

# Alternative staffing structures in a clustered domestic model of residential aged care in Australia

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## Abstract

**Objective:** A clustered domestic model of residential aged care has been associated with better consumer-rated quality of care. Our objective was to examine differences in staffing structures between clustered domestic and standard models.

**Methods:** A cross-sectional study involving 541 individuals living in 17 Australian not-for-profit residential aged care homes.

**Results:** Four of the homes offered dementia-specific clustered domestic models of care with higher personal care attendant (PCA) hours-per-resident-per-day (mean [SD] 2.43 [0.29] vs. 1.74 [0.46],  $P < 0.001$ ), slightly higher direct care hours-per-resident-per-day (2.66 [0.35] vs. 2.58 [0.44],  $P = 0.006$ ), higher staff training costs (\$1492 [258] vs. \$989 [928],  $P < 0.001$ ) and lower registered/enrolled nurse hours-per-resident-per-day (0.23 [0.10] vs. 0.85 [0.17],  $P < 0.001$ ) compared to standard models.

**Conclusions:** An Australian clustered domestic model of care had higher PCA hours, more staff training and more direct care time compared to standard models. Further research to determine optimal staffing structures within alternative models of care is warranted.

## KEY WORDS

health services for the aged, nursing homes, nursing staff

## 1 | INTRODUCTION

The Aged Care Act (1997) in Australia suggests the numbers of care staff should be sufficient to meet the assessed care needs of the residents,<sup>1</sup> but no further details are provided on what is considered the optimal staffing mix.<sup>2</sup> Staffing structure in residential aged care is a topical issue in Australia

with a recent inquiry recommending amendment of the Aged Care Act to mandate facilities to publish staffing ratios. There has been a further Bill proposed for the introduction of mandated minimum skilled staffing ratios, with the proposition that the Department of Health will determine which ratios are considered appropriate in consultation with the aged care sector.<sup>3,4</sup>

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Internationally, there is high variability in staffing requirements in residential aged care between countries.<sup>5</sup> The US federal standards require one registered nurse (RN) to be on duty eight consecutive hours every day and one RN and one licensed nurse (similar to enrolled nurse, EN in Australia) for the two remaining shifts per facility. Furthermore, if the facility has greater than 60 residents, they must also have a separate RN act as the director of nursing, but different US states may set higher or lower standards.<sup>6</sup> In England, national regulations state the registered manager must be suitably qualified and there must be “sufficient numbers of suitably qualified, competent, skilled and experienced persons”; however, what qualifications are considered suitable is not specified.<sup>7</sup> There is also variability in how aged care systems operate between countries which affects staffing structures. Japan has a national long-term care insurance scheme and mandated staff-to-resident ratios of 1:3, but the type of staff varies (average reported staffing mix: 16% RNs, 35% care staff, 7% therapists/dietitians/nutritionists and 42% non-clinical staff).<sup>8</sup> Arguably, this ratio is only possible with the Japanese long-term care insurance scheme, but a systematic review suggested increasing staff-to-resident ratios or additional staff training may offer potential cost savings over time from a societal perspective by reducing health-care costs.<sup>9</sup> The optimal skills mix associated with potential cost savings remains unclear.

Alternative models of care have been developed in Australia and internationally to allow individuals to have more independence, living in an environment that looks and feels “home-like” or “normalised.”<sup>10</sup> These models are often provided as dementia-specific homes. Previous research has suggested care staff in US home-like models of care (Green House models) may be able to spend more time in “direct care activities and engaging directly with the resident”.<sup>11</sup>

We recently published findings from a large cross-sectional study of people living in residential aged care in Australia showing that living in a clustered domestic model (Box 1) was associated with a higher consumer-rated quality of care, quality of life, fewer hospitalisations and potentially inappropriate medications, with similar costs of care

### Practice Impact

A dementia-specific clustered domestic model of residential aged care which has previously been associated with better consumer-rated quality of care has higher staff training costs and higher direct care hours. Further research on alternative staffing structures in alternative models of residential aged care should be undertaken.

and higher direct care hours.<sup>12-14</sup> However, differences in the staffing structures of the different models of care were not explored in detail. The current study is a descriptive analysis of the number of staff hours, direct care time and staffing mix in a clustered domestic model compared to a more standard model of residential care.

