



ADOPTING A COMMON NURSING PRACTICE MODEL ACROSS A RECENTLY MERGED MULTI-SITE HOSPITAL

DR. MICHAEL S. KERR

DR. GINETTE LEMIRE RODGER
DR. HEATHER LASCHINGER
DR. GAIL HEPBURN
MS. MARTINE MAYRAND LECLERC
MS. JULIE GILBERT
MS. GALE MURRAY
DR. LINDA-LEE O'BRIEN-PALLAS

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CHSRF

1565 Carling Avenue, Suite 700
Ottawa, Ontario
K1Z 8R1

E-mail: info@chsrf.ca
Telephone: 613-728-2238
Fax: 613-728-3527

PRINCIPAL INVESTIGATOR
DR. MICHAEL S. KERR

PHONE: 519-661-2111

EXT 85680

FAX: 519-661-3928

E-MAIL: MKERR@UWO.CA

MAILING ADDRESS

SCHOOL OF NURSING, UNIV. OF WESTERN ONTARIO,
ROOM H28, HEALTH SCIENCES ADDITION,
LONDON, ON, N6A 5C1

OTHER TEAM MEMBERS

NAME	ROLE	AFFILIATION
DR. GINETTE LEMIRE RODGER	CO-INVEST. /DECISION MAKER	THE OTTAWA HOSPITAL
DR. HEATHER LASCHINGER	CO-INVESTIGATOR	UNIV. OF WESTERN ONTARIO
DR. GAIL HEPBURN	CO-INVESTIGATOR	INSTITUTE FOR WORK & HEALTH
MS. MARTINE MAYRAND LECLERC	CO-INVESTIGATOR	THE OTTAWA HOSPITAL
MS. JULIE GILBERT	CO-INVESTIGATOR	THE CHANGE FOUNDATION
MS. GALE MURRAY	DECISION MAKER	THE CHANGE FOUNDATION
DR. LINDA-LEE O'BRIEN-PALLAS	CO-INVESTIGATOR	UNIVERSITY OF TORONTO

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KEY IMPLICATIONS FOR DECISION-MAKERS

- ▶ A new model of nursing care practice that emphasizes continuity of care for patients as well as the provision of clinical experts for nursing staff was developed by a multidisciplinary staff team at The Ottawa Hospital. The introduction of the model was extensively evaluated at the three largest campuses over a three-year period using a mixture of approaches and methods, including quality of care surveys from 1,672 patients as well as ratings of work and health indicators from 731 nurses.
- ▶ It is important to monitor the process of implementation as well as the main evaluation outcomes and to ensure that staff members have a strong buy-in for the changes being introduced in order to encourage active and ongoing participation throughout the process. Work reorganizations on this scale can take several years to complete and require extensive effort to maintain momentum and involvement.
- ▶ Patient ratings (from multi-item surveys) of nursing quality of care are consistently very high and thus are not very sensitive to detecting changes created by the introduction of a new model of nursing care. Patients from all three hospital sites consistently rated the overall quality of their nursing care as excellent or very good about 90% of the time. There were no significant changes noted over time in either the combined patient rating summary scales or the scores for the scale's individual questions designed to address several specific components of nursing care.
- ▶ Nursing staff survey data indicate that the intervention had a number of positive outcomes on the quality of nurse work life, well-being and their perceptions of the organizational climate although the improvements seen one year after the introduction of the new model were often tempered over time, suggesting the need for ongoing monitoring and adjustments of quality of work-life indicators.
- ▶ Major organizational change, such as introducing a new model of clinical nursing practice, can be done without negatively affecting work stress or nurse well-being. Markers of nurse health and well-being were not strongly affected by the introduction of the new model. Nurse burnout and family-work conflict were slightly improved one year after the new model was introduced while nurse ratings of their overall physical health showed a slight drop over time. No differences were seen over time for nurse ratings of their pain (back and neck/shoulder) or mental health.
- ▶ Nurse practice environment and organizational climate indicators were positively influenced by the introduction of the new model, as nurse-physician relations, nurse control over practice, nurse autonomy, nurse empowerment as well as organizational support, the patient safety climate and organizational justice were all rated by nurses as being better one year after the model had been introduced.
- ▶ Although the introduction of the new model appears to have had some benefit for nurses, this did not directly translate into improved patient care when assessed via the patients themselves or from nurse ratings. Thus, more work needs to be done to identify potential markers sensitive to the type of changes such interventions invoke.

EXECUTIVE SUMMARY

Background

Many health care organizations have recently undergone extensive reorganization and administrative change. Combined with the additional stresses of ongoing budget restraints, increasing patient acuity and shortages in nursing staff, it is likely that these organizations will continue to experience even more change in the future. With nursing care serving as the cornerstone of most patients' hospital experience, this study examined the multi-faceted impact of introducing a new model of nursing care on several key outcomes related to patients, nurses and health care organizations.

The study was a multi-faceted evaluation of the impact of introducing a new standardized model of nursing clinical practice at three sites of a previously merged tertiary care hospital. Each former hospital site within the merged structure had previously been using either one predominant nursing model of care throughout the hospital or a mixture of models within different sub-components of the hospital, creating a situation whereby a multitude of approaches to nursing care existed across the newly merged hospital. A local committee, the Model of Nursing Care Work Group, composed of multidisciplinary staff from The Ottawa Hospital, developed a new clinical practice model using resources and personnel from within their own organization, thereby ensuring a high degree of applicability and appropriateness across the sites. The new model has a strong emphasis on “direct” nursing care and uses a set of guiding principles to emphasize continuity of care for patients as well as the provision of clinical experts for nursing staff. Our project provided The Ottawa Hospital with the independent resources and expertise required to complete such an evaluation, in order to contribute important knowledge to the evidence base on the effects of changes to patient care delivery within the health care system.

