UNDERSTANDING DETERMINANTS OF OUTCOMES IN COMPLEX CONTINUING CARE

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IN COMPLEX CONTINUING CARE

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Main Messages

The main messages for managers and health administrators based on findings from this study are:

- Overall, staff rated their level of work empowerment as 59 out of 100. Staff work empowerment could be promoted by ensuring consistent and meaningful access to staff development activities and by sharing work and organization related information in timely and appropriate ways.

- Overall, staff reported relatively high levels of work effectiveness (73 out of 100). Efforts should be made to sustain and strengthen perceived work effectiveness. This can be accomplished by providing timely and constructive feedback to employees about their performance and by promoting workplaces that encourage and value performance feedback among peers.

- Overall, staff rated their leader/manager's behaviours at 65 out of 100 and the support received by staff from leader/managers as 69 out of 100. Providing CCC leaders and managers with leadership training may lead to higher perceptions of their effectiveness by employees.

- Although retention of all CCC staff is a concern, our evidence suggests that the allied health professional category of CCC staff is at highest risk to leave their employment (52% stated they intended to leave their jobs) and should, therefore, be given immediate and special attention. Targeted strategies to strengthen retention of all staff are suggested. Improving job satisfaction may be one of the most important approaches to promoting retention of CCC staff.

- On average, patients recovering from a stroke in CCC reported satisfaction with care scores of 71 out of 100. Further, 32% of patients surveyed reported satisfaction scores greater than 90 out of 100.

- On average, stroke patients recovering in CCC had a length of stay of 113 days.

- Across all facilities in the study, 48% of stroke patients were discharged home or to semi-independent living locations. Thirty-five percent were discharged to long-term care or more intensive rehabilitation settings and 17% were discharged to a higher level of care (e.g. acute care) or remained in CCC. Two of 81 patients in the study died during their CCC stay.

Executive Summary

Context

A central challenge in Complex Continuing Care (CCC) facilities, also known as chronic care, is the delivery of high quality patient care that results in best patient outcomes. Despite the growth in literature on relationships between patient outcomes and nursing-related organizational factors, little research has examined the effects of nursing care on patient or organizational outcomes in CCC.

The *Hospital Report*[1] initiative in Ontario has highlighted CCC outcomes. However, description of outcome performance alone, such as found in the *Hospital Report*, is insufficient to improve outcomes. Outcome improvement can best be facilitated through management of determinants of those outcomes. In this study, we describe selected structures and processes of care in CCC as well as evaluated the effects these structures and processes have on outcomes for stroke patients cared for in CCC facilities. The transitional care patient population is the focus of this research and in particular, patients recovering from stroke. These patients constitute a large proportion of the CCC transitional care patients (i.e., patients who no longer require acute care but have needs too intensive for community care).

The primary purpose of this study was to evaluate the effects that CCC structures and processes of care have on three transitional care stroke patient outcomes:
1. location of discharge;
2. length of stay; and
3. patient satisfaction with care.

Six categories of CCC structures and processes of care were evaluated for their effects on patient outcomes: (i) patient characteristics; (ii) staff characteristics; (iii) work environment characteristics; (iv) staff responses to the work environment; (v) nurse staffing; and (vi) therapeutic interventions provided by staff. Secondary study purposes included examining CCC patient characteristics, work environments experienced by CCC multidisciplinary staff, and staff responses to these work environments.

Approach

A prospective observational cohort design was used to guide the study. We used a non-experimental design to study groups of patients who were recovering from stroke in a slow stream (transitional care) CCC rehabilitative setting. Six facilities with CCC units participated in this study. Of the six participating facilities, three were complex continuing care hospitals and three were acute care hospitals that had designated CCC units. The final sample included 81 patients who were recovering from stroke on a CCC unit and 162 multidisciplinary staff that cared for these patients. There are four categories of CCC staff who participated in this study: licensed nursing staff, allied health professionals, unlicensed assistive personnel, and leaders / educators.

Results: Key Study Findings

Patient Outcomes

- *Discharge Location.* There were no statistically significant differences in the location of patient discharge among facilities. Nearly half of all patients (48%) were discharged to a location characterized by independent or semi-independent living such as home or a residential care facility.

- *Length of Stay.* The mean length of stay across all facilities was 113 days with one facility having a significantly longer average length of stay than other facilities.

- *Patient Satisfaction.* Overall, patients were fairly satisfied with the care they received in complex continuing care (mean score of 71 out of 100; range from 40 to 87). Significant differences in patient satisfaction were found across facilities.

Determinants of patient outcomes:

- *Discharge Location***.** None of the (selected) variables tested were found to be significant predictors of where patients were discharged to (e.g., lower level of care vs. same or higher level of care).

- *Length of Stay.* More continuity of nursing care providers was a significant predictor of patients staying longer than 100 days in CCC.

- *Patient Satisfaction*. Patients living alone prior to admission patients with lower ADL hierarchy scores were more likely to be satisfied with their complex continuing care.

Characteristics of and Staff Responses to the Work Environment

- Job satisfaction among staff working in CCC was rated between neutral and satisfied.

- Overall, nearly 30% of CCC staff reported experiencing high levels of burnout.

- Work empowerment was the lowest rated component of the CCC work environment.

- Work effectiveness was rated as the highest component of the CCC work environment.

- Less than one third of staff rated the quality of patient care as excellent. Allied health professionals had significantly lower ratings of perceived quality of patient care than did licensed nurses and unlicensed aides.

- Nearly one-third of the sample reported planning to leave their employment within the next five years. Allied health professionals were significantly more likely to be planning to leave their current role than other categories of CCC staff.

Processes of Care

- The amount of rehabilitative interventions provided by nursing, occupational therapy, and speech therapy were similar across facilities. Patients in one facility received significantly more minutes of physiotherapy than did patients in other facilities.

- There were significant differences in continuity of nursing care providers across facilities.

Implications

There are four key implications for managers and health administrators based on findings from this study.

1. Staff work empowerment could be promoted by ensuring consistent and meaningful access to staff development activities and by sharing work and organization related information in timely and appropriate ways.

2. Efforts should be made to sustain and strengthen perceived work effectiveness. This can be accomplished by providing timely and constructive feedback to employees about their performance and by promoting workplaces that encourage and value performance feedback among peers.

3. Providing CCC supervisors and managers with leadership training may lead to higher perceptions of their effectiveness by employees.