## 2 | METHODS

### 2.1 | The INSPIRED study

The Investigating Services Provided in the Residential Environment for Dementia (INSPIRED) study is a cross-sectional study of residential aged care in Australia. In the study, 1353 potential residents from 17 residential aged care homes in four states in Australia were assessed for eligibility and 541 consented to participate and have their facility records accessed. Residents either self-consented to participate or informed consent was provided by a proxy, usually a close family member (76% of the participants) if the participant had moderate-to-severe cognitive impairment measured by a Psychogeriatric Assessment Scale-Cognitive Impairment Scale (PAS-Cog) score of  $\geq 10$ . Residents were recruited, and data were collected between January 2015 and February 2016.

Data on the numbers of care staff and hours they worked were collected from the care homes. The care homes consented to provide this information; only deidentified, facility-level information about staffing was obtained. Further information about the care homes was collected from a questionnaire adapted from a previous study and completed by a staff member from the care home.<sup>15</sup> The questionnaire obtained information on who attended the latest case conference (eg residents, head nurse, members of the nursing team) for the 541 residents. These data provided information on the types of staff involved in case planning for the care of the residents. The questionnaire did not request any further details about the qualifications of “members of the nursing team” (ie if the staff were personal care attendants [PCAs], ENs or RNs) or qualifications of the “head nurse.” Care wages (including wages for RNs, ENs, PCAs, allied health and any other employees with direct involvement in

#### Box 1 Criteria used to define a clustered, domestic model of residential aged care

1. Small scale (maximum 15 residents per living unit)
  2. Residents have independent access to outdoors
  3. Continuity of staff assigned to the living units
  4. Meals cooked within the living units
  5. Self-service of meals by residents
  6. Residents can assist with meal preparation
- Clustered model identified if the residential aged care home met five of the six criteria.

the care of the residents) were collected from the care providers for two financial years, annualised and adjusted to 2016 prices.

## 2.2 | Residential aged care home models in the INSPIRED study

Residential aged care homes were defined as having a clustered, domestic model if they met five of six criteria (Box 1). These criteria were developed by examining similar models internationally<sup>16</sup> and from consultation with an advisory group comprising consumer representatives from the Alzheimer's Australia Consumer Dementia Research Network (who were informal caregivers), clinicians, health services researchers and representatives of residential aged care providers.

## 2.3 | Characteristics of the participants by model of care

All 17 residential aged care homes in this study were operated by not-for-profit providers. Four of the care homes were classified as having a clustered, domestic model, operated by a single aged care provider and were specifically for people living with dementia. All other homes were classified as having an Australian standard model of care. We compared 120 resident cases from four homes with a clustered, domestic model and 421 resident cases from 13 homes with a standard model.

## 2.4 | Statistical analysis

Mann-Whitney *U* tests and  $\chi^2$  tests were used to determine the difference in staffing between the models of care. All analyses were completed using Stata v.14.0 (Stata Corp LP, College Station, TX, USA).

## 2.5 | Ethical approval

This study was approved by the Flinders University Social and Behavioural Research Ethics Committee (references 6594, 6732 and 6753).

# 3 | RESULTS

## 3.1 | Participant characteristics

Participants residing in a clustered, domestic model were more likely to have a diagnosis of dementia in the medical records (98% vs. 55%,  $P < 0.001$ ) and had fewer co-morbidities (3.2 vs. 3.8,  $P < 0.001$ ). All care homes included people living with dementia (range in standard model: 23%-92%). There were also statistically significant differences in the distribution of age of the residents and cognitive scores (PAS-Cog). There was no difference in the proportion of females by model of care (Table 1).

## 3.2 | Differences in staffing structures by model of care

Clustered domestic models had significantly fewer nurse hours (mean [SD] registered [degree-educated] and enrolled [certificate/diploma trained] nurse hours-per-resident-per-day 0.23 [0.10] vs. 0.85 [0.17] in standard model,  $P < 0.001$ ) and allied health staff hours-per-resident-per-day (0.02 [0.01] vs. 0.15 [0.10],  $P = 0.042$ ), but significantly more personal care attendant (PCAs or care workers) hours-per-resident-per-day (2.43 [0.29] vs. 1.74 [0.46],  $P < 0.001$ ) and slightly, but statistically significantly more direct care hours-per-resident-per-day (2.66 [0.35] vs. 2.58 [0.44],  $P = 0.006$ ). Clustered domestic models also had significantly higher ratios of PCAs to nurses (91.91 [4.06] vs. 66.02 [10.73],  $P = 0.003$ ) and care staff training costs (\$1492 [258] vs \$989 [928],  $P < 0.001$ ). There was no significant difference in overall care staff wages by model of care (Table 2).

