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Feature Article

Caring for people with dementia in residential aged care: Successes with a composite person-centered care model featuring Montessori-based activities

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ABSTRACT

Person-centered models of dementia care commonly merge aspects of existing models with additional influences from published and unpublished evidence and existing government policy. This study reports on the development and evaluation of one such composite model of person-centered dementia care, the ABLE model. The model was based on building the capacity and ability of residents living with dementia, using environmental changes, staff education and organizational and community engagement. Montessori principles were also used. The evaluation of the model employed mixed methods. Significant behavior changes were evident among residents of the dementia care Unit after the model was introduced, as were reductions in anti-psychotic and sedative medication. Staff reported increased knowledge about meeting the needs of people with dementia, and experienced organizational culture change that supported the ABLE model of care. Families were very satisfied with the changes.

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Introduction

There is increasing interest in models of care for people with dementia. Current care challenges are universal and related to the complexity of needs of people with dementia, regardless of the context of the health system.^{1,2} Challenges include addressing behavioral and psychological symptoms of dementia, training residential care staff – many of whom have very basic or few qualifications in dementia care – and physical environments that are often not designed to support resident needs.^{3–10} Despite dementia being a terminal condition, the quality of life of people with dementia can be greatly enhanced through the care received. Up till now there has been no single model of care identified that can meet all the complex needs of people with dementia and their supporting families. However, many aged care models have increasingly embraced person-centered care as an underpinning principle.^{11–15} Presently, aged care services and dementia care models are commonly developed by merging aspects of existing

models of care, with emerging evidence from published and unpublished studies, and are influenced by government policy.

The purpose of this paper is to describe the development of a composite model of care and its impact on people with dementia. The model is based on person-centered principles,^{16,17} a social ecological model¹⁸ and the Montessori method.¹⁹ The paper reports on the evaluation and results of a pilot project exploring the new model's feasibility.

Method

Description of the intervention: development of the ABLE model

The model was developed by an Australian geriatric health service to improve the level of dementia care to its residents. The model is person-centered and incorporates Montessori principles and activities. These aspects were designed to build on the capacity and inherent abilities of residents through a number of system changes at an organizational level, in partnership with: family members, general practitioners (primary care physicians), a remote accessed consultant geriatrician, a physiotherapist, dietician,

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speech pathologist and graduate nurses. These changes included staff education, environmental changes and a new philosophy of care that identified, emphasized and built upon the current abilities of the residents. The aim was to help extend and retain those abilities, and to maximize residents' quality of life. The name of the dementia unit was also changed to the "Memory Support Unit (referred to as the 'Unit')", to better convey the care provided.

The ABLE model of care was first conceived as a quality improvement project in 2011. It was trialed in a 15 bed care unit for ambulant people with dementia, in a rural health service in Victoria, Australia. As described in Table 1, the model developed four core areas of focus: (A) Abilities and capabilities of the resident; (B) Background of the resident; (L) Leadership, cultural change and education; (E) Physical environment changes.

The rationale for development and implementation of the ABLE model was provided by feedback received from residents' family members about care provided in the Unit. The Board, Chief Executive Officer, other leaders, staff and residents' families, also recognized that many residents had unmet needs. These unmet needs were evidenced by pacing, wandering, physical and verbally aggressive behavior, the appearance of being 'sad and bored', and the high level of daytime sleeping observed among residents.

To better address resident and family needs, management changed the existing care model from the traditional 'biomedical' approach involving medication, to that with a 'person-centered care' focus, incorporating Montessori principles and activities.¹⁹ This decision was premised on the Montessori approach, which demonstrably engages people meaningfully in activities that could potentially improve their lives.^{11,20,21} The intervention was implemented with a part-time project manager who was an experienced aged care manager and registered nurse. A part-time dementia consultant, who was an experienced mental health nurse with expertise in applying Montessori principles to dementia care, was also employed. In addition a new full-time position, 'cognitive rehabilitation therapist (CRT)', was created, replacing the leisure and lifestyle staff role. The CRT was a Montessori 'champion' for Unit staff on a day-to-day basis, and also facilitated the transitioning of new residents and their families from pre-admission to admission. The CRT was an enrolled nurse, and was trained in Montessori principles for dementia care. To maintain continuity of care, existing interested health service staff, including registered nurses, enrolled nurses, personal care attendants and

environmental services staff were recruited for the project. Agency and casual staff were not employed on the Unit. The care model also included the development of a written protocol for admission and transition, to improve these processes for both residents and their families.

