A CASE STUDY OF
A NURSING ASSIGNMENT PATTERN

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At the threshold of the year 2000, the nursing environment is characterized by at least four important social forces - cost containment, nursing shortage, nurses’ dissatisfaction with the profession and pressures to maintain and improve quality of care. A number of these social forces are directly linked to nursing assignment patterns practised at the unit level. The problems of absenteeism, turnover, staff dissatisfaction, quality of care and cost have been attributed to a given nursing assignment pattern (Giovannetti, 1986; Macdonald, 1988). The term "nursing assignment pattern" is used to describe roles, tasks and the policy structure that effect the allocation of nursing personnel to patients for the provision of care on a nursing unit.

Previous work on nursing assignment patterns was influenced by administrative theories; the underlying philosophy was grounded in beliefs in objectivity, control, productivity and measurement of facts. Empirical research on nursing assignment patterns is commonly geared towards a perspective of cost containment, outcomes and predictability. On the other hand, there is also a holistic perspective and values are given to subjectivity, accountability and continuity of care, as well as to optimal human functioning through behavioural processes (Dunham, 1989; Jennings, 1987; Miller, 1987; Nyberg, 1989). These philosophical underpinnings led us to analyze events of a nursing assignment pattern within their real-life context. Therefore, this is a report of a case study describing the inherent elements in a currently practised assignment pattern in a nursing unit.

Review of Literature

There are several different kinds of nursing assignment patterns: team, primary and modular. Team nursing is based on the notion that a team of nursing personnel - nursing assistants and nurses aides, under the supervision of nurses - deliver nursing care to a group of patients. Team nursing is theoreti-

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cally designed to maximize use of skill levels and provide cost-effective nursing care (Brill, 1976). Primary nursing promotes the concept of individualized care. It is based on the proposition that a primary nurse is responsible for her primary patients on a 24-hour basis, seven days a week, from admission to discharge (Manthey, 1980). Modular nursing - a hybrid of team and primary nursing - is based on the concept of individualized care, provided by a small number of nursing personnel to a small group of patients, in a geographical area called a module (Magargal, 1987).

There is an abundant research-based literature dealing with the evaluation of these nursing assignment patterns. These evaluations reveal the influence of assignment patterns on cost, quality of care and patient and staff satisfaction. Recent reviews of this literature show that there exists an extreme diversity in findings (Giovannetti, 1986; Macdonald, 1988; Sandhu, Kérouac, Duquette & Truchon, 1991). The most frequent approaches to this research-based literature are experimental and quasi-experimental in nature. To evaluate nursing assignment patterns in these ways presents certain difficulties. The research milieu, a nursing unit, encompasses many intervening and extraneous variables that are difficult to control and that influence the study results. It is rarely possible to ensure a random selection of units under study. The overall problems associated with operationalization of variables, instrumentation and data collection methods and procedures further obstruct meaningful results. In certain studies, the "Hawthorne" effect is suspected because the data were collected soon after the implementation of the independent variable (Berry & Metcalf, 1986; Metcalf, 1986).

To reflect a more comprehensive view of a nursing assignment pattern, it appeared appropriate to use a case study as a research strategy. Case studies are pertinent when researchers have little or no control over the events and when the focus is on a contemporary phenomenon within some real-life context. Such a study allows a better understanding of the whole situation and can be used to develop conceptual explanations among the variables being studied. Providing insights for formulating explanations of complex processes can contribute to evidence for or against theories (Burns & Grove, 1987; Wilson, 1985; Yin, 1988).

Munson and Clinton's (1979) conceptual framework, specifically developed for defining nursing assignment patterns was used to ground the study. Inherent in this framework is the notion that a particular set of variables (types of patients, available nursing resources and types of organizational support) will influence the type of nursing assignment pattern at the unit level. In return, the structural variables inherent in the assignment pattern will give rise to specific approaches to nursing, especially in terms of quality attributes: comprehensiveness, continuity, coordination and accountability of care. These in turn, will profoundly affect the caliber of outcome variables - staff satisfaction, patient care, quality and cost of care.
Research Questions

In this study, we describe the principal variables inherent in the currently practised nursing assignment pattern in a 38-bed medical-surgical nursing unit, in an acute care general hospital in Montreal. For this purpose three questions have been formulated.