## 3.3 | Case conference teams by model of care

Between the models of care, there were no statistically significant differences in the proportion of residents who had a

**TABLE 1** Characteristics of participants by model of care

Characteristic	Clustered domestic (n = 120)	Standard (n = 421)	<i>P</i>
Age (years), % (n)			
<65	4 (5)	2 (9)	0.010
65-74	13 (16)	6 (27)	
75-84	31 (37)	26 (110)	
85-94	48 (57)	55 (230)	
95+	4 (5)	11 (45)	
Female, % (n)	75 (90)	74 (313)	0.88
Dementia, % (n)	98 (117)	55 (231)	<0.001
PAS-Cog score			<0.001
0-4 (no cognitive impairment), % (n)	2 (3)	21 (90)	
5-9 (mild cognitive impairment), % (n)	10 (12)	21 (88)	
10-15 (moderate cognitive impairment), % (n)	15 (18)	15 (64)	
16-21 (severe cognitive impairment), % (n)	72 (87)	42 (179)	
Co-morbidity index†, mean (SD)	3.2 (1.4)	3.8 (1.4)	<0.001

PAS-Cog=Psychogeriatric Assessment Scales-Cognitive Impairment Scale; SD=standard deviation.

†Cohen-Mansfield co-morbidity index score.

“head nurse” at their last case conference (23.5% in clustered domestic model vs 26.7% in standard model,  $P = 0.482$ ). Residents in the clustered domestic model were more likely to have members of the nursing team (97.5% vs 32.9%,  $P < 0.001$ ) and other care staff (31.9% vs 1.9%,  $P < 0.001$ ) present at their last case conference. The proportion of resident case conferences with a physician or therapist present was low in standard models (3.3% with a physician and 6.9% for therapeutic staff), and physicians and therapeutic staff were not present at any of the case conferences in the clustered domestic models. Residents were less likely to be present at the case conferences in the clustered domestic model

(2.5% compared to 24.3% in the standard model,  $P < 0.001$ ), but relatives or official legal guardians were more likely to be present (92.4% in the clustered domestic model vs 51.6% in the standard model,  $P < 0.001$ ).

## 4 | DISCUSSION

This study describes the staffing mix in residential aged care as operationalised in a clustered domestic model, compared to a standard Australian model. We have previously demonstrated within the same study that this clustered domestic

**TABLE 2** Staffing structures within a clustered domestic model of care and a standard Australian model of care

Staffing	All aged care homes (n = 541 residents, 17 homes)	Clustered model (n = 120 residents, 4 homes)	Standard model (n = 421 residents, 13 homes)	Difference	<i>p</i> -value <sup>†</sup>
Hours-per-resident-per day					
Nurse (registered or enrolled)	0.71 (0.30)	0.23 (0.10)	0.85 (0.17)	0.62	<0.001
Personal care attendants	1.89 (0.51)	2.43 (0.29)	1.74 (0.46)	0.69	<0.001
Allied health	0.12 (0.03)	0.02 (0.01)	0.15 (0.10)	0.13	0.042
Direct care <sup>‡</sup>	2.60 (0.43)	2.66 (0.35)	2.58 (0.44)	0.08	0.006
Other staffing variables					
Ratio of personal care attendants to care staff <sup>§</sup>	72.11 (14.75)	91.91 (4.06)	66.02 (10.73)	25.89	0.003
Care staff training costs, AU\$ per resident	1113 (844)	1492 (258)	989 (928)	503	<0.001
Care wages, AU\$ per resident	47005 (8470)	49231 (8627)	46370 (8326)	2861	0.198
Case conference attendances, n (%)					
Resident	105 (19.5)	3 (2.5)	102 (24.3)	99	<0.001
Relative or official legal guardian	326 (60.6)	110 (92.4)	216 (51.6)	106	<0.001
Head nurse	140 (26.0)	28 (23.5)	112 (26.7)	84	0.482
Members of nursing team	254 (47.2)	116 (97.5)	138 (32.9)	22	<0.001
Other care staff (eg social workers)	46 (8.6)	38 (31.9)	8 (1.9)	30	<0.001
Physician	14 (2.6)	0	14 (3.3)	14	0.043
Therapeutic staff	29 (5.4)	0	29 (6.9)	29	0.003
Other	26 (4.8)	5 (4.2)	21 (5.0)	16	0.716

Note: All data are mean (SD) unless stated otherwise.

