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**The effect of residential aged care size, ownership model and multi-chain affiliation on resident comfort and symptom management at the end of life**

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## Abstract

**Context:** In most resource-rich countries, a large and growing proportion of older adults with complex needs will die while in a Residential Aged Care (RAC) facility.

**Objectives:** This study describes the impact of facility size (small/large), ownership model (profit/non-profit) and provider (independent/chain) on resident comfort and symptom management as reported by RAC staff.

**Methods:** This retrospective 'after-death' study collected data decedent resident data from a subsample of 51 hospital-level residential aged care facilities in New Zealand. Symptom Management and Comfort Assessment in Dying at End of life with Dementia (SM-EOLD and CAD-EOLD) scales were administered post-mortem to Residential Aged Care staff most closely associated with 217 deceased residents. Data collection occurred from January 2016 to February 2017.

**Results:** Results indicated that residents of large, non-profit facilities experienced greater comfort at the end of life (CAD-EOLD) as indicated by a higher mean score of 37.21 (SD = 4.85, 95% CI 34.4, 40.0) compared with residents of small for-profit facilities who recorded a lower mean score 31.56 (SD = 6.20 95% CI 29.6, 33.4). There was also evidence of better symptom management for residents of chain facilities, with a higher mean score for Symptom management score (SM-EOLD total score) recorded for residents of chain facilities (mean = 28.07, SD = 7.64, CI 26.47), 29.66) was higher in comparison to the mean score for independent facilities (mean = 23.93, SD = 8.72, 95% CI 21.65, 26.20).

**Conclusion:** Findings suggest that there are differences in the quality of end-of-life care given in Residential Aged Care based on size, ownership model, and chain affiliation.

**Keywords:** residential aged care, end-of-life, ownership model, chain affiliation, palliative, ageing, older people

## The effect of residential aged care size, ownership model and chain affiliation on resident comfort and symptom management at the end of life

### Introduction

Over the past several decades in many resource-rich countries, there has been a shift from non-profit, single-site, residential aged care (RAC) providers to large privately-owned chain facilities, leading to concerns about whether inferior care then follows.<sup>1</sup> In line with this trend, a growing body of research has explored the impact of ownership model (for-profit/not-for-profit) on economic performance<sup>2-5</sup> or outcomes for aged RAC residents.<sup>1, 6, 7</sup> Evidence suggests that residents in non-profit facilities have better health outcomes than those in for-profit facilities, although financial performance tends to favour the for-profit sector.<sup>8, 9</sup> Furthermore, quality-of-care problems appear to be more pronounced in for-profit facilities owned by a corporate chain.<sup>10, 11</sup>

Structural factors of interest reported in the international research literature include the size of facilities, the ownership model (for-profit, non-profit) and whether the organisation providing aged care services are affiliated with a chain.<sup>12-14</sup> Research has indicated that larger facilities often have lower staff to resident ratios and more often focus on profit maximization rather than the quality of outcomes for residents.<sup>15</sup> Ownership model may also impact on resident outcomes with a predominance of the evidence suggesting that residents in non-profit facilities have better outcomes than those in for-profit facilities.<sup>1, 16</sup> Internationally, the emergence of chains within the RAC sector has been promoted as beneficial in terms of increased (cost) efficiency in service delivery based on economies of scale, a standardization of procedures and the facilitation of knowledge transfer between facilities.<sup>17, 18</sup> However, chain affiliation has also been associated with an inability to introduce needed changes based on complex decision structures and routinized procedures.<sup>17</sup> Research looking at these structural factors in combination indicates that large for-profit chains have lower staffing, increased regulatory violations, and more quality issues in comparison to non-profit facilities.<sup>10, 19</sup>

Within New Zealand, the setting for the study presented in this paper, RAC is categorised based on level of care: 1) *rest homes* provide support with activities of daily living but not 24-hour nursing care, 2) *private hospitals* deliver twenty-four-hour nursing/medical care 3) *dementia care* provides secure rest home care while addressing safety issues and 4) *psycho-geriatric care* delivers private hospital level care for residents with dementia as well as those experiencing behavioural challenges, psychiatric illness and/or physical frailty.<sup>20</sup> Currently, those entering a RAC facility either pay privately (negotiated with facility) or are subsidised by the Government through District Health Boards (DHBs) based on age (65+) (under 65 based on health needs) and financial means. RAC differs from *retirement villages* which can be defined as privately owned independent living residences for older adults.<sup>21</sup>

New Zealand has the highest number of reported deaths among older people in RAC internationally, with 38% of people aged >65 years dying in this setting and a further 18% estimated to have RAC as a place of residence at the time of death.<sup>(22)</sup> RACs are thus increasingly the place of death for older people and have been argued to be acting as ‘de facto hospices’.<sup>23</sup> Evidence in New Zealand indicates that a shift from not-for-profit, single-site, RAC providers in the 1980’s to the current situation of large chain privately owned facilities (facilities with 70 or more beds)<sup>24-27</sup> has contributed to work conditions characterized by low wages, a delegation of increasingly complex tasks to unqualified caregivers, increasing workload, and decreased organisational commitment.<sup>28-31</sup> Over the last 20 years in New Zealand, both the average age and dependency levels of residents have increased.<sup>32</sup> The increasingly complex needs of RAC residents, and the fact that a large number of older adults will die while in RAC, makes quality end of life care essential. Yet, Frey et al.<sup>33</sup> identified deficiencies in core clinical skills related to symptom management for residents as well as difficulties for staff in identifying when end-of-life care should begin. The shift to private ownership and the associated economic demands of the market<sup>34</sup> foster a task orientation.<sup>35-37</sup>

Little research has examined the impact of a combination of three organizational factors (size, ownership model, and chain affiliation) on resident end-of-life symptom management and comfort. Drawing on Donabedian’s<sup>38, 39</sup> original systems model, relationships between organizational structures, (e.g., ownership model, chain affiliation, and size) influence organizational outcomes such as indicators of resident quality of care. What impact then does size, ownership model (for-profit/non-profit) and chain affiliation (chain/independent) have on symptom management and comfort of residents at during the last month of life?

