



CARE AND CONSTRUCTION

Assessing Differences in Nursing Home Models of Care on Resident Quality of Life

Final Report

**Care and Construction: Assessing Differences in Nursing Home Models of Care on Resident
Quality of Life**

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www.careandconstruction.ca

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Purpose

The research project, *Care and Construction: Assessing Differences in Nursing Home Models of Care on Resident Quality of Life*, brought together a diverse team of researchers, nursing home administrators, and other long-term care sector representatives to examine what influences nursing home resident quality of life. Shifts within Nova Scotia's nursing homes provided the right context to examine how changes in physical design and staffing approaches impact nursing home resident quality of life.

This report presents results from the project that answer the main research question of the project, "To what extent and in what ways do differences in the nursing home model of care impact resident quality of life?" Results from the surveys and the case studies used in the project are reported here. These results inform the key messages of the project, which are summarized along with implications for long-term care policy, practice, and education.



Executive Summary

In Nova Scotia, the continuing care sector has been undergoing significant changes. Prompted by these changes, a team of researchers and sector representatives came together to examine the impact of different models of care in Nova Scotia's publicly-funded nursing homes on resident quality of life. The main objective of the Care and Construction team was to answer the question, to what extent and in what ways do differences in the nursing home model of care impact resident quality of life?

For the purpose of the project, model of care was defined by differences in physical design (new household design compared to traditional) and staffing approach (variations in scope of practice of Continuing Care Assistants). Nursing homes representing three models of care from across Nova Scotia were involved with the project. The team defined resident quality of life using different elements such as quality of care, degree of resident autonomy, and level of involvement in activities.

Multiple methods were used to answer the research question, which allowed the team to balance the inclusion of a large number of participants while also examining contextual factors. More than 1,600 participants provided information through surveys, interviews, focus groups, and case studies that included interview, participant observation, and activity monitoring. Results of the surveys and case studies are included in this report.

Survey Results

Surveys were completed with 319 nursing home residents, 397 family members, and 862 staff members. Each of the surveys included the same measure of resident quality of life, the *interRAI Survey on Nursing Home Quality of Life*®, which was tailored to the different perspectives. Results from each perspective were analyzed separately using multilevel modelling.

From the **resident perspective**, five variables were found to be significantly associated with resident quality of life:

- Having a partner (married or common-law) was associated with lower resident quality of life.
- Higher health status was associated with higher resident quality of life.
- A feeling of home-likeness was associated with higher resident quality of life.
- More staff bonding with the resident was associated with higher resident quality of life.
- Presence of resident personal relationships was associated with higher resident quality of life.

From the **family perspective**, four variables were found to be significantly associated with resident quality of life:

- Lower resident cognitive function was associated with lower family perceptions of resident quality of life.
- Open, respectful, and supportive relationships between family and staff were related to higher family perceptions of resident quality of life.
- Support within the nursing home for resident-to-resident relationships was related to higher family perceptions of resident quality of life.
- More home-likeness was related to higher family perceptions of resident quality of life.



From the **staff perspective**, seven variables were found to be significantly associated with resident quality of life:

- Staff from homes with the household design and full-scope staffing approach perceived higher resident quality of life compared to staff from homes with a traditional physical design and traditional staffing approach.
- Respectful relationships between staff and residents were associated with higher staff perceptions of resident quality of life.
- An increased sense of home-likeness was associated with higher staff perceptions of resident quality of life.
- Increased role clarity for staff was associated with higher staff perceptions of resident quality of life.
- A higher degree of skill use for staff was related to higher staff perceptions of resident quality of life.
- Greater transformational leadership among supervisors was associated with higher staff perceptions of resident quality of life.
- More experiences of resident challenging behaviours by staff were associated with lower staff perceptions of resident quality of life.

Early in each of the analyses of resident quality of life, model of care was significantly associated with resident quality of life. As additional variables were added to the analyses, the strength of the association decreased. To understand more about the influence of model of care on resident quality of life, indirect effects were tested through the mediators of relationships, home-likeness, and support for autonomy (from the staff perspective only). The results showed indirect effects of model of care on resident quality of life through home-likeness from all three perspectives and through relationships from the family perspective.

Case Study Results

Six in-depth case studies provided an opportunity to follow participants over time and to examine the dynamics and interactions between individuals within the broader context of the nursing home. Each case was comprised of a care constellation that included a resident with one of their family members and a staff member who regularly worked with the resident. Half of the cases included a resident who was unable to speak for themselves.

Data was collected using interviews with each member of the case, participant observation with the resident, and physical activity monitoring of the resident. Data was collected three times over a ten-month period.

From the analysis of the case study data, a number of elements that supported resident quality of life were identified:

- A feeling of home-likeness in the nursing home, which included elements such as private rooms, physical features of the nursing home, and relationships within the nursing home.
- Relationships with staff from the resident perspective (e.g., an opportunity to give back to staff) and from the family perspective (e.g., being included as part of the care team).
- Familiarity with resident needs and opportunities for relationship building that were enhanced by staff continuity.



- Involvement of family members in the nursing home, which provided social contact for residents and support in monitoring resident medical and personal care needs.
- Resident autonomy that was expressed as residents maintaining their favourite activities and routines.

Bringing It All Together

Looking across the survey and case study findings from each of the three perspectives reveals shared elements that were important in supporting resident quality of life. Positive relationships among residents, family, and staff and more home-likeness within the nursing home were associated with higher resident quality of life from all perspectives. It was through home-likeness and relationships that newer models of care had an indirect effect on resident quality of life. The importance of home-likeness and relationships were strong themes that emerged from the case studies as well.

These two factors, along with the unique role of working environment on staff perceptions of resident quality of life form the main messages from this research:

- Relationships matter in providing a positive quality of life for residents.
- Fostering a home-like environment within the nursing home will support the quality of life of the residents.
- Enhancing certain aspects of the working environment impacts the perceptions of staff in assessing resident quality of life.

These messages can guide policy, practice, and education for the long-term care sector. At a workshop held in Nova Scotia with almost 70 representatives from the sector, participants identified strategies for implementing these results:

- Support positive relationships in the nursing home through the modeling of good relationships by management, by providing training opportunities to improve skills, and by fostering relationships among residents and family.
- Increase home-likeness by reducing unnecessary signage, ensuring there are safe ways for residents to access the outdoors and to engage in their communities, and being creative about how shared rooms and spaces are divided to create more private conversation areas.
- Create a positive working environment by adopting collaborative practice models and providing consistent staffing assignments.



Building the Research Team

In Nova Scotia, the continuing care sector has undergone significant changes. As part of the Continuing Care Strategy (Nova Scotia Department of Health) released in 2006, a number of new and replacement residential long-term care facilities¹ were opened. These residential long-term care facilities or nursing homes included shifts in staff scope of practice and incorporated innovative physical designs (e.g., small, self-contained households replacing hospital-like wards). In addition to these system-level changes, individual nursing homes were adopting philosophies that emphasize resident-centered care. These changes had implications for residents, their families, and the staff that work in these homes.

In 2009, prompted by these changes in the sector, a team of researchers and sector representatives came together to identify research questions related to the resulting new models of care (Fancey, MacDougall, Hattie, & Keefe, 2010; Keefe & Stadnyk, 2009). A review of the literature identified that a transition to resident-centered care, through the use of more home-like environments and new staffing approaches, had the potential to improve delivery of care and address important resident concerns (Fancey, Keefe, Stadnyk, Gardiner, & Aubrecht, 2012; Keefe, Stadnyk, White, & Fancey, 2009). However, the impact of these innovations on resident quality of life had not been thoroughly assessed, specifically within a Canadian context.

Table 1: Project development timeline

Year	Activity
2006	Release of Nova Scotia Continuing Care Strategy
2008	Northwood research day where the idea for the project emerged
2009	Interdisciplinary planning workshop hosted by the Nova Scotia Centre on Aging
2010	Proposal development and funding application to CIHR
2011	Care and Construction project launched

Supported by funding from Mount Saint Vincent University (MSVU) and the Nova Scotia Health Research Foundation (NSHRF), the team developed a research proposal. The proposed project would examine the impact of different models of care in Nova Scotia's publicly-funded nursing homes on resident quality of life from the perspectives of residents, family members, and staff. The proposal was successful and in April 2011 the Care and Construction project began with three years of funding from the Canadian Institutes of Health Research (CIHR) and NSHRF.²

¹ In Nova Scotia, these are publically-funded and -licensed nursing homes. Throughout the report, the term 'nursing home' or 'home' is used in place of the term 'residential long-term care facility' and the term 'facility' is used to refer to the physical structure of the nursing home.

² With remaining funds, project work was extended for one year (until March 2015)



Identifying the Research Question

The work of the project was guided by the main research question, to what extent and in what ways do differences in the **nursing home model of care** impact **resident quality of life**? This question was asked from the perspectives of nursing home residents, family, and staff.

Incorporating Three Perspectives – Residents, Family, and Staff

The project team recognized the importance of including the diverse perspectives of nursing home residents, their families, and nursing home staff. Previous research has shown that changes in nursing home staffing approach and physical design impact residents, family, and staff but many of these studies included only one perspective (Brown-Wilson, Davies, & Nolan, 2009). Studies have found differences between resident and caregiver appraisals of quality of life (Berlowitz, Du, Kazis, & Lewis, 1995; Epstein, Hall, Tognetti, Son, & Conant, 1989), yet little is understood about why those differences exist (Mittal et al., 2007).

Previous research has tended to focus on the perspectives of family and staff to assess resident quality of life. The differences found between the perspectives underscored the importance of including residents themselves in the research and in finding unique ways to include the experiences of those with dementia and other cognitive impairments. These important considerations helped shape the design of the project and plans for data collection.

Describing Model of Care

Changes in staffing approach and physical design within Nova Scotia's nursing homes provided an ideal context to assess impacts on resident quality of life. To examine these impacts, the project team categorized the differences within the participating nursing homes. These categories are defined for the purpose of the project as the **model of care**. The three models of care are based on differences in physical design (new household design compared to traditional) and staff approach (variations in scope of practice of the Continuing Care Assistants (CCAs)), as outlined in Table 2.

Table 2: Overview of the project's models of care by physical design and staff approach

	Physical Design	Staff Approach
New-Full-scope	New Small, self-contained households	Full-scope CCAs responsible for all tasks, including dietary and housekeeping
New-Augmented	New Small, self-contained households	Augmented CCAs provide care needs and limited dietary and housekeeping
Traditional	Traditional floors/units	Traditional CCAs provide only care needs, other staff provide dietary and housekeeping services

Twenty-three nursing homes acted as the study sites for the project. These sites had residents, family and staff participate in data collection activities. A number of these homes were partners during the development of the project's research proposal and other homes were invited to participate once funding had been secured. A variety of homes were included to ensure representation across the three models of care.