Previous research suggested that changes in the nurse practice environment resulting from hospital restructuring could have a negative effect on nurse well-being. However, much of the research in this area did not follow people over time and therefore suffered from the inability to draw firm, evidence-based conclusions regarding the impact of change. Indeed, there is a shortage of intervention research in this area, thus well-designed longitudinal studies are required to properly inform policy initiatives on the issue. We therefore took advantage of a unique “natural experiment” to conduct a three-year evaluation of the adoption of this new common practice model, with special emphasis being paid to its potential impact on nurse well-being, organizational climate and the quality of patient care.

Methods

After obtaining full ethics approval, we conducted three surveys over the study time period: one at baseline before implementation of the new model of care; the others 12 and 24 months later. A total of 730 nurses participated in these surveys (although only 224 completed surveys at all three time points). Staff nurses were asked questions about key nurse outcomes measures of work stress (including effort-reward imbalance, physical and mental health, burnout and work-family balance) as well as factors based more at the organization level, such as safety climate and aspects of the nurse work environment. We also had surveys completed by a total of 1,672 patients over the course of the study relating to their quality of care.

Independent of the study research team, the new nursing model was rolled out to the hospital in a “unit-by-unit” approach. A full-time, on-site research coordinator worked closely with the model facilitators responsible for rolling out the new model. Prior to roll-out the research coordinator would work with the unit staff to determine the best approach to delivering and collecting staff and patient surveys. The baseline survey was delivered just before the model was implemented on the unit. Where possible, participating staff nurses were sent new surveys one year and two years after the initial (baseline) survey was completed. New patients from the unit were surveyed at each of the three time points. In addition to the surveys, the evaluation also included a set of qualitative focus groups to help provide more detailed information about the change process that the nursing and other professional staff at each hospital site experienced. The focus groups were conducted before implementation of the new practice model in order to provide the study with a better context for viewing the results of the change process and to expand upon the questions in the nursing staff questionnaires.

Based on the study’s underlying conceptual model, the nurse survey included questions on several key areas related to nurse health and well-being as well as factors related to organizational change. In order to determine the impact of the new model over time, a change analysis was conducted that focused on determining the extent of change in each of the study’s main outcomes within study participants over the three time points.

Results

Questions on the nurse survey related to their views about the new model of care or the process of introducing it generally indicated that nurses were relatively happy with their existing mode of care and were fairly knowledgeable about the new model and satisfied with their involvement in its development. However, when asked directly about the impact of the new model on job satisfaction and quality of patient care, nurses tended to report that things had not improved much. The results for these questions about the model and its implementation process seem to contrast somewhat with those observed for the nurse work and well-being and organizational outcomes.

The results of the change analyses are summarized below in Table 1. While not shown in the table, patients from all three time points consistently rated the overall quality of their nursing care as excellent or very good about 90% of the time. ($N_1=910$, $N_2=477$, $N_3=285$). These high ratings created a “ceiling effect” that could have made them insensitive to the changes created by the introduction of a new model of nursing care. With little room left to mark improvements it is not surprising that statistically significant changes were not observed over time, either for the combined patient rating summary scores themselves or any of the score’s individual questions, including the new items that were specifically added to address aspects of nursing care believed to be influenced by the introduction of the new model.

Table 1: Summary of Main Change Analysis Results

Factor	Change from Baseline to Yr 1	Change from Baseline to Yr 2
Patient-rated quality of care	NC	NC
Nurse outcomes		
burnout	+	NC
work stress (ERI)	+	NC
physical health	-	-
mental health	NC	NC
back/neck pain	NC	NC
work-family conflict	+	+
empowerment	+	NC
Organizational outcomes		
nurse-MD relations	+	NC
nurse autonomy	+	NC
nurse control over practice	+	NC
organizational support	+	NC
safety climate	+	+
organizational justice	+	+

NOTE: ' NC ' = no significant change; ' + ' = improvement (p<0.05); ' - ' = worse (p<0.05)

Analysis of the changes in nursing staff survey data indicates that the introduction of the new model had positive effects on the quality of nurse work life, well-being and their perceptions of the organizational climate. However, in general, the improvements that were seen one year after the introduction of the new model were typically not sustained over time. While some statistically significant changes were seen, several markers of nurse health and well-being were not strongly affected by the introduction of the new model. Nurse burnout and family-work conflict were improved one year after the new model was introduced, while nurse ratings of their overall physical health showed a slight decline over time. No differences were seen over time for nurse ratings of their pain (back and neck/shoulder) or for their mental health. Nurse practice environment and organizational climate indicators were generally more positively influenced by the introduction of the new model, and nurse-physician relations, control over practice, autonomy, empowerment, as well as organizational support, the patient safety climate and organizational justice were all rated by nurses as being better one year after the model had been introduced.

Conclusions

Although the introduction of the new model appears to have had some benefit for the work and well-being of nurses, these possible improvements were not sustained over time nor did they appear to directly translate into improved patient care, at least when assessed by the patients themselves. It is possible however, that the high drop-out of staff nurses over time could have made it more difficult to establish the permanency of these effects as statistical precision is reduced when the number of subjects decreases. The high ceiling effect for the quality of patient care ratings at baseline left very little room for change to the these perceptions. Thus, more objective measures of quality of care may be needed that are more sensitive to the type of changes administrative interventions invoke.

BACKGROUND

Change at The Ottawa Hospital

Many health care organizations have recently undergone extensive reorganization and administrative change. Combined with the additional stresses of ongoing budget restraints, increasing patient acuity and shortages in nursing staff, it is likely that these organizations will continue to experience even more change in the future. With nursing care serving as the cornerstone of most patients' hospital experience, this study examined the multi-faceted impact of introducing a new model of nursing care on several key outcomes related to patients, nurses and health care organizations.