### **Aim and Method**

This retrospective ‘after-death’ study describes the impact of facility size, ownership model, and chain affiliation on resident comfort and symptom management as reported by RAC nursing staff.

#### *Setting*

This study utilizes data from a retrospective study that explored the quality of death of residents from the perspective of RAC staff and families. Facilities for the larger study were a random cluster sampling of 61 representative facilities (approximately 3709 representative RAC beds) across New Zealand.

#### *Sample*

The sample for the current study consisted of after-death questionnaire data from 217 resident deaths in 51 hospital-level facilities (the highest level of need). Stand-alone ‘rest homes’ were not included in the analysis to ensure level of care homogeneity of the sample.

#### *Data Collection Procedure*

Facilities selected for the larger study were stratified by region, size (up to 70 beds/over 70 beds) and by the model (for-profit /not-for-profit). When a refusal occurred, a replacement facility

was selected randomly from the same strata. The sample for the current study consisted of data on decedents in hospital-level facilities ( $n = 51$ ). Continuing care (hospital-level) accounted for 66.4% percent of the level of care in the more extensive study sample and was selected to control for the effect of level of care on resident outcomes. Data from all resident deaths (whether they occurred in the facility or elsewhere) during staggered three month periods (January 2016 to February 2017) were recorded in 51 of the 61 facilities across New Zealand by facility administration. After-death staff questionnaires surveyed physicians and nurses and health care assistants (nursing assistants) directly involved in the resident's care at least 14 days prior to death. Data from the questionnaires completed with registered nurses (RNs) who cared for a resident were utilized. Ethical approval was obtained from the University Human Participants Ethics Committee (Phase One ref. 015461 and Phase Two ref. 015650).

Before proceeding further, the following definitions were adopted for the purpose of this study:

*End-of-Life Care:* Care provided within the last week of the resident's life.

*Ownership Model:* Non-profit facilities do not make profits which are distributed to shareholders/owners. Conversely, for-profit facilities distribute profits to stakeholders/owners.

*Chain:* an organization with more than five facilities that share the same business name and/or owner (3).

*Independent facilities:* Organisations with less than five facilities.

*Continuing care (hospital level):* Care which incorporates 24-hour registered nurse management and supervision, personal care, clinical support and accommodation for residents with the highest level of disability and needs.<sup>40</sup>

*Facility Size:* The definition of a small facility as 70 beds or under, and large facility as over 70 beds was based on a categorisation utilised in previous research.<sup>41-43</sup>

### *Questionnaires*

After-death questionnaires are an important tool in evaluating the quality of end-of-life care, and/or in investigating the experiences of people at the end of life.<sup>44</sup> These can be completed by either family or health professionals. Pertinent to the current study, while patients themselves provide the most accurate ratings<sup>45</sup> there is evidence that health professionals are better at rating a resident's functional status and physical symptoms than family members.<sup>46</sup> Furthermore, the agreement between patients and family is the lowest for the presence and severity of pain, anxiety, and depression., with family members tending to rate symptoms more severely than patients. Therefore, we decided to use nurse-reported ratings of symptom management and comfort for this study. Questionnaire data collected in relation to the 217 resident deaths included socio-demographic characteristics, date of admission, health status, clinical complications, recorded advanced care planning and quality of dying as well as the following measures:

### *Symptom Management at the End of Life in Dementia*

The nine items of the Symptom Management at the End of Life in Dementia (SM-EOLD)<sup>47</sup> assessed the management of resident symptoms during the last 90 days of their lives. Scale responses range from 0-45 with higher scores indicating better symptom management. There are two subscales: 1) physical (pain, shortness of breath, skin breakdown) and 2) psychological (calm, depression, fear, anxiety, agitation and restiveness to care) symptoms.

*Reliability.* Cronbach alpha reliability for the scale was .67. A significant correlation was recorded between mean scale scores reported by the 34 Nurses and those reported by 34 Health Care Assistants (nursing assistants) ( $r^2 = .35$ ) in the larger study.

### *Comfort Assessment in Dying with Dementia*

The 14 scale items of the Comfort Assessment in Dying with Dementia (CAD-EOLD)<sup>47</sup> indicate the condition of the resident during the dying process. Scale scores range from 14 to 42 with a higher score indicating a better comfort level. CAD-EOLD has four sub-scales: 1) Physical distress (discomfort, pain, shortness of breath and restlessness), 2) Emotional distress (anxiety, fear, moaning, and crying) 3) Well-Being (serenity, peace and calm) and 4) Dying Symptoms (e.g., choking, gurgling, difficulty swallowing, and shortness of breath).

*Reliability.* Cronbach's alpha reliability was .71. A significant correlation was recorded between mean scale scores reported by the 34 Nurses and those reported by 34 Health Care Assistants ( $r^2 = .55$ ).