The questionnaire included the following options for attendees of the case conference: resident, relative, official legal guardian, head nurse, members of nursing team, other care staff (eg social workers), physician, therapeutic staff, housekeepers, external moderator or other, with the option of selecting multiple responses. No questionnaires stated that any residents had housekeepers or external moderators attend their last case conference.

<sup>†</sup>Mann-Whitney *U* test for difference.

<sup>‡</sup>Direct care hours were determined from the direct care time provided by all care staff including registered nurses (RNs, degree-educated), enrolled nurses (ENs, certificate/diploma trained), personal care assistants (PCAs), allied health professionals or allied health assistants.

<sup>§</sup>Measured by dividing the number of full-time equivalents of PCAs by the total number of care staff (PCAs, RNs and ENs).

model of care was associated with better consumer-rated quality of care, quality of life, fewer hospitalisations and potentially inappropriate medications.<sup>12-14</sup> The clustered domestic model had more PCA hours-per-resident-per-day, higher levels of training for staff, slightly higher direct care hours-per-resident-per-day and fewer nurse hours-per-resident-per-day. The difference in direct care hours would equate to an additional 1.2 hours per 15 residents per day, an additional 8.4 hours per week for a 15-resident unit. We also found members of the nursing team were more likely to attend case conferences, indicating a high level of involvement of the team in the care planning of residents.

The specific needs of the residents are an important factor to consider in relation to the appropriate staffing structure for a residential aged care home. In this study, the clustered domestic model of care provided care specifically for people living with dementia. In addition, the residents in the INSPIRED study were not in immediate palliative care and had lived in the home for at least 12 months. This clustered model utilises an alternative staffing mix which included high levels of training for staff and was previously shown to be associated with a higher consumer-rated quality of care, as well as positive outcomes for residents. However, whether this finding is specific to providing care for people with dementia or this provider is unknown. Further longitudinal research is needed on the staffing mix and training used to provide care in different residential aged care settings and populations, measuring both consumer-rated quality of care and resident outcomes.

The staffing mix described within this clustered domestic model is similar to that reported in US Green House care homes which also provide a “home-like” model of care. It has been reported in a study of 14 Green House homes that there were more specially trained nursing assistants and more direct care time was delivered than in 13 traditional care homes.<sup>11</sup> A clinical support team is available to support the specially trained nursing assistants, known as “Shahbazim,” but the nursing assistants organise and lead care plans and are responsible for tasks such as checking vitals, as well as spending approximately one-third of their time on other tasks such as domestic activities.<sup>17</sup> Whilst we do not have direct data on how staff within the INSPIRED study allocated their time, a US study of 240 staff from 27 homes found that staff in the Green House homes reported care attendants spent more time in direct care activities, than in traditional homes, despite having expanded responsibilities including domestic duties.<sup>11</sup>

In Green House homes, supervision of clinical care remains the responsibility of the nurse, but they are not responsible for the non-clinical oversight of direct care staff. A supervisor is employed to oversee the non-clinical responsibilities of the direct care staff, but what constitutes clinical and non-clinical care may be interpreted differently across

homes. However, there have been differences reported across Green House homes in how nurses and direct care staff understood their roles including how much authority they had over the daily lives of the residents.<sup>17</sup>

Within aged care, multidisciplinary case conferences are used to ensure the needs of the resident are “met through a planned and coordinated approach.”<sup>18</sup> The higher involvement of members of the nursing team from the clustered domestic model in case conferencing in the INSPIRED study indicates that direct care staff are more involved in care planning in the Australian clustered domestic, dementia-specific model, but we do not have specific data on which members of the nursing team attended.