An additional invitation was made to all the nursing homes (n=66) in the province to have staff participate in the survey. This was to ensure a large enough sample to allow for detailed analysis of experiences working in long-term care. In response to this invitation, staff from 36 additional homes completed the survey.

These nursing homes represented diverse locations across Nova Scotia and included nursing homes from both rural and urban areas. The homes were from both the public and private sector and included not-for-profit and for-profit homes. The size of participating homes ranged from 15 beds to 474 beds. The age of the facilities ranged from 2 years to 42 years.

Defining Resident Quality of Life

Research looking at nursing home residents has used different measures to assess their experience. These measures include resident satisfaction, quality of care, and quality of life. For this project, the team chose to focus on resident quality of life as the main outcome. Resident quality of life includes a number of elements such as perceptions of autonomy, involvement in activity, and safety (Kane, 2001). It can also encompass elements of resident satisfaction and perceptions of quality of care (Crespo, Bernaldo de Quirós, Gómez, & Hornillos, 2012). Detail on how resident quality of life was measured for this project can be found in the analysis sections of this report.



Using Multiple Methods

A variety of data collection methods were used to assess the impact of model of care on resident quality of life from the three perspectives. This mix of data collection methods allowed the team to balance the inclusion of a large number of participants while also examining more in-depth contextual factors. The design included surveys, interviews, focus groups, and case studies that included interviews, participant observation, and physical activity monitoring.³ Most data were collected in 2012. The follow-up staff survey took place later, in late 2013 and early 2014.

Table 3 shows the number of participants involved in each of the different components of the project. Survey data were collected from each of the three perspectives. Follow up data collection was done for each perspective. This included in-depth interviews with residents, focus groups with family members, and follow-up surveys with staff.

Table 3: Summary of study participants by data collection method

	Survey	Follow Up	Case Study	Nursing Home Profile
23 Study Sites				
Residents	319	15	6	-
Family Members	397	21	6	-
Staff	442	60	6	-
Senior Administration	23	-	-	23
36 Additional Sites				
Staff	420	52	-	-
Senior Administration	-	-	-	34*

*Two of the thirty-six additional sites did not provide profile data.

Senior administrators at each of the study sites completed a survey regarding their opinions about resident quality of life within their nursing homes. At the study sites and the additional sites, administrators completed a profile of their nursing home environment, including descriptions of the facility size and layout, philosophy of care, staffing, and resident population.

The case study portion of the project also included the three perspectives. Six residents, each with one of their family members and one of the staff working with them, comprised six care constellations. All participants were interviewed at three different points in time within a 10-month period. Participant observation and physical activity monitoring were done with the residents at each of the three data collection points.

This report provides results from the surveys with residents, family, and staff and from the case studies.⁴ Results are presented in two parts, focusing first on the surveys, followed by the case studies. The discussion of the main messages brings together the results from these two parts of the project.

³ The project design and administration was approved by a number of research ethics review boards: Mount Saint Vincent University, Capital District Health Authority, Saint Mary's University, Dalhousie University, and the University of Prince Edward Island. Administrative approval was received from partnering long-term care providers: Alderwood Rest Home, Northwood, Rosecrest Communities, Shannex, Tideview Terrace, and Windsor Elms Village.

⁴ Other data collected as part of the project were still under review at the time of the publication of this final report.



Part 1 – Surveys with Residents, Family, and Staff

Working groups comprised of both researchers and sector representatives from the project team met to develop the survey tools. One survey was developed for each perspective: resident, family, and staff. Each of the surveys included the same questions to assess resident quality of life but each perspective had some unique questions, which were tailored to the individual perspectives. Surveys were revised based on feedback received during pretesting. Analyses of the survey data were done within the individual perspectives.

How Were the Data Collected?

Residents, families, and staff at the 23 study sites were invited by letter, posters, and through presentations at the nursing homes to participate in the survey. Health Association Nova Scotia, a partner in the research, invited all additional nursing homes in the province to participate in the staff survey. In those additional nursing homes, staff were invited to participate in the survey using posters and individual invitation letters distributed by their employer.

Residents completed surveys with the assistance of research assistants working for the project. These research assistants visited the nursing homes to meet with residents. Family and staff completed surveys either online or in print⁵. These print surveys were returned directly to the project office either via a drop-off box at the nursing home or by mail.

Informed consent was obtained from all participants. For residents, consent was obtained in person by the research assistants. For family and staff, consent was given by submitting a completed survey.

Administrators completed nursing home profiles that provided the team with more detail about the context of the homes. Questions examined the environment within the home, philosophies of care, and the use of specialized approaches within the home. Administrators completed the profile forms by paper or email. Follow-up phone calls were made to administrators to complete missing information and ask some additional questions.

Who Were the Participants?

Surveys were completed by **319 nursing home residents**⁶:

- **Gender:** 73% were female
- **Age:** 19% were under age 65; 39% were aged 85 and older
- **Marital status:** 18% were married or in a common-law relationship
- **Cognitive ability:** 80% had mild or no cognitive impairment
- **Time in nursing home:** 14% had lived in the nursing home less than 6 months; 46% had lived in the home for two years or more

⁵ Among family members, 67% completed print surveys and among staff, 63% completed print surveys.

⁶ This represents 13% of all residents living in the participating nursing homes at the time of the study. This does not represent the response rate from all eligible participants as a large number of residents would not have had the capacity to provide informed consent.



Surveys were completed by **397 family members**⁷:

- **Gender:** 78% were female
- **Age:** 36% were aged 65 and older
- **Employment status:** 55% retired; 27% employed full-time
- **Relationship to resident:** 64% were son or daughter of resident; 13% were spouse of resident

Family members answered the surveys about their relative living in the nursing home. These were:

- **Gender of resident:** 77% were female
- **Age of resident:** 5% were under age 65; 90% were aged 75 and older
- **Resident cognitive ability:** 51% experienced difficulty due to cognitive ability challenges
- **Resident time in nursing home:** 10% had lived in the nursing home less than 6 months; 42% had had lived in the home for two years or more

Surveys were completed by **862 staff**⁸:

- **Gender:** 91% were female
- **Age:** 44 years old, on average (ranged from 16 years to 71 years)
- **Work role:** 40% CCA or Personal Care Worker (PCW);
19% Registered Nurse (RN) or Licensed Practical Nurse (LPN);
12% support services (e.g., dietary, housekeeping, support services assistant)
- **Employment status:** 66% were full-time; 8% were casual
- **Role tenure:** working in current role for 8 years and 9 months on average (ranged from 1 month to 49 years)
- **Nursing home tenure:** working at current home for 8 years and 4 months on average (ranged from 1 month to 48 years)

What Measures Were Used?

A number of tools and questions were used as measures in the surveys. The outcome variable of resident quality of life was measured with a tool developed by interRAI. There were many explanatory variables measured in the surveys.

interRAI Survey on Nursing Home Quality of Life ©

The research team chose the *interRAI Survey on Nursing Home Quality of Life* © as a measure of resident quality of life. This survey is part of the interRAI suite of assessment tools and was used with permission from the authors. It was developed by a group of 20 researchers and was specifically designed for use in a nursing home context. The questions in this instrument examine a number of

⁷ This represents 17% of the main family member contacts for each resident living in the participating nursing homes (i.e., one family member per resident). There are limitations to this response rate as it is possible that not all family members received a personal invitation to participate in the study or that more than one family member per resident participated. The means of inviting family to participate varied between the nursing homes.

⁸ This represents approximately 13% of all staff working in participating nursing homes at the time of the study. There are limitations in using this response rate as the total number of staff was based on estimates from administrators or project staff and not all staff members received a personal invitation to participate (e.g., recruitment was done through announcements at meetings, in newsletters, and by poster). A prize incentive was used.



domains related to resident quality of life including autonomy, opportunities to engage in activities, food, and safety (Kehyayan, 2011; Kehyayan, Hirdes, Stolee, & Tyas, in press).

The survey was originally designed for use with residents. It was subsequently modified, in consultation with Dr. John Hirdes, to be used from the staff and family perspectives. Residents responded from their own perspective, family responded based on *their perceptions* of the experience of the resident (their family member), and staff responded based on *their perception* of the experiences of all residents living in the nursing home where they work.

Through analysis of the interRAI survey, the Care and Construction team identified four components of quality of life that are shared between residents, family, and staff in their assessments of resident quality of life (Godin, Keefe, Kelloway, & Hirdes, 2014). This allowed for comparisons between the three perspectives. These factors were:

- **Care and Support** (12 items): Residents have privacy and safety when receiving care, receive service when needed, are treated with dignity and respect, and are supported to live the way they want.
- **Autonomy** (9 items): Residents have the privacy they want, decide when to do things and how to spend their time, and have control over who is in their room.
- **Activities** (4 items): Residents have enjoyable activities to take part in and that keep them mentally active.
- **Food** (4 items): Residents enjoy mealtimes and have variety in their meals.

Each of the items on the survey was rated by participants on a 4-point scale, where 0 is 'Never' and 4 is 'Always.' Mean scores were calculated for each of the four factors. The means of the four factors were calculated for an overall score of resident quality of life.

Potential Predictors of Resident Quality of Life

A number of potential predictor⁹ variables were used in the analysis to examine resident quality of life. Some of these variables measured characteristics of the participants and some measured characteristics of the home in which they lived, visited, or worked. Some of these measures were developed by the project team and others were taken from previously developed tools.

The resident, family, and staff surveys included questions on demographics such as age, gender, and length of experience with the nursing home. As well, individuals' assessments of the quality of relationships and the degree of home-likeness within the nursing home were included. Characteristics of the nursing home used to understand resident quality of life included the model of care, the use of specialized approaches and philosophies in providing care, staffing ratios, facility age, and size of the facility or the households/units within the facility.

Surveys from each of the perspectives incorporated unique variables to understand the influences on resident quality of life. From the resident perspective, measures of physical activity levels and of physical and cognitive health were included. The family perspective included measures of the type and quality of the relationship between the family member and the resident. The staff perspective

⁹ The use of the term 'predictors' in multilevel modelling indicates a degree of correlation with the outcome variable (i.e., resident quality of life). Predictor variables with higher correlations help to predict but do not necessarily cause the outcome variable.