The complexity of practice environments has increased greatly due to changing patterns of health care, changing demographic trends, the exponential growth of health care knowledge and increased service demands. Nurses who are central to the delivery of patient care and to the ability of the system to respond to these increased demands have been affected by this changing reality. The Canadian Nurses Advisory Committee (2002) conducted an extensive review of the nursing situation in Canada and made unanimous recommendations including the need to promote autonomy and involvement of nurses in meaningful decision making from the point of service.

To meet these increasing health care demands, the basic educational preparation of nurses has been transformed to a baccalaureate degree as the new entry to practice in many provinces. The emphasis on evidence-based practice continues to grow, with the ongoing development and release of new knowledge in the form of best practice guidelines, standards of practice, quality and safety protocols, technologies and research reports. Despite this onslaught of information, very little attention has been paid to the basic nursing delivery model which is central to the ability of nurses and the health care team to provide care to the public.

At The Ottawa Hospital (TOH) it became evident that there was a need to review and redesign the professional practice environment for nurses in order to meet this new nursing reality. The characteristics of the organization of work of the 21st century (Toffler 1980; Toffler and Toffler 1995; Mintzberg 1997) served as the basis for the redesign which included the development of a new model of nursing care delivery, the *TOH Model of Nursing Clinical Practice* (MONCP®, The Ottawa Hospital, 2002). TOH is the result of the merger of six different institutions including the Civic Hospital, General Hospital, Riverside Hospital, the Rehabilitation Centre, The Cancer Center and the University of Ottawa Heart Institute. Currently it is the largest academic health science centre in Canada and includes approximately 4000 nurses working in more than 100 units/ services. Prior to the study patient nursing care was delivered via a diverse set of pre-existing practice models, including total patient care, primary nursing, team nursing, functional nursing and case management.

The need to standardize the delivery of nursing care was initially identified at a nursing leadership retreat and in May 2000, standardization was selected as the top priority by clinical nurses of the Corporate Nursing Clinical Practice Committee (CNCPC). It was widely agreed that a single model of care was needed to ensure efficient and effective nursing care within an organization that includes a multidisciplinary approach and program management. A standard model would have many advantages, it would facilitate the integration of nurses in their workplace, help to create a stronger corporate culture, be easily recognizable by all providers of care, facilitate mobility between clinical areas, articulate nursing values, and facilitate

collaboration with other health professionals. Collaboration with other health professionals would be achieved through enhanced decision-making and communication with first-hand patient information, facilitation of contact with the right providers and the clarification and standardization of the roles of various team members.

The Need for Evaluation

As previously mentioned, The Ottawa Hospital was created in April 1998 from the merger of six different institutions. At the time of the merger, nursing care for patients of the newly merged TOH was carried out through various models of nursing care delivery, including total patient care, primary nursing, team nursing, functional nursing and case management. Each model brought with it different ways of communicating and decision-making. Consequently, the nursing TOH leadership group (comprised of Clinical Directors, Clinical Managers, Nurse Educators and Nursing Coordinators) identified the need to agree on and implement a single system-wide model of nursing care, a decision supported by clinical nurses through their Corporate Nursing Clinical Practice Committee. A standard model of nursing care could help facilitate the integration of nurses in their workplace, help to create an overall corporate culture easily recognizable by all providers of care, facilitate mobility between clinical areas, articulate nursing values, and facilitate collaboration with other health professionals.

The newly developed professional practice model includes characteristics valued by clinicians, supported in the literature and summarized in a set of guiding principles. The consensus around direct care includes the concepts of autonomy and accountability for a selected group of patients, full scope of practice, team spirit, and specific delegation of activities to appropriate category of personnel. The consensus around the support systems required to facilitate quality practice includes guiding principles related to educational support, clinical expertise and organizational day-to-day support. Decision-aid tools have been developed to guide the implementation of the model, including a staff mix tool, a span of control tool for clinical managers and span of coverage tool for nursing educators. Nurses at TOH developed the new nursing care model through an extensive literature review, consultation and analysis. Membership of the Model Work Group consisted of clinical nurses representing the models of nursing care on the four sites, clinical managers, nurse educators and advanced practice nurses, as well as a public representative and a University of Ottawa School of Nursing representative. A key recommendation from the model building process was to develop a research protocol to document the impact of the new nursing care delivery model on nurse well being, organizational climate and nurse-sensitive patient outcomes. Implementation of the model was under the guidance of an Implementation Committee at TOH, who met regularly to plan each required step. The model roll-out began in selected sections of each hospital as deemed by the committee to be most ready for the change. The main purpose of our study therefore was to carefully evaluate the change process so that other organizations might benefit from the pioneering work being carried out at TOH. The presence of multiple models and the need for standardization is not unique to TOH, which makes the methods and results of our study widely applicable beyond TOH.

IMPLICATIONS OF THE STUDY FINDINGS

This research project was spearheaded by the developments within the Model of Nursing Care Work Group at The Ottawa Hospital, the committee responsible for planning, developing and implementing the new model of nursing clinical practice developed at the hospital. As mentioned previously, one of their main recommendations about the development and implementation of the model was that the process be thoroughly evaluated, from a variety of perspectives. Given such a direct call for research from local decision makers, it was evident that they had a very compelling interest in the results of the proposed research project. With numerous other institutions across Canada have recently undergone similar mergers, the findings should have strong relevance for decision makers across the country. As an example of an evaluation of a major service delivery change within a complex health care environment, it should also be of use to others planning change on a similar scale, but with possibly different aspects of care.

The project was born out of the desire of the people responsible for developing the new clinical practice model, rather than as an academic curiosity-driven exercise on the part of the investigators. As such, its relevance to the main research partner, The Ottawa Hospital, is very strong. The findings should also be relevant to other large health care organizations interested in making changes to the way nursing care is delivered.

