Knowledge Translation in Environmental Design of Residential Aged Care Facilities for People with Dementia

Dementia Collaborative Research Centre
Assessment and Better Care

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Translating dementia research into practice
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Background

The gap that exists between existing research based knowledge and its translation into practice to improve support and care for people with dementia and their family caregivers has been widely acknowledged (Kümpers, Mur et al. 2006; Doyle 2009). This gap is in part due to a paucity of information regarding effective knowledge translation strategies, as well as the need for practitioners to be provided with practical frameworks and ‘know-how’ to assist them in the translation process (Draper, Vickland et al. 2009). It is essential that researchers respond not only to the challenge of disseminating research findings (Draper, Vickland et al. 2009) but also to identifying evidence-based frameworks that may support the application of research by practitioners and policymakers. In the dementia field, one area requiring improved practice is the translation of knowledge about ‘good environmental design’ for people with dementia into both existing residential care environments (refurbishments) and in the planning of new residential environments.

The Project

This project aimed to assess the capacity of three Environmental Design interventions to translate evidence based knowledge about the aspects of the built environment that are helpful to people with dementia (Fleming and Purandore, 2010) into the practices of those involved in refurbishing or building residential care facilities for people with dementia.

An adapted version of the ‘Awareness to Adherence’ model (Pathman, Konrad et al. 1996) was utilised to assist in conceptualising the domains in which these interventions were effective in supporting the ‘translation of knowledge’. In general, the Pathman model describes knowledge translation as occurring in four stages:

- the raising of Awareness of new knowledge, followed by;
- gaining Agreement that the new knowledge demands a change in practice and agreement to participate in that change; then
- the Adoption of the new knowledge into practice and, finally
- Adherence when the new knowledge and associated practice(s) have been realised and become part of business as usual.

These concepts were adapted specifically within the project to assess:

- the ‘awareness’ or knowledge of participants regarding the principles of ED for people living with dementia;
- the ‘agreement’ of participants that the ED principles were important;
- the adoption of an idea or practice by participants – specifically the use of the Environmental Audit Tool [EAT] (Fleming, 2011 #589) and any actions taken to modify the environment of the RACF within which they worked; and
- indicators of adherence to the ED evidence and associated practice(s) beyond the initial actions – indicated by further plans for modifications or plans for actions in other facilities, change of policies etc.
Environmental Design Interventions

The three interventions were:

1. **Workshops** - The provision of one day workshops involving a detailed presentation and discussion of the evidence base, followed by an introduction to the systematic evaluation of built environments for people with dementia utilising the EAT (Fleming, 2011 #589). Workshops concluded with a discussion of the plans of refurbishments/new facilities brought by the participants. Participants took home a handbook containing a review of the literature, the EAT and instructions for its use. Participants had the option of submitting the results from environmental audits undertaken using the EAT for analysis and recommendations.

2. **On-site Consultancy** – The provision of a one-day, on-site visit to an organisation about to undertake refurbishment of a facility to be used for people with dementia. The consultation began with the same detailed presentation of the evidence base as used in the workshops. This was followed by an audit of the facility by the consultant and selected members of the facility team using the EAT. The consultation concluded with a discussion of the audit results leading to the beginning of the development of a plan for changes in the environment to be made in the short, medium and long term. A report based on the results of the audit with the EAT, highlighting areas for improvement, was made available.

3. **iPhone Plus** – This service is built around the development and promotion of an iPhone app (called Built Environment Assessment Tool-Dementia [BEAT-D]) that utilises the EAT to guide the user through an assessment of their facility. Once the user has registered and downloaded the app and literature review, they can use it to conduct an audit. Data from the audit is then uploaded, analysed and a report highlighting the areas for improvement is sent to the user. Finally, an invitation to take part in a two hour teleconference with an environmental design expert was offered to all recipients who have uploaded their data and received a report.

The aim of each of these interventions was to increase the adoption of the principles of environmental design that promote quality of life and reduce symptoms commonly associated with dementia, such as confusion, agitation and apathy (Fleming, 2010 #645). In their implementation, the three interventions vary in regards to their intensity, cost, support from an expert consultant (Fleming) and their use of technology (iPhone vs. workbook) to support learning and adoption.