1. What are the patient, personnel and organizational characteristics of the unit under study?
2. What are the structural variables inherent in the nursing assignment pattern: patient allocation, staff-mix, accountability, continuity and coordination of care?
3. What are the outcomes of this nursing assignment pattern in terms of personnel absenteeism and turnover rates?

Method

A descriptive case study design was used to allow an in-depth assessment and description of three groups of variables inherent in the nursing assignment pattern that was used to provide nursing care in a given unit. The study considers a large number of variables related to a single subject such as a nursing unit; as such, this research strategy appeared appropriate.

Twenty-nine variables, illustrated in Figure 1, were studied. According to the conceptual framework, they were classified in three groups: influencing, structural and outcome variables.

Influencing variables

The elements capable of acting upon the choice of an assignment patterns are:

Patient characteristics. Age, sex, patient’s condition, basic care requirements and therapeutic requirements were obtained through "La formule modifiée Rush-Medicus pour la classification des bénéficiaires" (Grenier, Drapeau & Desautels, 1989). Inter-observer reliability values over .85 were provided by the authors (Grenier et al., 1989).

Personnel characteristics. Age, sex, job title, education, experience, employment status and shift worked were collected through "Renseignements socio-démographiques" developed and pre-tested by the authors. Personnel comprises three groups of personnel: nurses, nursing assistants and nurses aides.

Organizational characteristics. Involvement, peer cohesion, supervisor support, autonomy, task orientation, work pressure, clarity, control, innovation
Study Framework

Figure 1

- AGE
- SEX
- PATIENT'S CONDITION
- BASIC CARE REQUIREMENTS
- THERAPEUTIC REQUIREMENTS

PATIENT CHARACTERISTICS

- AGE
- SEX
- EMPLOYMENT TITLE
- EDUCATION
- EXPERIENCE
- EMPLOYMENT STATUS
- SHIFT

PERSONNEL CHARACTERISTICS

- INVOLVEMENT
- PEER COHESION
- SUPERVISOR SUPPORT
- AUTONOMY
- TASK ORIENTATION
- WORK PRESSURE
- CLARITY
- CONTROL
- INNOVATION
- PHYSICAL COMFORT

ORGANIZATIONAL SUPPORT

- PATIENT ALLOCATION
- STAFF-MIX
- ACCOUNTABILITY
- CONTINUITY
- COORDINATION

NURSING ASSIGNMENT PATTERN

- ABSENTEEISM
- TURNOVER

ADAPTED FROM:
MUNSON, P. & CLINTON, J. (1979) DEFINING NURSING ASSIGNMENT PATTERNS,
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and physical comfort were measured by a French version of the Work Environment Scale (Moos, 1986) entitled "Echelle de l'environnement de travail" (Michaud, 1991).

This scale contains 90 items; each of the above variable contains nine items expressed as a score. Internal consistency and reliability tests yielded the following: Cronbach's Alpha .69 to .86; test-retest .69 to .83 (Moos, 1986). The French version has been adapted to the nursing unit context, pre-tested and the Cronbach's Alpha showed lower but comparable values for most of the subscales (Michaud, 1991).

**Structural variables**

Regarded as essential elements in the description and the naming of a nursing assignment pattern (Munson, Beckman, Clinton, Kever & Simms, 1980), this group of variables includes:

**Patient allocation.** Duration for which the same patients are assigned to the same personnel - nurses, nursing assistants, nurses aides - either by shift or hospital stay.

**Staff-mix.** Composition of budgeted positions of unit's personnel: nurses, nursing assistants, nurses aides.

**Accountability.** Responsibility for total nursing care needs, as assumed by an identifiable nurse, either for eight or 24 hours.