Both measures have been utilized to evaluate end of life care in patient groups with diagnoses other than dementia.<sup>47, 48</sup>

### *Data Analyses*

Data were coded into SPSS version 23. Both descriptive (frequencies, mean, mode, standard deviation) and inferential statistics appropriate to the level of measurement were utilized in the analyses. The level of statistical significance was set at  $p < 0.05$ . Data were weighted according to the sex/ age/ethnicity structure of the New Zealand residential aged care population using data from the 2013 census.<sup>48</sup>

Analyses included: ANCOVA and MANCOVA (for subscale analyses) controlling for age. ANCOVA and MANCOVA models are special cases of multivariable linear regression in which one or more predictors are nominal or ordinal.<sup>49, 50</sup> Sample size also influenced the selection of MANCOVA rather than multivariable regression.<sup>51</sup> In each analysis, the data were checked to ensure the variables met the multivariate assumptions for the MANCOVA procedure.

Small sample size necessitated separate analyses to examine main effects and interaction effects based on: 1) size (small/large) x ownership model (profit/non-profit) 2) ownership model (profit/non-profit) x chain affiliation (chain /independent) and 3) size (small/large) x chain affiliation (chain /independent).

## Results

### *Demographic Characteristics of Facilities, Nurses and Decedent Residents*

Over half of the facilities were ‘for-profit’ (55.8%) and had 70 beds or less (60.8%). Registered nurses (RN’s) (n = 34) were most often female (88.2%), between the ages of 30-39 (38.2%), and in terms of ethnicity, were most often Filipino (44.1%) or New Zealand European (23.5%). Only 23.5% reported English as a first language. The majority of RN participants reported Christianity as their religion (85.3%)(Table 1).

[Table 1 here]

Deceased residents in hospital-level care (n = 217) were most often female (53.5%) and between the ages of 81 and 91 years (42.9%). Thirty-three percent were aged 92 or over. The majority of the deceased residents were NZ European (82%). Almost half of the residents were diagnosed by a General Practitioner or Nurse Practitioner as having dementia (48.8%). The most frequently reported cause of dementia was vascular dementia (26.3%). Deceased residents most often had recorded a “no cardiopulmonary resuscitations” status (88.9%). The majority of decedents had an Enduring Power of Attorney (EPOA) in place (86.1%), although fewer had a formally activated EPOA (57.4%). Most of the decedents did not have Advance Care Planning (ACP) documentation (79.3%). Family members were involved with the majority of the deceased residents (88.0%). This family member was most often an adult child of the resident (70.0%)(Table 2).

[Table 2 here]

### *Level of Comfort*

*Size and Ownership Model.* A factorial ANCOVA was conducted to compare the influence of size and ownership model, on the CAD-EOLD total score. There was a significant interaction between size and ownership model ( $F(1,177) = 5.54, p = .020, \text{Eta squared} = 3.1\%$ ). The nature of this interaction suggested that residents of large, non-profit facilities experienced more comfort as indicated by a higher mean score of 37.21 (SD = 4.85, 95% CI 34.4, 40.0) than residents of small for-profit facilities (mean = 31.56, SD = 6.20, 95% CI 29.6, 33.4) (Figure 1). There was no significant main effect of ownership model on CAD-EOLD total score ( $p > .05$ ) (Table 3).

[Figure 1 here]

[Table 3 here]



There was, however, a significant main effect of size on CAD-EOLD total score ( $F(1,177) = 8.44, p = .004$ , Eta squared = 4.7%), indicating that residents of large facilities had a higher CAD-EOLD mean score of 34.96 (SD = 5.32, 95% CI 33.6,36.3) (indicative of greater comfort) than residents of small facilities (mean = 32.53, SD = 5.57, 95% CI 31.5, 33.5).

MANCOVA results also indicated a significant interaction effect between size and ownership model for the four CAD-EOLD subscales ( $F(4,114) = 3.40, p = .011$ , Eta squared = 10.7%). Between subject tests indicated that the significant difference in the CAD-EOLD Dying subscale ( $F(1,117) = 12.05, p = .001$ , Eta squared = 9.3%). Residents of large non-profit facilities had a higher mean CAD-EOLD Dying subscale score of 11.50 (SD = .65, 95% CI 11.1, 11.8) compared to the mean score for residents of small for profit facilities (mean = 10.49, SD = 1.44, 95% CI 10.1, 10.8)

*Ownership Model and Chain Affiliation.* Although there was no significant main effect of ownership model (profit/non-profit) or chain affiliation (chain/independent) on CAD-EOLD total score ( $p > .05$ ), MANCOVA results indicated a significant interaction effect between chain affiliation and ownership model for the four CAD-EOLD subscales ( $F(4,114) = 2.95, p = .023$ , Eta squared = 9.4%). Between subject tests indicated a significant difference in the CAD-EOLD Dying subscale ( $F(1,117) = 6.38, p = .013$ , Eta squared = 5.2%). Residents of chain non-profit facilities had a higher mean CAD-EOLD Dying subscale score (mean = 10.91, SD = 1.41, 95% CI 10.4, 11.4) compared to the mean score reported for residents of stand-alone for profit facilities (mean = 10.29, SD = 1.26, 95% CI 9.9, 10.5) and the mean score reported for non-profit facilities (mean = 9.62, SD = 1.66, 95% CI 8.9, 10.3) (Figure 2).

[Figure 2 here]

*Size and Chain Affiliation.* A factorial ANCOVA controlling for the effects of age revealed no significant main effect of size and chain affiliation on CAD-EOLD total score ( $p > .05$ ). MANCOVA results indicated no significant interaction effect between size (small/large) and chain affiliation (chain/independent) for the four CAD-EOLD subscales.