RESEARCH QUESTIONS AND STUDY OBJECTIVES

The main objective of this study was to determine the impact of adopting a new, common clinical practice model for nursing care across three recently merged campuses of The Ottawa Hospital (TOH). It was hypothesized that the implementation of the new model would have direct impact at three different levels in the organization thus three main research questions were addressed in this study:

- 1) What are the effects of introducing the new nursing care model on quality of patient care?
- 2) What are the effects of introducing a new model for nursing care on nurse work stress and nurse well-being?
- 3) What are the effects of introducing the new nursing care model on organizational climate, at both the unit and hospital (site) levels?

For question #1, there is speculation that increased levels of work stress could lead to deterioration in the quality of patient care. It is possible the new model could increase stress levels in the short term but then lead to lower levels in the longer term as the benefits of a more predictable and enriched practice code take effect. For question #2, there is considerable evidence from the published literature that nurses are experiencing disturbing rates of work stress and work-related health problems, as outlined in considerable detail in both the CHSRF-sponsored policy synthesis on nursing work environment (Baumann & O'Brien-Pallas et al., 2001), and the chapter on the "Health of Health Care Workers" in a publication from the

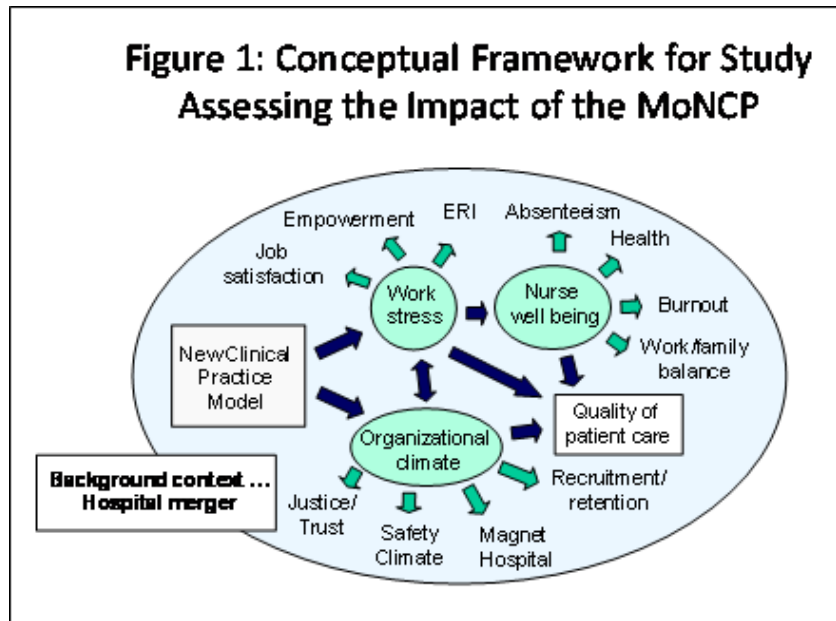
Canadian Institute for Health Information (CIHI) on Canada's Health Care Providers (CIHI, 2001). Health care workers in general, and nurses in particular, are consistently ranked among the occupations with the highest levels of work injury and absence (Akyeampong et al., 1998). Work-family conflict has been associated with job satisfaction, organizational commitment, absenteeism, and turnover. It has also been linked to life and family satisfaction, as well as individual health outcomes such as depression, substance abuse, and burnout (Allen, Herst, Burck, & Sutton, 2000). For question #3, the introduction of the new model in a post-merger period is likely to influence climate and culture variables. A necessary condition for the emergence and maintenance of a strong organizational climate is having policies and procedures that are sufficiently clear and unequivocal, allowing a consensus among employees concerning their nature (Schneider et al., 1998). Otherwise, climate and culture are considerably weakened (Zohar, 2000).

METHODS

Study Design

Results from the Ontario site of a large international survey on nurse practice and patient outcomes suggest that changes in the nurse practice environment resulting from hospital restructuring may have had a negative effect on several important indicators of nurse well-being, including burnout and job satisfaction. However, this was a one-time cross-sectional survey, which like most other research on this topic, suffers from the inability to draw firm evidence-based conclusions regarding the impact of restructuring. Indeed, there is a paucity of prospective research in this area, thus well-designed longitudinal studies are required to properly inform policy initiatives on the issue. We therefore proposed to take advantage of a unique "natural experiment" whereby three hospitals that had recently been merged under a centralized reporting structure would now all be adopting the same professional practice model for the provision of nursing care. As this could have a direct impact on the way in which nurses will perform their daily roles, we therefore proposed a longitudinal evaluation of the adoption of this new common practice model, with special emphasis being paid to its potential impact on nurse well-being, organizational climate and the quality of patient care. Our study used a quasi-experimental design approach to the evaluation the new model.

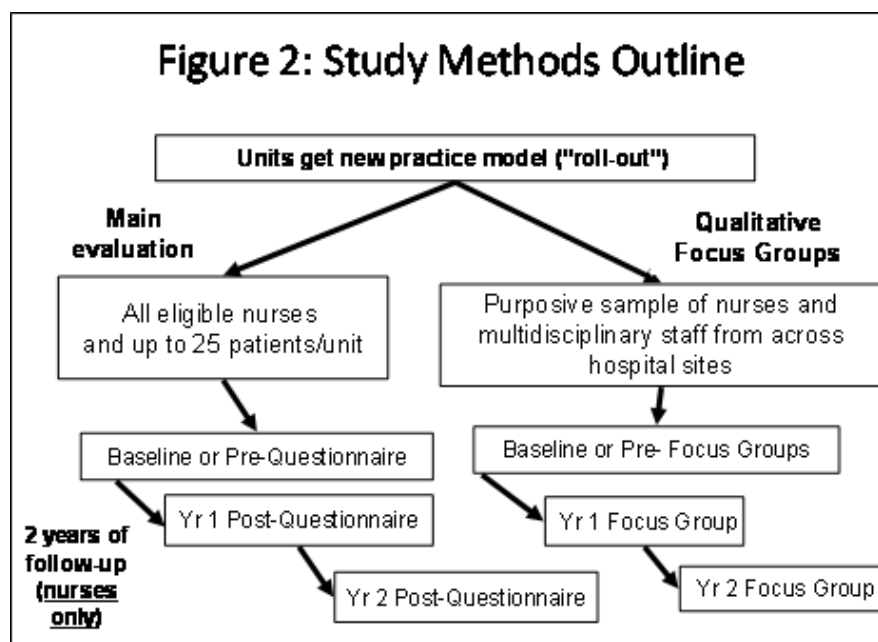
It is recognized that nursing is one member of the health care team and that effective multidisciplinary collaboration is required on this project. All partners of nursing care may experience changes as a result of the introduction of the new model, and as such, they were involved in the finalization of the implementation and evaluation plan.