**Coordination.** Identification of the person responsible for synchronizing various activities, and establishing the channels of communication with other health professionals and patient's family, during a specific shift.

**Continuity.** Mean number of personnel providing patient-centered and uninterrupted care as derived from 18 nursing activities during a specific shift.

Through a systematic review of pertinent literature, ten indicators and 11 sub-indicators relative to the above five variables were identified. Indicators were statements that guided the data collection, while sub-indicators were derived as principal questions of a tool entitled "Mode d'organisation des soins infirmiers". This is a semi-structured interview questionnaire that includes 11 open-ended questions and one 18-item observation grid. The latter estimates the continuity of care through a numerical value, while the open-ended questions capture narrative answers on accountability, patient allocation, staff-mix and coordination.
The tool "Mode d’organisation des soins infirmiers" was partly developed and partly adapted from Munson et al. (1980) and translated into French. It was submitted to two judges for content validity and pre-tested at the unit level.

**Outcome variables**

Absenteeism and turnover were chosen as measures of behavioural attributes of staff and have been considered as outcome variables.

**Absenteeism.** This is any unauthorized time taken off over a given period of time (Gillies, 1989; Steers & Stone, 1982). A total rate was calculated: based on short-term (1 or 2 days off) and long-term (3 or more days off) periods. A tool entitled "Mesure de l’absentéisme" was designed for the purpose of this study, and was pre-tested.

**Turnover.** Total turnover rate was calculated for internal (number of persons who left the unit) and external (those who left the organization) terminations of part-time and full-time personnel, over a given period of time (Gillies, 1989). A tool entitled "Mesure du roulement" was adapted from Munson et al. (1980), translated into French, and was pre-tested.

**Study milieu**

This research was conducted in a nursing unit of an acute care general hospital with over 800-beds, affiliated with Université de Montréal, in the metropolitan area. A 38-bed unit receives male and female, medical-surgical patients. Thoracic and vascular surgery and internal medicine are its specialties. The mean length of patients’ stay varies from nine to 17 days respectively for surgery and medicine.

**Procedure**

**Data collection**

Thirty patients were randomly selected on the unit under study. Data on patient characteristics were collected from their charts, over a period of two weeks. All nursing personnel of the unit (n=32) were invited to participate, at the time, two positions were vacant. Most members completed and returned two self-administered questionnaires: "Renseignements sociodémographiques" et "Echelle de l’environnement de travail" (n=31/32; 96%). Anonymity of patients and staff was assured. Data on structural variables were obtained during the day shift, on five consecutive days, through semi-structured interviews with the head nurse, the staff, as well as through observation. Data for absenteeism and turnover were collected retroactively, from the unit records, for a period of 12 months.
Data analysis

Influencing variables (patient, personnel and organizational characteristics) were organized by categorizing and tabulating calculations, means and percentages. Structural variables, such as patient allocation, staff-mix, accountability and coordination, were described; these permitted the naming of the nursing assignment pattern at the unit level. A mean number of personnel was calculated for continuity of care. For outcome variables, rates of absenteeism and turnover were calculated.

Results

Influencing variables

The results are presented under the headings of patient, personnel and organizational characteristics.

Patient characteristics. In the unit under study, males accounted for 76.7% (23/30) of the patients. The majority (76.7%; 23/30) of patients were over 60 years of age, while a substantial minority 26.7% (8/30) were over 70 years of age. At admission, patients were independent or rated very low on the patient’s condition dimension. A majority, 66.6% (20/30), rated zero on items related to unconsciousness, incontinence and immobility. Following surgery, patients’ levels of independence decreased. Requirement for care increased accordingly. For basic requirements, such as bathing, feeding, mobility, comfort, the majority (66.6%; 20/30) needed moderate amount of nursing care. For therapeutic dimensions, two-thirds (66.6%; 20/30) required such heavy nursing care as intravenous therapy and surveillance, patient or family specific teaching, constant observation and emotional support.