4. Although retention of all CCC staff is a concern, our evidence suggests that the allied health professional category of CCC staff is at highest risk to leave their employment and should, therefore, be given immediate and special attention. Targeted strategies to strengthen retention of all staff are suggested. Improving job satisfaction may be one of the most important approaches to promoting retention of CCC staff.

Further Research

Further research is suggested that explores the relationship between work environments and patient outcomes with larger samples of CCC patients and with patients with other health conditions besides stroke. As well, examining relationships between CCC work environments and staff responses to their work environments (e.g., retention of CCC staff) warrants further investigation.

CONTEXT

A central challenge in Complex Continuing Care (CCC) facilities is the delivery of high quality patient care that results in the best patient outcomes. With the current focus on accountability, health care organizations must not only measure outcomes but strive to meet and exceed outcome standards. To date there is little empirical evidence of the importance of nursing care structures and processes in CCC and, in particular, those that influence outcomes for CCC stroke patients. These gaps in our knowledge of determinants of outcomes for CCC patients leave both policy and decision makers at a loss for identifying opportunities to improve patient outcomes.

The *Hospital Report*[1] initiative in Ontario has highlighted CCC outcomes. However, description of outcome performance alone, such as found in the *Hospital Report*, is insufficient to improve outcomes. Outcome improvement is facilitated through management of determinants of those outcomes. In this study, we described some structures and processes of care in CCC as well as evaluated the effects these structures and processes have on outcomes for stroke patients cared for in CCC facilities.

In Ontario, three categories of institutional continuing care exist: long term care (e.g. nursing homes), rehabilitation, and CCC. CCC serves higher acuity continuing care patients and includes three general sub-populations: (i) transitional group who no longer require acute care but have needs too intensive for community care; (ii) near end-of-life group with intensive care needs; and (iii) extended stay group. The transitional care patient population is the focus of this research and in particular, patients recovering from stroke. Stroke patients constitute a large proportion of the CCC transitional care group. A primary transitional care goal is to transfer care from inpatient to community.[2] Though many stroke patients are discharged from acute care hospitals to fast-paced designated rehabilitation facilities, many are discharged to CCC because they may be too frail to tolerate intensive rehabilitation.

Most stroke patients have potential for improved health and for discharge to a location where they require less intensive care than provided in CCC. However, there is no evidence to assist decision making about what and how much care is needed, and what work environments should be like to enable staff to assist stroke patients achieve optimal recovery levels. There is speculation that CCC outcomes are influenced by nursing care structures such as experience and skill mix of nursing staff,[3] nurse job satisfaction,[4] and unit manager leadership and effectiveness.[5] The effects of nursing care have not been evaluated in CCC. Several approaches have been advocated to improve quality in continuing care environments involving managing the nursing workforce and maintaining a conducive work environment. Suggested strategies related to managing the nursing workforce include: ensuring the right nursing staff mix,[3, 6] managing turnover,[6, 7] retaining experienced staff,[6, 8] providing continuing staff education and training,[6, 9, 10] ensuring continuity of nursing care provider,[11] and ensuring adequate clinical support for staff development.[7] Suggested strategies related to maintaining a conducive environment include: developing care delivery models that support continuity of patient care[10] and providing transformational leadership for staff.[5] In acute care environments, it was found that nurses who felt more empowered experienced less burnout and it was speculated that this

leads to improved patient outcomes.[12] Similarly, it was found that nursing staff working in long-term care who felt more empowered in their work also had stronger organizational commitment.[13] It has been suggested that these conditions would result in better patient outcomes. Little or no evidence has been provided to support these claims, particularly for the CCC stroke patient population. One notable exception was found in an Australian study that found that patient satisfaction was directly and positively associated with staff satisfaction and that providing more hours of nursing care had a small but positive effect on patient satisfaction.[14] Additional research is needed in CCC settings to provide evidence for making decisions to ensure the best possible outcomes for stroke patients.

Study Purpose

The primary purpose of this study was to evaluate the effects that CCC structures and processes of care have on three transitional care stroke patient outcomes:
1. location of discharge;
2. length of stay; and
3. patient satisfaction with care.

Six categories of CCC structures and processes were evaluated for their effects on patient outcomes: (i) patient characteristics; (ii) staff characteristics; (iii) work environment characteristics; (iv) staff responses to the work environment; (v) nurse staffing; and (vi) therapeutic interventions provided by staff. Secondary study purposes included examining CCC patient characteristics, the condition of work environments experienced by CCC multidisciplinary care provider staff, and staff responses to these work environments. We studied transitional care patients admitted to CCC from acute care hospitals to recover from stroke.

Research Questions

Primary research question:
How do CCC staffing and work environments affect three patient outcomes for patients recovering from stroke in Ontario CCC settings: discharge location, length of stay, and patient reported levels of satisfaction with care?

Secondary research questions:
1. What are characteristics of CCC patients, multidisciplinary staff, and work environments?
2. How do multidisciplinary CCC staff respond to their work environments?

IMPLICATIONS

There are four key implications for managers and health administrators based on findings from this study.

1. CCC staff rated their work environments somewhat positively; however, there is much room for development of stronger and more positive work environments. Work empowerment was the lowest rated aspect of the CCC work environment. Staff work empowerment could be promoted by ensuring consistent and meaningful access to staff development activities and by sharing work and organization related information in timely and appropriate ways.

2. Work effectiveness was rated as the highest component of the CCC work environment, therefore, efforts should be made to sustain and strengthen perceived work effectiveness. This can be accomplished by providing timely and constructive feedback to employees about their performance and by promoting workplaces that encourage and value performance feedback among peers. Work effectiveness can also be strengthened by setting work team goals, monitoring their progress and celebrating accomplishments.

3. The importance of effective relationships between managers / supervisors and employees deserves attention in CCC. There is evidence that leadership and management have a role in shaping the work environment and in creating conditions for safe quality patient care.[15, 16] Therefore, supervisors and managers need to learn and practice leadership behaviours that effectively support staff and assist them to do their jobs as well as possible. Previous research has found that participation in leadership development programs result in significant increases in employee ratings of leadership effectiveness.[17] Providing CCC supervisors and managers with leadership training may lead to higher perceptions of their effectiveness by employees.

