needs of patients/parents; (c) the attendance to the non-physical needs (criteria include social, emotional, educational, and hospitality factors) of patients/parents; and (d) the evaluation of the nursing care objectives. A score of 85% compliance was established as the unit goal and a 10% change in the scores was considered to be clinically significant. Secondly, parents' perceptions of nurse-parent communication and the quality of care provided was determined by interviewing 12 parents, using the Medicus Parent Audit Tool during each of the three test periods.

Analysis

The Statistical Package for Social Sciences (SPSS-X) was employed for the MANOVA of the repeated measures of the WES; the paired-comparison t-test on variables demonstrating significant change over time; and the MANOVA of WES with years of nursing experience, years of neonatal nursing experience, and educational backgrounds as covariates. Descriptive statistics were employed on all other measures.

Results

Demographic Data

All nurses participating in this CHEO project were registered nurses with the following group profile: baccalaureate prepared 22%, community college diplomas 40%, hospital school graduates 38%, employed full time 76%, casual or part time nurses 24%, employed in the CHEO NICU for 5 years or more 47%, and 6 years or more experience as an NICU nurse (all hospitals) 56%.

Work Environment Scale (WES)

Significant differences occurred over time ($p<.05$) for involvement ($F=3.67$, df 2,60, $p=.031$), autonomy ($F=5.02$, df 2,60, $p=.010$), innovation ($F=6.57$, df 2,60, $p=.003$), and physical comfort ($F=3.97$, df 2,60, $p=.024$), indicating nurses' decreased satisfaction in these areas. Subsequently, paired t-tests were employed to compare each of these variables across time and results are presented in Table 3.

Table 3

Paired Comparison t-tests ($p < .05$) for the Effect of a Change to Primary Nursing on the Work Environment Scale

	Mean	Mean Diff. over Time	t	p
Involvement				
Baseline	52.32	5.19	2.05	.05
1 year	47.13			
6 months	53.26	6.13	2.59	.02
1 year	47.13			
Autonomy				
6 months	52.13	7.07	3.10	.00
1 year	45.06			
Innovation				
Baseline	45.84	5.71	2.24	.03
6 months	40.13			
Baseline	45.84	7.61	3.30	.00
1 year	38.23			
Physical Comfort				
Baseline	41.19	6.52	2.56	.02
1 year	34.67			
6 months	37.97	3.30	2.01	.05
1 year	34.67			

Repeat analysis of variance of WES subscale scores with nurses' education and experience as covariates demonstrated significant change at the .05 level over time by experience only for innovation ($F=2.93$, df 6,54, $p=.015$). The means of the scores at baseline, 6 months, and 12 months respectively, were as follows: nurses with less than 5 years experience – 52.2, 42.7, and 35.2; 6 to 10 years – 30.2, 36.8, and 33.6; 11 to 15 years – 41.6, 34.2, and 39.1; and more than 15 years of experience – 50.7, 43.5, and 43.4. No other covariates (experience as a nurse; experience in primary nursing; education) contributed to a significant change in the WES subscale scores over time.

Physician Perception of Nurse-Physician Communication and Collaboration

Baseline results indicated that physicians generally perceived good communication and collaboration with their nursing colleagues. At 6 months post implementation, results suggested an adaptation phase to the new primary nursing system, since there was a decrease in the percentage of physicians who perceived that the nurses were available to discuss, and were knowledgeable about their patients. This information was the basis for discussion with physicians and nurses. At 12 months post implementation, the physicians perceived that there was increased discussion about the degree to which the nurse should be involved in planning and implementing patient care. They also clarified more frequently whether the nurses or they were responsible for discussing different types of information with the parents. The one-year post implementation interview results demonstrated change in a positive direction and maintenance of the physicians' perceptions of good nurse-physician communication and collaboration. Ninety-two percent of the physicians stated that communication was excellent or very good and 100% rated collaboration as excellent or very good.

Allied Health Perception of Nurse-Allied Health Communication and Collaboration

Nurses were perceived by allied health professionals as providing useful medical information and as being accessible. However, allied health professionals consistently reported over the three time periods that nurses did not recognize the need for their services. Although all allied health professionals stated in the one year post implementation interview that they usually worked toward consensus with the nurses regarding the best approach to caring for a patient, there was a consistent decline in the overall rating of collaboration during the study.

Work Sampling Study

One thousand nursing activities were observed during each of the data collection periods. There was no appreciable change in the amount of time that nurses spent on direct or indirect patient care activities; there was a 2% increase in the former and a 7% decrease in the latter. These changes were minimal despite the fact that the primary nurse assumed additional responsibilities in relation to the infant's care (e.g. consultation with other health care professionals, coordination of care).