Stakeholder engagement

Pre-implementation and during planning, the project manager and dementia consultant met with local general practitioners (GPs), health service staff and residents' families to engage them in the project: a strategy which proved important for the sustainability of the ABLE model. Throughout the model development, consultation and communication occurred between staff, residents, residents' families and project leaders, including the nurse unit manager (NUM), CRT, dementia consultant and the project manager. The NUM also worked closely with the two local GPs to review residents' medications periodically.

Education and training

Education sessions were conducted by the dementia consultant for all eighteen staff working in the Unit, including nursing staff, care staff and environmental services staff. The education sessions, comprising two days of dementia care training and two days of Montessori activity training, were attended by all memory support Unit staff. There was also ongoing support during the 18 month period of study from the dementia consultant, including one day a month consultation and phone and email correspondence for the CRT. Support from the CRT and project manager was also provided to other staff.

Environmental changes

Photographs and video recordings of the Unit environment and surrounds were captured over an 18 month period, with the consent of staff and residents (or their substitute decision-maker). This provided a record of the stages of implementation over the pilot duration for all stakeholders. The internal environment was changed from a bland, hospital-style environment to a colorful, home-like space, designed to support the memory of the residents and to aid in enhancing their abilities. Signage^{9,10} designed in black and yellow was installed to provide memory prompts, and staff started to wear large print, clearly visible name badges. Some 'interactive' wall space was introduced to provide interesting tactile

Table 1
Summary of ABLE model core components.

Component	Description
A Abilities and capabilities of the resident	Capabilities assessed included both cognitive and physical capabilities, evaluated using standard clinical assessment processes. The approach was designed to enable residents to be as independent as possible and to contribute to and have a meaningful place in their small residential community. The care team focused on the individual rather than their dementia diagnosis, and especially residents' capabilities and abilities, rather than their perceived deficiencies and losses.
B Background of the resident	In this core area, staff collected background information about residents, including their life stories and interests, their likes, dislikes, skills and dreams – a critical aspect of ABLE. It facilitated a person-centered approach to care by enabling staff to support residents to undertake roles and activities that were appropriate and meaningful to them. Resident's stories were collected to promote interest and capabilities-based activities for each resident. Stories were collected via discussion with residents and their family members over several sittings, and were documented in a range of ways including written descriptions and visual displays of meaningful and personal items.
L Leadership, education training and organizational culture change	In this core area, strong, supportive leadership from the Board and Chief Executive Officer to managers and team leaders was crucial for the process of change. Organizational cultural change was facilitated by education and ongoing support and training for staff.
E Physical environment	The ABLE model facilitated a change to both the external and internal environment, and supported person-centered, ability- and capability-focused care to the residents. The changes created different spaces within the Unit to cater for the varying needs and interests of residents, and included additional signage and other memory aids. Prior to the development of the ABLE model the physical environment of the Unit was described by some staff and family members as 'clinical' and 'soul-less'.

and visual contrasts with other surfaces in the Unit. Other internal changes were made to support a range of activities, by reclaiming some spaces. For example, a large cupboard became a small shop and the nurses' station became a relaxation room for residents. A large television was removed from the common area and specific areas within the Unit itself were dedicated to music, hobbies, quiet reflection and reading, physical activity, games, story-telling, quiet social interaction, as well as domestic activities such as ironing. A bain-marie was introduced into the dining area, where residents began to be encouraged to choose their own meals.

The external environment was transformed from what staff described as "barren and uninviting", to an extended living space. This contained a pergola for sun protection, an old car, a chicken coop with chickens, a mural wall, a garden with raised garden beds for gardening, various private seating areas and a barbeque: many common features of a rural home environment.

Design: evaluation of the model

A mixed methods evaluation design was used to describe the effect of implementing the model on the environment, residents, their families and residential care staff. The evaluation examined whether the changes introduced with the model were associated with any changes in 1) resident behavioral and psychological symptoms of dementia, 2) the level of anti-psychotic or sedative medications prescribed for residents, 3) family satisfaction and 4) staff attitudes, knowledge, and perceptions of the care environment. Ethics approval (LNR/13/BHSSJOG/54) was obtained from Ballarat Health Services and St. John of God Hospital Ballarat Human Research Ethics Committee.