4. Job satisfaction and intent to remain employed merit special consideration. Overall, job satisfaction among staff working in CCC was rated between neutral and satisfied. The importance of job satisfaction is underscored as evidence continues to mount that job satisfaction is the most consistent predictor of intention to remain employed and ultimately of staff retention.[18, 19, 20] There may be no easy solutions to improving overall job satisfaction but one strategy might be to engage staff in discussions about what promotes job satisfaction from their perspectives and then collaboratively plan and implement strategies related to employee-identified job satisfiers. Nearly one-third of the sample reported planning to leave their employment. Therefore, targeted strategies to strengthen retention of all staff are suggested. Improving job satisfaction, as suggested above, may be one of the most important approaches to promoting retention of CCC staff. Other strategies to promote retention of staff include promoting a more overall positive work environment. Suggested strategies are those that promote staff empowerment (as above), those that create and sustain a positive organizational climate such as engaging in timely organizational communication as well as enabling active staff participation in decision making, and those that assist employees to realize their contribution to organizational accomplishments. Involving staff in these plans and strategies may be integral to promoting development of

stronger work environments that result in more positive staff responses, and ultimately in better organizational outcomes. Although retention of all CCC staff is a concern, our evidence suggests that the allied health professional category of CCC staff is at highest risk to leave their employment and should, therefore, be given immediate and special attention.

APPROACH

Research Design

A prospective observational cohort design guided this study. We used a non-experimental design to study groups of patients who were recovering from stroke in slow stream Complex Continuing Care (CCC) rehabilitative settings.

Sample

Six facilities with CCC units participated in this study. Of the six participating facilities, three were large institutional long-term care facilities (complex continuing care or chronic care hospitals) and three were acute care hospitals that had designated CCC units.

Patients. We included patients who were recovering from stroke on a CCC unit. Eligible patients were those who: (i) were admitted to CCC directly from acute care hospital after being treated for stroke; (ii) were able to speak and understand English; (iii) were cognitively able to complete self-report measures; (iv) were identified by staff as having potential for discharge; and (v) provided informed consent to participate. Across the six facilities, 95 patients from 8 units were eligible and invited to participate. Of these, 81 patients completed the survey yielding a response rate of 85.3%. Patient response rates across hospitals ranged from 70% to 94%.

Multidisciplinary staff. We surveyed multidisciplinary staff that cared for patients within the six study CCC settings. Nursing staff and other multidisciplinary care providers that regularly provided care to patients were invited to participate. Across the six facilities, 289 multidisciplinary staff working in eight patient care units were invited to complete the survey. Of these, 162 staff completed the survey yielding a response rate of 56.1%. Staff response rates across hospitals ranged from 37% to 69%. Four general categories of staff responded to the survey: (i) 95 licensed nursing staff (consisting of 48 registered nurses and 47 registered / licensed practical nurses); (ii) 31 allied health professional staff (including 8 physiotherapists, 10 occupational therapists, 4 speech pathologists, 3 recreation therapists, 3 social workers, 2 dieticians, and 1 pastoral care chaplain); (iii) 24 unlicensed assistive personnel (including 14 personal support workers / nurse aides, 5 physiotherapy assistants, 2 occupational therapy assistants, and 3 recreation therapy assistants); and (iv) 4 leaders / educators (including 2 managers and 2 educators). There were an additional 8 staff who did not indicate their role within their CCC setting.

Instruments / Data Sources

Study data were collected from four sources: a patient satisfaction survey, the Resident Assessment Instrument – Minimum Data Set (RAI-MDS), nurse assignment sheets, and a staff survey (to measure work environments and staff responses to these environments). Primary patient data were obtained through completion of the 9-item "satisfaction with staff" domain of the *Long-term Care Resident Evaluation Survey* from the *Ontario Hospital Report 2003: CCC*[21] by patients enrolled in the study. Secondary patient data were accessed through the Resident Assessment Instrument Minimum Data Set (RAI-MDS).[22] Patient characteristics, use of nursing and other therapeutic interventions, and two patient outcome indicators (length of stay, location of discharge) were also accessed through RAI-MDS data. Secondary patient data were also obtained by accessing the nurse assignment sheets for each study patient for each shift over a two week period to determine the type and continuity of nursing care providers. Primary staff data were collected through a survey completed by staff which included several established instruments to assess care provider characteristics, work environment, and staff responses to the work environment. Data collected from the four sources of data are detailed below within six categories: patient characteristics, staff characteristics, work environment, staff responses to work environment, processes of care, and patient outcomes.

Study Variables

1. *Patient characteristics*. Demographic information about each patient enrolled in the study was collected through RAI-MDS and included *age*, *sex*, *marital status*, *primary language spoken*, *living arrangements* and *location prior to admission*. Information about each patient's clinical status at admission was collected through RAI-MDS. Scores were calculated for a number of clinical status scales commonly used to assess CCC patients. The *Personal Severity Index*[23] has scores ranging from 0 to 18 with higher scores indicating that the patient is closer to death. The *Activities of Daily Living Hierarchy*[24] has scores ranging from 0 to 6 with higher scores indicating increased dependence. The *Social Engagement Measure*[25] has scores ranging from 0 to 6 with higher scores indicating higher levels of participation and initiative. The *Cognitive Performance Scale*[26] has scores ranging from 0 to 6 with higher scores indicating more severe cognitive impairment. The *Depression Rating Scale*[27] has scores ranging from 0 to 14 with higher scores indicating higher levels of depressive symptoms. The *Changes in Health, End-stage Disease, and Symptoms and Signs of Medical Problems Scale* (CHESS) [28] has scores ranging from 0 to 5 with higher scores indicating higher levels of instability. The *Pain Scale*[29] ranges from 0 to 3 with higher scores indicating more severe pain. The *Ontario Case Mix Index*[30] ranged from 0.40 to 1.78, during the time data was collected, with higher scores indicating higher expected utilization of resources.

2. *Staff characteristics*. In the staff survey, respondents were asked to identify their *age*, years of *experience* in CCC, *sex*, *employment status* (full-time, part-time, casual), *usual shift length*, *education*, and *enrolment in a university/college course*.

3. *Work environment*. The *Supervisory Support Scale* (SSS)[31, 32] and four subscales from the Learn, Empower, Achieve, Produce (LEAP) survey [33, 34] were included in the staff survey and used

to measure work environment. The SSS is a 15-item instrument developed to measure relations between staff and their supervisors in continuing or long-term care settings. LEAP is a 34-item instrument that has been developed and tested to assess work environments and job satisfaction in long-term care. The four subscales assessing the work environment include: _work empowerment_, _leadership effectiveness_, _organizational climate_ and _work effectiveness_. Detailed evidence of validity and reliability of LEAP and SSS are found elsewhere.[31 - 34] Scores for all scales were standardized to be out of 100 to facilitate comparisons with higher scores indicating more positive staff assessments of their work environments.