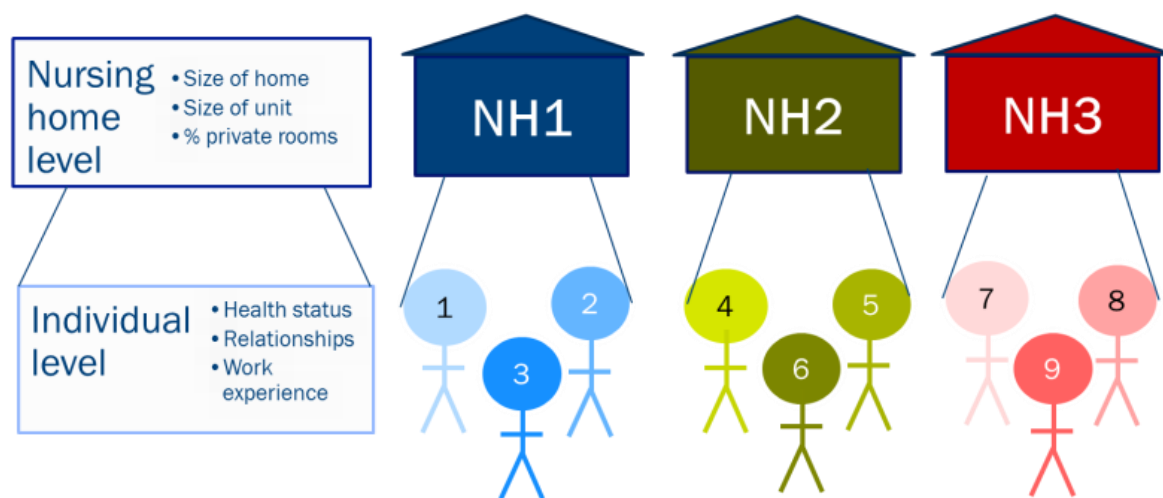
had a number of measures related to the working environment within the nursing home including role overload, role clarity, leadership style of supervisors, and the number of positive and challenging interactions with residents and family members.

Each of the variables used in the analyses are described in detail in Appendix A.

How Were the Data Analyzed?

Analysis was done using the statistical technique called multilevel modeling. This technique enables analysis of nested or clustered data. The residents, family members, and staff in the project are nested within nursing homes. Multilevel modeling takes into consideration how quality of life varies between nursing homes and allows for examination of nursing home characteristics and personal characteristics together as predictors of resident quality of life. Figure 1 depicts the two levels of variables that were accounted for in the multilevel modeling used in the study.

Figure 1: Visual representation of multilevel modeling



A multilevel model was developed to identify predictors of resident quality of life from each of the three perspectives: resident, family, and staff. A number of steps were followed in developing the models. To begin, the Intraclass Correlation Coefficient (ICC) was calculated for each of the perspectives to identify how much variance in resident quality of life was accounted for at the nursing home level. The ICCs are listed in Table 4.

Table 4: Intraclass Correlation Coefficients for resident quality of life by perspective

	Resident	Family	Staff
Intraclass Correlation	.09	.29	.20

Note: Scores range from 0 to 1, with higher scores indicating a greater proportion of variance accounted for at the nursing home level.

These ICCs indicate that 9%, 29%, and 20% of the variance in resident quality of life scores was accounted for at the nursing home level for the resident, family, and staff perspectives, respectively. This degree of variance at the nursing home level and the inclusion of nursing home-level variables in the models justified the use of multilevel modeling.



To build the model, variables were added in blocks of related predictors (e.g., demographics, health measures, or work features). As blocks were added, they were assessed for improvement in model fit using the Wald statistic¹⁰ (Meng & Rubin, 1992).

The sample sizes for each perspective limited the number of variables that could be used in the models. To manage the size of the final models, variables were removed from the model if (1) a full block of variables did not improve model fit and if none of the individual variables were significant unique predictors of resident quality of life or (2) an individual variable had an associated p-value higher than .30.

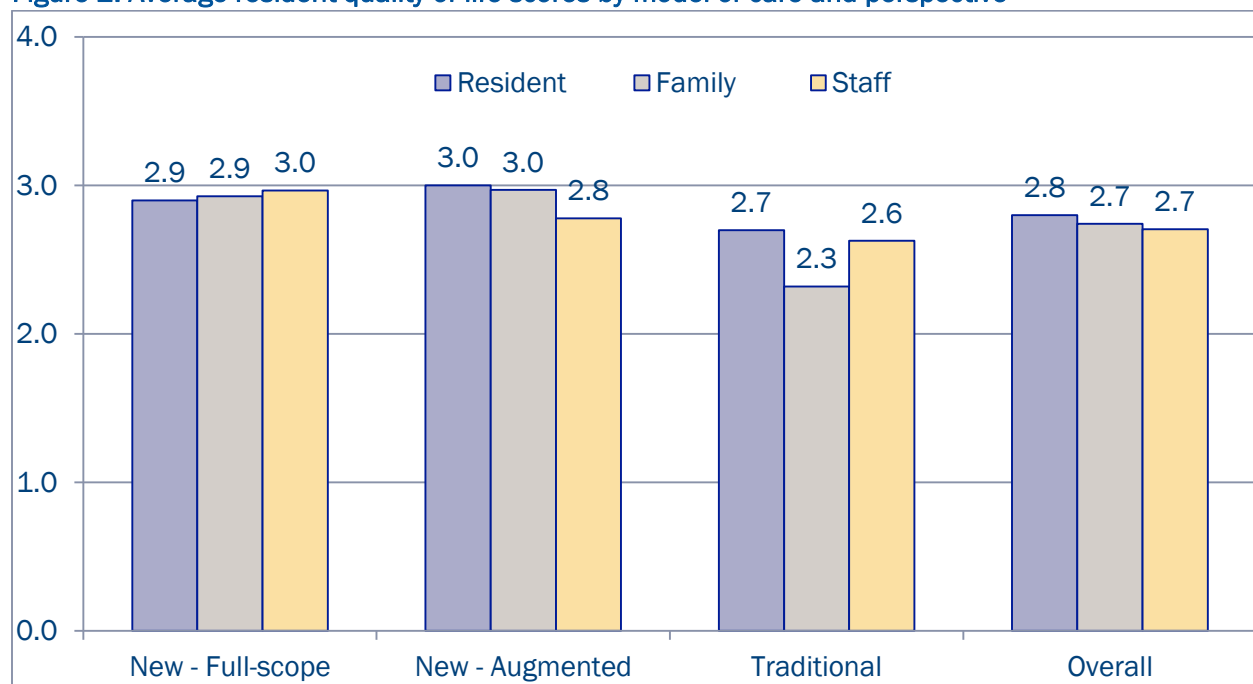
Dealing with Missing Data

Missing data were handled through multiple imputation. Multiple imputation is an advanced method for dealing with missing data that provides less biased estimates compared to more traditional missing data techniques, such as listwise deletion (Enders, 2010; Graham, 2009; Schafer & Olsen, 1998).

Comparing Resident Quality of Life across the Models of Care

Figure 2 presents the average resident quality of life scores by perspective across the different models of care (the scale was measured from 0 to 4, with higher scores indicating higher quality of life). On average, across the models of care, residents, family, and staff perceived a positive quality of life for residents (i.e., the average quality of life scores are above the mid-point on the scale).

Figure 2: Average resident quality of life scores by model of care and perspective



Note: Measured on a 5-point scale from 0 to 4; higher scores indicate higher resident quality of life.

¹⁰ The Wald statistic is similar to a Z-score, with higher scores indicating more improvement to model fit. Each score has an associated p-value.



There were also significant differences between them. For both the resident and family perspectives, the average resident quality of life score was significantly higher in homes with the New-Full-scope model compared to homes with the Traditional model (resident perspective, $p < .05$; family perspective, $p < .001$) and in the New-Augmented model compared to homes with the Traditional model (resident perspective and family perspective, $p < .001$).

From the staff perspective, the average resident quality of life was significantly higher in homes with the New-Full-scope model compared to homes with the New-Augmented model ($p < .01$) or with the Traditional model ($p < .001$). Staff from homes with the New-Augmented model of care reported significantly higher resident quality of life compared to those from homes with the Traditional model ($p < .01$).

To fully understand these differences, multilevel models were designed and tested from each of the three perspectives.

Examining Resident Quality of Life from the *Resident Perspective*

The intraclass correlation (ICC) for the data from the resident perspective was .09 indicating that 9% of the variance in resident quality of life was between nursing homes. Although this is not a large ICC, 9% is meaningful. As both nursing home-level and individual-level variables were included in the model, multilevel modeling was used to test for predictors of resident quality of life.

Variables were added to the model in six blocks (see Table 5). The first block of variables included demographic information about the resident: age, marital status, education, length of time living in the nursing home, and gender. There was a significant improvement in model fit when these variables were added. Gender was subsequently removed from the final model as it did not meet the criteria for inclusion.



Table 5: Fixed effects for the multilevel model examining resident quality of life: Resident perspective (showing significant blocks)

	Block 1† Demographic	Block 2† Health	Block 3† Model of Care	Block 6† Perceptions
<i>Intercept</i>	2.71***	2.72***	2.50***	2.72***
<i>Age (65 to 84)</i>	0.17	0.17	0.17	0.07
<i>Age (85 plus)</i>	0.20	0.18	0.17	0.09
<i>Marital status (Single=0)</i>	-0.17	-0.18	-0.18*	-0.22**
<i>Some high school</i>	0.14	0.11	0.14	0.04
<i>Some college/university</i>	-0.01	-0.03	-0.01	0.01
<i>Time in nursing home (<1yr=0)</i>	-0.10	-0.06	-0.02	-0.03
<i>Gender‡</i>	--	--	--	--
<i>Health scale (EQ-5D)</i>		0.36*	0.35*	0.27*
<i>Fatigue</i>		0.00*	0.00*	0.00
<i>Some exercise‡</i>		--	--	--
<i>Enough exercise‡</i>		--	--	--
<i>Cognition scale (MMSE)</i>		--	--	--
<i>Model of care (New-Full-scope)</i>			0.24*	0.15
<i>Model of care (New-Augmented)</i>			0.34**	0.13
<i>Home-likeness</i>				0.16***
<i>Personal relationships</i>				0.15***
<i>Staff/resident bonding</i>				0.18***
<i>Model fit improvement (Wald)</i>	2.21*	7.62***	5.82**	55.85***

†Two additional blocks of variables were added, Block 4 – Nursing home characteristics (9 variables) and Block 5 – Staff mix (3 variables) but did not significantly improve model fit and were excluded from the final model.

‡These variables had $p > .30$ when added to the model and were subsequently removed. Their removal did not result in a significant reduction in model fit.

* $p < .05$; ** $p < .01$; *** $p < .001$

The second block of variables included indicators of health and activity: a health scale, fatigue scale, and level of exercise the resident participated in on a regular basis. The two exercise variables were subsequently removed from the model as they did not meet the inclusion criteria. The addition of this block of variables improved model fit.

Third, the variables of model of care were added to the model: New-Full-scope compared to Traditional and New-Augmented compared to Traditional. Overall model fit was significantly improved with the addition of these variables.

The next two blocks of variables were removed from the final multilevel model as they did not significantly improve overall model fit. Block 4 included nine variables that were nursing home characteristics: proportion of residents in the nursing home with moderate to severe cognitive impairment, use of the Eden philosophy, use of a Montessori philosophy, presence of a dementia unit, age of the facility, proportion of private rooms in the facility, overall support for resident decision making, and overall support for resident autonomy. Block 5 included three variables about the mix of



staff available within the nursing home: number of direct care staff per resident, number of therapeutic staff per resident, and number of administrative or support staff per resident.