As this was a working Unit without dedicated research or evaluation staff, there were pragmatic limitations to the design and implementation of the evaluation. Evaluation data were collected by senior staff of the Unit (WW) and analyzed by independent researchers (GR, CD, SM). It was not possible to study a control group to compare changes in residents in other Units. Measures were taken at two time points during an 18 month period, once at baseline or admission to the unit, and again at follow-up (see Table 2).

Sample

Residents, family and care staff were recruited to be involved in the evaluation. All residents, all care staff and all family members who were regular visitors to the Unit were eligible to participate. There were 15 beds on the Unit and data was collected on all residents who lived there during the evaluation time period ($n = 16$).

Table 2

Design details showing measures used in the evaluation and time periods for data collection.

Measure (target)	Baseline	Follow-up
(Environment) – Photographic images and video	May–Jun 2011	Dec 2012
Medication record	Jun 2011–Sep 2012	Dec 2012
Cohen-Mansfield Agitation Inventory (CMAI) ²²	Aug 2011–Oct 2012	Feb 2012–Jan 2013
Dementia Care Mapping (DCM) ²³	–	July–August 2013
Psychogeriatric Assessment Scales (PAS) Cognitive Impairment Scale ²⁴	Aug 2011–Oct 2012	–
Resident/Relative Audit Tool Survey (unpub)	–	Feb 2013
Staff Survey – Five dimension Tool for Understanding Residents Needs as Individual Persons' (TURNIP) ²⁵	May–Jun 2011	Dec 2012

All care staff ($n = 18$) were invited to participate in the evaluation. All 15 visiting families were invited to participate in the Residential Aged Care (RESI) Resident/Relative Audit survey and seven responded ($n = 7$). During the study period, the average age of residents was approximately 85 years ($SD = 4.1$, range = 77–92, $n = 12$; age not available for four residents), and 12 were females and four males. All residents were involved in the changes to facilitate person-centered care. Eleven of the residents had been living in the Unit prior to the commencement of the project, and remained there for the duration of the project. The remaining residents were admitted to the Unit during the project and lived there for between 3 and 17 months (3, 8, 11, 16 and 17 months). All participating residents on the Unit had a diagnosis of moderate to severe dementia, as determined by Psychogeriatric Assessment Scales (PAS) scores (mean = 15.8, $SD = 4.6$, range = 8–21) conducted on admission.²⁴ Family members were included in ongoing communication about the intervention activities. During their visits they participated in some intervention activities with their relative living in the Unit. Families were also invited to be interviewed about their perceptions of the changes. All 18 staff working on the Unit during the implementation period participated in the evaluation.

Measures

Residents' use of antipsychotics (Risperidone and Quetiapine) or sedatives (Temazepam, Oxazepam or Diazepam) was collected through a retrospective audit of medication charts. Residents' frequency of behavioral and psychological symptoms of dementia was measured by the 29 Cohen Mansfield Agitation Inventory (CMAI) score.²² The 29 CMAI is a valid and reliable tool for use in nursing homes.²² In addition a specialist consultant (the 'Mapper') trained in Dementia Care Mapping (DCM)²³ performed DCM on five long-term residents 12–14 months after the intervention commenced. This was done as an assessment of the quality of care and quality of life of the residents after the intervention had been embedded into the Unit. Data were collected at baseline in May–June 2011 as part of the quality improvement project, and collected again in December 2012–February 2013.

Qualitative interviews were conducted with family carer relatives by a staff member (WW) to elicit their responses to the changes throughout the implementation period. Interviews were not transcribed but detailed notes were taken by the interviewer. In addition, written qualitative comments from family members were collected on the RESI Resident/Relative Audit tools to capture their views about the Unit and the impact of the person-centered intervention. Staff data was collected using the 'Tool for Understanding Residents' Needs as Individual Persons' (TURNIP) survey at baseline (June 2011) and follow-up (December 2012). The TURNIP is a reliable and valid tool that assessed five dimensions: the care environment, staff member attitudes toward dementia, staff member knowledge about dementia, the care organization and the content of care provided.²⁵

Data analysis

Photographic images of the internal and external environment were used to compose descriptions of environmental changes before and after implementation of the model. Quantitative measures of CMAI (resident behavioral and psychological symptoms) and TURNIP scales (staff perceptions) were analyzed using PASW 18.0 to analyze changes in scores between baseline and follow-up.²⁶ Medication lists (analysis of anti-psychotic and sedative prescriptions) were audited by hand for individual residents and totals reported as a percentage of the total sample. Dementia Care Mapping results are reported as qualitative summaries of observations. Family interviews were summarized

without thematic analysis due to the small number of interviews collected.