### *Symptom Management*

*Size and Ownership Model.* MANCOVA analysis using Wilk's lambda criterion indicated that there were differences in SM-EOLD subscale scores based on size (small/large) and ownership model (profit/not-for-profit) ( $F(2, 179) = 3.10, p = .047$ , Eta squared = 3.3%). Univariate follow-up tests indicated that there were significant differences in SM-EOLD psychological subscale mean scores based on size. Residents of large facilities had a higher mean score of 19.89 (SD = 6.14, 95% CI 18.2, 21.5) indicating better psychological symptom controls than residents of small facilities who registered a mean score of 17.70 (SD = 6.15, 95% CI, 16.6, 18.7). ANCOVA analysis revealed that there was no significant main effect on the size of the facility (small/large) or ownership model (profit/non-profit)  $p > .05$  (Table 4).

[Table 4 here]

*Ownership Model and Chain Affiliation.* ANCOVA analysis revealed a significant difference in SMEOLD mean score based on chain affiliation (chain/independent) ( $F(1, 145) = 5.03, p = .026, \text{Eta squared} = 3.4\%$ ). Chain facilities recorded a higher mean SM-EOLD total score 28.07 ( $SD = 7.64, 95\% \text{ CI } 26.47, 29.66$ ) than the mean score for independent facilities (mean = 23.93,  $SD = 8.72, 95\% \text{ CI } 21.65, 26.20$ ). MANCOVA results using Wilk's lambda criterion indicated no significant differences in SM-EOLD subscale scores ( $p > .05$ ).

*Size and Chain Affiliation.* ANCOVA analysis revealed that there was a significant difference in SM-EOLD mean score based on chain affiliation (chain/independent) ( $F(1, 184) = 6.28, p = .013, \text{Eta squared} = 3.4\%$ ). There were no other significant main effects or interaction effects ( $p > .05$ ). Chain facility decedent residents had a higher mean SM-EOLD score 28.07 ( $SD = 7.64, 95\% \text{ CI } 26.4, 29.6$ ) compared to that recorded for the decedents of stand-alone facilities, (mean = 23.93,  $SD = 8.72, 95\% \text{ CI } 21.6, 26.2$ ). F statistics for all analyses can be found in Supplemental Appendix Table 1

## Discussion

Our findings suggest that there are differences in the quality of end-of-life care given in RAC based on size, model, and provider. These results are consistent with earlier findings by Lemke and Moos<sup>52</sup> in the United States who found that larger non-profit facilities recorded higher scores on eight indices of quality of care. A more recent meta-analysis by Comondore et al.<sup>7</sup> concluded that on average, not-for-profit RAC facilities deliver higher quality care than do for-profit RAC facilities. Results support previous findings of better experiences of care for residents in large non-profit facilities<sup>10, 17, 53, 54</sup> at least in relation to comfort during the last seven days of life. Previous research has highlighted concerns that for-profit facilities may privilege economic interests over the needs of residents with the goal of maximizing economic returns.<sup>54</sup>

Size and ownership model did not significantly influence overall resident symptom management scores. It is possible that other organizational factors such as high turnover rates, low staffing levels, low stability levels, and high use of agency staff play a more important role in explaining differences in resident symptom management.<sup>55</sup> To some degree quality of care would seem to be influenced by all of these staffing characteristics. However, in results of a review by Fleming and Purandare,<sup>56</sup> residents of large facilities recorded better psychological symptom management in comparison to small facilities. It has been proposed that the potential impersonality of a larger institution might limit attention to the psychological needs of residents however, a larger institution might be capable of providing increased specialized staffing support facilitating psychological symptom management.<sup>56</sup>

The present study provides more insight into the effects of chain membership by demonstrating that chain membership in and of itself is not in and of itself indicative of poor quality care.<sup>11, 57</sup> Most prior studies that combine all chain-owned facilities into a single group, may have

under-estimated the effect of the ownership model (profit/not-for-profit) in relation to chain membership. In this study, chain not-for-profit facilities recorded higher scores for the dying subscale of the CAD-EOLD. Economics of scale afforded by chain membership may have facilitated greater access to resources allowing for greater comfort during the dying process.<sup>(58)</sup> Study results for small facilities, however, point to the potential impact of resource constraints on resident quality of care. Leroi et al.<sup>59</sup> indicated that the greater availability of resources (e.g., personal care hours, private rooms, opportunities for staff education) in larger facilities may positively impact on resident outcomes. Thus small facilities may be disadvantaged relative to larger and most, especially newer, purpose-built RAC facilities in part due to economic considerations. Research by Ullman<sup>5</sup> found that lower average costs in facilities with 100-199 beds compared to facilities with 0-49, 50-99 beds. In light of evidence which links quality outcomes to size, future economic evaluation studies are warranted.

### *Strengths and Limitations*

To our knowledge, this is the first study of its kind to examine the impact of a combination of three organizational factors (size, model, and provider) on resident end-of-life symptom management and comfort. That being said, the measures of resident symptom management and comfort rely on RAC nurse self-reported data. However, questionnaires were completed by the RN most directly involved in the residents care 14 days prior to death and results correlated significantly with those reported by the health care assistants most closely involved in the decedents care. SM-EOLD and CAD-EOLD were developed to assess persons with dementia. Although they can be used to assess care and outcomes for people without dementia<sup>60, 61</sup> evidence from other research<sup>62</sup> suggests that additional items may also be needed to measure the quality of end-of-life care and quality of dying among RAC residents with diagnoses other than dementia. The small number of decedents from non-profit large facilities included in the interaction effect models may impact on the generalizability of the results. Future research with a larger number of decedents from this size and type of facility is required. Finally, definitions of 'chain' vary across studies ranging from two or more facilities<sup>10</sup> three or more facilities,<sup>63</sup> five or more facilities<sup>3</sup> while a third study did not specify a number.<sup>5</sup> Such variation in definition prevents comparisons across results.