The final block of variables added to the multilevel model included indicators of resident perceptions. These three variables were: home-likeness, personal relationships, and staff-resident bonding. There was significant improvement to model fit with the addition of this block of variables.

In the final multilevel model of resident quality of life from the resident perspective, five variables were significantly associated with resident quality of life: marital status, health scale, home-likeness, personal relationships, and staff-resident bonding. These significant associations showed that:

- Having a partner was associated with lower resident quality of life.
- Higher health status was associated with higher resident quality of life.
- A feeling of home-likeness within the nursing home was associated with higher resident quality of life.
- More staff bonding with the resident was associated with higher resident quality of life.
- Presence of resident personal relationships was associated with higher resident quality of life.

Examining Resident Quality of Life from the *Family Perspective*

When looking at the family survey analysis, the intraclass correlation (ICC) was .29 indicating that 29% of the variance in resident quality of life from the family perspective was between nursing homes. A multilevel modeling approach was needed to test for predictors of resident quality of life.

Variables were added to the model in five blocks (see Table 6). The first block of variables included demographic information about the individual completing the survey (age and gender) and about their family member living in the home: length of time in the nursing home, degree of cognitive ability challenges, and degree of physical ability challenges. There was a significant improvement in model fit when these variables were added. Age and gender were removed from the model as they did not meet the criteria for inclusion.



Table 6: Fixed effects for the multilevel model examining resident quality of life: Family perspective (showing significant blocks)

	Block 1†‡ Demographic	Block 2‡ Model of Care	Block 3†‡ Relationships	Block 4‡ Home- likeness
<i>Intercept</i>	2.83***	2.41***	2.54***	2.60***
<i>Time in nursing home (0=<24 months)</i>	-0.12	-0.11	-0.08	-0.07
<i>Cognitive challenges</i>	-0.14**	-0.13*	-0.13**	-0.12*
<i>Physical challenges</i>	-0.07	-0.07	-0.06	-0.07
<i>Model of care (New-Full-scope)</i>		0.58**	0.39*	0.29
<i>Model of care (New-Augmented)</i>		0.62**	0.36	0.27
<i>Family/staff relationships</i>			0.35***	0.24***
<i>Resident/resident relationships</i>			0.22***	0.16*
<i>Home-likeness</i>				0.23*
<i>Model fit improvement (Wald)</i>	6.07***	6.50**	39.56***	6.10*

†Additional variables were initially added with this block but were removed as they had $p > .30$. Their removal did not result in a significant reduction in model fit.

‡ One additional block of variables was added, Block 5 - Nursing home characteristics (8 variables) but did not significantly improve model fit and was excluded from the final model.

* $p < .05$, ** $p < .01$, *** $p < .001$

Second the model of care variables were added to the model: New-Full-scope compared to Traditional and New-Augmented compared to Traditional. Overall model fit was significantly improved with the addition of these variables.

The third block of variables included a number of indicators of relationships: marital status of the resident living in the home, physical distance of the family member from the nursing home, visitation level, emotional closeness, family involvement in decision making, resident-staff relationships, family-staff relationships, and resident-resident relationships. Only the final two variables were retained in the model as the other six variables did not meet the inclusion criteria.

The home-likeness scale was added on as the fourth block. There was significant improvement in model fit with the addition of this variable.

The final block included nursing home characteristics. These were: number of residents in the nursing home, proportion of residents in the nursing home with moderate to severe cognitive impairment, number of residents per unit, support for moving furniture around residents' room, use of the Eden philosophy, use of the Montessori philosophy, presence of a dementia unit, age of the facility, and proportion of private rooms in the facility. This block was removed from the final multilevel model as it did not significantly improve overall model fit.



In the final multilevel model of resident quality of life from the family perspective, four variables were significantly associated with resident quality of life: degree of cognitive challenges experienced by the resident, family-staff relationships, resident relationships, and home-likeness. These significant associations showed that:

- Lower resident cognitive function was associated with lower family perceptions of resident quality of life.
- Open, respectful and supportive relationships (family-to-staff) were related to higher family perceptions of resident quality of life.
- Support for resident-to-resident relationships was related to higher family perceptions of resident quality of life.
- Perception of more home-likeness was related to higher family perceptions of resident quality of life.

Examining Resident Quality of Life from the *Staff Perspective*

In the analysis of the staff survey data, the intraclass correlation (ICC) was .20 indicating that 20% of the variance in resident quality of life from the staff perspective was between nursing homes. A multilevel modeling approach was needed to test for predictors of resident quality of life.

Variables were added to the model in eleven blocks (see Table 7). The first block included demographic variables. These were: age of the staff person, their gender, length of time in their work role, and the average number of hours worked each week. The addition of these variables did not significantly improve model fit, so this block was removed from the final analysis.

Table 7: Fixed effects for the multilevel model examining resident quality of life: Staff perspective (showing significant blocks)

	Block 2† Model of care	Block 4†‡ Philosophy	Block 6† Relations & Home	Block 7† Role stressors	Block 8† Task features	Block 9† Leadership	Block 10† Interactions
<i>Intercept</i>	2.64***	2.69***	2.70***	2.70***	2.70***	2.70***	2.70***
<i>Model of care (New-Full-scope)</i>	0.30**	0.15	0.11	0.13*	0.14*	0.15*	0.16*
<i>Model of care (New-Augmented)</i>	0.17	0.02	-0.07	-0.05	-0.06	-0.05	-0.06
<i>Support for autonomy</i>		0.26*	0.12	0.13*	-0.12	0.10	0.09
<i>Staff/resident relationships</i>			0.14***	0.11***	0.11***	0.10***	0.10***
<i>Home-likeness</i>			0.37***	0.31***	0.28***	0.27***	0.26***
<i>Role conflict</i>				-0.02	-0.02	-0.02	-0.02
<i>Role overload</i>				-0.04*	-0.05*	-0.04*	-0.03
<i>Role clarity</i>				0.10***	0.06**	0.04*	0.04*
<i>Recognition</i>					0.06***	0.03	0.02
<i>Skill use</i>					0.06***	0.05**	0.06**
<i>Job influence</i>					-0.03	-0.04*	-0.04*
<i>Job autonomy</i>					0.01	0.01	0.00
<i>Transformational leadership</i>						0.07***	0.07***
<i>Passive leadership</i>						-0.01	-0.01
<i>Resident positive interactions</i>							0.01
<i>Family positive interactions</i>							0.01
<i>Resident challenging interactions</i>							-0.05***
<i>Family challenging interactions</i>							-0.01
<i>Model fit improvement (Wald)</i>	6.05**	6.30*	162.82***	20.66***	7.81***	9.78***	5.45***

†Four additional blocks of variables were added, Block 1 - Demographics (4 variables), Block 3 – Nursing home characteristics (4 variables), Block 5 – Staffing (3 variables), and Block 11 – Mediators (3 variables) but did not significantly improve model fit and were excluded from the final model.

‡Additional variables were initially added with this block but were removed as they had $p > .30$. Their removal did not result in a significant reduction in model fit.

* $p < .05$; ** $p < .01$; *** $p < .001$



Second the model of care variables were added to the model: New-Full-scope compared to Traditional and New-Augmented compared to Traditional. Overall model fit was significantly improved with the addition of these variables.

The next three blocks of variables added to the model included a number of nursing home-level variables. The first of these included square footage of the building, proportion of residents with moderate to severe cognitive impairment, number of residents per neighbourhood or unit, and the building's age. The addition of these variables did not significantly improve overall model fit, so they were removed. Block four included philosophy of care variables: presence of the Eden philosophy, Montessori, a dementia care unit, UFirst or P.I.E.C.E.S. training for staff, institutional support for resident involvement in decision making, and institutional support for resident autonomy. Of these variables, only the support for autonomy was a significant predictor and was retained in the final model. Block five included variables measuring staffing ratios (number of staff per resident) for: direct care staff, therapeutic staff, and administrative or support staff. The addition of these variables did not significantly improve model fit so they were removed.

The next five blocks of variables included a number of work characteristics and experiences. Each of the variables were retained in the final model as the addition of each of the separate blocks significantly improved overall model fit. Block six variables measured the quality of staff-resident relationships and the degree of home-likeness in the nursing home. Block seven included variables measuring stressors within the work environment. These were: role conflict, role overload, and role clarity. Next, task characteristics were added. These were: measures of recognition on the job, degree of skill use, job influence, and job autonomy. Block nine included two measures of the type of leadership demonstrated by direct supervisors: transformational and passive. The next block of variables assessed positive and negative interactions on the job. These were: positive interactions with residents and family and challenging interactions with residents and family.

The final block of variables included: degree of employee engagement, a measure of employee mental health, and interpersonal job performance. None of these were significant predictors and the block did not significantly improve overall model fit, so they were excluded from the final model.

In the final multilevel model of resident quality of life from the staff perspective, seven variables¹¹ were significantly associated with resident quality of life: New-Full-scope model of care, staff-resident relationships, home-likeness, role clarity, skill use, transformational leadership, and challenging interactions with residents. These significant associations showed that:

- Staff from homes with the New-Full-scope model of care perceived higher resident quality of life compared to staff from homes with the Traditional model of care.
- Respectful staff-resident relationships were associated with higher staff perceptions of resident quality of life.

¹¹ An eighth variable, job influence, was found to be significantly associated with staff perceptions of resident quality of life but the relationship was in the opposite direction than expected. This was the result of a suppressor effect which only occurred when the other variables were controlled for in the model. The zero-order correlation is negative. This is because the other variables in the model are suppressing error variance in job influence, which can increase the stress of the relationship between job influence and resident quality of life and even change the direction of the relation.



- An increased sense of home-likeness was associated with higher staff perceptions of resident quality of life.
- Increased role clarity for staff was associated with higher staff perceptions of resident quality of life.
- A higher degree of skill use for staff was related to higher staff perceptions of resident quality of life.
- Greater transformational leadership among supervisors was associated with higher staff perceptions of resident quality of life.
- More experiences of resident challenging behaviours for staff was associated with lower staff perceptions of resident quality of life.

What is the Impact of Nursing Home Characteristics on Resident Quality of Life?

Model of care was defined, in part, by variations in physical design so it was anticipated that model of care would be highly correlated with many of the nursing home-level variables. In order to further explore the impact of specific nursing home characteristics on resident quality of life, nursing home characteristics were re-examined in multilevel modelling without the model of care block of variables.

Results of two separate analyses are presented, by perspective. The resident perspective analysis was similar to the analysis presented in Table 5 except that in Block 3 the model of care variables were replaced by a block of other nursing-home level variables not previously included in this block. The family perspective analysis was similar to the analysis presented in Table 6 except that Block 2 was repeated many times using nursing-home level variables being entered into the model one at a time to replace the model of care variables. This additional analysis was not completed from the staff perspective.

