



Canadian College of
Health Service Executives
Collège canadien des
directeurs de services de santé

CCHSE Fellowship “Special Project Option”

Using Evidence-Informed Management to Optimize Staff Mix Decisions in Long-Term Care and Evaluate Employee/System and Client Outcomes

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Date of Submission: April 2009

Table of Contents

Acknowledgement	
Key Messages.....	4
Executive Summary	5
1. Intervention Project	6
1.1 <i>Background</i>	6
1.2 <i>Problem Statement</i>	7
1.3 <i>Evidence Review</i>	8
1.3.1 Sources	8
1.3.2 Assessment	9
1.3.3 Applications.....	11
1.4 <i>Intervention Project Objectives, Models/Methods and Strategies</i>	13
1.4.1 Objectives	13
1.4.2 Models and Methods	14
1.4.3 Implementation Plan	17
1.4.4 Results	20
2. Lessons Learned.....	34
2.1 <i>Implementation of Change</i>	34
3. Dissemination.....	36
4. Implications	36
4.1 <i>For Other Decision Makers</i>	36
4.2 <i>Different Audiences</i>	37
4.3 <i>Future Activities</i>	37
Bibliography	39
Appendices	44

ACKNOWLEDGEMENTS

I would like to gratefully acknowledge the support provided by the Executive Training for Research Application (EXTRA) Program, administered by the Canadian Health Services Research Foundation (CHSRF) in collaboration with a group of partnering organizations: the Canadian College of Health Service Executives, the Canadian Nurses Association, the Canadian Medical Association, and a consortium of 12 Quebec partners, represented by the Agence des technologies et des modes d'intervention en santé (AETMIS).

I would also like to acknowledge the support of Eastern Health's Department of Corporate Strategy and Research, the Department of Psychology at Memorial University of Newfoundland and Labrador, and the Canadian Nurses Association (CNA).

KEY MESSAGES

- Creating models of care that enable nursing staff to work to their full scope of practice is critical to sustain quality, efficient care. In an environment such as Newfoundland and Labrador (NL) where the workforce is aging and declining, it is increasingly difficult to attract nursing staff to LTC, costs are escalating while funding is being constrained, and the demand for access to beds is increasing.
- Implementing a new staff mix is a major initiative that requires leadership, team commitment, collaboration, ongoing communication, and stakeholder engagement.
- Although many studies identify improved patient outcomes with higher ratios of professional nursing staff, there is no research-based evidence to support what the optimal staff mix for LTC should be or a systematic way to determine it.
- A tool for evaluating staff mix, such as the CNA Evaluation Framework, offers a means for assessing the comprehensive effects of staff mix changes and allocating resources more efficiently and effectively.
- Using an evidence-based approach to determine optimal staff mix can help influence health policy and inform best practice.
- Other variables in a LTC environment that might influence a resident's quality of care and nursing job satisfaction include: attitude, education and training of staff, leadership and management arrangements.
- Pilot projects offer the opportunity to test strategies for proactive change and system adoption for assessing staff mix.
- There is no "one size fits all" solution for determining best staff mix for LTC. Each LTC facility must consider various parameters specific to them when evaluating an appropriate staff mix.

EXECUTIVE SUMMARY

Faced with growing needs for high level long term care beds, a shrinking and aging nursing work force, difficulties in the recruitment of nursing staff, and increased pressure to achieve efficiencies, the Eastern Health Authority in Newfoundland and Labrador has decided to implement an alternative nursing staff mix.

As a response, Eastern Health initiated a pilot of the new staff mix model that enables RNs and LPNs to work to their full scope of practice and introduced the unregulated personal care attendant (PCA). This multi-site pilot was introduced with a corresponding control unit at three facilities. A study was conducted to measure the impact of this change using the Canadian Nurses Association (CNA) Evaluation Framework.

Results suggest improvements in staff satisfaction, as well as enhanced perceptions of quality of resident care following the staff mix change. Further, staff on control units was significantly *more* likely to report the need for a change in care and less likely to report their current staffing mix was providing quality care.

Overall improvements in resident and family satisfaction, and perceived quality of care were also observed between Phase I and II. Family members' perceptions of the living environment, activity, choice, communication, care and services, and overall environment were also significantly more favorable during Phase II of the study.

Wide variation of quality of care indicators suggest reporting practices need to be addressed within these LTC sites. Differences found, in fall rates for example, are difficult to attribute to the new staff mix rather than reporting practices during the intervention. Retraining of staff, regarding reporting and increased compliance with use of standardized forms across sites, may help alleviate this problem.

A decrease in overtime episodes between pre- and post-implementation periods for both control and intervention units was found at two sites. A pattern towards a decrease in episodes of absenteeism was found at one facility with an increase found for the other two. There was no statistically significant difference found in sick leave episodes pre- or post-implementation periods for the control and intervention units. The variation in the human resource indicators and lack of consistent pattern makes it difficult to draw conclusions about the impact of the staffing mix. However, it is positive that it did not appear to influence staff's use of overtime, absenteeism and sick leave - all indicators of job satisfaction.

The pilot provided invaluable information regarding planning and implementation of the new staff mix. Gaps in clerical support and the need for mentoring was identified as a necessity for role adjustment. Benefits included the flexibility of an increase of resources to be dedicated at peak times.

A set of core components from the findings will be incorporated into the full implementation phase. The pilot indicated the need for dedicated resources. A clinical coordinator and a human resources coordinator have been hired to assist with the planning and implementation of the new model. A plan including funding to enable LPNs and RNs to complete the Health Assessment and Medication Administration courses has been adopted.

The study also suggested that the CNA Evaluations Framework is a useful tool for managers and other decision-makers to use when measuring the comprehensive effects of staff mix change and planning further human resource modifications.

Findings from this research study will inform LTC policy in the province. The study illustrates how research can influence health policy as well as highlight the positive role of an evidence-informed approach to health workforce management.



1. INTERVENTION PROJECT

1.1. Background

Eastern Health, Newfoundland and Labrador's largest health authority serves a population of more than 290,000 and offers unique provincial programs and services. It has 63 percent (1485) of all LTC beds in the province spread over fourteen nursing homes throughout the region. Like many other health care organizations, Eastern Health is experiencing difficulty in recruiting and retaining nursing staff for LTC facilities. Diminishing pools of available health human resources and the inevitable retirement of an aging nursing work force has made recruitment to LTC difficult. One response to this has been an initiative to adjust the nursing staff mix within the LTC sector in the province.

A national review conducted found that NL had some of the highest hours of care per resident in the country, ranging from 2.5 – 4.7 hours of care; the highest nursing staff mix in the country with mixes from 22 – 30 percent RN and 70 – 78 percent LPN; and one of the highest cost per resident at approximately \$6,000 per month (see Appendix A). Staff mix (or skill mix) is the combination and number of regulated and unregulated persons providing direct and indirect nursing care to clients in all settings where regulated nursing groups practice¹. In a comparison of roles and responsibilities the review also found NL RNs were focused on tasks such as medication administration, which was the role of the LPN in most other jurisdictions and LPNs were performing basic personal care, which was the role of the PCAs.

Over recent years the traditional role of LPNs has been evolving to encourage a change in the staff mix. Educational programs for LPNs have evolved to meet national program standards and the future LTC human resource needs. In 2000, the College of Licensed Practical Nurses (CLPNNL), in consultation with the Association of Registered Nurses of NL (ARNNL), expanded the role of the LPN to include medication administration, wound care, and oxygen administration. In 2004, the College introduced the health assessment course.

In 2004, the Government of NL challenged the LTC system to become more efficient with respect to the nursing staff mix. A budget reduction measure was implemented that reduced funding for LTC facilities based on an assumption that nursing staff mix could be changed. The expectation was that the number of RNs and LPNs could be reduced and unregulated care providers, personal care attendants (PCAs), added. Inherent in this measure was the expectation that RNs and LPNs would work to their full scope of practice or range of services that a professional group is authorized to provide. This staff mix change was predicted to result in a potential savings of \$6,000 annually per position. While up to \$1M was reduced in some boards, little actual savings was achieved as there were virtually no trained PCAs available; RNs and LPNs were not trained to work to full scope of practice or receptive to take on new roles; there were significant union (labor relations) issues that had to be addressed; and the current model of care was not conducive to introducing untrained PCAs.

These issues have presented challenges for the implementation of a new staff mix into LTC sector over recent years. In particular, the model of care delivery, policies, job descriptions, and staffing mix in LTC did not enable the newer LPNs to practice to their full scope which caused frustration. When employers enabled the LPNs to practice their medication administration skills, RNs viewed it as an encroachment on



their role and expressed concern about their future. This reaction from nurses was common². While the implementation was slow, organizations began to change the role of the LPN, for example by assigning them the role of medication administration when there was no nurse available. In comparison, however, there was little enhancement of the new role of the nurse. Little support existed to enable the nurse to take on a coordinator of care/leadership role and frequently, RNs were reluctant even when supported by the employer.

Due to the negative reaction from RNs in NL, employers became engaged in discussions with the professional nursing association. In February 2004, the ARNNL developed a position statement regarding the role of the RN in LTC. It described key areas for the new RN role including: advocate; leader; practitioner; program planner; educator; and researcher³. The paper resulted in identified areas where support is required to enable nurses to take on their enhanced role including skills development in areas of leadership, conflict resolution, and team development⁴.

Since that time there has been a strong commitment to bring this change to the LTC system in the province. Recommendations regarding service delivery, education, and change management from a report from a provincial staff mix committee in 2006 were shared with and well-received by stakeholders⁵. Recent changes announced by the CLPNNL will help move the scope of practice forward for LPNs. By April 2012 all LPNs will be required to have the medication administration and health assessment courses completed in order to obtain a license to practice. However, this has put added pressure on Eastern Health to access additional training offerings to enable approximately 600 LPNs without the medication course and 1050 without the health assessment course to meet the 2012 deadline. LPNs have been utilized more frequently to administer medications when there is no nurse available. Also, the colleges have started to deliver the PCA program and the first class graduated in the fall of 2007.

The change in staff mix, moving to full scope of practice for RNs and LPNs, and the introduction of the unregulated PCA in LTC is a major change initiative for Eastern Health. This intervention project will involve a major change in how LTC care is provided and will have major human resource, labour relations, education, and training implications for all regional health authorities in Newfoundland. The change will see the reduction of RNs and LPNs and the addition of an unregulated PCA. Providing evidence to support the change is critical to getting buy-in of all internal and external stakeholders. Evaluating this initiative will enable Eastern Health to determine if the new staff mix is providing safe, efficient, quality care into the future as well as the level of satisfaction of residents, families, and staff.

1.2. Problem Statement

Eastern Health is faced with growing needs for high level LTC beds and a shrinking and aging nursing work force. Efforts to recruit nursing staff to LTC have become increasingly more difficult, resulting in periods where beds have been temporarily closed due to inadequate staff. This situation has led to a sense of urgency and has been identified as a priority within the organization. Additionally, Eastern Health's LTC sector is characterized by one of the highest nursing staff mixes in the country. In other words there is a higher ratio of professional, regulated workers (RNs and LPNs) to PCAs, or unregulated workers.



Consequently, Eastern Health is attempting to implement a new nursing staff mix that enables staff to work to their full scope of practice that would be more efficient and facilitate the ability to enhance services while continuing to deliver quality care to residents.

There is no systematic way to determine what an appropriate staff mix for LTC should be. Until recently, selection of a staff mix within an appropriate care delivery framework has not been well defined. Consequently, this project measured the outcomes of a pilot of a new staff mix that enables RNs and LPNs to work to their full scope of practice and introduces the unregulated PCA in three LTC facilities in Eastern Health. The new mix resulted in a reduction of RNs and LPNs and the addition of unregulated PCAs. The CNA Evaluation Framework was applied to identify resident, staff, and system indicators to determine the impact of the new staff mix. This pilot project involved changing how LTC is provided and will have major human resource, labour relations, education, and training implications for all regional health authorities in Newfoundland once implemented on a provincial scope.