4. *Staff responses to work environments*. Six categories of staff responses to their work environments were measured: _job satisfaction_, _perceived quality of patient care_, _emotional exhaustion_ burnout, _self-reported health_, _missed hours from work_ over the preceding three months, and _intent to remain employed_ for the next five years. Job satisfaction was measured using one of the LEAP subscales.[33, 34] The job satisfaction subscale score was standardized out of 100 with higher scores indicating higher levels of job satisfaction. A single item was used to assess staff perceptions of the quality of patient care on their units on a 5 point scale ranging from poor to excellent. Staff burnout was measured using the Maslach Burnout Inventory[35], a well-established 22-item tool that measures three dimensions of employee burnout: emotional exhaustion, personal accomplishment and depersonalization. We used the emotional exhaustion subscale only. Scores for each item of the subscale are summed and the total score is then classified as high, moderate, or low burnout. The percentages of staff with scores in each category are reported. Reliability and validity of the MBI and its scoring system are well documented.[35] Staff were asked to rate their overall health on a single item 5 point scale ranging from poor to excellent and to identify how many hours of work they had missed in the three preceding months. Staff were asked to identify how likely it was that they would continue to work in their current job until retirement on a single item 4 point scale ranging from very unlikely to very likely. The two single item measurements Staff health and intention to remain employed) are reported as the percentage of staff that chose each possible response option. The hours of work missed is reported as mean number of hours.

5. *Processes of care*. The amount of nursing rehabilitative interventions received by patients was calculated from data in the RAI-MDS assessment form. The total number of _nursing rehabilitative interventions_ received by that patient daily for at least 15 minutes within 7 days prior to assessment was summed. A higher score indicates the patient has received more rehabilitative nursing interventions. Length of time that interventions were provided by rehabilitative care providers (_occupational therapists_ , _physiotherapists_, and _speech therapists_) were also calculated from the RAI-MDS Full Assessment form. Higher scores indicate patients have received more care from other therapeutic disciplines.

For each patient, two components of nurse staffing were evaluated: continuity of nursing care providers; and skill mix of nursing staff providing care. These data were collected from nurse-patient assignment sheets for a 2-week period commencing no earlier than 15 days after CCC admission. A _continuity of nursing care provider index_ was calculated as the total number of different nursing staff assigned to each patient for the 2-week period. A higher number of different nursing staff working with each patient reflects less continuity of nursing

care provider. *Skill mix* was calculated as three separate variables including proportion of care provided by registered nurses, proportion of care provided by register practical nurses, and proportion of care provided by health care aids over a two week period. The higher the percentage, the greater the number of staff in that category provided care for patients.

6. *Patient outcomes*. Three patient outcomes were included in the study: location of discharge, length of stay, and patient satisfaction. The *location of discharge* data were retrieved from the RAI-MDS and were grouped into 3 categories: discharged to independent or semi-independent living (e.g., home, retirement home, lodge); discharged to lower level care (e.g., long-term care or active rehabilitation); or discharged to same or higher level of care (e.g., acute care hospital, remained in CCC). The location requiring least intensity of care is home and the location requiring the greatest amount of care are those not discharged from CCC or discharged to acute care. For the regression analysis the location of discharge variable was dichotomised into either a lower level of care or the same/higher level of care.

RAI-MDS data were used to calculate patient *length of stay* in CCC, counting from the day after admission and ending on the day of discharge. If the patient was not discharged after 180 days then their length of stay was counted as 181 days so that there was an end point for data collection without skewing the data for the few patients that stayed in CCC much longer than 180 days. For the regression analysis the length of stay variable was dichotomised into patients who stayed longer than 100 days versus less than 100 days.

Patient satisfaction was assessed using the 9-item 'satisfaction with staff' domain of the *Long-term Care Resident Evaluation Survey* as used in the *Ontario Hospital Report 2003: CCC*[21]. Patients responded to each question with one of three response options: yes, sometimes, or no. The number of "yes" responses for the 9 items was counted and divided by the number of items that were responded to (to account for missing responses). The resulting number was multiplied by 100 to obtain a total possible score of 100. Higher scores indicate greater satisfaction with staff. Sound psychometric properties of this tool have been repeatedly reported in the literature.[21,36-38] For the regression analysis patient satisfaction scores were dichotomised into scores greater than 90 versus scores less than 90.

Study Procedures

We worked with decision makers to gain access to study sites and establish relationships with patients and staff. Research assistants recruited patient and staff participants and managed data collection procedures. Patient and staff questionnaires were in paper format. Research assistants collected patient satisfaction data. Completed staff questionnaires were returned in envelopes directly to research assistants or to secure boxes located in work areas. RAI-MDS patient data were provided to investigators by participating facilities for linkage with primary data. Data collection took place over a period of 18 months, beginning in 2005.

Ethical approval was obtained from the University of Toronto Review Board and the Ethics Review Committees within each participating facility (in 2004) and renewed annually until 2008.

Data Analysis Approach

We used SAS 9.0® for descriptive and inferential statistics. All variables were summarized using frequencies or means depending on the type of data collected. Continuous variables related to patient characteristics, processes of care and patient outcomes were compared across facilities using Kruskal-Wallis tests. When a significant difference was found, each facility was compared to each other using a series of Wilcoxon rank sum tests. The significance level was set at .01 due to the large number of pairwise comparisons required. Categorical variables were compared across facilities using Chi-square tests of difference. CCC staff were divided into four categories for analysis: licensed nurses (registered nurses and registered / licensed practical nurses), allied health professionals, unlicensed assistive personnel, and leaders/educators. Because of the small number of personnel in the leader/educator category, no further analyses are reported for this group beyond their characteristics. Similarly, eight staff members did not indicate their role within CCC, so these staff are included with the whole sample description of staff characteristics but are not included in subsequent analyses. Continuous variables related to care provider characteristics, work environment, and responses to the work environment were compared among the three remaining categories of staff using Kruskal-Wallis tests. When a significant difference was found each staff category was compared to each other using a series of Wilcoxon rank sum tests. Categorical variables were compared across staff categories using Chi-square tests of difference.