Resident Perspective

For this analysis from the resident perspective, the model of care variables, previously included in Block 3 (see Table 5), were replaced with other nursing home characteristic variables. These characteristics were use of the Eden philosophy, use of the Montessori philosophy, presence of a dementia unit, age of the facility, overall support for resident decision making, overall support for resident autonomy, proportion of residents in the nursing home with moderate to severe cognitive impairment, and proportion of private rooms in the facility. Only the final two characteristics remained in the model as the others did not meet inclusion criteria (i.e., a p-value greater than .30). The results are presented in Table 8.



Table 8: Fixed effects for the multilevel model examining resident quality of life with model of care variables replaced a block of other nursing home characteristics: Resident perspective

	Block 3† Nursing home characteristics
<i>Intercept</i>	2.68***
<i>Age (65 to 84)</i>	0.16
<i>Age (85 plus)</i>	0.16
<i>Marital (Single=0)</i>	-0.18
<i>Some high school</i>	0.12
<i>Some college/university</i>	-0.01
<i>Time in NH (0=<1year)</i>	-0.03
<i>Health scale (EQ-5D)</i>	0.37*
<i>Fatigue‡</i>	0.00**
<i>Proportion mod/severe cognitive impairment</i>	-0.01
<i>Proportion private rooms</i>	0.52*
<i>Model fit improvement (Wald)</i>	4.54*

†Blocks 1 and 2 are the same as the first two blocks in Table 5.

‡ For every one point increase on the fatigue scale there is an expected drop in resident quality of life of .0027. This is a very small, but statistically significant effect.

*p<.05; **p<.01; ***p<.001

Along with the health scale and the fatigue scale, the proportion of private rooms was significantly associated with resident quality of life. This association indicated that when model of care was not included in the analysis, a higher proportion of private rooms was associated with higher resident quality of life.

Family Perspective

To explore the influence of nursing home characteristics from the family perspective, in Block 2 (see Table 6) the model of care variables were replaced with other nursing home characteristic variables. The nursing home characteristics included were: number of residents in the nursing home, proportion of residents in the nursing home with moderate to severe cognitive impairment, number of residents per unit, support for moving furniture around residents' room, use of the Eden philosophy, use of the Montessori philosophy, presence of a dementia unit, age of the facility, and proportion of private rooms in the facility. None of these individual variables were significantly associated with resident quality of life, but the group of variables did significantly improve model fit.

These nursing home-level variables were then added one at a time to the model while controlling for the trimmed block of demographic variables¹². The fixed effects for each of the individual characteristics are presented in Table 9.

¹² A trimmed block includes only those variables that met the inclusion criteria, in this case these variables were time in nursing home, cognitive challenges, and physical challenges.



Table 9: Individual fixed effects for the multilevel model examining resident quality of life with model of care variables replaced by other nursing home characteristics: Family perspective

	Individual fixed effects
<i>Number of residents in nursing home</i>	0.00*
<i>Proportion mod/severe cognitive impairment</i>	0.00
<i>Number of residents per unit</i>	-0.04***
<i>Moving furniture</i>	-0.07
<i>Eden alternative</i>	0.07
<i>Montessori</i>	-0.17
<i>Building age</i>	-0.02
<i>Percent private rooms</i>	0.01

*p<.05; **p<.01; ***p<.001

Two of the nursing home characteristics were significantly associated with resident quality of life when included one at a time. These significant associations indicate that when no other nursing home-level variables were included in the analysis:

- Fewer residents in the nursing home was associated with higher family perceptions of resident quality of life.
- Fewer residents per household/unit was associated with higher family perceptions of resident quality of life.

What is the Indirect Effect of Model of Care on Resident Quality of Life?

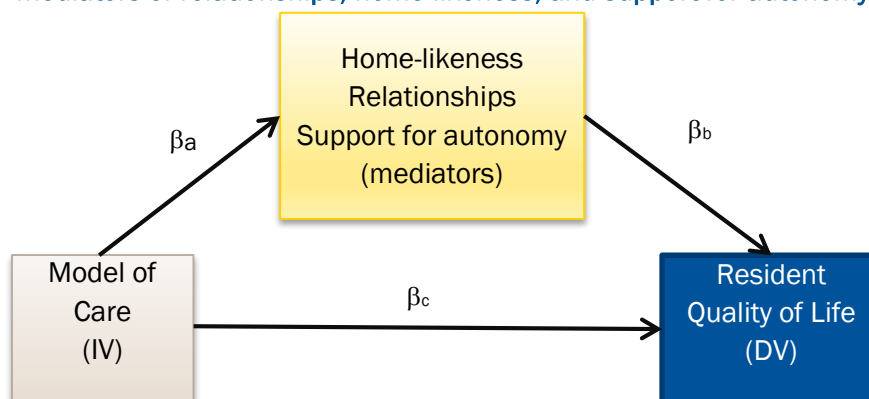
In building each of the multilevel models to examine resident quality of life, model of care was added in one of the early blocks of variables (i.e., Block 3 for the resident perspective, Block 2 for the family and staff perspectives). Initially the model of care variables were significant predictors of resident quality of life. As subsequent blocks were added, the predictive strength of the model of care variables decreased. In all but the staff perspective, the model of care variables were not significant predictors of resident quality of life in the final multilevel models.

To understand more about the influence of model of care on resident quality of life, indirect effects were tested.¹³ The indirect effects tested are depicted in Figure 3. Model of care variables are the independent variables (IV) and resident quality of life is the dependent variable (DV). The indirect effects of model of care on resident quality of life were tested through the mediators of relationships, home-likeness, and support for autonomy (from the staff perspective only).

¹³ A variable is said to have an indirect effect when its influence on an outcome is mediated through a third variable (i.e., a mediator).



Figure 3: Indirect effect of model of care on resident quality of life with mediators of relationships, home-likeness, and support for autonomy



The relationship between model of care and resident quality of life met the criteria to support testing for indirect effects:

- Model of care significantly predicts the mediator variables.
- The mediators significantly predict resident quality of life.
- The ability of model of care to predict resident quality of life is significantly reduced when the mediators are controlled.

The unique indirect effects for each model of care variable (New-Full-scope compared to Traditional and New-Augmented compared to Traditional) were tested through each mediator. The product of the direct effects of model of care on the mediator (β_a , Figure 3) and direct effects of the mediator on resident quality of life (β_b , Figure 3) measured the unique indirect effect of a single mediator in a multiple mediator model¹⁴. These results are presented in Table 10, Table 11, and Table 12, which are organized by the three perspectives.

The mediators used from the resident data were included in Block 6 of the overall multilevel model examining resident quality of life (see Table 5). These were home-likeness, staff and resident bonding, and resident relationships. From the resident perspective, a unique indirect effect on resident quality of life was found for the New-Augmented model of care through home-likeness (see Table 10).

¹⁴ Multilevel modeling procedures recommended by Krull and MacKinnon (2001) were used to test the indirect effects of model of care on resident quality of life through the proposed mediators. Krull and MacKinnon's procedure is based on those outlined by Baron and Kenny (1986), but adapted for multilevel models. Sobel's (1982) method for calculating the standard error of $\beta_a * \beta_b$ was used in the calculation of the z-statistics as recommended by Krull and MacKinnon.

**Table 10: Unique indirect effects of model of care on resident quality of life: Resident perspective**

Model of Care (IV)	Mediator	β_a	β_b	$\beta_a * \beta_b$	z
New-Full-scope	Home-likeness	0.25	0.16***	0.04	1.18
New-Augmented	Home-likeness	0.70**	0.16***	0.11**	2.81
New-Full-scope	Staff/resident bonding	0.02	0.18***	0.00	0.11
New-Augmented	Staff/resident bonding	0.24	0.18***	0.04	1.41
New-Full-scope	Personal relationships	0.24	0.15***	0.03	1.63
New-Augmented	Personal relationships	0.32*	0.15***	0.05	2.00

Note: Additional control variables were age (65 to 85 and 85 plus), marital status, education (some high school and some college/university), time in nursing home, health scale, fatigue, and exercise (some and enough). See Block 6 from Table 5.

* $p < .05$; ** $p < .01$; *** $p < .001$

From the family data, the mediators of family-staff relationships, resident-resident relationships, and home-likeness were used to test for the indirect effects of model of care. Significant indirect effects on resident quality of life were found through each of these mediators for both the New-Full-scope and the New-Augmented models of care (see Table 11).

Table 11: Unique indirect effects of model of care on resident quality of life: Family perspective

Model of Care (IV)	Mediator	β_a	β_b	$\beta_a * \beta_b$	z
New-Full-scope	Family/staff relationships	0.30**	0.24***	0.07*	2.24
New-Augmented	Family/staff relationships	0.43***	0.24***	0.11**	2.78
New-Full-scope	Resident/resident relationships	0.47***	0.16*	0.08*	2.09
New-Augmented	Resident/resident relationships	0.56***	0.16*	0.09*	2.23
New-Full-scope	Home-likeness	0.65***	0.23*	0.15*	2.19
New-Augmented	Home-likeness	0.71***	0.23*	0.16*	2.21

Note: Additional control variables were time in nursing home, cognitive challenges, and physical challenges. See Block 4 from Table 6.

* $p < .05$; ** $p < .01$; *** $p < .001$

From the staff perspective, indirect effects of model of care were tested through the possible mediators of support for autonomy, staff-resident relationships, and home-likeness. Significant indirect effects were found on resident quality of life through home-likeness for both the New-Full-scope and New-Augmented models of care (see Table 12).



Table 12: Unique indirect effects of model of care on resident quality of life: Staff perspective

Model of Care (IV)	Mediator	β_a	β_b	$\beta_a * \beta_b$	z
New-Full-scope	Support for autonomy	0.80***	0.12	0.06	1.74
New-Augmented	Support for autonomy	0.82***	0.12	0.10	1.74
New-Full-scope	Staff/resident relationships	0.12	0.14***	0.02	0.99
New-Augmented	Staff/resident relationships	0.22	0.14***	0.03	1.61
New-Full-scope	Home-likeness	0.28*	0.37***	0.05*	2.15
New-Augmented	Home-likeness	0.38**	0.37***	0.06*	2.54

Note: No additional control variables were used.

*p<.05; **p<.01; ***p<.001

Overall, indirect effects of model of care on resident quality of life were found to be mediated through home-likeness from all three perspectives and through relationships from the family perspective.



Part 2 – Case Studies with Care Constellations

Six in-depth case studies provided an opportunity to follow participants over time and to examine the dynamics and interactions between individuals within the broader context of the nursing home. This component of the research provided unique opportunities within the project. The case study approach provided linkages among the three perspectives within the same context, observational data to complement the text-based data, insight into the experiences of those who could not speak for themselves, and an examination of changes over time.

How Were the Data Collected?

Three study site homes were selected to be involved in the case study portion of the project. Each home represented one of the models of care. Two residents were selected from each home, one who could verbally communicate and another who could not. To comprise a full case or care constellation, a family member of each of these residents was included and a staff member who regularly worked with the resident.