1.3. Evidence Review

1.3.1 Sources

A preliminary literature review to identify staff mix for LTC was conducted using the databases Medline, PubMed, Cochrane Library and the Cumulative Index Nursing and Allied Health Literature (CINAHL). The results were limited by “long term care” and English. The PubMed search included the terms: “staff mix” or “staff mix” or “staffing mix” or “RN mix” and “long term care” (MESH) or “nursing homes” (MESH). This resulted in 29 articles being found. The Cochrane database was searched and the keyword phrase “staff mix” was used and found 12 results. A hand review was also completed and numerous related articles were retrieved. The CINAHL database search included key terms “RN mix” or “staff mix” and “residential aged care” or “nursing home” or “long term care”. This resulted in 22 articles. Additional search terms “staffing levels” and “resident outcomes” resulted in 12 articles.

As the study progressed, a second, more thorough review was undertaken in consultation with a professional university librarian. A search of CINAHL, Medline, and PubMed was repeated using “long term care” or “nursing homes” and “staff mix” “nursing staff” or “medical staff” or “health personnel” “staff mix” and “scope of practice”. In total, 46 articles were retrieved from CINAHL and 73 articles from PubMed. The Canadian Business and Current Affairs (CBCA) Reference database was also searched, but did not yield any results. The grey literature was addressed by searching the websites of select organizations such as the CNA and by a general Internet search using the same terms and keywords identified above. A number of local and provincial government documents, including the NL Provincial Staff Mix Committee Report and a Nova Scotia Task Force Report on resident/staff ratio in nursing homes and various CNA documents were obtained.

Evidence was also collected from program and policy documents located primarily through provincial and federal government websites. Furthermore, contact was made with key researchers, identified from the literature, at the University of British Columbia and University of Toronto who had interest and expertise in this project area. Discussions held with the Director of Care of a British Columbia LTC facility that recently redesigned their staff mix also proved to be informative. We learned how staff mix changes were



implemented, types of evaluation tools used, and lessons learned. Finally, participation in the NL Provincial Staff Mix Committee also provided information on experiences from other senior nursing executives regarding staff mix and provided an opportunity to garner support to move this project forward. Ongoing contact and involvement of the CNA regarding the use of their evaluation framework for determining the impacts of nursing staff mix decisions also proved helpful.

1.3.2 Assessment

A review of the literature revealed a lack of empirical research regarding evaluation of changes in staffing mix in Canadian LTC facilities. The vast majority of the literature is from the United States (U.S.) and involves evaluation of changes in staffing mix in acute care settings. There is no conclusive evidence in the literature as to what an optimal staff mix should be for Canadian LTC facilities.

A number of studies conducted in the U.S. have demonstrated a strong relationship between staffing mix ratios in LTC settings and quality of care and resident outcomes. It was found that facilities with a higher proportion of regulated nursing staff (particularly RNs) have been associated with better quality and more positive patient outcomes including lower death rates, higher rates of discharges to home, improved functional outcomes, fewer pressure ulcers, fewer urinary tract infections, lower urinary catheter use, and less antibiotic use⁶⁻²³. For example, researchers using data from 1,287 nursing homes in five states showed that having a higher RN staff mix was associated with better outcomes in terms of frequency of pressure ulcers, cognitive functioning, and use of restraints²⁴.

Although positive outcomes were found to be associated with more RN staff, there was no staff mix ratios provided in the U.S. studies. In fact, there is very little evidence to support what an appropriate nursing staff mix in LTC facilities should be. A task force report on resident/staff ratio in nursing homes in Nova Scotia (2002) stated that several factors contribute to the determination of appropriate staffing levels including: the variety of direct care staff available, the existence of non-direct care staff, the experience and education of staff, the roles and responsibilities of direct care staff, the intensity and complexity of resident care needs, the physical layout of the nursing home, the availability of time saving equipment and supplies, and the quality of care expected²⁵. This report acknowledged that this list was not exhaustive and may include other factors such as: number of residents, the dependency/health and social care needs of the residents, the intensity and complexity of those needs and how they varied at different times of the day; differences in practice patterns; the architecture, geography and layout of the home; the technology available (i.e. mechanical lifts); local policies and the quality of care expected²⁶.

Specific tools to help with decision-making regarding staff mix decisions are also limited²⁶. The tool most commonly used for determining staffing needs is a workload measurement system. This method of determining staffing requirements has been criticized for simply concentrating on tasks performed. For example, it does not allow for decision-making, a key part of the RN role, or fully consider environmental factors such as geographical situation, case mix and facility size, and available support services.

Patient classification systems are one of the newest methods for establishing staff mix requirements²⁶. The two most well known of these in the UK are the RUG III care mix system (MDS 2000) and the RCN



assessment tool (RCN 1997). Patient classification systems identify needs associated with individual patients and from this predict nursing care requirements and thus staffing. The validity and reliability of such systems, however, has been questioned and they do not account for environmental factors and policy constraints such as care requirements, administration, and teaching responsibilities.

The Resident Assessment Instrument (RAI 2.0), or MDS 2.0 data set has been endorsed by the province for LTC and by the Canadian Institute of Health Information (CIHI) as the national standard for LTC settings. RAI data allows for the categorization of residents into Resource Utilization Groups (RUG's), which is the case mix classification system. The case mix system uses combinations of resident characteristics to identify groups of residents with homogeneous resource requirements. A case mix index represents the mean resource used by residents in that group relative to other groups which can be used to predict the nursing resources required.

Others have suggested a multifaceted approach to determining staff mix. Hurst (2002) identified three main types of staff mix calculations that have been advocated in services for older people: expert professional judgment; workload/activity analysis to calculate the staff required per occupied bed; and patient classification system. He suggested that more than one method should be used to calculate staff mix. Sibbald suggested the development of an appropriate staff mix for LTC requires an evidence-informed process to ensure the right staffing mix to meet resident's needs, to achieve buy-in from internal and external stakeholders and to ensure quality resident, system, and staff outcomes. The importance of expert professional judgment was supported as a valuable and necessary component in determining staff mix^{27, 28-31}.

There have been a number of frameworks identified in the literature to assist decision-makers in making staff mix decisions. Mueller, C. (2002) identified a framework that included five interrelated components: 1) philosophy on standards of care; 2) resident needs; 3) nursing resources; 4) allocation of nursing personnel; and 5) delivery of nursing care²⁸ (see Appendix B). Furthermore, several provincial professional associations have proposed frameworks to guide decision makers in determining staffing mix and levels. The ARNNL (2006) proposed a framework that presents guiding principles to be considered in making staff decisions and recommended the CNA Evaluation Framework for staff mix decision be used²⁹. The CNA Evaluation Framework is a comprehensive tool that considers the matching of staff, resident, and system structures and processes on outcomes²⁷. The framework identifies many factors that must be considered in making decisions regarding an appropriate staff mix for LTC and was selected to evaluate this project³² (see Appendix C).

There is a lack of literature related to optimal staff mix levels or evaluation of nursing staff mix decision-making³³⁻³⁶. Much of the literature on nursing staff mixes is descriptive and provides little in terms of methodologies and interpretation of results³⁷. Studies that go beyond descriptive are often limited by problematic methodology such as inappropriate evaluation, small sample size, and are of short duration. In addition, the majority of publications in this research area have originated in the U.S. where differences in the LTC system limit its ability to generalize to Canada.

In conclusion, research indicates that determining appropriate staff mixes in LTC is a complex process and many factors must be considered²⁶. It is almost impossible to provide "a one size fits all" solution for



determining the best staff ratio. Hence, each LTC facility must consider the various parameters specific for their facility when calculating appropriate staff mixes.

1.3.3 Applications

Without evidence to support what an optimal staff mix should be, Eastern Health implemented a new staff mix within the ranges recommended by the NL Department of Health Staff Mix Committee (2006). These recommendations were made in three priority areas, including: service delivery; education; and change management issues. The provincial committee recommended staff mix ratios of RN 14 – 20 percent; LPN 40 – 53 percent; and PCA 33 – 40 percent. The ranges were based on reviews of related literature including those of Hurst and Mueller; of other jurisdictions; experience with the current provincial staff mix; and expert advice from the committee and other nurses and nurse managers in the system.

The Staff Mix Committee's report identified the need for evaluation of the new staff mix to ensure resident needs are met and to identify impacts on residents, staff, and the system. The new staff mix was implemented across three pilot sites and the CNA Evaluation Framework was used to determine the impact of the new nursing staff mix on residents/family, staff, and the system.

The MDS assessment tool was used where possible to match resident care needs with staffing needs. In determining which units to pilot, units that had the minimum data set in place were sought. In determining staffing mix, there are a number of factors, according to Seago (2002) that should be considered besides patient acuity, which included "RN/LPN expertise; work intensity; physical layout of the unit; and the availability of other health care providers, support staff and physicians to the unit"³⁸. These factors were considered when determining the appropriate ranges of staff mix for this project. Also, the CNA Evaluation Framework for Staff Mix Decision Making was used which has a comprehensive list of resident, staff, and system factors that impact the staffing mix.

There were significant challenges/barriers to overcome to move this major initiative forward. Using a pilot approach and evaluating the impacts was the strategy that provided the evidence to support the staffing mix, engage the management and staff, and to get buy-in. These challenges/barriers included:

- Four of the 14 LTC facilities within the region are faith-based and are not directly managed by Eastern Health although they are operated under a Memorandum of Understanding. The expectation is they would be part of the intervention. However, there is constant challenge regarding policy direction, particularly when change is expected.
- A significant percentage of the current LTC nursing workforce are not trained to work to their full scope of practice. Of the 1350 LPNs in Eastern Health, 600 require the medication course of which 247 could retire by 2012 and 1050 require the health assessment course of which 288 could retire by 2012. This may result in staff having to move from their assigned units/facilities to provide an adequate pool of full scope LPNs to achieve the targeted staff mix. Significant training for RNs is also required regarding health assessment, leadership, and conflict resolution. Of the 304 RNs in LTC, 103 RNs could retire by 2012. This poses a challenge from a planning perspective as staff nearing the end of their careers are



reluctant to participate in education. Employers are not interested in investing in training for those close to retirement.

- There are a limited number of PCAs that have fulfilled the educational requirements for their role as outlined in their job description. A four-month training program is currently being offered through the college system, and several classes have graduated since 2007. However, feedback from sites has been that graduates often need additional training and support.
- Different facilities are at different stages in implementation of upgrading LPNs and RNs. Rural areas tend to have more difficulty recruiting staff and accessing education/training.
- Resistance from the nursing professional associations/unions/staff regarding the change in traditional roles of RNs, reduction of regulated staff and the introduction of an unregulated worker. Getting buy-in from unions will be difficult in the current environment as the integration of bargaining units is still ongoing. Currently each facility has separate bargaining units, however, four of the six nursing homes in the St. John's area have separate owners and their bargaining units will remain separate. Consequently, issues will have to be negotiated with various stakeholders which may impede the roll-out of the new model.
- The classification system in place to determine residents' hours of care is a provincial tool and it is subjective. The organization has only begun to implement the minimum data set (MDS), which is widely accepted as a superior resident assessment tool and is used internationally. The tool is implemented in approximately 40 percent of the LTC beds and traditionally completed by RNs. This will need to be implemented fully and LPNs will also need to be trained as the new model is implemented.
- There is no workload measurement tool in place for LTC in Eastern Health to determine staffing levels.
- Diversity between LTC facilities. Facilities vary greatly in unit size, types of residents, and unit layout/design. These differences do impact workflow and intensity and will have to be considered when determining optimal staff-mix.
- Government/Eastern Health has made a decision to implement the change through attrition. This will result in the change taking longer to implement and may require extra resources. Also, the number of LPNs requiring training significantly lowers the number of appropriately trained staff to establish model unit levels.
- Significant resources/costs will be required to implement this initiative at a time when there is pressure to achieve savings in the system.
- Labour relations issues, such as what will happen to staff not trained to full scope and will LPNs be reclassified or demoted from a salary perspective, arise.