Generalized estimating equation (GEE) was used to assess the impact of nurse staffing, work environment, and staff responses to the work environment on each of the three patient outcomes (length of stay, location of discharge and patient satisfaction). GEE was used to account for patients being clustered within facilities. GEE adjusts for the possibility that patients within a given facility are similar to each other because of referral practices. Logistic regression was used to predict the impact of selected structures and processes of care on patient outcomes.

Involvement of Decision Making Partners

This project received support from senior Vice-Presidents at CCC facilities and the Ontario Heart and Stroke Foundation. Decision making partners were responsible for guidance, support, and expertise in issues related to the specific work environments in the selected CCC facilities. Decision makers assisted in focusing the research questions and in making sure that the questions were relevant, and they helped to identify the three important outcomes of interest to CCC. These partners were instrumental in assisting with practical implementation procedural plans such as access to patients and staff for study inclusion. Decision making partners are participating in dissemination of these findings and suggesting strategies to a broader group of stakeholders (including patients and their families).

Decision making partners are also participating in our knowledge transfer strategies (eg. decision maker/partner organization websites). We have prepared several study updates and reports in clear, non-technical language to communicate study processes, findings, implications and applications for distribution in relevant newsletters and websites. We have also developed

a study website and provided linkages to this website through partner websites and newsletters. The study website articulates details of study processes, findings, and use of findings. We have prepared traditional manuscripts for peer review and publication consideration to disseminate findings, implications, and applications beyond our borders.

RESULTS

First, results related to secondary research questions are presented. Results related to the primary research question are presented last.

Secondary Research Questions:

1. What are characteristics of CCC patients, multidisciplinary staff, and work environments?
2. How do multidisciplinary CCC staff respond to their work environments?

Characteristics of Patients

Characteristics of the 81 patients included in the study are detailed in Appendix A. Patient characteristics were similar across all facilities, although the small samples from some facilities made it difficult to adequately statistically assess significant differences among sites. Overall, patients were 74 years of age, 60% were female, 51% were married and 35% lived alone prior to admission. Over 90% of patients in the sample were English speaking. This finding was likely due to the criteria that participants be able to understand and speak English well enough to complete the patient satisfaction survey. In terms of clinical characteristics, patients in the study were fairly similar among facilities. Exceptions noted included patients in Facility A who had significantly lower scores on the Personal Severity Index and the ADL Hierarchy, as well as higher scores on the Social Engagement Measure. This suggests that patients in Facility A were less ill and more socially active than patients in other facilities. Patients in Facilities B and D had significantly lower CHESS scores suggesting they were more clinically stable than patients in other facilities.

Characteristics of Staff

Characteristics of the 162 staff who participated in the study are detailed in Appendix B by occupational category (licensed nurses, allied health professionals, unlicensed aids, and leaders/educators). Staff who did not indicate their CCC role have been included in the whole sample totals. There were no significant differences among staff job categories in relation to proportion of females, proportion working full-time, and proportion enrolled in a university or college course. Although the mean age of all participants was 44 years, licensed nurses were significantly older than were allied health professionals. The number of years experience in the current role was different across all job categories. Leaders and educators had the least amount of experience (2.1 years) and licensed nursing staff had the most experience (11.8 years). Leaders and educators worked longer hours (more than 8 hours a shift) than did all other job categories. A significantly higher proportion of allied health professionals (90.3%) reported having a baccalaureate university degree than did licensed nurses (20%) and unlicensed aides

(22%). However, this is not surprising given that allied health professionals (e.g., physiotherapists, occupational therapists) require a university degree as their minimum education level for practice (for some professional groups, this minimum entry to practice requirement has changed over recent years). Of interest was that a higher proportion of unlicensed aides had a university degree than did licensed nursing staff.

Characteristics of the Work Environment

Multidisciplinary staff ratings of their work environments are detailed in Appendix C by occupational category. Results for the leaders and educators are not reported because of the small sample size in this job category. There were no statistically significant differences among occupational categories in any of the work environment ratings. This indicates that regardless of job category, CCC staff seem to be experiencing similar work environments.

The mean supervisor support score was 69.1 and ranged from 9.1 to 100 across all staff. Staff rated their immediate supervisor as displaying empathy, being dependable, and building connections with staff more often than 'occasionally' but less frequently than 'often'. Findings are similar for the other four aspects of the work environment (work empowerment, leadership behaviour, organizational climate and work effectiveness – see Appendix C). However, on average, staff reported significantly higher scores about their own work effectiveness than other aspects of their work environments.

Staff Responses to the Work Environment

Multidisciplinary staff responses to their work environments are detailed in Appendix D by occupation category. Results for leaders and educators are not reported due to the small sample size in this job category.

The mean level of job satisfaction score was 60.7 with observed scores ranging from 22.2 to 94.4 for all staff. These findings indicated that staff rated their overall job satisfaction as higher than neutral but less than satisfied. There were no significant differences in job satisfaction among staff categories.

Overall, less than one third of staff rated the quality of patient care as excellent. There were significant differences in perceived quality of patient care among categories of staff. Allied health professionals had significantly lower ratings of perceived quality of patient care than did licensed nursing and unlicensed aides.

Staff emotional exhaustion (burnout) scores indicated that 27.7% of staff were experiencing high levels of burnout and 30.5% were experiencing moderate levels. There were no significant differences in emotional exhaustion among staff categories.

Nearly two thirds of staff rated their general health as very good or excellent. There were no significant differences in self-reported health among categories of staff.

The mean number of missed hours in the preceding three month period was 10.7 hours. Both licensed nursing staff and allied health professionals reported significantly fewer missed hours from work than did unlicensed aides. Across the sample 53% (86 staff) reported missing no hours from work in the preceding three months.

Overall, 30.2% of staff indicated it was unlikely or very unlikely that they would remain employed in that setting for the next five years. Allied health professionals were significantly more likely to be planning to leave their current role than other categories of staff (52% reported planning to leave their jobs).

Processes of Care

The amount of rehabilitative interventions provided by nursing, occupational therapy, and speech therapy were similar across facilities. Patients in Facility F received significantly more minutes of physiotherapy than did patients in other facilities (see Appendix E).