Reviews have indicated both that higher total staffing levels have been associated with improved quality of care<sup>19</sup> and that there is no clear relationship.<sup>20</sup> When describing quality care, the amount of time that care staff spend with residents is considered highly important by both residents and their family members.<sup>21</sup> High-quality care that optimises resident quality of life should be delivered with a person-centred care approach, which is usually described as a social or humanistic perspective for promoting well-being and optimal quality of life for residents.<sup>22</sup> However, aged care providers have reported insufficient staff time as a challenge to implementing person-centred care.<sup>23</sup> In the United States, it has been shown that various staff in residential aged care homes can be trained to assess the preferences of residents in relation to person-centred care and certified nursing assistants found it helpful to receive additional training which allowed them to get to know the preferences of residents.<sup>23</sup>

Given the high prevalence of dementia within residential aged care populations, dementia-specific training may be needed for optimal care in all aged care homes.<sup>24</sup>

Evidence has suggested positive associations between staff variables (including training, education, numbers and skills) and quality of care; yet, evidence is lacking in order to clearly determine a staffing mix that optimises quality of life for residents.<sup>20</sup> Studies do suggest however that where staff treat and interact empathically in their care there are better outcomes for residents including behaviour (positive affect) and less decline in functional status.<sup>20</sup>

There have been concerns expressed that RNs in Australian residential aged care settings are not working to their full scope of practice leading to suboptimal use of their professional skills.<sup>25</sup> “Skeleton staffing” in Australian aged care homes has been associated with increased frequency of missing unplanned care needs (such as answering call bells or toileting residents within 5 minutes of request).<sup>25</sup> The 2018 Aged Care Workforce Strategy Report in Australia reported that the specialised role of nurses in aged care needs to be recognised and nurses should work in close collaboration with PCAs to develop a care team. Thus, there has been an increase in the number of aged care settings moving to a

model of care which increases the capacity of PCAs through additional training to adequately carry out tasks and identify changes which require input from a nurse.<sup>26</sup> How RNs spend their time may vary depending on the home and by country. In a US study of a 174 bed aged care home, RNs spend 59% of their time on indirect care, with documentation comprising almost 50% of time,<sup>27</sup> whereas an Australian study reported that RNs in a 110 bed home spent 48% of their time on oral communication, 18% of their time on documentation and 18% on medication management.<sup>28</sup> A possible consequence of increased PCA hours and training could be that RNs could have more time to exercise their clinical expertise and leadership; however, this requires confirmation.

Staffing in residential aged care is traditionally based on the assumption that more staff with higher educational backgrounds will ensure better quality of care and quality of life for the residents, but there is currently a lack of consistent evidence to confirm or refute this.<sup>29</sup> Discussions about the importance of resident-to-staff ratios are topical in Australia as there are currently no nationally mandated ratios. Legislating staffing ratios is proposed as a potential approach to ensuring quality of care in Australian residential aged care settings. It has been suggested that a skills mix requirement of 50% nurses (30% RNs and 20% enrolled nurses) and 50% personal care assistants is the minimum requirement for safe residential aged care.<sup>2</sup> Yet, the INSPIRED study suggests that, within some models of care, providers may be able to deliver good quality care using an alternative staffing mix and higher levels of staff training. The findings of our study warrant further investigation in longitudinal studies examining the staffing mix from a range of providers and models of care and measuring resident-centred outcomes.

A limitation of this study is that it includes a limited number of facilities using the clustered domestic model. This study included 17 residential aged care homes from four states in Australia and case conference information for 541 residents, but only four homes offered a clustered, domestic model operated by a single provider.

We also do not have detailed observational data on the roles of the PCAs in the clustered domestic homes and data were not available on whether increased PCA hours was associated with increased engagement in meaningful activities such as meal preparation. We were able to examine members of the case conference team for the residents' last case conference using a previously established questionnaire<sup>15</sup>; however, lack of detail on which staff were considered "members of the nursing team" was a limitation. Understanding the staffing mix used in the clustered domestic model is important when considering how this model is operationalised by providers and our analysis shows the importance of undertaking further research into alternate staffing structures in residential aged care.

## 5 | CONCLUSIONS

Consideration of staff skills in terms of both formal qualifications and level of training is needed when considering appropriate staffing structures in residential aged care. Further longitudinal observational research should examine resident outcomes with different staffing mixes and alternative models of residential aged care. The current study indicates that good quality care for people living with dementia can be provided with a model of care that uses an alternative staffing mix and higher levels of staff training.

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## CONFLICT OF INTEREST

The authors declare no conflicts of interest.

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