Personnel characteristics. The majority of personnel (80.6%; 25/31) were female, and half (50%; 15/30) were over the age of 30 years. Over three quarters (77.4%; 24/31) were registered nurses: a minority of nurses (12.5%; 3/24) held bachelor’s degrees; one-quarter (25.0%; 6/24) were involved in further education at the bachelor’s, master’s or certificate levels. A majority of the personnel (71.0%; 22/31) had five or more years of experience in nursing; 51.6% (16/31) had worked in the hospital over four years, 48.4% (15/31) had worked on the present unit more than two years, 51.6% (16/31) had been on the unit less than two years. A majority (61.3%; 19/31) worked on a full-time basis at the time of their interview. A little over half (51.6%; 16/31) were on the day shift; 29.0% (9/31) were on evening shift; and 19.4% (6/31) were on night shift, without rotation.

Organizational characteristics. The strengths of the organization focussed on work relationships and the structure of work. Work relationships were
characterized by involvement (Mean (x)=7.4, standard deviation (SD)=1.3); peer cohesion (x=7.3, SD=1.3); and supervisor support (x=6.6, SD=1.5). Work structure clarity was demonstrated by task orientation (x=7.2, SD=1.3); work pressure (x=6.1, SD=1.3) and clarity of expectations (x=7.3, SD=1.5). Weaknesses inherent in the organization included such limitations as physical comfort (x=4.5, SD=1.9); innovation (x=5.2, SD=2.0); control (x=5.6, SD=1.9); and autonomy (x=5.8, SD=1.4) which registered lower means.

Analysis of influencing variables resulted in the following findings. Patients on admission were mostly independent. Following surgical interventions they required complex nursing care. Nursing personnel, being an experienced group, were able to provide the care required. Personnel perceptions of their work environment showed that work relationships were characterized by involvement, peer cohesion and supervisor support. Task orientation, clarity of expectations and moderate work pressure demonstrated that the knowledge of tasks, rules and policies was clear. On the other hand, the personnel viewed the physical surroundings as being deprived of quality, while autonomy and innovation might be weakened by some rules and pressures that they felt were designed to keep personnel under control.

**Structural variables**

These results are presented under the headings of patient allocation, staff-mix, accountability, continuity and coordination.

**Patient allocation.** The unit was divided into four sections, according to the severity of patients’ condition and the number of nursing personnel. The nursing personnel were allocated to specific sections for a period of two weeks on the day shift, and one week on evenings and nights. For example, on the day shift, the basic nursing team consisted of seven nursing members. Of those, one registered nurse was responsible for six patients grouped in section one. The care in other sections was given by either two registered nurses or a registered nurse and a nursing assistant. Within the sections, the patients were allocated to individual nurses or to a nurse with a nursing assistant, depending upon patients’ basic and therapeutic requirements, according to their conditions. In this context, the likelihood of nurses having the same patients for several days was favoured (patients’ average stay: 9-17 days). The nurses aides were given specific tasks such as bathing, feeding and making beds.

**Staff-mix.** The nursing unit had 34 budgeted positions: 25 registered nurses, including the head nurse; three nursing assistants; and six aides. A majority of these budgeted nurses’ positions were full-time (60%; 15/25), while 40% (10/25) were part-time. Three nursing assistants’ posts were all part-time and
in the process of being modified and replaced with registered nurses. Nurses aides occupied three full-time and three part-time positions.

**Accountability.** Registered nurses were accountable for eight hours of patient care. They formulated and updated the nursing care plans, observed any changes in the patient’s condition and communicated the changes to the appropriate persons: doctors or family members. Nurses initiated proper treatments, coordinated patient-centered activities in collaboration with the assistant head nurse and communicated with the next shift by means of verbal and written records. The head nurse assumed the administrative responsibility for the unit on 24-hour basis. In her absence, the nursing supervisors on the evening and night shifts and the assistant head nurses assumed most of the administrative responsibility.