### *Recommendations and Policy Implications*

The differences among RAC facilities presented above do not provide any simple solutions for the improvement of RAC resident quality of care. Nevertheless, the results lend themselves to a number of recommendations:

Firstly, the complexity of the relationship between end-of-life resident outcomes and facility size, ownership model and chain affiliation noted here and by other researchers<sup>10, 60</sup> warrants further exploration due to its potential implications for optimal RAC facility organization and alternative

approaches for achieving efficiencies while maintaining the quality of care at the end of life. Second, as the residents of RAC facilities become more ethnically diverse<sup>64, 65</sup> the relationship between ethnicity and symptom management should be further explored to gain insight into why differences exist as well as ways to address these differences. Finally, research which incorporates consideration of additional facility and environmental characteristics are shown to impact on resident outcomes is also recommended.

While acknowledging that both long-term care structure and government regulation varies widely between countries if the quality of care is influenced by practices, policies, and systems inherent to ownership and provider<sup>10, 18, 54</sup> a facility-specific approach might be ineffective and fail to identify root causes of differences in care outcomes. Switching to a broader regulatory approach may not be feasible for the individual quality assurance systems (e.g. audit and certification systems) currently in place in some developed countries (e.g. New Zealand, Australia, United Kingdom, United States)<sup>66, 67</sup> but could be a key feature in a comprehensive approach to identifying areas for improvement. Crucially, a reformed strategy could extend responsibility for resident care beyond the individual RAC facility to the organizational level.<sup>68</sup> A greater focus on “culture change” initiatives<sup>69</sup> to improve quality by changing organizational norms and values is also recommended.<sup>70, 71</sup>

### **Conclusion**

RAC policy decisions should be both based upon the best available evidence and should facilitate the provision of quality care.<sup>1</sup> Results reported here indicate better resident end-of-life comfort and symptom management in non-profit facilities. Furthermore, the resources provided by non-profit chain organizations may provide greater comfort for residents at the end of life. Policy responses to the evidence presented clearly depend on the jurisdictional and facility context. In light of the growing popularity of large RAC corporate chains in countries such as New Zealand, Australia, United Kingdom, and the United States<sup>66, 72</sup> governments should develop policy in line with the evolving needs of ownership. Such policy would include requirements for clear financial accountability, quality reporting, oversight, and enforcement to deal with the challenges posed by privatization and marketization of RAC services.<sup>73</sup> Moving forward the results of this and other studies point to the need to unpack which features of RAC ownership and corporate structuring have the most significant impact on resident care.<sup>74</sup> The knowledge gained will allow for the development of both an evidence-based and effective model of knowledge translation to ensure high quality of care for residents, especially at the end of life.

### **Ethical Approval**

Ethical approval was obtained from the University of Auckland Human Participants Ethics Committee (Phase One ref. 015461 and Phase Two ref. 015650).

### **Financial support**

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[3709141].

**Contribution of Authors**

All authors were involved in the conception, design, and implementation of the research. RF, DB, JR MG, and MB were involved in the data analysis and interpretation and drafting of the paper. All authors were involved in the review and approval of the final article for publication.

**Conflict of interests**

None.

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**Table 1** Registered Nurse Staff Demographic Characteristics: Frequency and Percentage (n = 34)

<b>Variable</b>	<b>RN Staff</b>	
	<i>Frequency</i>	<i>Percentage</i>
<b>Gender</b>		
Male	4	11.8
Female	30	88.2
<b>Age</b>		
20-29	9	26.5
30-39	13	38.2
40-49	6	17.6
50-59	2	5.9
60-69	3	8.8
70-79	1	3.0
<b>Ethnicity</b>		
NZ European	8	23.5
Pacific	1	3.0
Filipino	15	44.1
Indian	6	17.6
Asian	1	3.0
Other	3	8.8
<b>Home Language</b>		
English	8	23.5
Maori	2	5.9
Tagalog(Philippines)	14	41.2
Chinese (Mandarin, Cantonese)	2	5.9
Other	8	23.5
<b>Religion</b>		
Christian	29	85.3
Other	1	2.9
No religion	4	11.8