Differences across facilities in terms of the category of care giver (Registered Nurse versus Registered Practical Nurse versus Health Care Aide) assigned to provide patient care are partly due to the small sample sizes in some facilities. Hiring practices and different nursing care delivery models exist across facilities. For example, Facility B has an all Registered Nurse staff while Facility A is the only study setting where health care aides are hired and assigned specific patient assignments. The other facilities have a combination of Registered Nurse and Registered Practical Nurse staff who are assigned to provide nursing care to patients. Facility A provided greater continuity of nursing care providers than Facilities C, D, E and F (see Appendix F).

Patient Outcomes

Satisfaction. The mean patient satisfaction score across facilities was 71 (out of 100) and ranged from 40 to 87 across the six settings. Facility E had lower patient satisfaction scores than Facilities A, C, and F. As well, Facility B had lower scores than Facilities A and F (see Appendix G).

Length of Stay. The mean length of stay across facilities was 113 days and ranges from 88 to 174 days. Facility B had a significantly longer length of stay than did other facilities (see Appendix G).

Location of Discharge. There were no statistically significant differences in the location of discharge among facilities. Overall, nearly half of all patients (48%) were discharged to a location characterized by independent or semi-independent living such as home or a residential care facility. Just over one third (35%) were discharged to a long-term care facility (lower amount of care provided than CCC) while the remainder of patients (17%) stayed in CCC or were discharged to a facility that provided a higher level of care such as an acute care setting (see Appendix G).

Primary Research Question:

How do CCC staffing and work environments affect three patient outcomes for patients recovering from stroke in Ontario CCC settings: discharge location, length of stay, and patient reported levels of satisfaction with care?

The small sample of patients (n=81) recruited into the study dictated that only five predictor variables could be entered into the regression models for each patient outcome. Predictor variables were chosen based on research in other settings that have indicated links between patient outcomes and patient characteristics, work environments, processes of care and staff responses to work environments. The variables chosen were: whether or not the patient lived alone, patient scores for the ADL Hierarchy, continuity of nursing care providers, minutes of nursing rehabilitative interventions, and staff job satisfaction.

Discharge Location. None of the variables tested were found to be significant predictors of where patients were discharged (lower level of care vs. same or higher level of care). Please see Appendix H for regression results.

Length of Stay. More continuity of nursing care providers was a significant predictor of patients staying longer than 100 days in CCC. Please see Appendix I for regression results.

Patient Satisfaction. Two patient characteristics were found to be significant predictors of higher patient satisfaction scores (greater than 90 out of 100): patients who lived alone prior to admission and patients with lower ADL hierarchy scores. None of the staffing or work environments characteristics were found to be significant predictors of patient satisfaction with care. Please see Appendix J for regression results.

Study Limitations

One important limitation of this study was the low number of patients eligible to be recruited for the study. As a result of the small sample of patients in the study, only a limited number of variables could be placed into the regression models. Therefore, some of these variables or even other un-assessed variables may well be predictors of these patient outcomes.

There were a number of limitations related to external validity of findings. Because this study involves a convenience sample of six facilities with CCC units, the representativeness of both patient and staff samples working in CCC settings in Canada or internationally is unknown. Furthermore, although all staff who regularly worked on study units were invited to participate by completing the staff survey, differences in work environment perceptions and experiences might have existed between participant responders and staff non-responders. The same threat may exist in relation to patient participants. Although there have been no significant systematic events or changes within CCC settings since these data were collected, staff perceptions of the work environment and their responses to work may be different today.

FURTHER SUGGESTED RESEARCH

Based on our findings, the following are suggested areas for future research:

1. Examination of relationship between work environments and patient outcomes with larger samples of CCC patients and with patients with conditions other than stroke

2. Examination of relationships between CCC work environments and staff responses to their work environments (e.g., retention of CCC staff).

3. Almost half of all stroke patients admitted to slow stream rehabilitation units went back to their home or residential care facility when discharged. Examination of additional factors that influence patients' ability to return to an independent living environment is suggested.

4. Within the 6 facilities sampled, variations existed in terms of staff mix (registered nurse versus registered practical nurse versus health care aide). Future research should focus on understanding the most appropriate staff mix for this patient population.

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Tourangeau, A. E., Widger, K., Cranley, L., Bookey-Bassett, S., & Pachis, J. (2009). Work environments and staff responses to work environments in institutional long-term care. *Health Care Management Review*, 34(1), 104-114.

PEER-REVIEWED PRESENTATIONS

Delivered

Tourangeau, A. E. & Widger, K. (November 24, 2008). Burnout and Other Responses to Work and Work Environments for Nurses Caring for the Elderly in Institutional Long-Term Care Settings. 61st Annual Scientific Meeting of the Gerontological Society of America, National Harbor, Maryland, USA.

Tourangeau, A. E. & Pachis, J. (November 14, 2008). Nurse Work Environments and Nurse Responses to Work Environments in Institutional Long-Term Care Settings. 6th Biennial Joanna Briggs Colloquium in association with 12th International Nursing Research Conference, Cordoba, Spain.

Tourangeau, A. E. (October 20, 2008). Hospital mortality rates: Impact of structures and processes of hospital care. The International Society for Quality in Health Care 25th International Conference: Healthcare Quality and Safety: Meeting the Next Challenges. Copenhagen, Denmark.

Tourangeau, A. E. (March 3, 2008). Nurse burnout and other nurse responses to work and work environments. 2nd Annual Healthcare Safety Forum, Canadian Standards Association & Ontario Safety Association for Community and Healthcare, Toronto, Ontario.

Tourangeau, A. E. (October 1, 2007). Impact of structures and processes of hospital care on hospital mortality rates. The International Society for Quality in Health Care 24th International Conference: Transforming Healthcare in the Electronic Age. Boston, Massachusetts.

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Accepted for Presentation

Cranley, L., Pachis, J., Tourangeau, A. E., & McGilton, K. (May 27-29, 2009). Work environments and staff responses to work environments in chronic care hospital settings. 4th International Congress on Innovations in Nursing. Perth, Australia.