The interventions also vary in the extent to which they focus on the four stages of knowledge translation – awareness, agreement, adoption and adherence. That is, the workshops and consultancy both included a substantial amount of time and effort aimed at ensuring the participants were aware of and agreed with the principles of design. This took the form of a systematic description of the application of the principles in practice and the evidence for them. Each principle was
described and discussed in turn and the discussion typically lasted 2.5 hours. The iPhone Plus did not include this. That is, gaining the awareness of, and agreement to, the principles was left to the participants’ willingness and ability to read and engage with the 28 page review of the literature provided to them when they signed up for the iPhone version of the Environmental Audit Tool. The fact that the participants using the iPhone Plus were able to utilise the EAT and felt that the process was sufficiently likely to be useful to them to warrant the investment in a two hour teleconference, was taken as an indication that they were aware of and agreed to the principles of design.

The workshops were intended to prepare the participants for the Adoption stage by introducing the EAT to the participants and encouraging them to test its relevance to them by completing it on the basis of their memory of their facility. They were then invited to discuss the strengths and weaknesses of a facility, utilising plans/photographs of their own facility or those provided in the workshop. While this activity may have encouraged the adoption of the principles, it is clearly not as likely to have brought this about as the detailed discussions of their own facility that was available to iPhone Plus participants and the consultancy service. Both of these interventions allowed for discussions of the participants facility that lasted up to two hours.

None of the interventions were specifically targeted at adherence. The assumption was that should the participants find the interventions useful they would continue to utilise the knowledge gained through them.

**Methods**

This was a naturalistic study in which participants self-selected to participate in one of the three interventions and were invited to participate in the evaluation 6-12 months after engagement in the intervention. A mixed methods design was utilised to conduct the post intervention evaluation. It involved an online survey and telephone interviews. All participants who took part in a workshop or consultancy service or who had downloaded the BEAT-D iPhone app between February 2012 and August 2013 were invited by email to take part in the evaluation.

The survey: Survey items were developed to collect demographic information including: gender (M/F); age (in years); role at work; highest level of education; and number of years working in aged care sector. Participants were also asked to identify which of the interventions they had participated in: a DTSC workshop on ED (Y/N); access to the DTSC EAT iPhone app (Y/N); or receipt of a DTSC ED consultancy service (Y/N). The capacity of the interventions to translate knowledge of ED principles into the modification of the participants environment was assessed against the Pathman et al (1996) Knowledge Translation domains (awareness, agreement and adoption). The domains are presented in Table 2.

Table 1. Knowledge Translation Continuum and Survey Tool items
<table>
<thead>
<tr>
<th>Pathman domain</th>
<th>Items</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Awareness</td>
<td>Can you name any ED principles* for residential facilities which promote QOL of people with dementia</td>
<td>(Open response)</td>
</tr>
<tr>
<td></td>
<td>‘The intervention increased my awareness of the use of ED to improve quality of life for residents with dementia in aged care facilities’</td>
<td>Level of agreement, 5 point Likert scale from ‘Strongly Disagree’ to ‘Strongly Agree’</td>
</tr>
<tr>
<td></td>
<td>‘The workshop increased my awareness of the EAT to assess the environment of residential aged care facilities’</td>
<td>Level of agreement, 5 point Likert scale from ‘Strongly Disagree’ to ‘Strongly Agree’</td>
</tr>
<tr>
<td></td>
<td>Rate importance of 12 ED principles:</td>
<td>5 point Likert scale from ‘Very important’ to ‘Not Important’</td>
</tr>
<tr>
<td></td>
<td>‘On the basis of my attendance at the workshop I have more positive attitudes towards the use of environmental design to improve the quality of life for residents with dementia in aged care facilities’</td>
<td>Level of agreement, 5 point Likert scale from ‘Strongly Disagree’ to ‘Strongly Agree’</td>
</tr>
<tr>
<td></td>
<td>‘Do you intend to conduct an assessment of your workplace using the EAT?’ [for those who hadn’t yet used the EAT]</td>
<td>Y/N</td>
</tr>
<tr>
<td>Agreement</td>
<td>On the basis of my attendance at the workshop I feel my capacity to address this issue in my workplace was enhanced</td>
<td>Level of agreement, 5 point Likert scale from ‘Strongly Disagree’ to ‘Strongly Agree’</td>
</tr>
<tr>
<td></td>
<td>‘Have you conducted an environmental assessment of your workplace using the EAT?’</td>
<td>Y/N</td>
</tr>
<tr>
<td></td>
<td>Have you made any environmental modifications at your workplace since participating in the Dementia Training and Study Centre program?</td>
<td>Y/N</td>
</tr>
<tr>
<td></td>
<td>If yes, what changes were made</td>
<td>Open response</td>
</tr>
<tr>
<td></td>
<td>If no, do you intend to make environmental modifications to your workplace in the near future?</td>
<td>Yes/unsure/No</td>
</tr>
<tr>
<td></td>
<td>If yes, what changes were made</td>
<td>Open response</td>
</tr>
</tbody>
</table>