The overall conceptual model driving our study framework is shown in Figure 1. Our model was built up from a combination of research experience and literature review, and it draws extensively from the combined disciplinary backgrounds of the study investigators. Consequently it reflects elements of organizational psychology, epidemiology, and health human resources management. We chose our main study variables carefully to reflect what is best supported by the literature from each disciplinary perspective. Given the format of our proposed model, the most appropriate approach to evaluating it required a longitudinal (i.e. follow-up) study design combining data from both nurses and patients.

To collect the study data we conducted three surveys over a period of 36 months - one at baseline, before implementation of the new model of care; the others 12 and 24 months later. Approximately 3600 nurses work at TOH and prior to the study we estimated our required sample size for the study to be about 1500 for the baseline survey to ensure that we would have at least 1000 subjects with pre and post-intervention data (based on an expected overall loss-to-follow-up of about one-third, or 33%). This large number of survey respondents was deemed large enough to provide the study with sufficient statistical power to carefully examine the relationships between the main study explanatory variables and the key nurse outcomes measures of burnout, health status and work absence. We also anticipated that a realistic response rate for the baseline survey would be between 60 and 70% of those approached, thus we would require a total of 2300 surveys to be sent out for the baseline measurement period in order to enroll approximately 1500 baseline subjects. The patient surveys were not intended to be given to the same patients at the three time points as they would not be in an acute care hospital over that time period. Thus for patients we used a different sample of subjects at each of the three time points.

The overall process for conducting the study is outlined below in Figure 2. A 3-year longitudinal quasi-experimental design was deemed the preferred option since organizational change of this scale also has the potential to create short-term deteriorations in the indicators under study, a situation that could seriously confound the conclusions drawn from the intervention. Neither a short-term longitudinal studies nor cross-sectional surveys were viewed as being the best approach since we would not be able to determine potential changes in the intervention impact over time.



As described above, the survey will include standardized measures to address the indicators for each of the main areas identified in our conceptual model – i.e. work stress, nurse well-being, organizational climate and quality of patient care. The measures used were influenced by our knowledge of the literature and our research questions as well as by the input of the local study steering committee.

Organizational change may be better accepted when the changes are made in ways that individuals view to be procedurally fair. The development of TOH nursing care model incorporated strong efforts in this direction (e.g., representation of all groups). It is important to know how effective this process was, thus we evaluated individual nurses' perceptions of the procedural justice of the process and the impact these perceptions have on their acceptance of the new model of nursing care. In the present study we focus on two kinds of climate: hospital safety climate, i.e. shared perceptions among nurses concerning safety policies, procedures, and practices; and quality climate, i.e. shared perceptions among nurses concerning organizational policies, procedures and practices that regulate and set standards for the quality of patient care.

The Study Procedures

Prior to launching the evaluation of the model, the study protocol was reviewed and approved by research ethics committees at the University of Western Ontario (the affiliated institution for Dr. Kerr) and The Ottawa Hospital. It should be noted that by the time the research team had secured funding and ethics approval the model implementation process had already started and as such we were unable to include pre-implementation measures on some of the larger units.

In addition, the SARS (severe acute respiratory syndrome) epidemic struck the province and the hospital during the core of the data collection phase of the project, setting back the model rollout process back by almost a year and no doubt interrupting the evaluation the model as well. While it is impossible to determine the full extent of the impact this event had on the results of the model roll-out and its evaluation, it clearly had the potential to negatively impact the ability of the project staff to follow-up on staff and patients surveys.

Although the complete details of how the study progressed across the different units and sites varied slightly, in each case the research effort was led by the research coordinator who worked closely with the unit manager to determine the process best suited for that unit. Typically the nurse questionnaires were delivered to the units (along with a sealed drop box for returns) during week one of the preparatory stage of the new model implementation process. The drop box was normally picked up after a 2-week response period. The patient questionnaires were delivered to the units at the same time as the nurse questionnaires and were distributed to patients upon discharge to complete at home and returned to the study coordinator via a stamped, self-addressed envelope. Subjects were provided with a \$2 Tim Horton's coupon as a thank-you for their participation.

Nurse Surveys

The nurse surveys contained questions from several well standardized instruments designed to measure the factors shown in our conceptual model (Figure 1). These included: the Effort Reward Imbalance model, assessing nurse perceptions of their work stress (Siegrist, 2004); the Revised Nurses Work Index to measure the nursing work/practice environment (Aiken & Patricien, 2000); the SF-12 Health-related Quality of Life to assess nurse physical and mental health (Ware, Kosinski & Keller, 1996); the Copenhagen Burnout Inventory (Kristensen et al., 2005); Work-Family Conflict (Carlson, Kacmar & Williams, 2000); Nurse Empowerment (Laschinger, Sabiston & Kutzscher, 1997); Organizational Justice (Moorman, 1991); and the Hospital Safety Climate (Zohar, 2000). All of these tools have been used in previous research studies and have been shown to be valid and reliable indicators of the constructs being assessed. In addition to these standardized measures we also included some newly developed questions focusing on the implementation process for the model as well as a set of job-related and demographic questions included to help us describe our study sample. See Appendix A for more information on the tools used.