**Table 2** Facility and Decedent Resident Profile: Frequency and Percentage (n =217)

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<b>Variable</b>	<b>Facilities</b>	<b>Frequency</b>	<b>Percent<sup>±</sup></b>
<b>Ownership Model</b>			
Profit		152	70.0
Non-Profit		65	30.0
<b>Chain Affiliation</b>			
Independent		80	36.9
Chain		137	63.1
<b>Facility Size</b>			
lowest to 70 beds		140	64.5
> 70 beds		77	35.5
<b>Decedent Characteristics</b>			
<b>Gender</b>			
Female		116	53.5
Male		82	37.8
<b>Age</b>			
lowest to 80		51	23.5
81-91		93	42.9
92 and over		71	32.7
<b>Ethnicity</b>			
NZ European		178	82.0
Maori		4	1.8
Pacific		1	.5
Asian		8	3.7
Other		15	6.9
<b>Primary Diagnosis</b>			
Dementia		106	48.8
Cancer		45	20.7
Chronic Condition		63	29.0
<b>Dementia Cause</b>			
Alzheimer's		20	9.2
Vascular Dementia		57	26.3
Mixed		10	4.6
Fronto-Temporal Lobe		2	.9
Lewy Body		2	.9
Other		6	2.8
<b>CPR status</b>			
No CPR		193	88.9
CPR		5	11.1
<b>Enduring Power of Attorney (EPOA)</b>			
yes		172	79.3
no		31	14.3
<b>Enduring Power of Attorney (EPOA) Activated</b>			
Yes		90	41.5
No		101	46.5
<b>Advance Care Planning Documents</b>			
Yes		60	27.6
No		150	69.1
<b>End-of-Life Care Pathway Used</b>			
Yes		45	20.7
No		162	74.7
<b>Hospice Involvement in last days of life</b>			
Yes		30	13.8
No		180	82.9
<b>Family Involvement during last months of life</b>			
Yes		191	88.0
No		24	11.1
<b>Family Member Involved (multiple response)</b>			
Spouse		56	25.8
Children		152	70.0
Other Relative		52	24.0
Grandchild		31	14.3
Friend		39	18.0
Other		22	10.1

<sup>±</sup> Actual Percent - Excludes missing cases and may not total 100%

**Table 3** Means, Standard Deviations (SD) and Confidence Intervals (CI) of Comfort Assessment in Dying with Dementia (CAD-EOLD) scale and subscales: Ratings by Facility Size, Model and Provider

	CAD-EOLD total			CAD-EOLD Physical			CAD-EOLD Emotional			CAD-EOLD Wellbeing			CAD-EOLD Dying			
	Sample (n)	Mean	Standard Deviation	95% Confidence Interval	Mean	Standard Deviation	95% Confidence Interval	Mean	Standard Deviation	95% Confidence Interval	Mean	Standard Deviation	95% Confidence Interval	Mean	Standard Deviation	95% Confidence Interval
<b>Size</b>																
<i>Small</i>	117	32.53	5.57	31.5, 33.5	8.93	1.76	8.6, 9.2	10.50	1.47	10.2, 10.7	7.20	1.87	6.8, 7.5	10.15	1.56	9.8, 10.4
<i>Large</i>	62	34.96	5.32	33.6, 36.3	9.71	1.63	9.2, 10.1	10.54	1.52	10.1, 10.9	7.32	2.00	6.8, 7.8	10.47	1.38	10.1, 10.8
<b>For Profit</b>																
<i>Small</i>	74	33.16	5.08	31.9, 34.3	9.00	1.90	8.5, 9.4	10.27	1.46	9.9, 10.6	7.16	1.60	6.7, 7.5	10.49	1.44	10.1, 10.8
<i>Large</i>	48	34.31	5.32	32.7, 35.8	9.51	1.67	9.0, 9.9	10.40	1.54	9.9, 10.8	7.44	1.87	6.8, 7.9	10.15	1.39	9.7, 10.5
<b>Non Profit</b>																
<i>Small</i>	43	31.46	6.24	29.5, 33.3	8.84	1.59	8.3, 9.3	10.84	1.46	10.3, 11.2	7.26	1.87	6.6, 7.8	9.80	1.69	9.2, 10.3
<i>Large</i>	14	37.21	4.85	34.4, 40.0	10.35	1.33	9.5, 11.1	11.00	1.41	10.1, 11.8	7.32	2.00	6.1, 8.4	11.50	0.65	11.1, 11.8
<b>Chain Affiliation</b>																
<i>Independent</i>	76	32.59	5.59	31.3, 33.8	9.04	1.68	8.6, 9.4	10.36	1.60	9.9, 10.7	7.12	1.74	6.7, 7.5	10.08	1.42	9.7, 10.4
<i>Chain</i>	103	33.96	5.54	32.7, 35.1	9.50	1.76	9.1, 9.8	10.63	1.41	10.3, 10.9	7.36	2.05	6.9, 7.7	10.47	1.51	10.1, 10.7
<b>Chain</b>																
<i>Non Profit</i>	33	33.93	6.24	31.7, 36.1	9.45	1.66	8.8, 10.0	10.83	1.27	10.3, 11.2	7.08	2.43	6.2, 7.9	10.91	1.41	10.4, 11.4
<i>For Profit</i>	70	33.97	5.23	32.7, 35.2	9.52	1.82	9.0, 9.9	10.54	1.48	10.1, 10.8	7.50	1.85	7.0, 7.9	10.25	1.52	9.8, 10.6
<b>Independent</b>																
<i>Non Profit</i>	24	31.41	6.43	28.6, 34.1	9.25	1.69	8.5, 9.9	11.00	1.67	10.2, 11.7	7.25	2.08	6.4, 8.2	9.62	1.66	8.9, 10.3
<i>For Profit</i>	52	33.13	5.13	31.7, 34.5	8.94	1.70	8.4, 9.4	10.05	1.49	9.6, 10.4	7.05	1.59	6.6, 7.6	10.29	1.26	9.9, 10.6



**Table 4** Means, Standard Deviations (SD) and Confidence Intervals (CI) of Symptom Management End-of-Life in Dementia (SM-EOLD) scale and subscales: Ratings by Facility Size, Model and Provider