Results

Analysis of anti-psychotic and sedative medication showed that there were substantial reductions in medication prescription. Four of the 16 residents (25%) living in the Unit during the baseline period had no anti-psychotic or sedative medication prescribed during the project. However, 12 of the 16 residents (75%) included in the pilot had regular anti-psychotic, or regular or prn sedative medication prescribed at baseline. Of these 12 residents, 5 (31.3%) had a combination of both medications prescribed. At follow-up six months later, 7 of 12 residents (58%) were no longer prescribed the anti-psychotic or sedative medication (four of these residents had anti-psychotic medication ceased). Nine months after baseline, an additional 2 residents had ceased anti-psychotic medications. At subsequent follow-up 18 months after commencement, no resident was prescribed anti-psychotic medication and only two of the 12 residents were still prescribed sedatives: one, for nocte prn use (which had never been dispensed, as it was not required) and the other, for continuity of long-term symptom management.

The CMAI total scores also reduced from baseline (mean = 80.1, SD = 14.3) to follow-up (mean = 44.87, SD = 13.64, paired samples *t*-test, $n = 15$, $t = 9.41$, $df = 14$, $p < 0.0001$); see Table 3. Using subscale scores, there was a significant overall difference between baseline and follow-up scores for aggressive behavior (paired samples *t*-test, $n = 15$, $t = 2.99$, $df = 14$, $p = 0.01$). For physically non-aggressive behavior and verbally-agitated behavior there were also significant reductions in subscale scores after implementation of the program (physically non-aggressive behavior: $t = 6.873$, $df = 14$, $p < 0.001$; verbally-agitated behavior, $t = 6.632$, $df = 14$, $p < 0.001$).

The DCM process provided information about quality of care and quality of life of the residents, as witnessed through a range of activities being conducted in the Unit. The Mapper found that residents were engaged in meaningful activities that they seemed to enjoy, including 'household' activities such as feeding chickens, ironing, setting the table, sweeping the floor and folding clothing, plus leisure activities such as reading the newspaper and playing cards. The Mapper observed that daytime sleeping occurred relatively infrequently among most residents in the Unit, except for a brief 'nap' by some residents after a period of 'working' or other activity, or due to ill health. The Mapper also noted that the majority of Unit staff demonstrated 'quality (person-centered) dementia care practices'.

Qualitative responses to the RESI Resident/Relative Audit conducted 20 months after implementation, showed that carer relatives ($n = 7$) of the residents in the Unit were overwhelmingly positive about the changes made and the effect seen in the residents. A resident's spouse commented that:

"the sense of homeliness and trust that exists in (the Unit) surely marks leaders and staff as outstanding in their duties. Without doubt, the most innovative dementia Unit in the state."

Table 3
Cohen-Mansfield Agitation Inventory scores ($n = 15$).

CMAI	Baseline Mean (SD)	Follow-up Mean (SD)	<i>t</i> -Test ($df = 14$) significance
Total CMAI score	80.0 (14.3)	44.87 (13.64)	9.41, $p < 0.001$
Physical/verbal aggression	25.67 (12.88)	16.00 (5.74)	2.99, $p < 0.01$
Physical non-aggression	30.60 (8.24)	16.33 (5.45)	6.87, $p < 0.001$
Verbally agitated	23.87 (9.35)	12.53 (5.07)	6.63, $p < 0.001$

One relative commented that the best thing about the changes in the Unit was "making patients (sic) feel wanted, also when you visit, it feels like home", and another commented that it was, "the involvement of clients in their own space and lifestyle".

The impact of the model changes on staff showed that they were overwhelmingly positive about the change. Thirteen (72%) of the staff members completed the TURNIP baseline questionnaire and 15 staff members (83.3%) completed the TURNIP follow-up questionnaire. Overall there were significant changes in perceptions of the care environment, knowledge of dementia, the care organization, and the content of care, while individual attitudes remained positive before and after the project (see Table 4).

In the 'care environment' responses, staff indicated a significant shift toward better supporting residents to express their identity. There was unanimous agreement that the Unit was now both 'homely' and 'pleasant'. There was also recognition that, since the intervention, it better supported personal choice, and better facilitated movement around the Unit, including the external space. In the 'individual attitudes' dimension responses, there was no significant change from a previously high level, but there was some strengthening of staff perception that personhood remains in dementia, and that a focus on quality interaction with residents surpasses the importance of completing tasks. Staff responses to the 'care organization' dimension indicated that the organization was aware of the importance of a person-centered approach, both prior to and following the pilot. Importantly, there was an increase in the number of staff who felt they had more time to be person-centered in their care post intervention. The 'content of care' section of the TURNIP survey demonstrated the most dramatic shift in staff perceptions was about changes to their dementia care.