Interview guides for each of the three perspectives were developed by the project team. For residents who could not speak for themselves¹⁵, the resident perspective was gathered in the family member interview. Interview questions pertained to the topics of environment, meaningful activities, meaningful relationships, home-likeness of the nursing home, resident autonomy, and resident affect. Participant observation guides were also developed to capture observations and reflections around themes similar to those in the interviews.

The members of each care constellation were interviewed at three points in time. The data collection time points were two to four months apart and spanned a ten-month period (from March 2012 to January 2013). Research trainees completed participant observation of the residents for approximately four hours following the interviews at each of the three data collection time points. During and following the participant observation, residents wore a physical activity monitoring device¹⁶ on their wrist or ankle for 24 hours. Informed consent was obtained from each participant or from a substitute decision maker in the case of those who could not provide consent.

Who Were the Participants?

All of the residents who participated in the case study were female (see Table 13). They ranged in age from 58 to 90 years old. Most had lived in the nursing home between 12 and 24 months but one had lived there longer than 2 years.

¹⁵ These residents could not speak for themselves due to cognitive challenges (i.e., dementia) or physical challenges (i.e., multiple sclerosis).

¹⁶ The device used was the Actical Physical Activity Monitoring System by Respironics.



Table 13: Demographic characteristics of case study participants by model of care

		New-Full-scope		New-Augmented		Traditional	
Constellation:		#1	#2	#1	#2	#1	#2
Resident	Age	90	86	78	58	81	78
	Gender	Female	Female	Female	Female	Female	Female
	Marital Status	Widowed	Widowed	Widowed	Never married	Widowed	Married
	Time in nursing home	12-24 months	12-24 months	12-24 months	More than 24 months	12-24 months	12-24 months
	Health condition	COPD	Dementia	Visual impairment	Multiple sclerosis	Blind	Alzheimer's disease
Family	Age	57	49	46	59	63	--
	Gender	Female	Male	Male	Female	Female	Male
	Relationship	Daughter-in-law	Son/Daughter-in-Law	Son	Sister	Daughter	Spouse
Staff	Age	33	25	45	36	44	48
	Gender	Female	Female	Male	Female	Female	Female
	Position	CCA	CCA	LPN	CCA	LPN	LPN

Family members ranged in age from 46 to 63 years of age (missing age for one family member). They represented a number of family relationships: spouse, sister, son, daughter, or daughter-in-law. Staff included were either Continuing Care Assistants (CCA) or Licensed Practical Nurses (LPN).

How Were the Data Analyzed?

Each of the interviews were transcribed verbatim. These, along with the notes from the participant observers, were coded using a coding framework developed by the team. The team used a multi-step framework analysis approach that included case narratives, thematic analysis, and comparisons between cases and groups.¹⁷ Changes over time were captured in codes specifically related to change (e.g., change in family role).

Data from the physical activity monitors were analyzed to determine the proportion of time spent at different levels of activity (i.e., sedentary, light, moderate, and vigorous).

Examining Resident Quality of Life across the Perspectives

From the analysis of the case study data, a number of elements that supported resident quality of life were identified. **Home-likeness** in the nursing home was found to contribute to resident quality of life. Residents and family members valued having a private room as part of a home-like atmosphere. Family specifically stated that other physical features of the nursing home contributed to a sense of home-likeness:

¹⁷ The analysis approach was taken from Lewis (2007), which identified a multi-step framework analysis as a way to analyze longitudinal qualitative data. The framework includes seven ways to organize the data including cross-sectional analysis, repeat-cross sectional, individual case narratives, thematic analysis, linkages between themes, between- case comparisons, and between-group comparisons.



“It is bright, airy, it feels homey, it’s not stuffy, it doesn’t stink. The open kitchen, it’s all part of what maybe even you and I are used to at home, you become social. You see people cooking, you’re not just in a room on a tray, you actually see people cook and laugh and carry on.” –Family member interview

In contrast, residents focused on relationships with staff and family when describing if they felt at home.

Relationships with staff were important for residents and family. Residents valued opportunities to share and give back to staff, through activities such as teaching staff crafts, and sharing recipes and books. Family members valued a collaborative relationship with staff and wanted to be seen as a part of the care team.

In addition to these relationships, **staff continuity and familiarity** with residents and family supported resident quality of life. Staff consistency enhanced familiarity with resident needs and created opportunities for relationship building with the resident and family members. Consistent staffing assignments were valued by residents, family members, and staff members alike:

“They know her little twitches and things like that, she likes to do this and do that, we’ll get her on this or get her on that...so it gives you reassurance that she is looked after, comfortable.” –Family member interview

Involvement of family members in the nursing home provided support to resident quality of life in a number of ways. This involvement provided residents with opportunities for social contact both in and outside the home. Their involvement gave a sense of historical continuity for residents and staff. They provided comfort and familiarity for residents who were unable to speak for themselves. Family helped to monitor resident medical and personal care needs. They scheduled and planned for services, such as dental hygiene and massage therapy.

The value of **resident autonomy** in supporting resident quality of life was evident in the case study analysis. Residents expressed their autonomy by maintaining their favourite activities and routines:

“I have not had any trouble with any of the staff because they don’t tell you what to do, they ask you what you want to do.” – Resident interview

“I think I like that I can still be 100% independent, I can do my own clothing, I can do my own everything in here in the bathroom and I can do my own laundry.” - Resident interview

Sometimes residents and their family members negotiated with staff to increase opportunities for independence and autonomy.

Some concerns related to resident quality of life were also apparent from the case studies. Staff expressed concerns about risk of falling and poor nutritional intake. Staff felt that familiarity with residents was important to managing risk and safety. Residents and family members were concerned about maintaining privacy and security of possessions, particularly within the residents’ own rooms.



Based on results from the physical activity monitoring, there were also concerns specifically related to residents' activity levels and the impact on their quality of life. Most residents were not participating in healthy amounts of physical activity. There was a need for more physical activity choices for residents with varying capabilities.

Looking specifically at the impact of model of care on resident quality of life, a few features emerged as important. These were:

- A home-like design with private rooms for residents and spaces for family and social activity.
- Staff interactions that promoted close, reciprocal relationships with residents and collaborative relationships with family members.
- Continuity of staffing assignments.



Bringing it All Together: The Main Messages from the Project

Results from the project bring together three key perspectives on resident quality of life: the residents themselves, family members, and staff. Unique predictors of resident quality of life were identified from each of the perspectives (e.g., health status, degree of cognitive challenges, number of challenging behaviours). Recognizing these differences among the perspectives emphasizes the importance of including each perspective when examining resident quality of life.

Differences among the perspectives existed, yet there were elements that consistently emerged as important in supporting resident quality of life from both the survey and case study findings. Positive relationships among residents, family, and staff and more home-likeness within the nursing home was shown to support higher resident quality of life from all perspectives. It was through home-likeness and relationships that newer models of care had an indirect effect on resident quality of life outcomes. Home-likeness and relationships were important themes that emerged from the case studies as well.

These two factors, along with the unique role of working environment on staff perceptions of resident quality of life form the main messages from this research:

- Relationships matter in providing a positive quality of life for nursing home residents.
- Fostering a home-like environment within the nursing home will support the quality of life of the residents.
- Enhancing certain aspects of the working environment impacts the perceptions of staff in assessing resident quality of life.

Relationships Matter

Relationships are important. The importance of relationships in supporting resident quality of life stood out in all participant groups. Not surprisingly, residents with friendship and companionship in their lives reported better quality of life. For residents and staff, open and honest communication based on mutual respect was related to positive resident quality of life. This included a feeling of “friendship” between residents and the staff providing their care.

For residents, feeling as though what they were contributing was important. Residents who felt that they were able to help and advise others had higher quality of life. Opportunities to ‘give back’ to the staff were important for residents.

The involvement of family members in the lives of residents was an important source of social contact. Family members provided a connection to the outside community and to the resident’s life prior to life in the nursing home. From the family perspective, having access to private and/or community spaces within the nursing home and having supports for residents to develop relationships was linked to positive resident quality of life.

The relationships of family members and staff also had an impact on resident quality of life. The presence of clear and open communication channels, and an overall respect and friendliness between family members and staff were found to be related to positive quality of life of residents. Findings from the case study demonstrated that families value being treated as part of the care team. Family can play an important role in monitoring and supporting the resident’s needs.



Fostering a Home-like Environment

Home-likeness of the nursing home was shown to have a positive impact on resident quality of life. For residents, home-likeness was assessed in the survey by the ambiance or warmth of the space; it “felt like home.” Residents involved in the case study identified that relationships with family and staff contribute to feelings of home.

For family members and staff, home-likeness was measured by both the physical and intangible characteristics of the space (i.e., cleanliness, coziness, attachment to space). From both the family and staff perspective, positive resident quality of life was related to residents maintaining connection to the community outside of the nursing home.

Our Workplace, Your Home

From the staff perspective, there were three elements of the work environment that were found to positively influence their perception of resident quality of life. These were having a clear vision of what was expected in their role, a higher degree of skill use in their position, and working with supervisors who demonstrate qualities of transformational leadership. Staff with supervisors who used this leadership style felt recognized as an individual and trusted, experienced encouragement and recognition, and had a sense of cooperation among their team.

Consistency of staffing assignments was recognized as supporting resident quality of life in the case study findings. Consistency supported familiarity with the needs of residents and with family members.



Moving Forward: What Does this Mean for Policy, Practice, and Education?

The study's results were shared at a day-long workshop with almost 70 representatives from the long-term care sector in Nova Scotia. Participants were encouraged to actively participate in discerning the implications of the results and in identifying possible ways in which the results could be applied at the practice and policy levels. Specifically, participants were asked to consider ideas for action springing from the main messages of the project—the importance of relationships, home-likeness, and working environment (see Appendix C for detailed lists of the actions identified at the workshop).

When seeking to foster positive relationships, nursing home staff and management play a sizable role in enhancing resident quality of life. Success begins with hiring practices that take into consideration an individual's fit with the home's culture and philosophy of care. Staff could also benefit from modeling and coaching to help improve their skill base and to instill cooperation and teamwork as a value of the organization. The offer of continued education or training opportunities for staff shows an investment in their potential as individuals, and helps to broaden the skill base of staff.

Staff play a critical role in encouraging resident-to-resident relationships, by identifying meaningful commonalities and interests among residents and ensuring opportunities exist for residents to foster those connections. Getting family members involved in the nursing home, through an ambassador program or family council, could also have a positive impact on the resident experience.

The notion of home-likeness means something different from one person to the next. There is benefit for nursing home administrators and staff to ask what their residents and family members feel contributes to a home-like environment. Some changes which could improve home-likeness in any nursing home include the reduction of unnecessary signage, ensuring there are safe ways for residents to access the outdoors and engage in the larger community outside of the nursing home, and being creative about how shared rooms and spaces can be used to provide private conversation areas.