Patient Surveys

To assess patient quality of care we used a modified version of the Patient Judgment of Hospital Quality as revised by Laschinger. We added three new items to this tool to focus on evaluation of aspects of care presumed to be most amenable to the introduction of the new model. These included items relating to coordination and continuity of care as well as overall nursing care. We also asked patients questions to help us describe our study sample as well as a couple of items about their contact with the hospital (i.e. admission and reason for visit).

Analyses

Our study used a quasi-experimental design format rather than a randomized control trial approach. The former was chosen for a number of reasons including the research team not having direct control over the roll-out of the model as well as the practical challenges in randomly allocating nurses in the same hospital or unit to different model of care. With this design option, each nurse subject served as their own control over time, thus the emphasis for

the analysis was placed on determining changes in subject survey scores over time (i.e. a change score analysis). Significance testing used a 2-sided p-value of 0.05 (paired t-tests).

For the patient data we used different subjects at each time point thus we used one-way analysis of variance (ANOVA) looked for changes in mean (i.e. average) patient quality of care scores over the three times points used in the study (i.e. before model implementation and at one and two-years post implementation). In addition to looking at the overall and combined quality of care scores we explored each of the 24 items used item to see if there any specific points of interest to be noted.

Qualitative interviews

Although we originally planned to use qualitative interviews at each survey time point, we opted instead to use focus groups at the two largest participating sites during the rollout of the new model. The main reasons for this shift in the methods used for the qualitative component of the study were related to the many logistical constraints experienced when trying to accommodate the scheduling of individual interviews with professional staff. Two focus groups were conducted with nurses from the General and Civic campuses and two additional focus groups were held with other multidisciplinary health team members from both the General and Civic campuses. The multidisciplinary team members included Physiotherapists, Respiratory Therapists, Spiritual Care, Social Workers and Occupational Therapists. It should also be noted that despite considerable efforts by the study team we were unable to acquire any physician representation for these focus groups. Subjects for the focus groups were intended to be reflective of the multidisciplinary professional staff working directly with patients at the hospital. The main purpose of these focus groups was to better assess the context for the survey and to hopefully gain some additional insight regarding perceptions of the new model and the implementation process as well as the overall impact of the intervention on nurses and non-nurses.

Each focus group included from four to six participants and the audio-taped interviews lasted approximately 70 minutes. Observational notes were taken by a research assistant to supplement the data collected as a means to link the verbal accounts with the non-verbal interactions of the participants (Sim, 1998). The interviews were subsequently transcribed verbatim and observational notes were used to supplement the intensity of the narrative. (Krueger, 1994). Data analysis used an inductive approach to question analysis, whereby recurring key words or phrases were identified. Broad categories were developed that appeared to link the concepts in each of the questions across interviews. The transcripts were again analyzed for responses by questions and a content analysis was subsequently conducted by question. The transcripts were further loaded into the Non Numerical Unstructured Data Indexing Searching and Theorizing (NUDIST) system to capture exemplars that housed these key concepts and categories.

RESULTS

Patients

Characteristics of the patient included in the study are shown below in Table 1A.

Table 1a: Characteristics of the patients enrolled in the study.

	Baseline (N=910)	Year 1 (N=477)	Year 2 (N=285)	Overall (N=1672)
Age (years)	55.1	53.9	57.1	55.1
Marital status (%)				
Married	70.5	72.5	68.6	70.7
Single	10.0	12.1	10.2	10.7
Other	19.5	15.4	21.2	18.6
Gender (%)				
Male	40.8	41.2	41.1	40.9
Female	59.2	58.8	58.9	59.1
Campus (%)				
Civic	47.9	37.5	50.2	45.3
General	31.4	37.1	19.3	31.0
Riverside	20.7	25.4	30.5	23.7
Admission Status (%)				
Out-patient	52.5	47.0	42.8	49.3
In-patient	47.5	53.0	57.2	50.7
Length of stay (%)				
<7 days	60.4	54.1	65.1	59.4
≥7 days	39.6	45.9	34.9	40.6

A total of 1672 useable patient surveys were collected over the three time points although there was a strong drop-off in the number collected over time, with slightly more than half of the patient surveys being collected from the pre-implementation time point (i.e. baseline). The numbers for the three time points were: Baseline N=910; Year 1 N=477; Year 2 N=285. As shown in Table 1A, the patient subjects were predominantly female, married, and had an average age of about 55 years old. Although gender did not change over time, there was some variation in age as well as site and admission status over the three time points although it was not consistent over time (i.e. it appeared to fluctuate up and down).

On average patients consistently rated their quality of care very highly with the mean scores for each year falling between the values for Very Good (4) to Excellent (5). The overall mean scores (out of 5) were almost identical from year to year (Baseline M=4.26 SD=0.688; Year 1 M= 4.23 SD=0.759; Year 2 M=4.24 SD=0.731). With the mean summary scores being so close to each other we did not find any significant improvement in the survey questions (completed by patients) relating to quality of patient care. This was true for each of the three time point comparisons that were examined. A similar response was seen for the individual questions from the patient survey, including the question about overall quality of nursing care received. These three items were focused on the core guiding principles of the model and included questions about identification of the nurse assigned to you, participation in decision making and consultation about their care. Even when these three items were combined into a model-specific scale no significant differences were seen in satisfaction scores over time.

It should be noted however, that in each of the three time points about 90% of the patients responded that their care was either very good or excellent, thus it appears as though a very strong “ceiling effect” was observed making it very difficult for the introduction of the model to shift patients perspectives about the quality of their care. On average there was a slightly higher rating for quality of care scores by out-patients than for in-patients (M=4.41 for out-patients; M=4.12 for in-patients $p<0.001$). However, there was no difference seen in patient scores over time by admission status – in other words patient rating scores did not change before or after implementation either for out-patients or for in-patients (or when combined).