With such a fundamental change to traditional roles, mixed reaction to the new staff mix can be anticipated. Much of the literature and provincial reviews indicate significant numbers of unregulated workers in other jurisdictions; however, negative reaction from professional nursing associations and the public is anticipated with the introduction of PCAs due to a perception that this will lead to reduced quality of care. Although the new staff mix will result in a reduction of regulated workers (RN and LPNs) and an increase in PCAs, the ratio of regulated to unregulated workers will still be significantly higher than in other jurisdictions. In recent years there has been some support for the move to enable RNs and LPNs to function at their full scope of practice. The Canadian Nurses Advisory Committee Report (2002), on *Our Health, Our Future: Creating Quality Workplace for Canadian Nurses* recommended that all employers put policies in place that allow each RN, LPN, and RPN to function to the maximum of their practice abilities



according to their respective legislation, licensing body, and employer. At present, the ARNNL and CLPNLNL are supportive of nurses and LPNs moving to full scope of practice.

Although there is no body of literature to support the implementation of the new staff mix within LTC, there are factors driving the need to change that will facilitate this intervention. The current difficulty recruiting RNs and LPNs to LTC has created a sense of urgency to address the scope of practice of nursing staff. The lack of staff has resulted in bed closures in LTC which has resulted in beds being blocked in Acute Care, cancelled surgeries, and growing waitlists. The increasing complexity of resident care needs requires that all staff function at their full scope of practice. This change is supported both at the executive level in Eastern Health and the provincial Department of Health.

1.4 Intervention Project Objectives, Model/Methods, and Strategies

1.4.1 Objectives and Anticipated Outcomes

The overall project goal is to implement a new staff mix in LTC and evaluate its impact on residents, families, staff and the system using the CNA Evaluation Framework.

This will be assessed by examining differences between pilot and control units in three facilities regarding:

- Quality of care indicators (e.g.; medication errors, fall rates, and restraint utilization) through indicator tracking,
- Human resource indicators (e.g.; absenteeism, sick leave, and overtime rates) through human resource data, and
- Satisfaction levels for staff, residents, and families through surveys and focus groups.

Short term objectives for the project include:

- Determining whether the new staff mix model is appropriate and feasible,
- Engaging managers/decision makers in the project to increase awareness of evidence-informed decision-making and its contribution to organizational change,
- Getting buy-in from staff, unions, associations and executive to provide resources and support to move forward with a new staff mix,
- Determining the usefulness of the CNA evaluation framework, and
- Raising the profile of LTC within the health care system in order to encourage RN recruitment and build research capacity.

Long-term system objectives include:

- Implementing a staff mix across Eastern Health that enables RNs and LPNs to work to their full scope of practice improves quality of care and satisfaction for residents and families,
- Enhancing recruitment/retention and job satisfaction of nursing staff,
- Reducing the cost per resident day per level of care,
- Informing the provincial system regarding an appropriate framework for determining staff mix for long term care,
- Developing a tool kit that can be used by others for making staff mix decisions, and



- Building research capacity in the LTC sector and creating a research, evidence-informed culture in the organization.

1.4. 2 Models and Methods

The CNA Evaluation Framework is a comprehensive tool that considers the matching of resident, staff and system structure and process on outcomes (see Appendix C). The framework identifies many factors that need to be considered when determining what an appropriate nursing staff mix should be. It also enables employers to determine how effectively they are using their nursing resources and how well staff, organizational, and client needs are matched²⁷.

The Prosci Change Management Framework was adopted and used to assist the team in developing a change plan. The framework highlights the need for leadership and sponsorship, project management that deals with the technical side of change, and change management that supports the people side of change. Various tools associated with the model were used to develop a change plan (see Appendix D). A change project team is in place preparing for the change and to manage and reinforce the change.

Outcome Measures

Valid indicators of LTC quality are based on a number of outcomes of care experienced by the resident, family and staff³⁹. Such outcome measures were assessed as part of the CNA framework to evaluate the impact of staff mix changes (see Appendix E for evaluation markers). Resident outcome measures included satisfaction surveys and the collection of quality of care indicators including falls, medication errors, restraints, infections and wounds. Satisfaction surveys and focus groups were used to determine the impact of staff mix changes on families. Finally, staff outcome measures included staff satisfaction surveys and factors that measure the quality of work life, such as overtime, absenteeism, and injury/illness. Surveys were administered in two phases, at the beginning of the intervention, and re-administered in the last month of the intervention. The staff focus groups were held prior to the intervention and again during the last month.

Resident Outcomes

Resident outcome measures included satisfaction surveys and the collection of quality of care indicators.

Resident Satisfaction Survey

The resident satisfaction surveys were based on satisfaction questionnaires that had been previously used by the St. John's Nursing Home Board on a similar population. Several items were added based on the objectives of the current study and the existing literature^{40, 41}. The survey also had wording changes made to reflect the group of interest (for example, wording changes to reflect a question that is resident-centered versus family-centered). The surveys were divided into nine sections with items assessing satisfaction with 'Living Environment', 'Activities', 'Choice', 'Communication', 'Care and Services', 'Assistance with Eating', 'Overall Environment', 'Recommending the Facility', and an item to determine the resident's unit at the facility (see Appendix F). In total, the resident survey contained 53 items.



Residents who met the inclusion criteria were those residents who were cognitively well, who agreed to participate, and were residents on the units of interest. These residents were initially approached by the resident care managers and/or social workers at each facility and invited to participate. An interview for each participating resident was conducted with the researcher who first went through the consent process with the resident (see Appendix G). Surveys were then either self-administered by the resident or aided by the researcher depending on the ability and will of the resident. Each resident interview was completed in approximately 30 minutes.

Quality of Care Indicators

Quality of care indicators were collected from monthly indicator reports to assess the impact on resident's care following the implementation of the new staff mix. Indicator data was collected for a six-month period beginning in May-June 2008 at each LTC facility. The indicators included medication errors, infection rates, fall rates, restraint utilization, episodes of aggression, and choking. Data regarding the same indicators were also collected on the same units as a baseline for six months preceding the initiation of the pilot.

Family Outcomes

Family Satisfaction Surveys

The family satisfaction survey was a family member-centered version of the satisfaction survey administered to residents but adjusted to reflect the participant. Consequently, the survey contained the same items with minor wording changes to reflect the group of interest and also contained 53 items (see Appendix H). The family satisfaction surveys were administered via telephone interviews. Firstly, staff determined the most appropriate family member such as the next of kin or family member most active in residents care. A letter inviting the family member to participate was sent from the facility on behalf of the researchers (see Appendix I). Approximately one week after the mail-out letter had been sent to families, researchers contacted family members regarding participation. It became clear immediately that family members were keen to provide more information than the survey questions or time resources allowed. Consequently, a focus group was added to the second phase of the project to allow family input on the subject.

Staff Outcomes

Staff outcome measures included staff satisfaction surveys and factors that measure the quality of work-life such as sick leave, injury, overtime, and absenteeism.

Staff Satisfaction Surveys

During the initial design of the study, there were a number of extraneous variables and events identified that could have influenced the survey responses (e.g., seasonal variations in nurse workload). Therefore, it was decided to conduct staff focus groups within each site in order to help establish a more accurate scenario of the intervention outcomes, as well as establish a deeper understanding of the working contexts, gain insight into how best to introduce and assess similar programs in the future, create a sense of "buy-in" from a staff perspective, and gain information as to how to alter the staff mix if such was the case.



Focus groups lasting approximately one hour were conducted for each facility, once during the beginning of Phase I and again during Phase II prior to the administration of the surveys. The focus groups were attended by the focus group facilitator(s) and staff (RNs, LPNs and PCAs). The site manager or administrator introduced the focus group facilitator(s) and then left the focus group discussion. For each session, all participants signed consent forms, and data collection involved note taking (during Phase I), and audio recording (during Phase II). In terms of respondent numbers 14 staff members were involved in Phase I and 16 in Phase II (see Appendix J). The majority of participants during both phases were LPNs.

Lines of questioning were similar between the two research Phases (and for each site), and involved simple queries including typical job duties (e.g., “Tell me about your job.”), perceptions of work environment (e.g., “Tell me about your workload.”; “Is your job stressful at times?”; and “How do you get along with your co-workers?”), sense of control and autonomy (e.g., “Do you have input in decision making?”), scope of practice (e.g., “Do you feel like you’re working to your full scope of practice?”), and sense of leadership (e.g., “What is the relationship like between staff and management?”). There were also questions about staff member knowledge and experiences with the new staff mix change, and the requirement for LPNs to be training in medication administration and health assessments. The information collected from the focus groups were then used for survey development and the interpretation of survey results.

The staff satisfaction survey instrument contained a total of 86 items (see Appendix K). The first section of the survey contained 29 items comprising of six scales adapted from the Karasek’s Job Content Questionnaire^{42, 43}. The second section of the LTC staff survey contained a total of 47 items. These items were adapted from the 2005 National Survey of the Work and Health of Nurses (NSWHN)⁴⁴. In addition to being applicable to the objectives of the current project, the rationale behind choosing the items from the NSWHN was in anticipation of potential future comparisons of this dataset with the national findings. The items contained in this survey assessed various job characteristics specific to the nursing profession. An additional section was added to the instrument that was not included in the NSWHN. The final section of the staff satisfaction survey consisted of demographic items.

Based on the recommendations of staff, packages were placed in staff mailboxes at each site. Packages contained an information sheet and the survey (see Appendix K and L). Participants were informed through the information sheet that completion and return of the survey was considered their consent to participate. Completed surveys were then sealed and returned to the front desk of the facility. Participants from one site opted to send surveys directly to the researcher’s office.

Human Resource Indicators

Human Resource data was collected to determine any differences between staff of either the pilot and control units regarding sick leave, injury, overtime, and absenteeism rates. All staff (RNs, LPNs and PCAs) regularly assigned to the study units throughout the pilot were included. Temporary call-in/casual staff or “floaters” that were not regularly or consistently assigned to either the pilot and control units were excluded. Payroll data was collected for each payroll period from April 2007 to the conclusion of the pilot December 2008. Relevant earning codes from the payroll data were categorized as: sick leave, injury, overtime, or absenteeism.



Ethics

Approval was sought and received from the Human Investigations Committee of the Faculty of Medicine at Memorial University of Newfoundland, Newfoundland and Labrador. Initially there was some question whether the project should be categorized as an internal quality review rather than a research project and consequently, the first phase of focus groups and surveys were conducted as a pilot test for a quality review. However, ethics approval was granted for the remaining data collection process (see Appendix M).

1.4.3 Implementation Plan

Study Sample/ Setting

The new staff mix was piloted at three LTC facilities, two urban (St. Pat's and Escasoni) and one rural (Golden Heights Manor) with a corresponding control unit in each facility for comparison and to observe differences attributable to geographical location. Units had residents with similar levels of acuity and resident numbers were matched as closely as possible; St. Pat's (pilot unit - 44 residents, control unit – 44 residents); Escasoni (pilot unit - 25 residents, control unit – 21 residents); and GHM (pilot unit – 40 residents, control unit – 30 residents). The pilot phase ran for approximately six months at each facility. Family, resident, and staff data were collected throughout the pilot phase. Baseline data from both the intervention and control units were collected for six months preceding initiation of the pilot.