ED: Environmental design; EAT: Environmental Assessment Tool; RACF: residential aged care facilities
* ED principles = ED principles for residential facilities which improve QOL for people with dementia

Participants were also surveyed to establish their perceptions of barriers across the KT continuum (see Table 2).

Table 2. Barriers to Knowledge Translation.

<table>
<thead>
<tr>
<th>Pathman domain</th>
<th>Context within study</th>
<th>Items</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adoption</td>
<td>Barriers to use of the EAT</td>
<td>For those who answered ‘no’ to use of EAT and 'no' to intention to use EAT</td>
<td>Select all that apply: ‘I don’t have the skills’; ‘I don’t have the confidence’; ‘I don’t think the EAT will provide useful information’; ‘I don’t have the authority in my workplace’; ‘I don’t feel I will be able to act on the information the EAT will provide me with’; ‘I intend to audit the environment with another tool’</td>
</tr>
<tr>
<td>Adoption Adherence</td>
<td>Barriers to making ED modifications in the RACF</td>
<td>‘Can you please indicate why you are not intending to do ED modifications in the RACF’</td>
<td>Click any that apply: ‘I don’t have the ability to use the EAT feedback to modify the environment of my workplace’; ‘I don’t feel modifying the environment will achieve anything useful for dementia residents’; ‘I don’t have the authority to modify the environment of my workplace’; ‘I don’t have the money to modify the environment of my workplace’; ‘Other’ (Specify)</td>
</tr>
</tbody>
</table>

ED: Environmental design; EAT: Environmental Assessment Tool; RACF: residential aged care facilities

All data were collected anonymously online using SurveyMonkey. Data were exported into a spreadsheet and descriptive analysis was performed using SPSS 19 Statistical Software.
Telephone interviews

Qualitative telephone interviews were undertaken with a sample of 30 participants (10 participants from each intervention). Potential participants for the telephone interviews were selected at random from survey respondents who indicated a willingness to complete a telephone interview. All interviews were audio-recorded and transcribed verbatim for analysis. Thematic analysis was undertaken using Dedoose Qualitative Software. Coding occurred against a pre-determined set of codes (the Pathman stages of KT - awareness, agreement, adoption, adherence) and to identify both enablers and barriers to KT within each of these domains. See Appendix 2 for Interview Guide.

Results

Participation and Reach of the Three ED Interventions

In regards to the reach of each of the interventions, the BEAT-D was downloaded by 226 potential iPhone Plus participants of whom 16 went on to upload data and receive a report, the workshops were attended by 165 people and the consultancy service was accessed by 64 individuals.

Figures 1, 2 and 3 depict the numbers of participants who initially enrolled in each of the interventions, and the final number of respondents who completed post-intervention surveys.
Figure 1. Consultancy Service Participants and Survey Respondents.

Invited to complete Post-Intervention Survey
n = 64

Respondents
n = 54

No Response
n = 10

Consent YES
n = 52

Consent NO
n = 2

Completed Surveys
n = 40

Incomplete Surveys
n = 8
DROP OUT

Repeated Surveys
n = 4
DROP OUT

Figure 2. Workshop Participants and Survey Respondents.

Invited to complete Post-Intervention Survey
n = 165

Respondents
n = 45

No Response
n = 120

Consent YES
n = 43

Consent NO
n = 2

Completed Surveys
n = 38

Incomplete Surveys
n = 5
As depicted in Figure 3, a total of 226 participants registered and downloaded the iPhone app. A total of 9 participants completed the post-intervention survey.

Of the 9 participants who completed a survey:

- 3/9 had downloaded the BEAT-D app but did not upload audit data to receive a recommendations report
- 4/9 had taken part in the full consultancy – including downloading the app, uploaded data & receiving a report and responded to the invitation to participate in an iPhone Plus teleconference.
- 2/9 reported utilising the BEAT-D App to undertake an audit of the environment in the survey. It is unclear from their survey responses whether they participated in a teleconference with the consultant.