Nursing Audit including Parent Satisfaction

There was a clinically significant increase (>10% change) in the formulation of patient care plans (10.75%), in meeting non- physical needs (20.0%), and in the evaluation of care provided (10.5%). The increase in physical needs attended was 6.5%. At one year after implementation of primary nursing the percentage of compliance with the unit standard of 85% ranged from 92.6% to 99.0%. Criteria of the nursing audit indicated that the quality of care had improved. The criteria that were used to determine the non-physical needs scores were: parent orientation to unit/hospital; privacy and rights of parents honored; staff courtesy; emotional needs of family attended to; parent education; and family inclusion in the care process. These scores rose steadily over time with a 12-month post implementation compliance for this objective of 99%.

Actions Based on Feedback

A major benefit of a formative evaluation is that it provides an opportunity to identify and address the concerns of participants before the issues or concerns become insurmountable. When the 6-month post implementation data were analyzed, the principal investigator met with the various health care professionals on the unit who provided feedback. The WES scores indicated that the degree to which the nurses were committed to their work was the same and slightly on the rise. Peer cohesion was the same and the extent to which the staff was encouraged to be self sufficient and make their own decisions was increasing. However, the mean of the standard score for supervisor support was well below the standard score for health care workers provided by Moos (1986). Meetings were held with staff nurses and assistant head nurses on both shifts. The assistant head nurses were experiencing difficulty with their new roles as facilitators of change and educators, and many staff nurses were unfamiliar with referral procedures which had previously been the responsibility of the assistant head nurses. The redefinition of roles and the transfer of information was causing conflict. These issues were addressed by inservices on referral procedures, conflict resolution, and leadership, and both groups met together as well as separately with the nursing consultant. All potential sources of conflict were openly addressed. The 12-hour shifts were a

cause for concern in the areas of continuity of care and parent teaching. It was agreed that if the associate nurse had cared for the infant and family for 3 of the 4 days prior to discharge, that the primary nurse upon return from his/her days off should allow them to complete the discharge teaching. Results of periodic audits indicated that at least 75% of the infants were cared for by his/her primary nurse each day.

Prior to the implementation of primary nursing, the assistant head nurses had been conducting rounds with the physicians. Subsequently, the primary nurses communicated directly with the physicians, but they were not accustomed to detailed, direct two-way communication and appeared to have difficulty eliciting information from physicians. This was reflected in the physicians' 6-month post implementation responses to items that addressed primary nurses' knowledge about the health status of their patients and their clear communication of this information. The primary nurses expressed concern about giving and receiving information when physicians made rounds. They were accustomed to answering questions, but realized that they had to be more proactive in order to be the core coordinators of care.

The interview feedback from the allied health group was presented to nurses and allied health professionals. It facilitated discussion and contributed to a better understanding of what constituted the need for referrals to specific disciplines.

Based on the discussions surrounding the feedback to the nurses, physicians, and allied health professionals at one year post implementation, the primary nurses on the NICU were asked to indicate what advice they would give to nurses on other units who wished to implement primary nursing. The following is a sample of their responses: Clearly define the roles of supervisors prior to starting primary nursing and then continuously review the roles. Involve nurses who do not want primary nursing in the implementation meetings. The implementation committee should consist of as many staff nurses as possible. Make all plans and new protocols visible to all staff. Make everyone feel a part of the change process. Assess the abilities of inexperienced staff to cope with difficult assignments; assistant head nurses should provide assistance as required. Primary nursing works better with 8-hour rather than 12-hour rotations. Adapt the primary nursing system to your needs, do not literally go by the books. Emphasize individual nurse responsibility and provide inservices on coping with change, conflict resolution, and decision making. These suggestions were integrated into the NICU primary nursing protocols and were shared with other units interested in implementing primary nursing.

Conclusion

This study examined the effects of changing the nursing care delivery system in the NICU at the Children's Hospital of Eastern Ontario on the nurses' perceptions of their work environment; on the physicians' and allied health professionals' perceptions of communication and collaboration with nurses; on the parents' perceptions of communication and of care provided; and on the nurses' direct and indirect care activities. The major contribution of this study was to enable all participants to monitor the effects of the change process and to immediately address any areas of concern. One year after implementation, the nursing audit indicated that compliance with all the audit standards ranged from 92.6% to 99%. Parents, in particular, expressed satisfaction with the system. Physician-nurse communication and collaboration grew in a positive direction or remained excellent or very good. The relationship between nurses and allied health professionals continued to require attention, but the communication and collaboration tool permitted areas of concern to be identified and addressed. The nurses' perceptions of their work environment decreased on four of the 10 subscales of the WES. These areas continue to be addressed by the nurse manager of the unit

The NICU primary nursing task force continues to meet on a regular basis to deal with issues that arose from the evaluation process. Clarification of the role of supervisory staff is an example of an issue that required attention. In addition, ongoing concerns are addressed as they arise. Audits related to compliance with the principles of primary nursing are conducted regularly. In this change process, evaluation has been the key to the continuing success of primary nursing in the NICU at the CHEO.