Nursing Staff

The characteristics of the nurses enrolled in the study are shown above in Table 1B. We collected data from at least one study time point on a total of 731 nurses. The numbers collected at the three time points were: Baseline = 731; Year 1 = 416; Year 2 = 227. We had useable data from all three time points in the study for a total of 227 nurse subjects. As shown in Table 1B, the nurses enrolled in the study were predominantly female, married, with an average age of about 44 years old and an average of almost twenty years of clinical experience. The largest proportion of our sample came from the two biggest campuses, with almost half coming from the Civic site. The sample was almost evenly split between full-time and part-time staff (including job share and casual), with slightly more employed full-time.

Table 1B: Characteristics of the nurses enrolled in the study (at baseline).

Mean Age (years)	43.5 yr (SD=9.6)
Mean Length of Clinical Experience (years)	18.9 (SD=10.5)
Gender (%)	
Male	3.8
Female	96.2
Marital Status (%)	
Married/Common Law	72.9
Single (never married)	14.8
Other	12.3
Campus (%)	
Civic	48.1
General	37.2
Riverside	14.7
Employment Status (%)	
Full-time	52.5
Part-time / other	47.5

Nurse views about the new model of care

As summarized below in Table 2, questions on the baseline nurse survey relating to their views about the new model of care or the process of introducing it generally indicated that nurses were relatively happy with their existing mode of care and were fairly knowledgeable about the new model and most were either neutral or satisfied with their input into the model development, with only about 1 in 5 (21.2%) reporting that they participated in any activities related to its development.

Table 2: Nurse views about models of care at baseline and its impact after one year.

Satisfaction with Pre-existing Nursing Model (% at baseline)	
Very satisfied / satisfied	56.8
Neutral	27.0
Very dissatisfied / dissatisfied	16.2
Aware of “new model” prior to implementation of this study? (% at baseline)	
YES	67.5
NO	32.5
Participated in the development of the new model? (% at baseline)	
YES	21.4
NO	78.6
Satisfied with input into Model development? (% at baseline)	
Very satisfied / satisfied	12.3
Neutral	56.7
Very dissatisfied / dissatisfied	31.2
Extent of impact the new model had on my unit (% at Year 1)	
Much better / better	12.1
Neutral	65.7
Much worse / worse	22.3
Extent of impact the new model had on your job satisfaction (% at Year 1)	
Much better / better	10.5
Neutral	71.4
Much worse / worse	18.1
Extent of impact the new model had on quality of patient care (% at Year 1)	
Much better / better	12.3
Neutral	72.8
Much worse / worse	14.9

However, when nurses were asked in the follow-up surveys about the impact that the new model had on their job satisfaction, their unit and the quality of patient care they tended to report that things had not improved much. In fact, more nurses tended to report things had gotten worse than better although the majority (about 80%) reported no change or an improvement. The results for these questions about the model and its implementation process seem to contrast somewhat with those observed for the nurse work and well-being and organizational outcomes.

Nurse Change Scores

In order to assess the impact of the model on nurse responses to the standardized survey questions on their well-being and their organizational work environment, a detailed analysis of the change in nurse survey scores over time was conducted. Change scores were calculated within each nurse with data at the different time points and the differences in these scores were then summarized to determine if any overall change had been observed. The results of these change analyses are summarized below in Table 3, with a “+” symbol indicating that scores

had (statistically) significantly improved, a “-” symbol indicating that they had significantly deteriorated (i.e. got worse relative to the prior time point) and “NC” indicating that there was no (statistically significant) change in the scores for that period of comparison.

Analysis of the changes in nursing staff survey data from baseline (i.e. pre-implementation) to year 1 (i.e. one year post-implementation) indicates that the introduction of the new model had a number of positive effects on the quality of nurse work life, well-being and their perceptions of

the organizational climate. However, these potential benefits seen one-year after the introduction of the new model were typically not sustained over time. While some statistically significant improvements were noted, the markers of nurse health and well-being were not strongly affected by the introduction of the new model. Nurse burnout and family-work conflict were improved one-year after the new model was introduced while nurse ratings of their overall physical health showed a slight decline over time. No differences were seen over time for nurse ratings of their pain (back and neck/shoulder) or for their mental health.

Table 3: Summary of Main Change Analysis Results

Factor	Change in scores from Baseline to Year 1	Change in scores from Baseline to Year 2
Patient outcomes		
patient-rated quality of care	NC	NC
Nurse outcomes		
burnout	+	NC
work stress (ERI)	+	NC
physical health	-	-
mental health	NC	NC
back/neck pain	NC	NC
work-family conflict	+	+
nurse empowerment	+	NC
Organizational outcomes		
nurse-MD relations	+	NC
nurse autonomy	+	NC
nurse control over practice	+	NC
organizational support	+	NC
safety climate	+	+
organizational justice	+	+

NOTE: ' + ' = improvement ($p < 0.05$); ' - ' = worse ($p < 0.05$); ' NC ' = no statistically significant change;

Nurse practice environment and organizational climate indicators were generally more positively influenced by the introduction of the new model, as nurse-physician relations, control over practice, autonomy, empowerment as well as organizational support and the patient safety climate were all rated by nurses as being better one year after the model had been introduced. Although this report focuses on the change scores, more detailed analysis of each of the outcome measures used in the study can be found in Appendix C.

Qualitative Focus Groups

Based on the four qualitative focus groups conducted with nurses and multidisciplinary staff at the two largest sites, three main themes were identified related to nursing care at TOH: i) Work Load Issues, ii) Lack of supports or resources and iii) Environmental Issues. Work load issues included staffing shortages, higher patient acuity, higher patient to nurse ratios, as well as the need for appropriate work load measurement tools. Lack of supports or resources included not enough Clinical Manager support, not enough support staff, lack of equipment and supplies,

teaching staff not available and nurses being too busy to lend each other a hand as support. Environmental issues included aging nurses finding the work physically demanding, patients and families expecting more and knowing more, and lack of experience of the new graduate nurses coming to unit. More detailed information about the focus groups and the themes mentioned above can be found in Appendix B.