	SM-EOLD total			SM-EOLD Physical			SM-EOLD Psychological			
	Sample (n)	Mean	Standard Deviation	95% Confidence Interval	Mean	Standard Deviation	95% Confidence Interval	Mean	Standard Deviation	95% Confidence Interval
<b>Size</b>										
<i>Small</i>	129	25.58	8.24	24.1, 27.0	7.95	3.29	7.3, 8.5	17.70	6.15	16.6, 18.7
<i>Large</i>	58	27.81	8.24	25.6, 29.9	7.91	3.28	7.0, 8.7	19.89	6.14	18.2, 21.5
<b>For-Profit</b>										
<i>Small</i>	79	25.90	8.45	24.0, 27.7	8.11	3.38	7.3, 8.8	18.03	6.28	16.6, 19.4
<i>Large</i>	45	26.88	8.43	24.3, 29.4	7.73	3.53	6.6, 8.7	19.15	6.16	17.2, 21.0
<b>Non Profit</b>										
<i>Small</i>	50	25.21	8.14	22.8, 27.5	7.69	3.18	6.7, 8.5	17.18	5.97	15.4, 18.8
<i>Large</i>	13	31.00	6.94	26.8, 35.1	8.53	2.18	7.2, 9.8	22.46	5.53	19.1, 25.8
<b>Chain Affiliation</b>										
<i>Independent</i>	59	23.93	8.72	21.6, 26.2	7.56	3.81	6.5, 8.5	16.68	6.19	15.0, 18.2
<i>Chain</i>	91	28.07	7.64	26.4, 29.6	8.20	2.85	7.6, 8.7	19.56	5.98	18.3, 20.8
<b>Chain</b>										
<i>Non Profit</i>	32	28.00	7.73	25.2, 30.7	8.13	2.46	7.2, 9.0	19.66	5.95	17.5, 21.8
<i>For Profit</i>	59	28.11	7.66	26.1, 30.1	8.22	3.04	7.4, 9.0	19.51	6.09	17.9, 21.0
<b>Independent</b>										
<i>Non Profit</i>	23	24.60	8.59	20.8, 28.3	7.50	3.81	5.8, 9.1	16.38	6.20	13.6, 19.0
<i>For Profit</i>	36	23.50	8.90	20.4, 26.5	7.59	3.94	6.2, 8.9	16.83	6.25	14.7, 18.9

**Table 1**

Summary of *F* statistics for Ownership Model, Size, Chain Affiliation, Ownership Model x Size, Ownership Model x Chain Affiliation, Size x Chain Affiliation: Comfort Assessment in Dying with Dementia (CAD-EOLD) and Symptom Management End-of-Life in Dementia (SM-EOLD) ANCOVA Results (Effect Sizes in Parentheses)

Effect	Degrees of Freedom	CAD- EOLD	Effect Size	Degrees of Freedom	SM- EOLD	Effect Size
Ownership Model (profit/not for profit)	1,163	.75	(.005)	1, 164	1.00	(.006)
Size (small/large)		2.65	(.016)		.15	(.001)
Ownership Model x Size		4.15	(.025)*		2.61	(.016)
Chain Affiliation (chain/independent)	1,177	4.68	(.028)*	1,183	3.13	(.019)
Chain Affiliation x Ownership Model		.30	(.002)		.00	(.000)
Size x Chain Affiliation	1,174	2.49	(.014)	1,180	1.49	(.008)

\*  $p < .05$

**Figure Captions**

*Figure 1* CAD-EOLD mean score by size (small under 70 beds /large 70 beds or more) and ownership model (stand-alone/chain) (n = 179)

*Figure 2* CAD-EOLD Dying subscale mean score by ownership model (profit/non-profit) and chain affiliation (stand-alone/chain) (n = 173)