Discussion

This small pilot study showed that the impact of the new care model on residents' daily life was substantial, in particular, changes in medication use and frequency of behavioral and psychological symptoms of dementia. Results from the mixed methods evaluation indicated that overall the ABLE model was associated with changing resident behavioral and psychological symptoms of dementia, improving staff confidence and awareness of person-centered care and improving family satisfaction with the care of their relatives. We could not attribute causality to the changes associated with the implementation of the model because we did not have a control group or the ability to randomly allocate interventions, but the changes in outcomes associated with the interventions applied merit further investigation in a controlled study. Family members provided feedback to management and staff that the ABLE model significantly improved many aspects of the care of their relative living with dementia in the Unit. This was credited by staff and family members, at least to some degree, to the increased individualization of care to the needs of each resident. Similar positive findings are recorded in other Australian and international studies

Table 4
Results of staff perceptions ($n = 13$ baseline, $n = 15$ follow-up) from 'Tool for Understanding Residents' Needs as Individual Persons' (TURNIP).

TURNIP subscale	Baseline Mean (SD)	Follow-up Mean (SD)	<i>t</i> -Test ($df = 26$), significance
Care environment	1.23 (3.17)	7.73 (2.05)	-6.54, $p < 0.001$
Individual attitudes	6.77 (2.28)	7.40 (2.23)	-0.74, ns
Knowledge of dementia	-0.62 (2.10)	-2.93 (1.98)	3.00, $p < 0.01$
Care organization	-1.15 (3.91)	-3.67 (2.44)	2.07, $p < 0.05$
Content of care	2.00 (5.83)	11.47 (3.77)	-5.16, $p < 0.001$

where person-centered and Montessori-influenced changes to dementia care have been implemented for people with dementia.^{27–31}

The present study is unusual in the dramatic improvement found in residents.³² Through working with primary care physicians, staff were able to effect decreases in anti-psychotic and sedative prescription rates without deleterious effect. Behavioral and psychological symptoms of dementia improved at the same time.

The development of this model of care has highlighted the challenges in developing and delivering a care model that is flexible to the needs of people with dementia, including their families. It also highlights some of the challenges in conducting research with people with dementia and their families, when attempting to capture subtle as well as overt aspects of care design, care delivery and care experience. The lack of direct residents' voices in the evaluation and relatively few family members' voices were limitations of the study, as was the absence of pure pre-implementation data and a control group. Qualitative interviews were conducted by a staff member, so could be biased against admitting negative views of the new model, but there was no evidence that family carers were unwilling to complain to staff if they considered care unsatisfactory. In addition, CMAI results were recorded by staff members who were not blind to the changes being implemented. There was no treatment fidelity analysis undertaken as part of the study, which was a pragmatic trial in a working Unit. Nevertheless, the intervention applied was monitored by an experienced dementia consultant from Alzheimer's Australia, with formal qualifications in dementia care. Finally, the exact date for baseline and follow-up resident measures was not available in some cases.

Maintaining relative continuity of staff and residents participating in research, where turnover of both residents and staff is a stark reality, is difficult and can affect methodological rigor. Nevertheless, research in this area is important to conduct. Opportunities to share information about evolving care models for people with dementia and their families help to build a picture of what is possible, and what is important to people with dementia. A continuing challenge is to determine how studies of models of care delivered to relatively small cohorts of people with dementia, such as that described in this paper, might somehow contribute to a 'meta-analysis' of different dementia care models, and foster the sharing of similarly small but illuminating interventions. The interventions described here were based on other models and so feasibly could be applied in other settings. The main challenges in their application were more related to conducting an evaluation in a working Unit with limited research support and resources.

Further research

Research into the design and implementation of person-centered dementia care models from the perspective of people with dementia in residential care would be particularly interesting. It would also be helpful to study the longer term impact of support and ongoing education about dementia care for staff and attending health professionals. This would allow identification of the type of ongoing support and follow-up education required to maintain person-centered practice, such as the ABLE model, for people with dementia. Further research could also investigate the number of activities engaged in by residents as the volume or intensity of activities may influence the strength of outcomes achieved.

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