**Coordination.** The coordination of patient-centered activities such as diagnostic tests and physiotherapy was achieved by means of collaboration between the patient’s nurse and the assistant head nurse. In the absence of the patient’s nurse, whoever was around assumed responsibility for these tasks. Most of the time communication with the patient’s doctor, other health professionals and the patient’s family was established by the nurse. The nurse was also the person who communicated to the patient any pertinent information related to the care activities.

**Continuity.** From observations collected on 18 nursing activities, over a period of five consecutive days on the day shift, a mean of two nursing personnel delivered care for the same patient. The patient’s nurse was primarily responsible for giving assistance with the psychological adjustment required by the patient and family. This nurse was helped by a colleague or an assistant with treatments, health teaching and preparation for discharge. Other activities, such as, vital signs, assistance with hygiene and recordings of intake and output involved at least three persons. Moreover, securing the needed patient information, making nursing diagnoses, stating goals for care, revising and evaluating nursing care plans were generally implemented through a collaboration between nurses and their assistants.

The description of structural variables demonstrates that the current assignment pattern used at the unit under study is similar to modular nursing. Modular nursing, also known as district nursing - an adaptation of team and primary nursing - is oriented towards individualized care, provided by a small number of nursing personnel (nurses, nursing assistants and nurses aides) to a small group of patients in a geographical area called a module (Magargal, 1987). Registered nurses had an eight-hour accountability for patient care. The coordination of care was mainly maintained by the bedside nurse and continuity of care was favoured most of the time.
Outcome variables

Absenteeism. The short-term absenteeism was 3.7% and the long-term absenteeism was 3.7% annually. Therefore, the total short- and long-term absenteeism rates was 7.4%. This surpasses the recommended norm of 4% annually (Oberman & Rainer, 1983).

Turnover. The nursing personnel had an internal turnover of 20.0%, an external turnover of 8.5% and a total turnover rate (resignations and transfers from the unit) of 28.6% annually. Although, this total rate is lower than others studied in the Montreal area (Collinge, 1988), it surpasses the recommended optimum turnover rate of five to ten per cent annually (Gauerke, 1977).

Discussion

In this study we attempted to describe the work situation of nursing personnel who practise on a medical-surgical unit, in a large metropolitan city. Studying people and their environment is consistent with a nursing philosophical perspective in which numerous characteristics are related and, to a certain extent, inseparable. However, there are limitations to this study. The major disadvantage of a case study approach lies in the constraints to generalizability. Other limitations are the small sample size and the measurements used. Data collection on patients is constrained by the short time frame (three weeks). The instruments for structural variables have not had a broad application to date; they should be further refined and tested.

The Munson and Clinton (1979) conceptual framework was specifically designed to highlight the essential elements of assignment patterns. It was a foundation for this study and our findings underline the importance of the influencing factors. For instance, the complexity of patient characteristics, especially the therapeutic requirements, required that specialized treatments be confined to a few, highly trained caregivers. To deal with this reality, the staff-mix was modified by increasing the proportion of registered nurses to ancillary caregivers. Rutkowskia (1987) points out that the severity of illness is translated into nursing workload; this defined the staffing requirements for the unit.

Nursing assignment patterns are not only influenced by institutions’s philosophical aspects, but also, by the contextual constraints imposed by other factors, such as acuity of patients and available resources. Most of the patients were elderly, short-term in-patients, rating high on the patient classification scale (La formule modifiée Rush-Medicus pour la classification des bénéficiaires). These patients required intensive, continuous and complex nursing care - not only for therapeutic requirements, but also for emo-
tional support and guidance for patients and their families. It was evident in these circumstances that employing nursing assistants to provide care might result in the fragmentation of care; this ultimately would jeopardize the delivery of care.