To create a working environment that supports resident quality of life, one option is to adopt a collaborative practice model, ensuring that each member of the team feels valued in their contribution to the care provided in the nursing home. Administrators can support staff in getting to know the residents, and residents getting to know the staff, by providing consistent staffing assignments whenever possible. When changes need to be made within the nursing home, consulting with all of the groups that would be impacted by such changes (residents, family members, staff, unions, administration) could support a collaborative work environment.



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Appendix A – Potential Predictors of Resident Quality of Life

Table A1: Individual-level variables used in the analysis of resident quality of life: Resident perspective

Variable name	How it was measured	How it was coded
Age^a	How old are you?	Two dummy variables with less than 65 as the comparison group 1) 65 to 84 2) 85 and over
Marital status^a	What is your relationship status?	0 = never married, divorced, separated, widowed 1 = common-law, married
Education^a	What is the highest grade or level of school that you have completed?	Two dummy variables with 8 th grade or less as the comparison group 1) Some high school or high school graduate 2) Some college/university or college/university graduate
Time in nursing home^a	In total, about how long have you lived in this nursing home?	0 = 1 month to almost 12 months 1 = 12 months or longer
Gender^a	What is your gender?	0 = female 1 = male
Health scale (EQ-5D)^b	Includes 5 questions (e.g., How would you describe your level of mobility?) in five health areas (mobility, self-care, performance of usual activities, pain, and anxiety/depression)	Scale was calculated using the syntax provided by EuroQol Group
Fatigue^c	How much influence does fatigue have on your daily life (the everyday life at home and at work) and on your relationships?	Visual analog scale 0 = No influence at all 100 = A lot of influence
Exercise^d	Categories were created based on frequency and intensity of exercise.	Two dummy variables with no regular exercise as the comparison group 1) some exercise (less than 3 times per week and/or less vigorous than or equal to walking) 2) enough exercise (more vigorous than walking, 3 times per week)
Cognitive scale (Mini Mental State Exam)^e	26 questions (e.g., What year is this?) or commands (e.g., Spell the word WORLD) measuring different areas of cognitive ability (orientation, registration, attention, calculation, recall, language, repetition, complex commands).	Items are scored 1-point for each correct answer (one question is scored out of five). 0 = low cognitive function 30 = high cognitive function
Home-likeness^f	This place feels like home to me.	5-point scale: 0 = Never 4 = Always
Personal relationships^f	The mean of 5 items (e.g., I have people who want to do things together with me). Cronbach's α = 0.76	5-point scale: 0 = Never 4 = Always



Variable name	How it was measured	How it was coded
Staff/resident bonding^f	The mean of 5 items (e.g., Staff take the time to have a friendly conversation with me). Cronbach's $\alpha = 0.72$	5-point scale: 0 = Never 4 = Always

^aThese measures were developed by the Care and Construction team.

^bSource: Kunz, 2010; Cheung, Oemar, Oppe, & Rabin, 2009

^cSource: Kos, Nagels, D'Hooghe, Duportail, & Kerckhofs, 2006

^dSource: Davis, MacPherson, Merry, Wentzel, & Rockwood, 2001

^eSource: Psychological Assessment Resources

^fSource: Kehyayan, 2011; Kehyayan, Hirdes, Stolee, & Tyas, in press



Table A2: Individual-level variables used in the analysis of resident quality of life: Family perspective

Variable name	How it was measured	How it was coded
Age^a	To which age group does your family member belong?	0 = < 65 1 = 65 and over
Gender^a	What is your family member's gender?	0 = female 1 = male
Time in nursing home^a	In total, about how long has your family member lived in <i>this</i> nursing home?	0 = 1 month to almost 24 months 1 = 24 months or longer
Cognitive challenges^a	The mean of 3 questions (e.g., How would you describe your family member's usual ability to remember things?) in the areas of remembering, thinking/solving problems, and communication. Cronbach's α = .78	Continuous scale ranging from 1 to 4 with higher values indicating more challenges
Physical challenges^a	The mean of 3 questions (e.g., How would you describe your family member's ability to perform personal care tasks?) in the areas of personal care, moving around, and getting out of bed. Cronbach's α = .85	Continuous scale ranging from 1 to 4.67 with higher values indicating more challenges
Resident/staff relationships^a	The mean of 2 items (e.g., There is a mutually respectful relationship between my family member and staff who provide care for him/her). Cronbach's α = .85	5-point scale: 1 = strongly disagree 5 = strongly agree
Relationship to resident^b	What is your relationship to your family member who resides in a nursing home?	0 = Other relationships (e.g., my parent, my sibling, my friend) 1 = My spouse/partner
Distance from nursing home^a	How many minutes do you have to travel between your home and the nursing home to visit your family member?	0 = < 1 hour 1 = 1 hour or longer
Visitation level^a	Categories were created based on frequency and length of visit.	Two dummy variables with low-level comparison group 1) Mid-level visitation 2) High-level visitation
Emotional closeness^a	How would you describe your current relationship with your family member?	5-point scale: 1 = very close 5 = very distant
Family involvement in decision making^a	The mean of 2 items (e.g., I am able to be involved in the decisions about my family member's care as often as I want to be). Cronbach's α = .78	5-point scale: 1 = strongly disagree 5 = strongly agree
Resident/resident relationships^a	The mean of 2 items (e.g., My family member's care team supports him/her in maintaining relationships with other residents). Cronbach's α = .91	5-point scale: 1 = strongly disagree 5 = strongly agree
Family/staff relationships^c	The mean of 5 items (e.g., I am comfortable bringing my concerns to a staff member). Cronbach's α = .90	5-point scale: 1 = strongly disagree 5 = strongly agree



Variable name	How it was measured	How it was coded
<i>Home-likeness</i> ^d	The mean of 7 items (e.g., The area in which my family member lives looks home-like). Cronbach's $\alpha=.87$	5-point scale: 1 = strongly disagree 5 = strongly agree

^aThese measures were developed by the Care and Construction team.

^bSource: Frentzel, Sangl, Evensen, Cosenza, Brown, Keller, & Garfinkel, 2012

^cSources: Eden Alternative, 2010 and others were developed by the Care and Construction Team.

^dSources: Eden Alternative, 2010; Molony, McDonald, & Palmisano-Mills, 2007; and others were developed by the Care and Construction Team.



Table A3: Individual-level variables used in the analysis of resident quality of life: Staff perspective

Variable name	How it was measured	How it was coded
Age^a	What is your age?	Reported in years
Gender^a	What is your gender?	0 = female 1 = male
Role tenure^a	How long have you worked in this role?	Reported in months
Hours per week^a	How many hours do you work per week, on average?	Reported in hours
Staff/resident relationships^a	There is a mutually respectful relationship between staff and residents.	5-point scale: 1 = strongly disagree 5 = strongly agree
Home-likeness^b	The mean of 3 items (e.g., The area in which residents' live looks home-like). Cronbach's $\alpha=.70$	5-point scale: 1 = strongly disagree 5 = strongly agree
Role conflict^c	The mean of 3 items (e.g., I am asked to do more than one task at the same time). Cronbach's $\alpha=.82$	5-point scale: 1 = not at all or rarely 5 = most of the time or always
Role overload^c	The mean of 3 items (e.g., I have too much work to do). Cronbach's $\alpha=.84$	5-point scale: 1 = not at all or rarely 5 = most of the time or always
Role clarity^c	The mean of 3 items (e.g., I am given clear directions). Cronbach's $\alpha=.73$	5-point scale: 1 = not at all or rarely 5 = most of the time or always
Recognition^c	The mean of 3 items (e.g., I hear if I've done a good job). Cronbach's $\alpha=.68$	5-point scale: 1 = not at all or rarely 5 = most of the time or always
Skill use^c	The mean of 3 items (e.g., My job allows me to use my skills and abilities). Cronbach's $\alpha=.76$	5-point scale: 1 = not at all or rarely 5 = most of the time or always
Job influence^c	The mean of 3 items (e.g., I have a say in how my work gets done). Cronbach's $\alpha=.82$	5-point scale: 1 = not at all or rarely 5 = most of the time or always
Job autonomy^c	The mean of 3 items (e.g., I have control over my work schedule). Cronbach's $\alpha=.78$	5-point scale: 1 = not at all or rarely 5 = most of the time or always
Transformational leadership^d	The mean of 9 items (e.g., My supervisor communicates a clear and positive vision of the future). Cronbach's $\alpha=.97$	5-point scale: 1 = not at all or rarely 5 = most of the time or always
Passive leadership^e	The mean of 3 items (e.g., My supervisor fails to intervene until problems become serious). Cronbach's $\alpha=.89$	5-point scale: 1 = not at all or rarely 5 = most of the time or always
Resident positive interactions^a	The mean of 5 items (e.g., In the last year, how often have residents cheered you up?). Cronbach's $\alpha=.79$	6-point scale: 1 = Never 6 = More than 6-7 shifts a month
Family positive interactions^a	The mean of 5 items (e.g., In the last year, how often have family cheered you up?). Cronbach's $\alpha=.88$	6-point scale: 1 = Never 6 = More than 6-7 shifts a month



Variable name	How it was measured	How it was coded
Resident challenging interactions^a	The mean of 6 items (e.g., In the last year, how often have residents yelled at you in anger?). Cronbach's α =.90	6-point scale: 1 = Never 6 = More than 6-7 shifts a month
Family challenging interactions^a	The mean of 6 items (e.g., In the last year, how often have family yelled at you in anger?). Cronbach's α =.65	6-point scale: 1 = Never 6 = More than 6-7 shifts a month
Employee engagement^a	The mean of 5 items (e.g., My work is more than just a job to me, it's a passion). Cronbach's α =.92	5-point scale: 1 = strongly disagree 5 = strongly agree
Mental health^f	The mean of 12 items (e.g., Have you felt that you couldn't overcome your difficulties?). Cronbach's α =.85	5-point scale: 1 = not at all or rarely 5 = most of the time or always
Interpersonal job performance^g	The mean of 17 items (e.g., I show interest in each resident as a whole person (mentally, physically, and emotionally)). Cronbach's α =.89	5-point scale: 1 = not at all or rarely 5 = most of the time or always

^aThese measures were developed by the Care and Construction team.