**Survey Participant Demographics**

Table 3 presents the demographics of the participants who completed the post-intervention survey. Consultancy participants were more likely to be male (12/40 [30%] vs 6/38 [16%] {workshops} vs 1/9 [11%] {iPhone Plus}) and in management roles (28/40 [70%] vs 13/38 [34%] vs 3/9 [33%]). More than 83% (73/87) of all participants...
across the three intervention groups had worked in the dementia sector for more than 5 years.

Table 3. Post-intervention survey participant demographics

<table>
<thead>
<tr>
<th></th>
<th>iPhone Plus BEAT – D APP (3)</th>
<th>Workshop n = 38/165</th>
<th>Consultancy n = 40 /64</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>F = 89%; M = 11%</td>
<td>F = 84%; M = 16%</td>
<td>F = 70%; M = 30%</td>
</tr>
<tr>
<td>Age</td>
<td>Mean: 42 yrs</td>
<td>Mean: 51 yrs</td>
<td>Mean: 51 yrs</td>
</tr>
<tr>
<td></td>
<td>SD: 7.4 yrs</td>
<td>SD: 11.8 yrs</td>
<td>SD: 9.8 yrs</td>
</tr>
<tr>
<td>Role at work</td>
<td>Management: 33%</td>
<td>Management: 34%</td>
<td>Management: 70%</td>
</tr>
<tr>
<td></td>
<td>Clinical: 22%</td>
<td>Clinical: 34%</td>
<td>Clinical: 10%</td>
</tr>
<tr>
<td></td>
<td>Education/Researcher: 11%</td>
<td>Education/Researcher: 5%</td>
<td>Education/Researcher: 8%</td>
</tr>
<tr>
<td></td>
<td>Policy Development: 0%</td>
<td>Policy Development: 3%</td>
<td>Policy Development: 3%</td>
</tr>
<tr>
<td></td>
<td>Other: 33%</td>
<td>Other: 24%</td>
<td>Other: 10%</td>
</tr>
<tr>
<td>Highest level of education</td>
<td>Postgrad: 44%</td>
<td>Postgrad: 21%</td>
<td>Postgrad Degree: 40%</td>
</tr>
<tr>
<td></td>
<td>Graduate Degree: 22%</td>
<td>Graduate Degree: 40%</td>
<td>Graduate Degree: 25%</td>
</tr>
<tr>
<td></td>
<td>Other: 33%</td>
<td>Grad Cert: 11%</td>
<td>Grad Cert: 20%</td>
</tr>
<tr>
<td></td>
<td>TAFE / Tech: 18%</td>
<td>High School: 23%</td>
<td>TAFE / Tech: 10%</td>
</tr>
<tr>
<td></td>
<td>Other: 8%</td>
<td>Other: 8%</td>
<td>Other: 5%</td>
</tr>
<tr>
<td>Years Spent in dementia sector</td>
<td>0-4 yrs: 34%</td>
<td>0-4 yrs: 21%</td>
<td>0-4 yrs: 10%</td>
</tr>
<tr>
<td></td>
<td>5-9 yrs: 33%</td>
<td>5-9 yrs: 24%</td>
<td>5-9 yrs: 15%</td>
</tr>
<tr>
<td></td>
<td>10-14 yrs: 11%</td>
<td>10-14 yrs: 13%</td>
<td>10-14 yrs: 25%</td>
</tr>
<tr>
<td></td>
<td>Over 15 yrs: 22%</td>
<td>Over 15 yrs: 42%</td>
<td>Over 15 yrs: 50%</td>
</tr>
</tbody>
</table>

Indicators of KT Impact

In regards to the impact of the interventions across the Knowledge Translation continuum from Awareness to Agreement, to Adoption and Adherence (Pathman et al., 1996), the following impacts and outcomes were observed:

**Awareness of ED Principles and assessment tools for people with dementia**

Table 4 presents the responses to questions which assessed the efficacy of the interventions regarding increasing participants ‘Awareness’ of ED principles for people with dementia.
Table 4: Awareness of ED principles for Dementia