In addition to issues related to the provision of nursing care, the focus groups were also asked about expectations for the new model including its possible impact on their professional practice. There was some indication that it might increase autonomy or control, a potential result that was supported in part by our change analysis results for the practice environment. When asked if there were any special issues at The Ottawa Hospital that might affect the success of the new model, nurses indicated that concerns with the work environment, such as appropriate nurse patient ratios and better working conditions, might outweigh the impact of the new model. Nurses were seen as being already overloaded and the introduction of the new model could make things even worse for them. Participants also expressed the need for a clear communication strategy about the model as there had been some previous concern expressed about not knowing enough about the model of care or its development.

DISCUSSION

A comprehensive policy synthesis by Baumann & O'Brien-Pallas et al. (2001) identified problems with the nurse practice environment as being a key contributor to nurse health and job satisfaction. The policy synthesis also suggested that the nurse practice environment may be a major contributor to quality of patient care. Additionally, publications from the Ontario Hospital Association (OHA, 2002) and the Canadian Institute for Health Information (CIHI, 2001) have both made reference to the ensuring that the work environment for health care staff is conducive to both high quality patient care as well as a high quality of work life, particularly given the shortage of clinical staff, especially nurses, that is expected in the short term. The OHA report concludes with a strong endorsement for change that improves work environments:

“And perhaps, most fundamentally, the health care sector is about people – both those receiving and giving the care. The main message to health care employers is that basic qualities of work and management remain critical in attracting and retaining talent. How best to achieve that is the challenge before us.” pp. 3

In the CIHI report, the effect of changes in professional scopes of practice and collaborative practice (which can be interpreted in our study framework as the introduction of the new clinical practice model) on patient and provider satisfaction as well as on quality of care were highlighted as key areas needing research attention in order that key questions relating to health human resources can be addressed. The report concludes that:

“A fuller understanding [of the present challenges] depends on a broad range of timely, reliable, systematic, and comparable data and analysis that will fill these and other important information gaps”. pp. 98-99

It is evident from the emphasis found on issues related to the quality of the work environment in these two important documents (directed at the manager/policy maker audience), that identifying work-related factors related to the health and well-being of health care workers is a crucial research issue, not only from an occupational health perspective, but also from a more broad health human resource management perspective. The results of studies that develop and test a framework for evaluating the impact of major workplace changes, such as the introduction of a new clinical nursing practice model, can be of direct benefit to managers and policy-makers trying to meet the challenge of the complex health human resources issue.

As previously noted, the study did not find any changes in patient ratings of their quality of care. Patients from all three time points consistently rated the overall quality of their nursing care as excellent or very good about 90% of the time. ($N_1=910$, $N_2=477$, $N_3=285$). These high ratings created a “ceiling effect” that could have rendered them somewhat insensitive to the changes created by the introduction of a new model of nursing care. There was little room left to record improvements in scores over time, either for the combined patient rating summary scores or any of the score’s individual questions. It is also worth noting that while the nurse surveys were administered to the same nurses over time, this was not possible with the patient surveys since they were not patients at TOH at all three different time points. This repeat cross-sectional approach might make the patient surveys even less sensitive to change given the likely increase in background variability introduced by using multiple subjects over time.

Although the introduction of the new model appears to have had some benefit for the work and well-being of nurses, these possible improvements were not sustained over time nor did they appear to directly translate into improved patient care, at least when assessed by the patients themselves. It is possible however, that the high drop-out of staff nurses over time could have made it more difficult to establish the permanency of these effects as statistical precision is reduced when the number of subjects decreases. It should also be noted our analysis focused on identifying statistically significant changes in the outcome measures used. While statistical significance can be important, it can ignore the “clinical significance” of these changes and thus meaningfulness of the change can be obscured.

FURTHER RESEARCH

While our study results suggest there may be some benefits for nurses from the introduction of the new model of nursing clinical practice at The Ottawa Hospital, more detailed analyses will be required to try and determine why there may have been a disconnect between their responses to the standardized practice and work environment questions in the survey, which generally showed improvement over time, and their overall views on the impact of the new model which did not indicate a strong sense of improvement in the status quo. Future studies should also explore ways and means of improving and maintaining subject response over time as the drop-off in our nurse responses limited some of the multi-level analyses planned to explore unit and nurse level responses. Given the recurring problems of work load and support noted in the focus groups, it could be that the nurses enrolled in the project became overwhelmed by these issues, leaving them little time and energy to continue with the study.

It would also be useful in future research to explore ways to have more direct control over the intervention by the research team, so that a control group of nurses can be included rather than relying upon internal change analyses alone. Although a typical randomized control design whereby nurses would be randomly allocated to use the new model or the existing one would be effectively impossible for such an intervention due to the complexities and challenges in providing nursing care in the modern hospital. Creative options that parallel the experimental paradigm should be considered to help strengthen the overall evidence base being generated.

Our study findings indicate that the new model of nursing clinical practice developed at The Ottawa Hospital has the potential to improve the professional practice and organizational environments in multi-site tertiary level acute care hospitals. We also noted slight improvements in nurse burnout and job stress but patient ratings of their quality of care were not improved by the introduction of the new model. Based on these findings we propose to extend our research on the model by evaluating its implementation in additional sites, through research collaborations with interested stakeholders in community and specialty hospitals. We hope to build on our expertise developed in this study to explore additional markers of patient, nurse and organizational outcomes in order to continue efforts to improve the evidence base for changes to the delivery of nursing care in Canada.

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