^bSource: Kelloway & Barling, 1994

^cSource: Carless, Wearing, & Mann, 2000

^dSource: Kelloway, Mullen, & Francis, 2006

^eSource: Makowska & Merecz, 2000; Werneke, Goldberg, Yalcin, & Ustun, 2000

^fSource: Stewart & Barling, 1996



Table A4: Nursing home-level variables used in the analysis of resident quality of life: All perspectives

Variable name	How it was measured	How it was coded	Perspective that used variable
Model of care^a	Coded by the research team using criteria for differences in physical design and staffing approach	Two dummy variables with traditional as the comparison group 1) New-Full-scope 2) New-Augmented	Resident Family Staff
Eden alternative^a	Is the special program or approach Eden Alternative in practice at this nursing home (either as a registered nursing home or by using elements of the approach)?	0 = no 1 = yes	Resident Family Staff
Montessori^a	Is the special program or approach Montessori in practice at this nursing home?	0 = no 1 = yes	Resident Family Staff
Dementia unit^a	Is the special program or approach specialized dementia unit or secure unit in practice at this nursing home?	0 = no 1 = yes	Resident Staff
UFirst/PIECES^a	Is the special program or approach of UFirst or PIECES training in practice at this nursing home?	0 = no 1 = yes	Staff
Building age^a	Year facility originally opened or year of facility replacement	Age in years as of 2012	Resident Family Staff
Proportion private rooms^a	Number of residents with private rooms divided by the total number of residents, converted to percentage	0 = no private rooms 100 = all private rooms	Resident Family
Decision making support^b	Total number of policy areas (out of 15 areas, e.g., Planning entertainment such as parties or movies) where residents decide	0 = decide in no areas 15 = decide in all areas	Resident Staff
Support for autonomy^b	The mean of 8 items (e.g., personalizing one's own room).	3-point scale: 1 = Encouraged 3 = Discouraged	Resident Staff
Moving furniture^b	Individual item from the support for autonomy scale	3-point scale: 1 = Encouraged 3 = Discouraged	Family
Direct care staff per resident^a	Ratio of number of residents to full-time equivalent positions in the roles of registered nurse, licensed practical nurse, continuing care assistants or personal care workers	No recoding	Resident Staff
Therapeutic staff per resident^a	Ratio of number of residents to full-time equivalent positions in the roles of occupational therapist, physiotherapist, recreation therapist, therapist aids, dieticians, other therapists (e.g., music)	No recoding	Resident Staff



Variable name	How it was measured	How it was coded	Perspective that used variable
<i>Administrative/ support staff per resident^a</i>	Ratio of number of residents to full-time equivalent positions in the roles of Recreation (non-therapists), Social work, Administration, Housekeeping, Maintenance, Dietary workers (including cooks)	No recoding	Resident Staff
<i>Number of residents in nursing home^a</i>	Total number of residents	No recoding	Family
<i>Number of resident per unit^a</i>	How many residents are there per neighbourhood/unit?	No recoding	Family Staff
<i>Square footage^a</i>	Total square footage of the facility	No recoding	Staff
<i>Proportion with moderate to severe cognitive impairment^a</i>	Estimate by administrator of the proportion of residents who have moderate to severe cognitive impairment	No recoding	Family Staff

^aThese measures were developed by the Care and Construction team.

^bSource: Moos & Lemke, 1996



Appendix B – Background on Analysis of Survey Data

Background on developing the multilevel models

First, the unconditional model or random intercept model with no predictors was tested in order to obtain the Intraclass Correlation (ICC) and provide a baseline model to compare subsequent statistical models.

The necessity of doing multilevel analyses was partially assessed using the ICC. ICC measures how much of the variance in resident quality of life is between the individual nursing homes. In other words, how much variance in resident quality of life is accounted for by characteristics of an individual nursing home? Multilevel modeling was also considered on the basis that there was interest in variables that described nursing home characteristics and variables that described resident characteristics.

For each perspective, there were a number of nursing home-level and participant-level variables that were selected based on theoretical considerations, which were considered potential predictors of resident quality of life.

Variables were added to the statistical model in blocks. For instance, a block of demographic variables (e.g., age, gender, time in nursing home, role tenure) was added to the model first. The variables contained in subsequent blocks varied by perspective. Each time a block of variables was added, the improvement in model fit was assessed. In multilevel modeling, improvement in model fit is usually calculated by comparing the change in deviance ($-2 \times \log \text{likelihood}$) to a χ^2 distribution, however the uncertainty inherent in analyses with missing data is not taken into consideration with this traditional method. For this reason, improvement in model fit was assessed using the Wald statistic (Meng & Rubin, 1992).

The sample size for each of the perspectives limited the number of variables that could be included in the final model. Variables were dropped from the statistical model in the following circumstances:

1. A full block of variables was dropped if the block did not improve model fit and if none of the individual variables were significant unique predictors of resident quality of life.
2. A variable was dropped if, when first added to the model, the associated p-value was higher than .30.

The final model was achieved once all blocks of variables had been tested and the appropriate variables or blocks had been omitted.

Background on analysis of indirect effects

Multilevel modeling procedures recommended by Krull and MacKinnon (2001) were used to test the indirect effects of model of care on resident quality of life through the proposed mediators. Krull and MacKinnon's procedure is based on those outlined by Baron and Kenny (1986), but adapted for multilevel models. The product of β_a and β_b is a measure of the unique indirect effect of a single mediator in a multiple mediator model. Sobel's (1982) method for calculating the standard error of $\beta_a \times \beta_b$ was used in the calculation of the z-statistic as recommended by (Krull & MacKinnon, 2001).



There was discussion in the literature regarding cross-level mediation effects and the appropriateness of individual-level variables (i.e., staff perceptions of home-likeness) mediating the effects of higher level variables (e.g., model of care). Zhang, Zyphur, and Preacher (2009) recommended separating the between-group and within-group effects of the mediator and examining only the between group effects. This essentially eliminated the cross-level nature of the mediation effects. By using the cluster-level mean of the mediator (e.g., nursing home mean of home-likeness), the mediating variable was no longer a true individual-level variable. Further, in this paradigm the relative standing of each individual within his or her cluster (e.g., nursing home) was controlled.

Other researchers (e.g., Pituch & Stapleton, 2012) argue that the above procedure can lead to an unnecessary reduction in the ability to detect a mediating effect (i.e., loss of power). According to Pituch and Stapleton, an individual-level variable (e.g., staff perception of home-likeness) can mediate the effects of a nursing home-level variable (e.g., model of care) when the theory being tested specifies that an outcome is impacted by a treatment through and individual-level mediator and the mediator is measured in absolute scale values rather than relative standing within a cluster or nursing home.



Appendix C – Actions Identified at Knowledge Translation Workshop

Table C1: Actions identified by workshop participants to support *Relationships*

Area	Actions to support relationships
Policy	<ul style="list-style-type: none"> • Revise policies to be outcomes based, specifically related to quality of life outcomes • Develop consistent policy templates that can be used and tailored by individual nursing homes that address these outcomes • Address the different perspectives in revising policies (i.e., differences for residents, family, staff, and general public) • Develop communication strategies that support relationships between the different perspectives
Practice	<ul style="list-style-type: none"> • Establish a better link between practice and resident-centered policies • Standardize the admission process • Establish family ambassador program to support communication • Address problem relationships between staff and residents and between staff and other staff; address team functioning challenges • Ensure staff fit with the organizational culture and approach • Support self-directed teams among staff (e.g., allow teams to negotiate their own time off schedules) • Encourage leadership to model and provide coaching to support positive relationships (there is a challenge to find time for this among leadership due to administrative responsibilities) • Support leadership to maintain focus on overall goal of supporting resident quality of life in the midst of managing specific crises • Provide activities and practices that support resident-to-resident relationships (e.g., identify appropriate table mates)
Education	<ul style="list-style-type: none"> • Engage in team building, specifically for CCAs (could be a monthly practice) • Promote positive stories of nursing home care in the media and with general population • Share training resources between nursing homes • Provide education on resident-centered and family-centered philosophies • Provide leadership and mentorship training • Provide conflict management training for all staff • Provide cultural diversity training to address challenges that arise among a multicultural workforce

Table C2: Actions identified by workshop participants to support *Home-likeness*

Area	Actions to support home-likeness
Policy	<ul style="list-style-type: none"> • Incorporate concepts of home-likeness into policy, licensing, regulations (e.g., fire marshal and Department of Agriculture regulations) • Promote collaboration between different government departments to identify inconsistencies in policy and regulation to better support home-likeness • Develop a clear definition of home-likeness at the policy level • Review philosophies of care to see how they support choice and control over routines (e.g., resident-centered care) • Engage in ongoing review of policies and practices that address change within the sector and within nursing homes
Practice	<ul style="list-style-type: none"> • Share ideas within the sector and across sectors (e.g., home care, private sector) so others can capitalize on ideas that have worked • Encourage staff to share personal interests with residents • Consult with residents and family to find out what is homelike for them and what their needs are • Find balance of risk (or perceived risk) with home-likeness • Make facility space available for community groups when not in use by residents; Local communities are a resource for continuing cultural traditions and ongoing leisure activities for residents. Engaging community to increase awareness of the realities of nursing home care and connect the nursing home to the community. • Explore opportunities to engage community members. May find a community member who can be a champion for home-likeness or share their expertise in the area. • Reduce signage in the buildings • Review access to outdoor spaces • Have rolling walls to allow for privacy in shared rooms • Acknowledge needs of those with dementia and include 'wayfinding' features in homes • Make spaces for children
Education	<ul style="list-style-type: none"> • Provide leadership development among staff regarding the importance of home-likeness for resident quality of life • Support creativity among staff to provide home-likeness within current constraints • Involve staff in changes, specifically those changes that directly impact staff • Engage in team building with staff



Table C3: Actions identified by workshop participants to support *Working Environment*

Area	Actions to support working environment
Policy	<ul style="list-style-type: none"> • Determine consistent baseline for what is considered good care. For example, some nursing homes are accredited but others are not. • Review current standards to understand how they were developed and the rationale for them (e.g., how was the standard of one shower per week determined) • Ensure consistency between measures and the desired outcomes (e.g., to promote the values of relationships and home-likeness this needs to be part of what is evaluated as 'good care') • Review funding to support changing philosophy of care and changing physical designs (e.g., what are appropriate staffing levels in more spread out facilities?) • Review philosophy of care to support a resident focus rather than task focus • Engage in ongoing review of policies to address changes within the nursing home • Support policy and practice that is focused more on supporting residents and less on avoiding risk
Practice	<ul style="list-style-type: none"> • Encourage discussions with unions to understand the value of full-scope practice • Review job descriptions and performance reviews to reflect full-scope practice and the values of relationships and home-likeness to ensure expectations are clear • Involve staff and unions in the discussions • Promote a collaborative practice model that views all staff and clinicians as part of the team • Institute consistent staffing assignments (there can be challenges filling these staffing roles) • Capitalize on the expertise currently in the long-term care sector by sharing between nursing homes
Education	<ul style="list-style-type: none"> • Provide ongoing education to support a transition from a task-oriented approach to a resident-centred approach • CCA training needs to clarify the different scopes of practice within new models of care • Provide training to all staff, not just front-line staff, in a resident-centered philosophy • Educate family and the general public about living and providing care in the long-term care setting • Acknowledge challenges in providing ongoing training as resources to fund training are limited and ensuring all staff within a 24/7 operation are able to attend training is difficult