The implementation plan involved multiple steps. First, the care delivery model was changed to take advantage of the full scope of practice of both RNs and LPNs. Second, a new unregulated PCA position was created to support nursing staff. Third, the CNA evaluation framework for nursing staff mix decisions was used as a template to evaluate the impact of the new staff mix on family, residents, and the system (see Appendix N).

Steering Committee

A regional steering committee was established with representation from key stakeholders, including: nursing managers, advance practice nurses, professional practice, directors, human resource managers, and the education provider representative. The committee reviewed and provided input into the implementation plan. Sub-groups were also established to address key areas, such as education/training requirements; model of care; and human resource/labour relations' issues, job descriptions and satisfaction survey development. The involvement of a broad group of management at various levels in the organization allowed for the development of a comprehensive plan to initiate the change. Furthermore, buy-in was achieved across the organization at the management level by engaging stakeholders and sharing information early in the planning.

Model of Care/Staffing Mix

A new model of Total Resident Care was developed based on a review of the literature. This model encompasses seven principles, including: resident-centered care; autonomy; accountability; comprehensiveness; interdisciplinary collaboration; competence; and leadership. Within the model, all nursing staff work to their full scope of practice and have clearly defined roles and responsibilities based on their training. For principles and key components of the model (see Appendix O).



To determine what the actual target staff mix should be across the Eastern Health LTC system, a unit by unit analysis was completed of resident care needs, based on the provincial levels of care assessment and/or the MDS assessment tool. A template was developed, and each facility was requested to complete an analysis of the current staff mix and project what the future mix would be. The facilities were asked to consider: the components of a new model of total resident care, the new job descriptions that enabled RNs and LPNs to work to their full scope of practice, and PCAs performing all of the duties within their job description. The Director of Resident Care worked with the sites to advise and provide support. A unit-by-unit analysis was completed that considered factors outlined in the structure and process component of the CNA evaluation framework. Factors included, but were not limited to: the level of acuity of the resident; staffing levels and patterns based on time of day; physical layouts of the unit; proximity of other supports such as rehabilitation, clerical support; and the nursing leadership present. This approach was supported by the ARNNL²⁹. Proposed staff mixes ranged from 14 – 22 percent RN; 25 – 50 percent LPN; and 30 – 45 percent PCA. Further review to work out variations is ongoing. Most variations have been related to the size of the facility/unit and the ability to share staff.

Targeted Education/Training

Another key component of moving the new staff mix forward was to ensure that the level of educational preparation enabled RNs and LPNs to work to their full scope of practice. A significant percentage of the current LTC nursing workforce are not trained to work to their full scope of practice and all require education in the new Resident Centered Model of Care. The NL provincial committee (2006) identified education components for RNs to include leadership development, health assessment (included in the BN curriculum), and a gerontology course. At the provincial consultation on the role of the nurse in LTC, nurses identified a need for skills development in leadership, conflict resolution, and team development to enable them to feel comfortable in their enhanced role.

Many LPNs will require post-basic training for medication administration, health assessment and gerontology in order to work to full scope of practice. These educational requirements are priority areas. The Center for Nursing Studies are engaged in planning exercises to provide extra training capacity for LPNs by increasing the number of seats from 40 to 100 per year. This will help ensure LPNs will be able to access the health assessment course prior to the 2012 date mandated by the CLPNNL. An education proposal was also developed internally in consultation with Human Resources, the Center for Nursing Studies, the professional practice consultants and the staff mix working group to address the training requirements for medication administration and health assessment for LPNs. Approval was provided by executive to move forward with a plan to support the training at a cost of \$1.5M over two years.

Furthermore, consultation occurred among nursing management, Human Resources, Policy and Program Development, and executive to determine an appropriate level of support to provide to staff to complete the educational training. A leadership-training module has also been developed by the Department of Health for nurses and is being delivered across LTC. Also, a Resident Centered Care training program was developed for all nursing staff. An educator was hired to deliver the education sessions to the pilot units on Resident Centered Care and the Leadership Module.



Union Engagement

Prior to the implementation of the new staff mix, union leaders were sent letters explaining the pilot project. Discussions were also held with the Newfoundland and Labrador Nurses' Union (NLNU) regarding the pilot project and they were in agreement to proceed.

Implementation of the new staff mix at Hoyles Escasoni involved an agreement between the Newfoundland and Labrador Association of Public and Private Employees (NAPE) and the employer. The agreement required that permanent, full time, medication proficient LPNs already scheduled on the pilot unit remain on the unit following implementation. Medication proficient LPNs on the control units were given the opportunity to move to the pilot units if they choose. An expression of interest was then forwarded to all units inviting medication proficient LPNs to apply in writing for any remaining positions on the pilot units (see Appendix P). These remaining medication proficient positions were then staffed based on the responses received and the applicant's seniority. In the rural site, Golden Heights Manor, NAPE also required an agreement and the same process was followed. In the case of St. Patrick's Mercy Home, the Canadian Association of Public Employees (CUPE) agreed with the pilot and staff were assigned to study units based on seniority and staff self-selecting to participate. Because staff were rotated throughout the home based on need, an expression of interest was not necessary.

Once agreement was obtained from the unions, a letter was sent to staff, family councils, and families of residents on the study units, explaining the intervention project and the process that would be followed (see Appendix I). Meetings were held at each site with nursing staff on the study units where managers explained the project and answered questions.

Implementation of Model

The "Total Resident Care Model of Care Delivery" was implemented on the pilot units. The staffing on the pilot units was changed to reflect the target mix for RNs, LPNs and PCAs (see Appendix Q). The staffing percentage for each pilot and control unit varied based on analysis of the residents needs, unit layout and size, and the skill level of the staff. The job descriptions that required staff to work to their full scope of practice were implemented. The model of care delivery was set up, with the nurse coordinating the care and the LPNs administering medications and completing documentation for a pod of residents (on average twelve to fourteen residents). The PCAs were also assigned a group of residents they were responsible for. The leadership module was delivered in six modules and offered initially to the RNs on the pilot units and then to LPNs. The Resident Centered Care Model was delivered to all staff and a daily monitoring tool was implemented on the pilot units (see Appendix R), analyzed on a daily basis, and summarized on a monthly basis by the managers.

Feedback from staff in the initial phases of the intervention was mixed, but mainly positive. LPNs were happy to be working to their full scope of practice. RNs at one site expressed concern that they were not participating to their full scope and that they didn't feel in touch with the residents. The role change resulted in less staff available for hands on personal care. Feedback from residents in the initial phase was that they had to wait longer to get fed, bathed, etc. This was addressed temporarily by adding some extra PCA hours at peak care times. This was experienced consistently across the three pilots. Also, lack of equipment, particularly adequate medication carts and access to computers, was an issue that was



identified and addressed by obtaining extra carts and computers for the unit. Overall, feedback from staff and residents has been generally positive.

Change Plan

Once the pilot was functioning, work began on developing a Change Management Strategy and components of a change plan were identified (see Appendix D). Eastern Health's Change Management Consultant was engaged with the staff mix committee, providing education and guidance around a change management plan. The change management literature was reviewed and a planning day was held with the various stakeholders to identify key concepts in managing the people side of change, to overview a change management methodology, and to identify the next steps in developing a change management approach for this initiative.

Due to timing of the intervention, the change management plan was not fully developed prior to completion. The preparatory work for the pilots supported the evidence from the change management literature. The Prosci Change Management framework which highlights the need for leadership and sponsorship was reviewed and adopted (see Appendix D). Work that had been completed regarding the initiative was reviewed and what was working well and what was needed was identified. An action plan was developed that identified tasks and resources necessary to implement the initiative across the region.

1.4.4 Results

Data Analysis

Using the Statistical Package for Social Sciences (SPSS), quality of care indicators and human resource indicator data were entered, coded and analyzed. Descriptive statistics and graphs were used to summarize and illustrate the sample data. Data was aggregated to the unit level which limited the ability to conduct significance testing for quality of care indicators. However, where possible, repeated measures t-tests were conducted for both control and intervention groups for human resource indicator data to determine statistical significance.

Quality of Care Indicators

Quality-of-care indicators were assessed to evaluate the impact of the new nursing staff mix. Only indicators that were consistently reported on during the pre-and post-implementation period were utilized. As a result, episodes of choking and aggression were not included as few incidents were reported.

Medication Errors

There were very few total medication errors reported at Golden Heights Manor (Pre: \underline{M} =0 for control and intervention; Post: \underline{M} =0 for control \underline{M} =1 intervention) while three or fewer medication errors were reported for Hoyles Escasoni Complex (Pre: \underline{M} =0 for control \underline{M} =3 for intervention; Post: \underline{M} =2 for control and \underline{M} =3 for intervention). The total number of medication errors reported for St. Patrick's Mercy Home was much higher in comparison (Pre: \underline{M} =8 for control and \underline{M} =4 for intervention; Post: \underline{M} =9 for control and \underline{M} =12 for intervention). (See Figure 1.1 for frequency of total medication errors by site pre- and post-implementation). One explanation for the observed difference could be attributed to reporting practices at St. Patrick's Mercy Home (i.e., more accurate reporting) as this site has undergone extensive training with staff regarding



reporting practices of medication errors. Furthermore, this site has more residents on the study units compared to other sites, which could contribute to the higher incidences of medication errors. These findings illustrate the challenges concerning reporting of medication errors in these LTC sites and suggest reporting practices need to be addressed within these LTC sites. Retraining of staff and the use of standardized forms across all sites may help alleviate this problem.

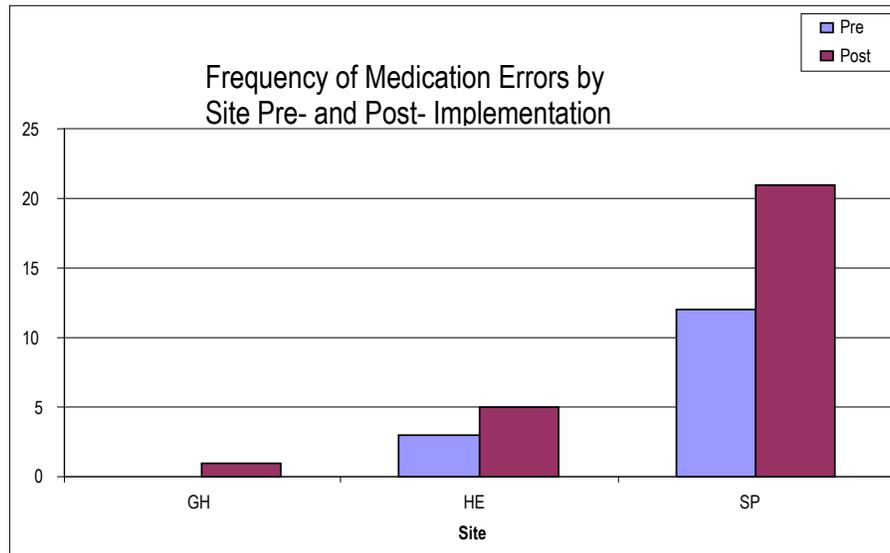


FIGURE 1.1. *FREQUENCY OF TOTAL MEDICATION ERRORS BY SITE PRE- AND POST INTERVENTION

**Frequency = Number*

The number of medication errors increased post intervention in both control and intervention units across all sites with the exception of the intervention unit of Hoyles Escasoni Complex (see Figure 1.2 for total med errors by site). However, due to the issues surrounding reporting, this may suggest that the introduction of the intervention may have heightened awareness of reporting. It is difficult to determine whether this increase is the reality or reflects staff behavior.