Study Website Link: http://www.atourangeau.nursing.utoronto.ca/

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Appendix A: Patient and clinical characteristics by facility and for whole sample

	Facility A	Facility B	Facility C	Facility D	Facility E	Facility F	Whole Sample	P value*
N	36	10	7	15	6	7	81	
Patient characteristics								
Mean age at admission (SD)	70.9 (11.3)	74.0 (11.6)	71.7 (6.2)	80.4 (9.9)	76.1 (5.3)	76.9 (6.2)	74.0 (10.5)	NS
% Female	61.1	50.0	57.1	73.3	33.3	57.1	59.3	NS
% Living alone	33.3	40.0	20.0	35.7	33.3	42.9	34.6	NS
% English speaking	97.2	90.0	85.7	93.3	83.3	100	93.8	NS
% Currently married	51.5	40.0	not reported	40.0	80.0	71.4	51.4	NS
Mean (SD) scale scores for clinical characteristics								
Personal Severity Index	2.1 (1.6)	4.0 (2.7)	5.3 (2.0)	3.7 (1.9)	4.7 (2.4)	3.3 (1.3)	3.2 (2.1)	.001
ADL Hierarchy	2.7 (1.1)	4.1 (1.3)	4.1 (1.2)	3.8 (1.3)	3.8 (1.2)	2.9 (1.8)	3.3 (1.4)	.002
Social Engagement Measure	4.5 (1.4)	2.7 (1.6)	3.4 (1.6)	2.3 (1.7)	2.7 (2.3)	4.0 (2.6)	3.6 (1.9)	.002
Cognitive Performance Scale	1.4 (1.2)	2.1 (0.9)	0.6 (0.8)	2.1 (1.8)	2.2 (0.8)	2.4 (1.4)	1.7 (1.3)	NS
Depression Rating Scale	0.7 (1.1)	0.9 (1.4)	0.6 (1.1)	1.1 (1.2)	1.7 (1.8)	1.3 (1.9)	0.9 (1.3)	NS
CHESS	1.5 (1.1)	0.7 (1.3)	1.6 (0.8)	0.7 (0.9)	2.3 (1.2)	2.0 (1.0)	1.4 (1.1)	.005
Pain Scale	1.2 (0.8)	0.5 (0.7)	1.3 (1.1)	1.2 (0.9)	1.5 (0.5)	1.3 (1.0)	1.1 (0.8)	NS
Ontario Case Mix Index	1.2 (0.1)	1.2 (0.2)	1.3 (0.2)	1.3 (0.1)	1.3 (0.1)	1.2 (0.1)	1.2 (0.2)	NS

Note. SD = standard deviation; ADL = Activities of Daily Living; CHESS = Changes in Health, End-stage Disease, and Symptoms and Signs of Medical Problems; * P value refers to the probability of finding a significant difference among facilities for a variable by chance; NS = non-significant.
Theoretical ranges for scales: Personal Severity Index 0-18 (higher scores indicate patient is closer to death); ADL Hierarchy 0 − 6 (higher scores mean increased dependence); Social Engagement Measure 0-6 (higher scores mean higher levels of participation and initiative); Cognitive Performance Scale 0 − 6 (higher scores indicate more severe impairment); Depression Rating Scale 0 − 14 (higher scores indicate higher levels of depressive symptoms); CHESS 0-5 (higher scores mean higher levels of instability); Pain Scale 0 − 3 (higher scores indicate more severe pain); Ontario Case Mix Index 0.40 - 1.78 (higher scores indicate higher expected utilization of resources)

Appendix B: Staff sample description by occupational category and for whole sample

Sample characteristics	Licensed nursing	Allied health professionals	Unlicensed aides	Leaders / Educators	Whole sample*	P value**
N	95	31	24	4	162	
Mean age (SD)	46.3 (10.0)	38.3(12.2)	42.3 (12.1)	47.5 (9.3)	44.0 (11.2)	.008
Mean years in current role (SD)	11.8 (9.1)	3.3 (3.1)	6.0 (4.2)	2.1 (1.2)	8.9 (8.3)	<.001
% Female	95	94	87	100	94	NS
% Full-time	63	77	83	100	70	NS
% Usually working 8-hour shift (usual shift is 8 hours or less)	85	74	96	25	82	.002
% Baccalaureate or higher education	20	90.3	22	75	37	<.001
% Enrolled in university / college course	14	10	25	25	14	NS

Note. SD = standard deviation; NS = non-significant

* Whole sample includes 8 respondents who did not indicate their occupation

** P value refers to the probability of finding a significant difference among occupational categories for a variable by chance

Appendix C: Characteristics of work environment by occupational category and for whole sample

	Licensed nursing	Allied health professionals	Unlicensed aides	Whole sample*
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
N	95	31	24	150
Supervisory Support Scale	69.8 (21.6)	69.6 (17.4)	66.1 (22.9)	69.1 (21.0)
LEAP - Work empowerment	58.7 (18.0)	60.3 (13.7)	58.5 (14.6)	59.0 (16.6)
LEAP - Leadership behaviour	64.8 (19.7)	66.0 (14.2)	67.1 (18.5)	65.4 (18.5)
LEAP - Organizational climate	60.3 (15.2)	60.4 (12.4)	64.5 (11.9)	61.0 (14.2)
LEAP - Work effectiveness	73.4 (13.8)	70.0 (14.4)	75.6 (14.5)	73.1 (14.1)

Note. SD = standard deviation; LEAP = Learn, Empower, Achieve, Produce Survey

* Whole sample does not include leaders/educators and the 8 staff who did not indicate their CCC role

All scales standardized to be out of 100 (theoretical range)
Supervisory Support Scale: The higher the number, the higher supervisory support is rated. Observed range=9.1-100
LEAP - Work empowerment: Higher numbers indicate greater perceived work empowerment. Observed range=20.8-100
LEAP - Leadership behaviour: The higher the number, the higher supervisor leadership behaviour is rated. Observed range=15-100
LEAP - Organizational climate: The higher the number, the higher the organizational climate is rated. Observed range=31.3-100
LEAP - Work effectiveness: Higher numbers indicate more perceived work effectiveness. Observed range=25-100

Appendix D: Staff responses to work environment by occupational category and for whole sample