ACCEPTED MANUSCRIPT

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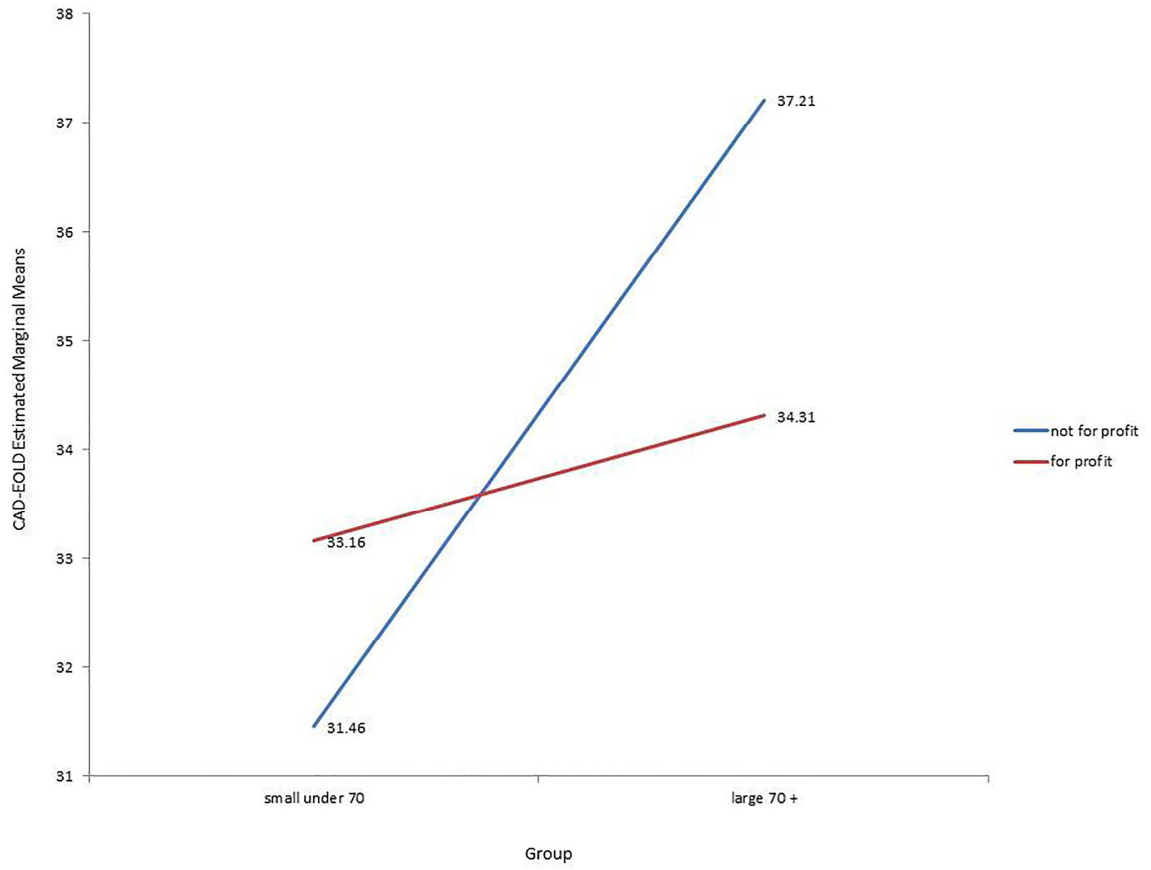
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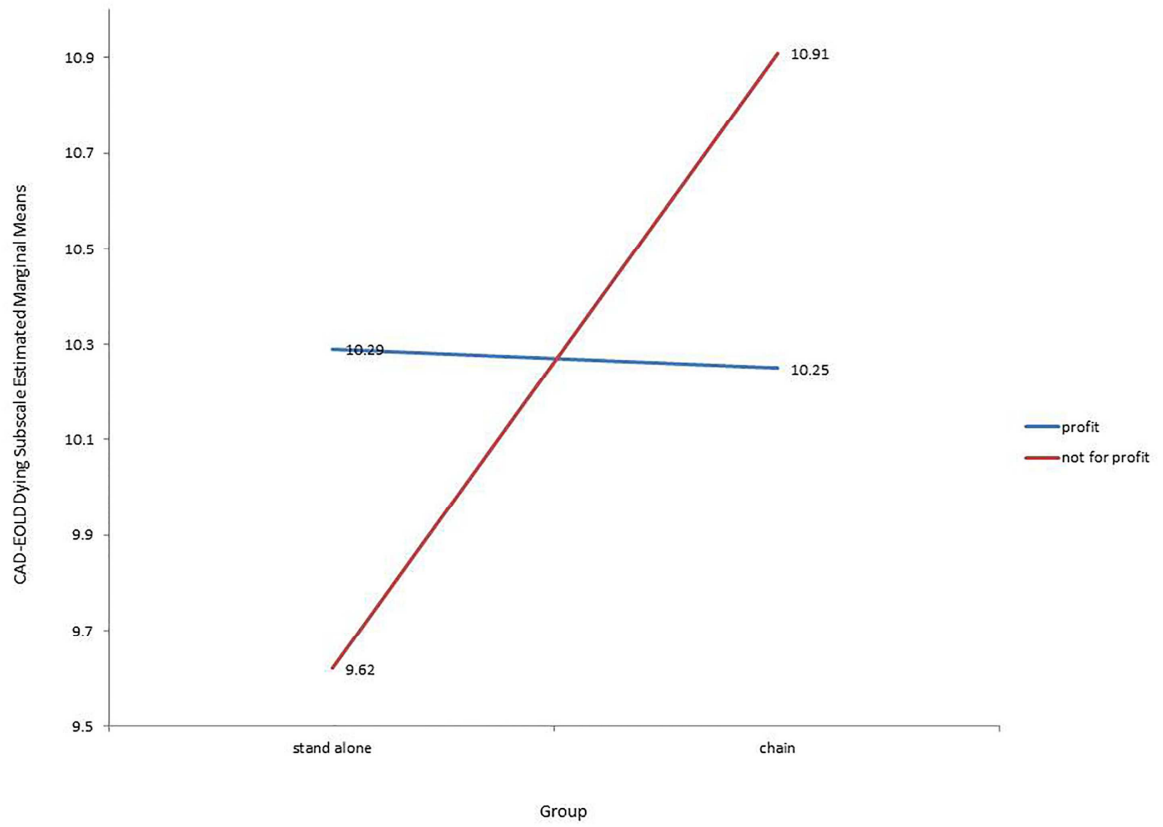
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## Appendix A

**Table 1**

Summary of *F* statistics for Ownership Model, Size, Chain Affiliation, Ownership Model x Size, Ownership Model x Chain Affiliation, Size x Chain Affiliation: Comfort Assessment in Dying with Dementia (CAD-EOLD) and Symptom Management End-of-Life in Dementia (SM-EOLD) ANCOVA Results (Effect Sizes in Parentheses)

Effect	Degrees of Freedom	CAD-EOLD	Effect Size	Degrees of Freedom	SM-EOLD	Effect Size
Ownership Model (profit/not for profit)	1,163	.75	(.005)	1,164	1.00	(.006)
Size (small/large)		2.65	(.016)		.15	(.001)
Ownership Model x Size		4.15	(.025)*		2.61	(.016)
Chain Affiliation (chain/independent)	1,177	4.68	(.028)*	1,183	3.13	(.019)
Chain Affiliation x Ownership Model		.30	(.002)		.00	(.000)
Size x Chain Affiliation	1,174	2.49	(.014)	1,180	1.49	(.008)

\*  $p < .05$