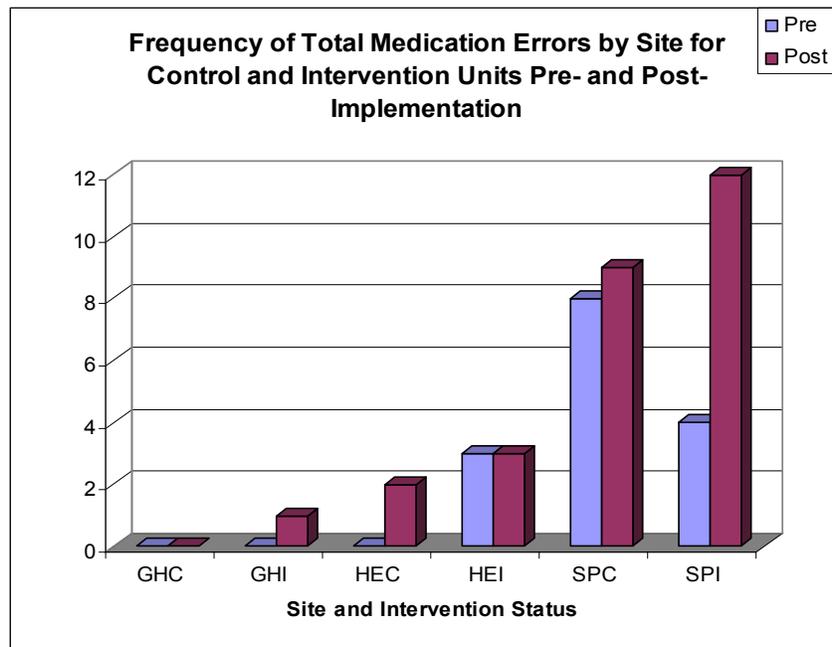


FIGURE 1.2 *FREQUENCIES OF TOTAL MEDICATION ERRORS BY SITE FOR CONTROL AND INTERVENTION UNITS PRE- AND POST- IMPLEMENTATION

*Frequency = Number

Fall Rates

The impact of changes in nursing staff mix on fall rates was also evaluated. At Golden Heights Manor, the average fall rate stayed the same over the pre-and post-implementation period for the control unit and decreased on the intervention unit post-implementation (Pre: \bar{M} =2.14 for control \bar{M} =1.29 for intervention; Post: \bar{M} =2.13 for control and \bar{M} =0.48 for intervention - see Figure 1.3). At Hoyles Escasoni, the fall rate increased slightly on control unit and decreased slightly on intervention unit post-implementation (Pre: \bar{M} = 3.72 for control and \bar{M} = 4.59 for intervention; Post: \bar{M} = 4.14 for control and \bar{M} =4.43 for intervention - see Figure 1.4). It is important to note that interpretation of these findings is limited by the small number of falls reported, with Golden Heights Manor reporting an average total number of falls less than two over the pre- and post-implementation period and Hoyles Escasoni reporting less than 3.5 falls. In the case of St. Patrick's Mercy Home, fall rates decreased on control unit and increased on intervention unit post-implementation. Compared to the other sites, St. Patrick's Mercy Home had the highest average number of total reported falls, with a total average of 7.5 falls per control unit and 3.64 falls for intervention unit pre-implementation and 2.43 falls per control unit and 4.43 falls for intervention unit post-implementation (see Figure 1.5) . The higher fall rates for St. Patrick's Mercy Home could be partially explained by a greater number of residents at this site or differences in reporting practices. The increased incidence of falls in the intervention could be explained by heightened reporting practices during the intervention. It is also plausible

that the increase in total numbers of falls on intervention unit post-implementation could be attributable to the new nursing staff mix.

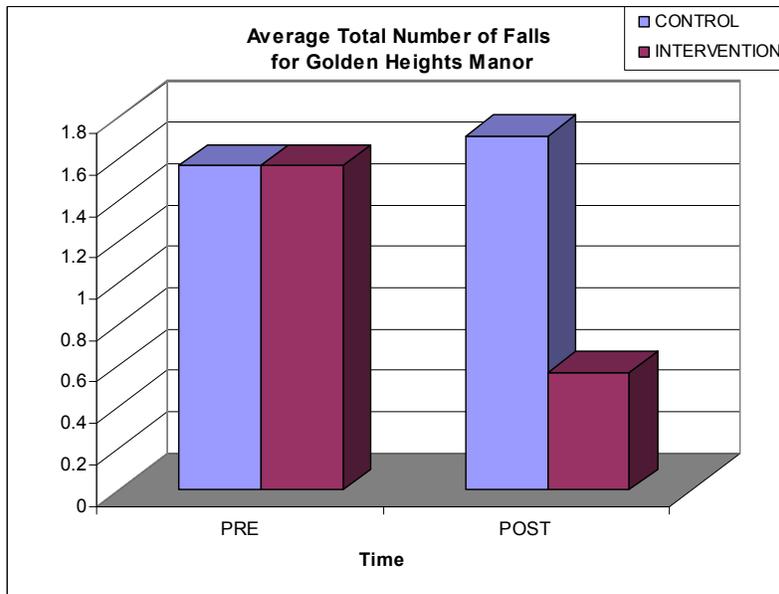


FIGURE 1.3 AVERAGE TOTAL NUMBERS OF FALLS FOR GOLDEN HEIGHTS MANOR

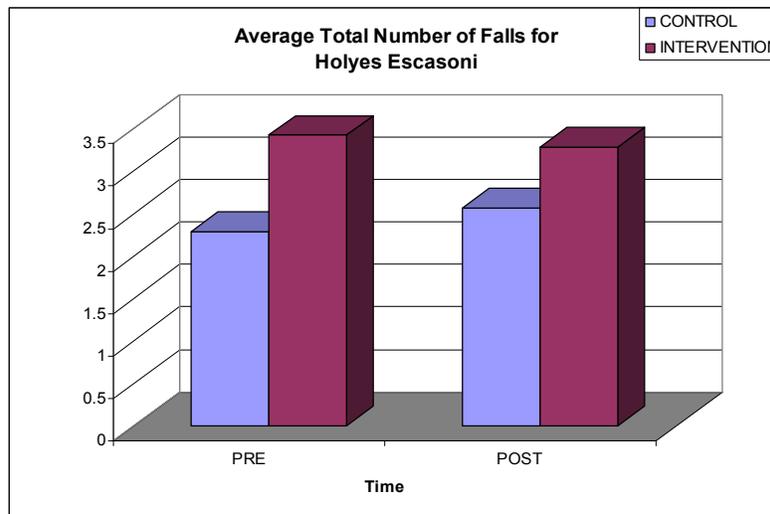


FIGURE 1.4. AVERAGE TOTAL NUMBERS OF FALLS FOR HOYLES ESCASONI

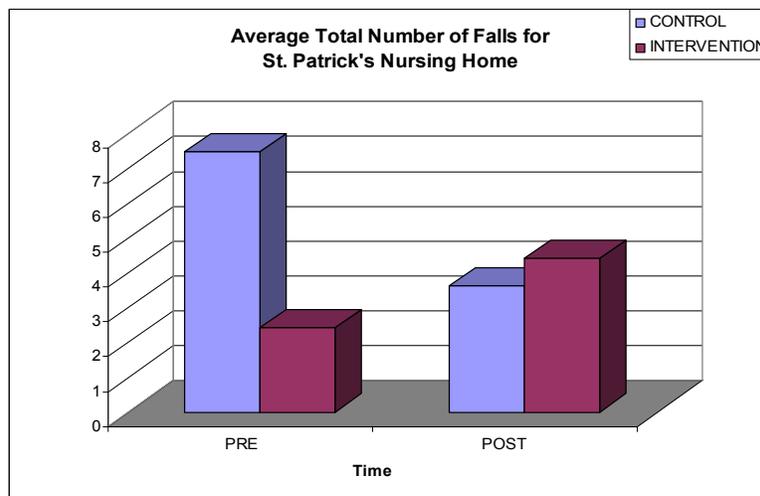


FIGURE 1.5 AVERAGE TOTAL NUMBER OF FALLS FOR ST. PATRICK'S MERCY HOME

Infection Rates

Infection rates (or the total infections/resident bed days) were analyzed pre- and post-implementation to examine any impact attributable to the new nursing staff mix. At Golden Heights Manor, infection rates increased on both the control and intervention units post-implementation (Pre: \underline{M} = 4.57 for control \underline{M} = 3.56 for intervention; Post: \underline{M} = 5.65 for control and \underline{M} = 4.43 for intervention - see Figure 1.6). Conversely, at Hoyles Escasoni, infection rates decreased on both control and intervention units post-implementation (Pre: \underline{M} = 17.28 for control \underline{M} = 10.81 for intervention; Post: \underline{M} = 11.54 for control and \underline{M} =9.28 for intervention - see Figure 1.7). At St. Patrick's Mercy Home, infection rates decreased on control unit and increased on intervention unit post-implementation (Pre: \underline{M} =6.84 for control \underline{M} =5.12 for intervention; Post: \underline{M} =5.67 for control \underline{M} =7.23 for intervention - see Figure 1.8). Again, it is plausible that increases in infection rates on intervention units could be explained by heightened reporting practices during the intervention. The lack of consistent patterns suggests that the new nursing staff does not appear to impact infection rates.