This research showed how nursing managers have reacted to some of the problems at hand. For instance, to cope with acuity levels of patients, using available resources, unit managers modified the existing team nursing assignment pattern to modular nursing. Modular nursing was chosen for many reasons, including maximizing the potential of ancillary caregivers, allowing nurses more autonomy and getting nurses accustomed to accountability and responsibility. Other advantages are that nurses are encouraged to use the nursing process while maintaining continuity and coordination of care and that, when patients are admitted and assigned to sections, this method of assignment may help equalize workloads. Disadvantages are that, during busy periods, help may not be readily available, and that it weakens the team spirit, thus reducing the willingness to lend a hand to others. In the unit under study, "peer cohesion" was an influence that helped overcome these negative features. In addition, the "support" of the head nurse and "role clarity" are also strengths on which managers might capitalize to promote more accountability and responsibility.

With respect to the outcome variables, both measures (absenteeism and turnover rates) were higher than the optimal rates reported in the literature. Data for absenteeism and turnover were partly collected during the contract negotiation period for nurses. To maintain the unit optimally functional, Oberman and Rainer (1983) recommend that institutions maintain absenteeism rate of around 4%; Gauerke (1977) suggests that organizations should aim for 5-10% annual turnover rate (terminations) to reduce personnel turnover to manageable levels. In the context of this unit, perhaps it is important to mention that the absenteeism rate was highest among the nursing assistants and that the turnover rate was highest among the nurses aides.

This framework allows for continuous relationships between variables, as well as linear. In a continuous framework the influencing variables have an impact on the structural variables; these, in turn, influence the outcome variables. For instance, a high rate of absenteeism and turnover may influence certain aspects of nursing care delivery, such as the continuity of care. Increasing turnover of registered nurses increases the likelihood that the assistant head nurse would assume responsibility for the coordination of care as well as the likelihood that institutions will implement more rules and procedures: Decision-making power becomes increasingly centralized.

It is important to know how nurses deliver patient care with respect to each assignment pattern. Such knowledge should improve our understanding of
the methods of allocating work and of the related autonomy and well-being of nurses. Further studies would make possible "cross-case" analyses which would provide greater insights to these complex processes.

We believe that nursing assignment patterns, to be useful, must meet three essential criteria. First, they should be based on patient-oriented care: such aspects as comprehensiveness, continuity, coordination and accountability of care must form the core of all assignment patterns. Only then will high-quality care be a reality. Secondly, they should possess properties that are nurse-oriented: these should focus on the autonomy, empowerment and psychological well-being of nurses. Thirdly, a nursing assignment pattern should be cost-oriented: nurses should be paid for nursing and not for clerical, housekeeping or administrative tasks.

This case study describes the influencing and structural variables inherent in the currently used nursing assignment pattern for a 38-bed medical-surgical unit, and measured some of its outcomes. We observed that the assignment pattern, although somewhat in transition from team nursing to total care nursing, currently is modular nursing. In spite of some constraints, particularly in the context that the study was done in, our results should be seen as a first phase of understanding of a complex and multidimensional research theme - the nursing assignment patterns.
REFERENCES


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Étude de cas d'un mode de prestation des soins infirmiers

Influencés par des forces d'ordre social, économique et professionnel, plusieurs modes de prestation des soins sont apparus au cours des dernières années. Comment ces modes de prestation sont-ils appliqués dans le contexte québécois francophone? Cette étude descriptive vise une exploration intensive des variables liées à l'application d'un mode de prestation des soins infirmiers dans une unité d'un centre hospitalier de la région de Montréal. Appuyées par un cadre de référence (Munson & Clinton, 1979), 29 variables, regroupées selon trois ensembles, ont été étudiées. Les instruments de recherche ont été choisis, traduits, adaptés ou élaborés à partir des écrits consultés. L'analyse des données montre que le mode d'organisation identifié s'apparente au système modulaire. Les caractéristiques des bénéficiaires, celles du personnel et de l'organisation exercent une influence marquée sur la prestation des soins infirmiers, en particulier la composition de l'équipe de soins, l'affectation du personnel, la coordination, la continuité et l'imputabilité des soins eux-mêmes. Enfin, des indices d'absentéisme et de roulement du personnel furent aussi captés. Cette étude mène à une meilleure compréhension des multiples forces qui agissent sur le mode de prestation des soins infirmiers.