	Licensed Nursing	Allied health professionals	Unlicensed Aides	Whole sample*
N	95	31	24	150
LEAP – Mean (SD) Job satisfaction**	60.3 (14.6)	62.8 (10.9)	59.7 (12.9)	60.7 (13.6)
Quality of patient care:				
% Fair	10.5	33.3	8.3	14.8
% Good	50.5	53.3	66.7	53.7
% Excellent	49.0	13.3	25.0	31.5
Emotional exhaustion level				
% High	30.5	25.8	12.5	27.3
% Moderate	32.6	29.0	29.2	30.5
% Low	36.8	45.2	58.3	42.2
General health rating:				
% Poor	1.1	0	0	0.7
% Fair	9.5	6.5	4.2	8.0
% Good	24.2	32.3	25.0	26.0
% Very Good	47.4	38.7	45.8	45.3
% Excellent	17.9	22.6	25.0	20.0
Mean (SD) Hours missed in last 3 months	9.1 (14.8)	6.6 (10.3)	23.8 (27.5)	10.7 (17.5)
Intent to stay for 5 years:				
% Very Unlikely	12.8	22.6	4.2	13.4
% Unlikely	10.6	29.0	25.0	16.8
% Likely	38.3	22.6	29.2	33.6
% Very Likely	38.3	25.8	41.7	36.2

Note. SD = standard deviation; LEAP = Learn, Empower, Achieve, Produce Survey

* Whole sample does not include leaders/educators and the 8 staff who did not indicate their CCC role

** Scale standardized to be out of 100

LEAP job satisfaction: Higher numbers indicate greater perceived job satisfaction. Observed range=22.2-94.4

Appendix E: Mean (SD) total minutes of focused rehabilitative care provided over 7 day period by facility and for whole sample

Occupation category	Facility A	Facility B	Facility C	Facility D	Facility E	Facility F	Whole sample	P value*
Nursing interventions	616 (191)	563 (276)	619 (66)	539 (172)	568 (67)	750 (165)	604 (188)	NS
Occupational therapy interventions	88 (25)	188 (130)	136 (99)	69 (27)	145 (130)	76 (69)	104 (77)	NS
Physiotherapy interventions	116 (42)	143 (89)	103 (73)	88 (21)	152 (53)	176 (31)	121 (55)	.003
Speech therapy interventions	30 (58)	43 (94)	0 (0)	8.3 (27)	59 (51)	8.6 (23)	26 (55)	NS
Total focused rehabilitative care	851 (199)	937 (480)	858 (174)	705 (172)	923 (144)	1011(134)	854 (247)	NS

Note. SD = standard deviation; NS = non-significant

* P value refers to the probability of finding a significant difference among facilities for a variable by chance

Appendix F: Skill mix and continuity of nursing care provider by facility and for whole sample

Measure	Facility A	Facility B	Facility C	Facility D	Facility E	Facility F	Whole sample
Proportion of care provided by RNs over 2 weeks	29.7 (34.6)	100 (0)	44.7 (36.5)	35.0 (14.0)	41.7 (24.5)	26.0 (30.6)	41.4 (35.9)
Proportion of care provided by RPNs over 2 weeks	69.2 (34.1)	0	55.3 (36.5)	65.0 (14.0)	58.3 (24.5)	74.0 (30.6)	58.2 (35.5)
Proportion of care provided by HCAs over 2 weeks	1.1 (2.5)	0	0	0	0	0	0.47 (1.9)
Continuity of nursing care provider*	37.0 (10.0)	35.0 (10.9)	44.1 (7.1)	41.3 (6.5)	46.4 (6.4)	44.4 (6.5)	39.7 (9.3)

Note. SD = standard deviation; RN = Registered Nurse; RPN = Registered Practical Nurse; HCA = Health Care Aide (NOTE: Only one facility assigned HCA as primary care providers).

* Ratio of number of different people assigned to provide care over 2 weeks with higher number indicating less continuity of nursing care provider.

Appendix G: Patient outcomes by facility and for whole sample

Outcome	Facility A	Facility B	Facility C	Facility D	Facility E	Facility F	Whole sample
Mean patient satisfaction score (SD)	80 (30)	58 (21)	83 (27)	60 (37)	40 (25)	87 (12)	71 (31)
Mean adjusted length of stay (SD)	109 (47)	174 (22)	124 (60)	88 (42)	112 (47)	88 (19)	113 (49)
Location of discharge:							
% Independent/semi-independent	60	50	71	13	40	42	48
% Long term care/rehab	23	40	0	80	40	29	35
% Higher level of care	17	10	29	7	20	29	17

Note. SD = standard deviation; Mean adjusted length of stay = stays greater than 180 days counted as 181 days

Appendix H: Logistic regression model of discharge destination (home care service, residential care service or private home)

Variable	OR (95% CI)	P value*
Lived alone prior to admission		
No	1.00	
Yes	0.67 (0.25, 1.79)	0.424 (NS)
Activities of daily living hierarchy	1.03 (0.670, 1.52)	0.861 (NS)
Continuity of nursing care provider	1.01 (0.96, 1.06)	0.820 (NS)
Nursing interventions	1.23 (0.95, 1.59)	0.119 (NS)
Staff's job satisfaction	0.92 (0.84, 1.02)	0.111 (NS)

Note. OR = odds ratio; CI = confidence interval; P value refers to the probability of finding a variable to be a significant predictor of discharge destination by chance (none were found to significant predictors in this model at the .05 level); NS = non-significant

Appendix I: Logistic regression model of length of stay of 100 days or longer

Variable	OR (95% CI)	P value*
Lived alone prior to admission		
No	1.00	
Yes	0.48 (0.18, 1.32)	0.155 (NS)
Activities of daily living hierarchy	1.41 (0.92, 2.16)	0.116 (NS)
Continuity of nursing care provider	0.93 (0.88, 0.99)	0.027
Nursing interventions	1.01 (0.78, 1.30)	0.968 (NS)
Staff's job satisfaction	0.95 (0.85, 1.06)	0.343 (NS)

Note. OR = odds ratio; CI = confidence interval; P value refers to the probability of finding a variable to be a significant predictor of patient stay of 100 days or longer by chance; NS = non-significant

Appendix J: Logistic regression model of a patient satisfaction score of 90 (out of 100) or higher

Variable	OR (95% CI)	P value*
Lived alone prior to admission		
No	1.00	
Yes	4.11 (1.34, 12.65)	0.014
Activities of daily living hierarchy	0.56 (0.34, 0.93)	0.026
Continuity of nursing care provider	1.03 (0.97, 1.09)	0.282 (NS)
Nursing interventions	0.81 (0.61, 1.08)	0.151 (NS)
Staff's job satisfaction	0.94 (0.84, 1.05)	0.296 (NS)

Note. OR = odds ratio, CI = confidence interval, P value refers to the probability of finding a variable to be a significant predictor of patient satisfaction score of 90 (out of 100) or higher by chance; NS = non-significant