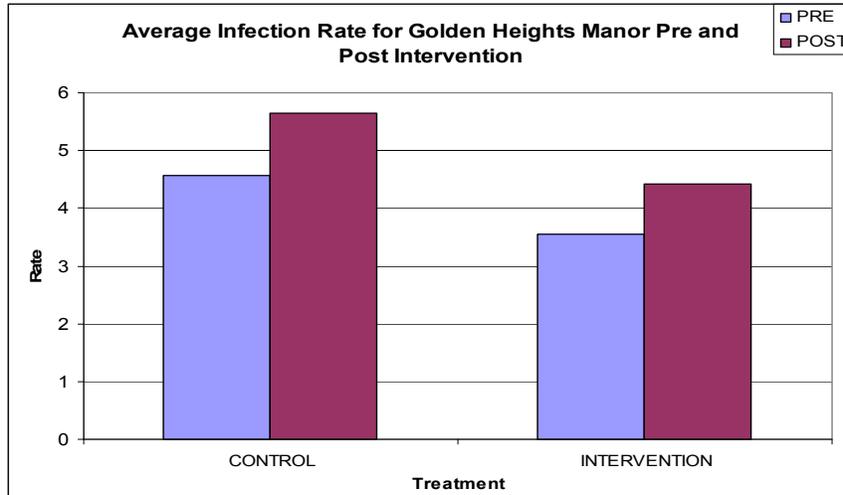


FIGURE 1.6. AVERAGE *INFECTION RATE FOR GOLDEN HEIGHTS

*Infection rate = Total Infections/Resident Bed Days

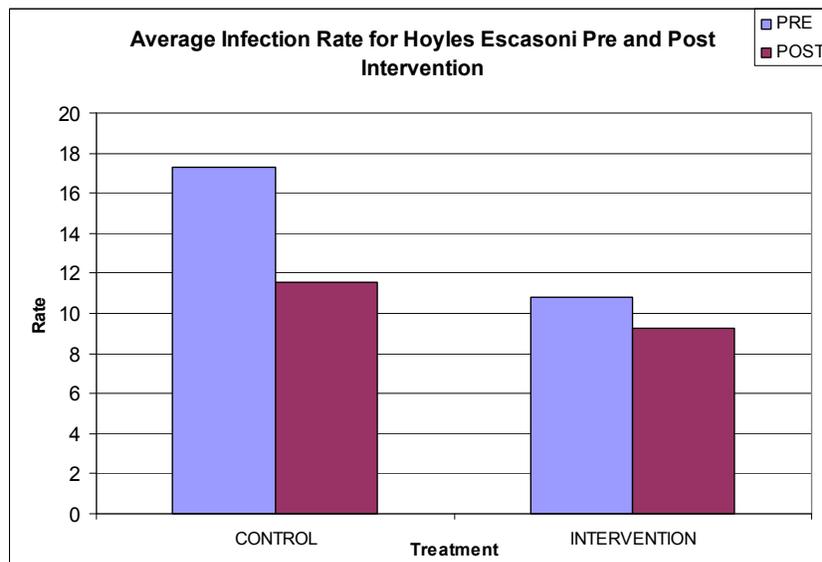


FIGURE 1.7. AVERAGE INFECTION RATE FOR HOYLES ESCASONI

*Infection rate = Total Infections/Resident Bed Days

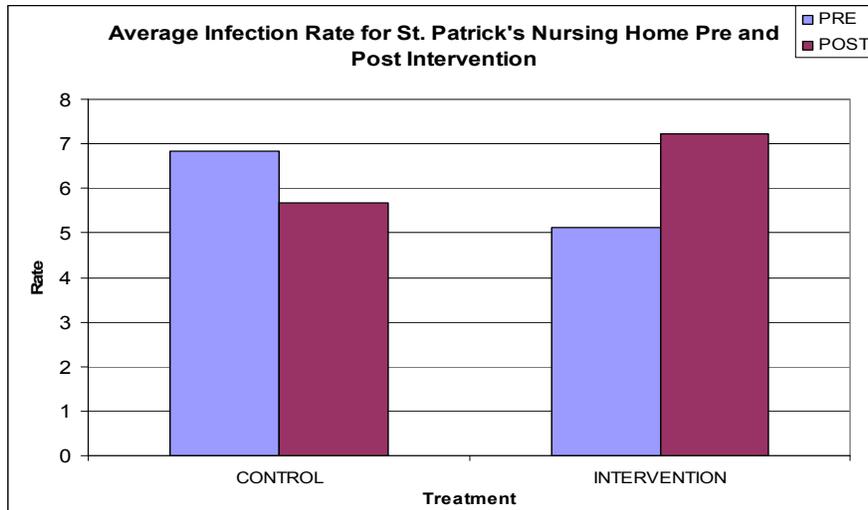


FIGURE 1.8. AVERAGE INFECTION RATE FOR ST. PATRICK'S

*Infection rate = Total Infections/Resident Bed Days

Restraint Utilization

The impact of the change in nursing staff mix on restraint utilization was also assessed. At Golden Heights Manor, the average frequency (frequency = number) of restraint utilization increased on both the control and intervention units post-implementation (Pre: \underline{M} = 19.03 for control and \underline{M} = 22.45 for intervention; Post: \underline{M} = 22.01 for control and \underline{M} = 24.50 for intervention - see Figure 1.9). Conversely, at Hoyles Escasoni, the average frequency of restraint utilization decreased for both the control and intervention units post-implementation (Pre: \underline{M} = 9.90 for control and \underline{M} = 39.38 for intervention; Post: \underline{M} = 0.75 for control and \underline{M} = 36.57 for intervention - see Figure 1.10). The lack of consistent patterns suggests that restraint utilization does not appear to be affected by the new nursing staff mix. St. Patrick's Mercy Home was not included in this analysis as restraint utilization was calculated per facility and not per unit.

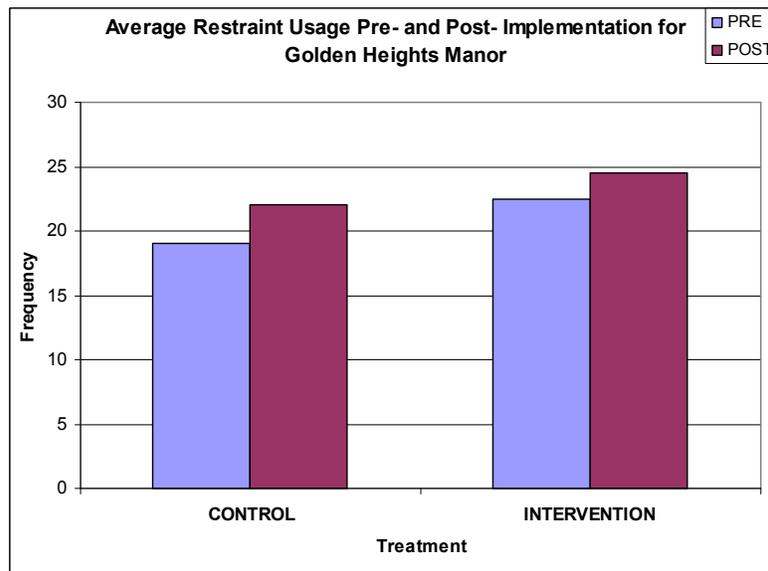


FIGURE 1.9 AVERAGE RESTRAINT USE FOR GOLDEN HEIGHTS

*Frequency = Number



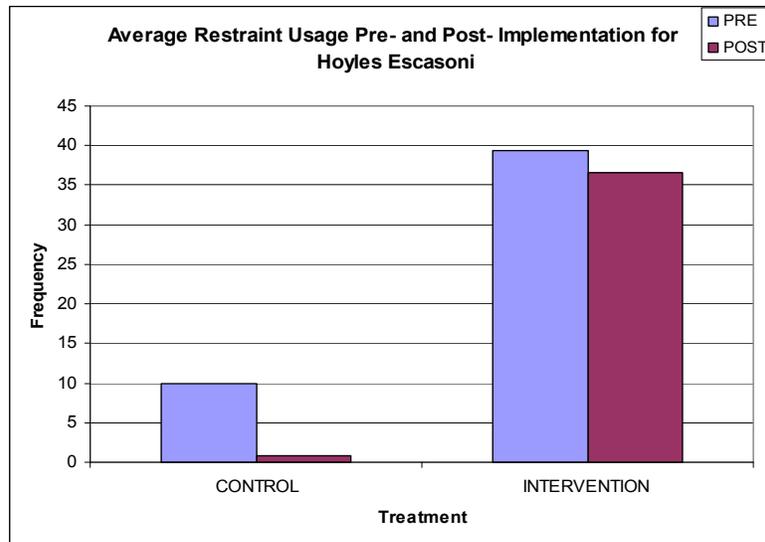


FIGURE 1.10 AVERAGE RESTRAINT USE FOR HOYLES ESCASONI

*Frequency =Number

Conclusion

Overall, examination of quality of care indicators revealed inconsistent patterns and illustrated the need for changes in data collection methods and reporting practices. These findings are viewed as positive as they address the need for retraining of staff and the use of standardized forms across all sites. But most importantly, the findings illustrate that the new nursing staff mix did not appear to negatively impact resident’s care, which is fundamental in deciding whether to implement this initiative in LTC across the region.

Human Resource Indicator Data

Human resource indicators including overtime, absenteeism, and sick leave were also evaluated to examine the impact of the new nursing staff mix on quality of work life and job satisfaction. Each indicator was defined by specific human resource earning codes. For instance, absenteeism encompassed vacation leave, family leave, paid leave, general leave unpaid, stat taken, stat bank taken, time owed taken, special leave without pay, excused time and compensatory time taken off.

Overtime

At Golden Heights Manor, both the control and intervention units experienced a decrease in average number of episodes of overtime post-implementation between pre- and post-implementation. This decrease was statistically significant for the control but not the intervention unit ($t(8)=2.83, p<.022$). No statistically significant difference or change in average number of overtime hours pre- and post-implementation was detected for the control or intervention units. Analysis was not conducted for overtime dollars as the assumption of normality was violated. At Hoyles Escasoni, the results revealed a statistically significant decrease in both the average number of overtime episodes ($t(14)=3.00, p<.009$) and hours of overtime ($t(14)=2.76, p<.015$) post-implementation for the control unit only. There was no statistically significant change in the average number of overtime episodes or hours for the intervention unit. While there was a

decrease in the number of dollars spent between the pre- and post-implementation period for the control and the intervention unit. The results of the paired t-test revealed no statistically significant difference or change in the average number of dollars spent between the pre- and post-implementation period for either the control or the intervention unit. For St. Patrick's Mercy Home, no statistically significant difference was detected in the average number of overtime episodes or hours post-implementation for the control and intervention unit. Analysis could not be conducted for overtime dollars as violations to normality were noted for both the control and intervention unit (see Table 1 for Average Overtime Results). The inconsistent pattern suggests that the new nursing staff mix does not appear to impact overtime.

Table 1 - Average Number of Overtime Episodes, Hours and Dollars for Golden Heights Manor, Hoyles Escasoni and St. Patrick's Mercy Home Pre- and Post-Implementation

	Pre Intervention Period		Post Intervention Period	
	<i>Control M</i>	<i>Intervention M</i>	<i>Control M</i>	<i>Intervention M</i>
Golden Heights Manor				
Overtime Episodes ¹	36.22	40.64	29.44*	35.38
Overtime Hours	813.02	695.83	703.72	735.18
Overtime Dollars	1236.46	828.33	650.69	930.90
Hoyles Escasoni				
Overtime Episodes	31.56	36.31	25.53*	33.24
Overtime Hours	726.00	712.63	565.81*	678.95
Overtime Dollars	720.26	2234.60	527.68	1083.96
St. Patrick's				
Overtime Episodes	27.31	27.00	24.56	30.44
Overtime Hours	600.01	591.72	539.69	686.43
Overtime Dollars	490.40	1223.22	1141.62	2177.57

¹Episode - a period that may vary in length/not defined by a specific time frame

* decrease between pre and post period

** increase between pre and post period

Note: the figures listed in the table above may differ slightly from that used in the t-test computations given the listwise/pairwise deletion default found in SPSS.

Absenteeism

The number of absenteeism episodes and hours were also examined to determine whether they were impacted by the new nursing staff mix. At Golden Heights Manor, both the control and intervention unit experienced a decrease in the average number of absenteeism episodes and an increase in the average number of absenteeism hours post-implementation; however, these differences were not statistically significant. A paired-t-test conducted to assess a non-zero change in absenteeism dollars revealed a non-significant increase in absenteeism dollars spent for both the control and intervention unit. At Hoyles, Escasoni, there was also a statistically significant increase in the average number of absenteeism episodes between the pre- and post-implementation period for the control group ($t(16) = -3.17, p < .006$). Analysis on absenteeism hours was prohibited for both the control and intervention units due to violations in the assumption of normality. The results of the paired t-test to determine a non-zero change in absenteeism



dollars spent pre- and post-implementation revealed a statistically significant increase in dollars spent for the control group only ($t(16)=-2.17, p<.045$). At St. Patrick's Mercy Home, the intervention unit experienced an increase in dollars spent on absenteeism but this did not reach statistical significance. There was no statistically significant difference in the average number of absenteeism episodes or dollars spent for the intervention unit. However, a statistically significant increase in the average number of absenteeism hours was found for this group ($t(24)= -2.12, p<.045$). No significant difference or change in average number of absenteeism episodes or hours was found for the control unit. Analysis could not be conducted to determine statistically significant changes in dollars spent for the control units as violations in normality were detected (see Table 2 for Average Number of Absenteeism results).

Table 2 - Average Number of Absenteeism Episodes, Hours and Dollars for Golden Heights Manor, Hoyles Escasoni and St. Patrick's Mercy Home Pre- and Post-Implementation

	Pre Intervention Period		Post Intervention Period	
	<i>Control M</i>	<i>Intervention M</i>	<i>Control M</i>	<i>Intervention M</i>
Golden Heights Manor				
Absentee Episodes ¹	10.22	11.68	8.0	10.57
Absentee Hours	118.81	117.23	148.78	152.35
Absentee Dollars	2292.13	2261.59	2870.34	2939.23
Hoyles Escasoni				
Absentee Episodes	6.29	8.44	8.72**	9.18
Absentee Hours	113.25	126.65	187.01	159.90
Absentee Dollars	2408.40	2627.57	2969.98***	3471.08
St. Patrick's				
Absentee Episodes	13.40	11.93	11.35	11.66
Absentee Hours	97.47	85.05	99.59	115.81**
Absentee Dollars	1988.49	1875.22	2206.07	2517.83

¹Episode - a period that may vary in length/not defined by a specific time frame

** increase between pre and post period

*** approaching significance ($p=.06$)

Note: the figures listed in the table above may differ slightly from that used in the t-test computations given the listwise/pairwise deletion default found in SPSS.