References

Alexander, C.S., Weisman, C.S., & Chase, G.A. (1981). Evaluating primary nursing in hospitals: Examination of effects on nursing staff. *Medical Care, 19,* 80-89.

Babington, L. (1986). RNs' job involvement and need for achievement in primary and team nursing settings. *Nursing Administration Quarterly, 11,* 43-49.

Bennis, W.G., Benne, K.D., Chin, R., & Core, K.E. (1976). *The planning of change* (3rd ed.). New York: Hold, Rinehart & Winston.

Betz, M. (1981). Some hidden costs of primary nursing. *Nursing and Health Care, 2,* 150-154.

Brooten, D., Hayman, L., & Naylor, M. (1978). *Leadership for change: A guide for the frustrated nurse.* Philadelphia: J. B. Lippincott.

Buffa, E.W. (1980). *Modern production/operations management* (6th ed). New York: John Wiley and Sons.

Chavigny, K. & Lewis, A. (1984). Team or primary nursing care? *Nursing Outlook, 32,* 322-327.

Daeffler, R.J. (1975). Patients' perception of care under team and primary nursing. *Journal of Nursing Administration, 5,* 20-26.

Griffin, P., Alcock, D., Emmerson, L., & Quintero, T. (1989). Nurses' perceptions of their work environment: Organizational change on an adolescent unit. *Canadian Journal of Nursing Administration, 2,* 19-23.

Kent, L.A., & Larson, E. (1983). Evaluating the effectiveness of primary nursing practice. *Journal of Nursing Administration, 13*(1), 34-41.

La Forme, S. (1982). Primary nursing: Does good care cost more? *Canadian Nurse, 78,* 42-46.

Manthey, M. (1980). *The practice of primary nursing.* Boston: Blackwell Scientific Publications.

Marram, G.D., Flynn, K.T., Abaravich, W., & Carey, S. (1976). *Cost effectiveness of primary and team nursing.* Wakefield MA: Contemporary Publishing.

McPhail, A., Pikula, H., Roberts, J., Browne, G., & Harper, D. (1990). Primary nursing: A randomized crossover trial. *Western Journal of Nursing Research, 12,* 188-20.

Moos, R. H. (1986). *Work Environment Scale Manual* (2nd ed.). Palo Alto: California Consulting Psychologists Press.

Olson, E. (1979). Strategies and techniques for the nurse change agent. *Nursing Clinics of North America,* 14, 323-336.

Rafferty, D. (1991). Management of primary importance. *Senior Nurse, 11,* 4-8.

Reed, S.E. (1988). A comparison of nurse-related behaviour, philosophy of care and job satisfaction in team and primary nursing. *Journal of Advanced Nursing, 13,* 383-395.

Reinkemeyer, A. (1970). Nursing's need: Commitment to an ideology of change. *Nursing Forum, 9*(4), 341-355.

Shukla, R.K., & Turner, W.E. (1984). Patients' perception of care under primary and team nursing. *Research in Nursing and Health, 7,* 93-99.

Thomas, L.H. (1992). Qualified nurse and nursing auxiliary perceptions of their work environment in primary, team and functional nursing wards. *Journal of Advanced Nursing, 17,* 373-382.

Thomas, L., & Bond, S. (1991). Outcomes of nursing care: the case of primary nursing. *International Journal of Nursing Studies,* 28(4), 291-314.

Weiss, S.J., & Davis, H.P. (1985). Validity and reliability of the collaborative practice scales. *Nursing Research, 34,* 299-305.

Wilson, N.M., & Dawson, P. (1989). A comparison of primary nursing and team nursing in a geriatric long term care setting. *International Journal of Nursing Studies, 26,* 1-13.

Wolf, G.A., Lesic, L.K., & Leak, A.G. (1986). Primary nursing. The impact on nursing costs within DRGs. *Journal of Nursing Administration, 16,* 9-11.

Zander, K. (1985). Second generation primary nursing. *The Journal of Nursing Administration, 3,* 18-24.