Sick Leave

At Golden Heights Manor, both the control and the intervention unit experienced a slight increase in the average number of sick leave episodes and hours between the pre- and post-implementation period. However, these increases were not statistically significant for either the control or intervention unit. Analysis was not conducted for sick leave hours or dollars spent as the assumption of normality was violated. At Hoyles Escasoni, no statistically significant change in sick leave episodes or hours was detected for either the control or the intervention unit between the pre- and post- implementation period. Analysis could not be conducted for sick leave dollars as violations to normality were noted. However, descriptive statistics



indicate an increase in dollars spent for both the control and intervention units between the pre- and post-implementation period respectively. For St. Patrick's Mercy Home, no significant differences in the average number of sick leave episodes or hours between the pre- and post- implementation period were found for either the control or intervention unit. Analysis could not be conducted for sick leave dollars as violations to normality were noted for this variable for both the control and intervention group (see Table 3 for Average Sick Leave results).

Table 3 - Average Number of Sick Leave Episodes, Hours and Dollars for Golden Heights Manor, Hoyles Escasoni and St. Patrick's Mercy Home Pre- and Post-Implementation

	Pre Intervention Period		Post Intervention Period	
	Control <i>M</i>	Intervention <i>M</i>	Control <i>M</i>	Intervention <i>M</i>
Golden Heights Manor				
Sick Leave Episodes ¹	6.67	7.77	7.0	8.29
Sick Leave Hours	147.06	119.90	148.20	136.48
Sick Leave Dollars	2837.11	2307.80	1709.55	2102.30
Hoyles Escasoni				
Sick Leave Episodes	4.73	5.00	4.15	5.12
Sick Leave Hours	82.45	84.68	112.36	105.46
Sick Leave Dollars	1861.65	1914.25	2516.22	2320.49
St. Patrick's				
Sick Leave Episodes	21.66	17.43	20.75	17.33
Sick Leave Hours	126.49	120.09	163.05	100.31
Sick Leave Dollars	2045.93	1565.91	2657.60	1781.90

¹Episode - a period that may vary in length/not defined by a specific time frame

Note: the figures listed in the table above may differ slightly from that used in the t-test computations given the listwise/pairwise deletion default found in SPSS.

Overall, examination of the descriptive statistics suggest variation in overtime, absenteeism, and sick leave episodes, hours and dollars spent between sites and between control and intervention units within sites pre- and post- implementation. However, no consistent pattern was identified. It is possible that the lack of statistically significant differences or changes between pre- and post-implementation with regard to many of these variables may be attributable to type II error; more specifically, the inability to detect a significant effect due to lack of power as a result of the small sample size utilized in this pilot study. Although there are inconsistencies, these findings are positive as the new nursing staff mix did not appear to influence staff's use of overtime, absenteeism, and sick leave – all indicators of job satisfaction.

General Observations from Staff Focus Groups

There was an overall sense during the Phase I focus groups that staff morale was quite low for all facilities, characterized by poor communication, staffing concerns, and unmanageable workloads. Further, while it was generally admitted across the facilities that the staff mix change made theoretical sense, the primary theme was that of worker concern over the change. More specifically, how it was going to impact daily



routines, staffing levels and scheduling, resident care, and workloads. In fact, an initial meeting with staff at one research site was quite emotional and had to be terminated as issues were raised with a manager during the focus group. Workers were also concerned with how the staff mix changes were being implemented, according to many, without adequate notice and information. Finally, staff members were wary of the logistics of the research study itself, and what their practice actually meant in terms of “Pilot” and “Control” units. For instance, some were concerned that they would not be allowed to help colleagues on the control units for fear of “contaminating the results.”

However, after several months had passed, and Phase II data collection commenced, the staff focus groups yielded a notable shift in terms of comfort level with the change, and a general sense of acceptance of and contentment with evolving roles and responsibilities. Overall, Phase II focus groups took on a more reflective tone as staff offered advice about how best to introduce such changes in the future.

A primary observation by most participants was that the staff mix change needed to be adequately staffed, and in situations where this occurred, participants reported that the intervention ran more smoothly. There was also a general contention that the way the project was introduced was very stressful, and an issue that should be considered if and when the change occurred in other sites. Some recommended that there be a resource person assigned specifically to answer questions and address issues regarding the staff mix change. Respondents also discussed the research process, and how it may have impacted resident care and staff workload. In one site in particular, despite the call for extra support on the “Control” unit due to heightened resident needs, staff avoided providing the additional support in fear of interfering with the “Control/Pilot” unit divide. It was also suggested that there were initial challenges with the project because there were too few medication proficient LPNs to make the staff mix change work. There was also the suggestion that while the change had positive implications for LPNs since they were working at a new and challenging scope of practice, there was some resulting confusion and perhaps frustration for RNs because they had lost a significant proportion of their work duties and felt their new roles were not well defined.

Staff, Resident and Family Survey Outcomes

The satisfaction survey results were analyzed from Phase I and II. The Phase I survey was collected at the beginning of the pilots and the Phase II survey collected in the last month of the pilot.

Staff Outcomes

Response rates for Phase I and II by LTC facility (see Table 1, Appendix S) show an overall reduction from 36 to 30 percent between Phase I and II. There was variability among facilities from Phase I and II. In terms of response rates for the pilot and control units, the response rates were higher for pilot units in both phases, however, the response rates were lower at GHM as all staff reported working between both the pilot and control units in Phase I and ten reported working between in Phase II (see Table 2, Appendix S.)

The LPNs accounted for the majority of the participants in the surveys in Phase I at 61.8 percent and 71.4 percent in Phase II. There was a notable difference in the number of RN/BNs who responded in Phase II, i.e. from 15 to 5 (see Table 3, Appendix S).



The Karasek Job Content questionnaire to explore staff perception of their working environment and condition results were analyzed. There were no differences between responses from Phase I and II except for supervisor support, suggesting that perceived supervisor support for staff was higher several months following the staff mix change (see Table 4, Appendix S).

A further assessment of staff perceptions between pilot and control group staff members in Phase I in terms of perceived job demands showed the staff control mean was significantly higher than the pilot staff mean ($M_p=39.9$ vs. $M_c=44.0$; $t(31) = -2.5$, $p = .019$) suggesting a higher perceived workload for control staff. However, there was no significant difference found for Phase II.

Analysis using one way ANOVA was conducted to determine job contentment by LTC facility showed no significant differences in Phase I. However, in Phase II, GHM staff reported significantly higher job demands (GHM = 4.6, $F(2,37) = 3.3$, $p = .05$) and supervisor support (GHM = 8.88, $F(2,35) = 6.0$, $p = .006$) compared to St. Pat's. The findings may have been contributed by absence of a supervisor during a period of the pilot at GHM and the higher job demands may be a result of the staff from the pilot units not responding to requests to assist the control unit during peak care times.

Comparing overall mean responses for all questionnaire subscales (see Table 5 Appendix "S") and responses using individual t-tests from Phase I and II, there were no overall changes in issues such as perceived autonomy, control over practice, roles, respect and support, and communications. Neither were there any changes in terms of the degree to which staff felt that the change impacted whether they were working to their full scope, whether it was working well, or whether it was improving quality of care – comparing staff responses by facility between Phase I and II showed no significant differences. Also, comparing responses from the three pilot units between Phase I and II there were no significant differences. However, there were significant differences between the control staff between Phase I and II in two subscales; autonomy and quality of care. Control staff reported significantly more autonomy during Phase II in comparison to Phase I ($M_{p1} = 1.93$ vs $M_{p2} = 2.42$; $t(28) = -3.07$, $P = .005$). This finding was unexpected as the staff mix on this unit had not changed. This may have been influenced by a heightened awareness of control unit staff of their roles as a result of the study. Despite this finding however, control unit staff in Phase II were also significantly less likely to report that the current staffing mix on their unit was providing quality resident care ($M_{p1} = 2.85$ vs $M_{p2} = 2.19$); $t(27) = 2.63$, $p = .014$). This is a significant finding as staff on the control unit indicated that their staff mix needed to change and perceived the pilot unit staffing model to be providing quality resident care.

The staff questionnaire also asked respondents if they felt that the quality of resident care had improved or deteriorated in the past three months and why. There was a notable increase in the proportion of respondents indicating an overall improvement in the perceived quality of resident care between Phase I and II (i.e. 9 to 21 percent). Among the reasons for the improvement were "more staff", "team approach", and "improved communications" (see Figure 1, Appendix S).

Resident Outcomes

The resident response rate was quite high at 77 percent in Phase I and 89 percent in Phase II. Overall 40 residents responded in Phase I and 58 in Phase II (see Table 6, Appendix S). The resident response rate



by pilot and control units was comparable both in Phase I at 71 and 74 percent, and 78 and 91 percent for Phase II (see Table 7, Appendix S).

The resident's perception of living environment was analyzed for Phase I and II (see Table 8, Appendix S). There were notable differences for five of the subsections: homely living environment, choice, communication one and two, and overall environment. In all cases the mean increased suggesting that resident responses were more favourable in Phase II. Comparison of the pilot and control units did not show any significant differences in Phase I on any of the subscales. However, in Phase II there was significant difference with respect to care and services and overall environment, with pilot unit residents having more favourable perceptions of these aspects after several months of the pilot (see Table 9, Appendix S).

Family Outcomes

The overall response rate decreased from Phase I to Phase II from 67 to 57 percent. While the response rate for St. Pat's and GHM decreased, it increased for Escasoni (see Table 10, Appendix S). Comparing response rates for facility by pilot and control groups during Phase I, there were a greater percentage of respondents from the control units compared to the pilot, i.e. 72 versus 63 percent. However, in Phase II, the response rates were identical at 57 percent (see Table 11, Appendix S).

Family member's perception of their relative's care was higher in Phase II than for Phase I, regardless of whether they were on the pilot or control unit (see Table 12, Appendix S). There were no significant differences found in family perception of resident care between the pilot and control units during Phase II indicating that families were equally satisfied with the care during Phase I and II.

Analysis of family means between Phase I and II for the pilot units showed that there was a significant difference in perception of living environment, activity, choice, communication one and two, care and services, and overall environment in Phase II (see Table 13, Appendix S). Similar findings were noted between Phase I and II for the control group, showing family members perception was more favourable during Phase II (see Table 14, Appendix S).

A variety of differences were observed in resident and family responses between Phase I and II, where there were overall increases in favourable perceptions in a variety of aspects of care. For the residents, for instance, there were heightened perceptions of living environment, choice, communication, and overall environment. Family member perceptions of living environment, activity, choice, communication, care and services, and overall environment were also significantly more favourable during Phase II of the study.

During Phase II, pilot unit residents had more favourable perceptions of care and services, and overall environment. However, family member perceptions of residents' care were more favourable during Phase II for both the pilot and control units.

Overall, there is evidence to suggest overall improvements in perceived staff satisfaction, as well as enhanced perceptions of quality of resident care on the part of staff, and more importantly, residents and their families.



Potential causes for observed changes in staff, resident/family perceptions of satisfaction and perceived quality of care (other than changes in staff mix):

- Things improved for staff between Phase I and II because the initial confusion and concern over the pilot project subsided as they became more accustomed to it,
- The time of implementation (i.e., summer months) may have caused an initial negative reaction from staff which naturally dissolved as the months proceeded, and
- Consequently, resident and family perceptions may have become more favourable as they perceived less frustration and confusion of staff.

There wasn't really a distinct divide between the pilot and control units as a significant proportion of staff reported working on both units; this is probably why there are few differences between them in the survey analyses. Future studies should have pilot and control units in separate facilities.

2. LESSONS LEARNED

2.1 Implementation of Change

Implementing a complex change such as a new staffing mix across a regional health care authority poses many challenges in an environment where there are many competing factors. In this project, there were both challenges and facilitators that impacted implementation.

Applied research in a setting such as a LTC facility provides certain challenges for conducting research. While there was an attempt to educate all relevant staff/management and precautions were made, contamination of staff across units and volunteer bias are inherent limitations in the study. For example, staff self-selected to be part of this study. Additionally, due to staff shortages and scheduling difficulties, some staff such as "floaters" and regular staff worked on both control and pilot units. Other challenges included:

- HR viewed the plan as a major initiative that would have significant labour relations issues. There was a lot of resistance initially, but by engaging HR in the process, by sharing results and the urgency in the organization to recruit/retain RNs and LPNs, support was eventually garnered.
- Timing of the implementation was both an advantage and a challenge. This project would have encountered greater resistance had it been implemented when there was an abundance of RNs and LPNs. Factors that facilitated an openness to participate included: the inability to recruit RNs and LPNs; LPN training not being accommodated in the current Model of Care; expanding waitlists and cancellation of surgeries due to closure of beds causing delays in discharging from Acute Care to LTC; the provincial nurses union publically declaring a nursing shortage, and; the College of LPNs announcing that LPNs would be required to have their medication administration and health assessment course completed by 2012 in order to maintain their license. Implementing the pilot over the summer months, during peak vacation time presented challenges and resulted in periods where



there were inexperienced staff and no LPNs available to work to their full scope; i.e. a medication proficient LPN was not always available during night shift. There was also difficulty maintaining the control unit staffing levels, and at times, they were below the pilot unit levels. Staff resignations occurred on some units after the pilots were initiated.

- The pilot was also subject to several challenges regarding delivery of education/training to the staff, including a significant time delay at one site. Some staff had not received training in the Resident Centered Care Model and the Leadership Modules prior to implementation of the new staff mix.
- All three sites participating in the pilot were not at the same level of experience in working with the MDS assessment tool. MDS was not fully implemented at Hoyles Escasoni initially, but was completed by the end of the second month. At St. Patrick's Mercy Home, not all staff had received MDS training and they often required support to complete the assessments. Finally, Golden Heights Manor staff was trained in the MDS tool prior to the commencement of the study. Due to limited resources, the MDS training was slow to be implemented and required extra support.
- There were variations in schedules between facilities, with some sites working twelve-hour and others eight-hour shifts. Consequently, the targeted staff mix was not always achievable to provide the desired care hours to meet residents' needs. Schedules could not be changed due to union contracts.
- Lack of support positions such as ward clerks was identified as a concern and resulted in nursing staff having to do clerical work.
- Residents on pilot units expressed concern initially that care was being delayed due to the new model of care delivery. An additional four-hour PCA shift was added in the morning to address this issue.
- Although communication was a primary focus, feedback from staff was that they did not have enough information. Even though the job descriptions were shared and discussed with the staff there still was confusion about their new roles in the initial phase of the pilot. Also, although other care team members such as Allied Health were engaged in the pilot, they were not fully aware of the new roles of the RN and LPN. Broader communication and repeated communication across sites is required to ensure key participants are aware.
- Limitations also existed regarding the data itself, particularly concerning quality of care and human resource indicators. Inconsistencies were found in how quality of care indicators were defined and reported between sites.

In moving this project forward, a number of lessons were learned that will help shape implementation across other LTC sites. These findings were supported in the literature by a similar study conducted in B.C.⁴⁵. The lessons include:

- It is crucial to emphasize the difficulty encountered obtaining consistent quality of care indicator data from LTC facilities. Data collection was burdensome for staff due to limited resources and there was often a considerable time lag before receiving the data. Hence, it is recommended that resources be put in place to make this process more manageable, i.e. having a person within each site be responsible for ensuring indicator data is collected at the unit or individual level, reviewed, and then forwarded in a timely fashion.
- Although considerable education has been done regarding standardized reporting mechanisms for quality of care indicators, discrepancies still exist in how they are defined and reported between sites. For instance, it appears that medication errors are underreported within sites. Potentially, this could be alleviated by using standardized reporting mechanisms consisting of standardized forms and universal



definitions of indicators. Furthermore, changing the culture within LTC from a “blame-oriented” climate to a more accepting quality control and safety atmosphere may also improve reporting practices.

- On many occasions, sites reported that staff felt lost and confused in terms of their new roles. Assigning a front-line coordinator, mentor or resource person who could empower staff by increasing their morale, confidence and job satisfaction, provide support and encouragement, and answer questions and concerns would be very beneficial. Also, providing education prior to implementing changes in staff mix and continuous communication is crucial for success.
- Planning for the change is crucial. Comprehensive planning before implementing the change is crucial. For example, support and a training plan for staff that will take on new roles should be well thought out in advance.
- Staff whose roles are to be significantly changed should be consulted beforehand and must understand the reasons for the change. Although the new job descriptions were shared with staff and discussed prior to the intervention, initially there still was confusion over role clarity. It is necessary to give people time to fully grasp what their new roles are.
- It is important that each member of the care team is aware of the substance and boundaries of each other’s roles and scope of practice.
- Information needs to be provided to staff, residents and families on a continuous basis and in multiple forms during change. Sharing results/impacts of the change will help focus on issues and engage staff in providing feedback important in getting buy-in.
- Creating a culture that embraces the need for evidence-informed administrative practice and the adoption of an evidence-informed approach to health workforce management requires significant investments in knowledge transfer and a supportive infrastructure.
- Implementing a major change when there is no body of evidence to support the initiative has implications for the health system as a whole and requires broad participation of internal and external stakeholders at the regional, provincial, and national level.

3. DISSEMINATION

A communications plan has been developed and identifies key venues and opportunities to share results in order to facilitate implementation across Eastern Health. Internally, findings will be shared through an online newsletter, through presentations to the Executive, presentation at a research day, and from staff on pilots who will share their experiences with others in the organization. The results will also be shared regionally with the various professional associations and the Provincial Staff Mix Committee. Furthermore, a case study based on the experience of the pilot at one site was published in the Canadian Nurse January/February 2009. An article on the results of the project and the use of the CNA framework is also being prepared in collaboration with the CNA. Finally, an abstract has been accepted for presentation at the National Healthcare Leadership Conference in June 2009. This will provide an opportunity for health leaders from across the country to learn about this work.



4. IMPLICATIONS

4.1 For Other Decision Makers

As other organizations and health sectors strive to determine an appropriate staff mix for LTC, this project will provide helpful information on factors that need to be considered. The importance of having a framework and evidence to support the change was critical for success from all aspects. Engaging staff, managers and stakeholders in the planning and implementation was key and proved to be effective for sustaining change. Having adequate resources and ensuring that the necessary information, education, and support was available before implementation was crucial. Finally, the ability to adapt to change and be flexible was also required for implementing such a change in a dynamic environment such as healthcare.

The implications of these research findings are large and are related to healthcare policy, evidence-informed administrative practice and the adoption of an evidence-informed approach to health workforce management. This work confirms that there is no universal nursing staff mix ratio for LTC and that many factors have to be considered. For instance, the staff mix ratios at some sites varied from those identified in the Provincial Staffing Mix document.

4.2 Different Audiences

There are a variety of audiences that will be interested in this work.

- Other LTC centres, provincial and national organizations, researchers and policy makers as there is limited research on what an appropriate staff mix for LTC should be.
- Administrators of LTC facilities within Eastern Health as they will be required to move to this new model of care.
- Clients and families in LTC as the new staff mix will impact the care they or their relatives receive.
- The research community as they will have an interest in publishing the results of this work. Furthermore, the findings will help inform them for future studies.
- The CNA will be interested in the feasibility and practicality of its Evaluation Framework. The results will support the use of the tool by others and validates its use by managers and other decision-makers when measuring the comprehensive effects of staff mix changes and planning further human resource modifications.
- Human Resource Departments as policies surrounding the hiring of LPNs are important as LPNs will require medication administration and health assessment courses in order to work to full scope. This will impact the abilities of some of the current LPNs to continue to function as LPNs in the future.
- The Provincial Department of Health will be interested as the intervention has implications for the funding model for LTC. The experience with the staff ratio that was implemented may be used as a potential benchmark for future funding levels.
- Professional associations such as the ARNNL will be interested in the impact of the new role of RNs in LTC. From a worklife perspective as well as from a professional practice perspective and quality of care, the CLPNNL will also be interested as their recent policy direction of full scope by 2010 will impact many of their members and those not up to the full scope level.



- Unions, as the findings of this study have implications regarding the numbers of their membership as well as worklife implications. Also, there are significant labour relations issues regarding seniority, on-call lists etc. that will require negotiations with the unions.

4.3 Future Activities

A Change Management Team, Steering Committee, and Project Change Team have been established to support the implementation of the new staff mix across the organization. Eastern Health's change management consultant will work with the Project Change Team as this new staff mix model is implemented across other sites. Dedicated resources, including one clinical coordinator and one human resources coordinator, have been hired to assist with the planning and implementation of the new model. An education consultant has also been hired since the pilot began. Funding has been provided to cover tuition costs for RNs and LPNs completing the Health Assessment and Medication Administration courses. A plan to enable staff to complete these courses over the next three years has also been developed. A set of components, based on lessons learned from the pilot, have been identified and will be required for any future implementation.

A readiness assessment has been completed and those LTC sites ready to start implementation have been identified. Where resistance/concerns exist, more discussion, sharing and collaboration will take place. Pilot staff will share their experiences and assist other sites during implementation. "Repeatedly telling staff about successful improvement helps to introduce and reinforce desired altered values and behaviours and to build momentum for change."

A change plan is also being developed to facilitate implementation across other sites. The Prosci Change Management Process will be used to guide the development and implementation of this plan. This includes tools such as checklists and assessments to assist with preparing, managing, and reinforcing the change (see Appendix D) (www.change.management.com).

A number of resources have been identified and will be required to provide education to staff and support including:

- Mentoring role,
- Education in leadership/change management and management essentials for managers, and
- Additional access to computers and training for LPNs for documentation and MDS.

Engaging the various levels of staff and managers through collaboration with the clinical and human resource coordinators will be key to ensuring the necessary support for change. Engaging an implementation team at each site will also give an opportunity for input and to reflect site uniqueness. The ongoing evaluation will provide feedback which will be used to take corrective actions or share positive experiences as outlined in the Prosci's Change Management Process. The ADKAK filter and guide (see Appendix D) for applying change management will ensure that plans are in place for each area, including communications, working and training, resistance management, sponsor involvement, project team activities, and a master schedule.



Since the pilot ended, the Hoyles Escasoni site has implemented the model on another unit that had been closed due to inadequate RN staffing. The supports identified in the pilot have been implemented, and all the feedback from the managers, staff, and residents/families has been positive.



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Appendices:

Appendix A – Provincial peer site review

Appendix B – Framework to assist decision makers in making staff mix decisions (Mueller, C (2002))

Appendix C – Evaluation Framework to Determine the Impact of Nursing Staff Mix Decisions

Appendix D – Prosci Change Management Process

Appendix E – Evaluation Markers

Appendix F – Resident Satisfaction Survey

Appendix G – Resident Consent Form

Appendix H – Family Satisfaction Survey

Appendix I – Letter to Family Members

Appendix J – Focus Group Participants

Appendix K – Long-Term Care Provider Survey

Appendix L – Participant Information Sheet

Appendix M – HIC Approval

Appendix N – Implementation Plan with Target Time Frames

Appendix O - Total Resident Care Model

Appendix P - Expression of Interests - LPNs

Appendix Q - Staff Ratios - Pilot and Control Units

Appendix R - Daily Monitoring Tool

Appendix S - Staff, Resident and Family Survey Results