<table>
<thead>
<tr>
<th>Questions</th>
<th>IPhone Plus</th>
<th>Workshop</th>
<th>Consultancy</th>
</tr>
</thead>
<tbody>
<tr>
<td>‘The … increased my awareness of the use of environmental design to improve quality of life for residents with dementia in aged care facilities’</td>
<td>78% (7/9) ‘Agree’ or ‘Strongly Agree’</td>
<td>87% (33/38) ‘Agree’ or ‘Strongly Agree’</td>
<td>85% (34/40) ‘Agree’ or ‘Strongly Agree’</td>
</tr>
<tr>
<td>‘The workshop increased my awareness of the EAT to assess the environment of RACF’</td>
<td>78% (7/9) ‘Agree’ or ‘Strongly Agree’</td>
<td>92% (35/38) ‘Agree’ or ‘Strongly Agree’</td>
<td>83% (33/40) ‘Agree’ or ‘Strongly Agree’</td>
</tr>
</tbody>
</table>

Agreement with the ED Principles

Table 5 presents the levels of agreement with the ED principles. Overall there was high agreement with the level of importance of all the ED principles.

Table 5: Agreement with ED Principles ranked from highest to lowest

<table>
<thead>
<tr>
<th>Principles</th>
<th>iPhone</th>
<th>Workshop</th>
<th>Consultancy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Be simple and have good visual access</td>
<td>100% (9/9) ‘Very or Extremely Important’</td>
<td>92% (35/38) ‘Very or Extremely Important’</td>
<td>100% (40/40) ‘Very or Extremely Important’</td>
</tr>
<tr>
<td>Be safe and secure</td>
<td>100% (9/9)</td>
<td>95% (36/38)</td>
<td>95% (38/40)</td>
</tr>
<tr>
<td>Provide for planned wandering</td>
<td>100% (9/9)</td>
<td>95% (36/38)</td>
<td>93% (37/40)</td>
</tr>
<tr>
<td>Be familiar</td>
<td>100% (9/9)</td>
<td>92% (35/38)</td>
<td>93% (37/40)</td>
</tr>
<tr>
<td>Reduce unwanted stimulation</td>
<td>89% (8/9)</td>
<td>92% (35/38)</td>
<td>95% (38/40)</td>
</tr>
<tr>
<td>Highlight important stimuli</td>
<td>100% (9/9)</td>
<td>82% (31/38)</td>
<td>88% (35/40)</td>
</tr>
<tr>
<td>Provide opportunities for privacy and community</td>
<td>100% (9/9)</td>
<td>84% (32/38)</td>
<td>83% (33/40)</td>
</tr>
<tr>
<td>Provide links to the community</td>
<td>89% (8/9)</td>
<td>79% (30/38)</td>
<td>68% (27/40)</td>
</tr>
<tr>
<td>Be domestic</td>
<td>67% (6/9)</td>
<td>66% (25/38)</td>
<td>75% (30/40)</td>
</tr>
<tr>
<td>Be small</td>
<td>78% (7/9)</td>
<td>68% (26/38)</td>
<td>48% (19/40)</td>
</tr>
</tbody>
</table>

Table 6 presents the level of agreement to a statement about attitudes to the use of environmental design as a means of improving quality of life of residents with dementia.
Table 6: Agreement that attitudes to the use of environmental design to improve QoL have become more positive as a response to the intervention.

<table>
<thead>
<tr>
<th>Example item</th>
<th>iPhone Plus</th>
<th>Workshop</th>
<th>Consultancy</th>
</tr>
</thead>
<tbody>
<tr>
<td>I have more positive attitudes towards the use of ED to improve the QOL for residents with dementia in aged care facilities</td>
<td>78% (7/9) Agree or Strongly Agree</td>
<td>87% (33/38) Agree or Strongly Agree</td>
<td>80% (32/40) Agree or Strongly Agree</td>
</tr>
</tbody>
</table>

Adoption

*Use of the Environmental Assessment Tool (EAT & BEAT_D app)*

As part of the Consultancy Intervention, all the facilities of participants were audited by an expert consultant and a group of individuals (managers/staff) from each facility using the EAT. Survey respondents from the consultancy service indicated that 30/40 (75%) of them were personally involved in this audit with the consultant, or in their own independent audit. A further 4/10 also indicated that they still personally intended to conduct an audit utilising the EAT.

Whilst workshop participants were familiarised with the EAT at the workshop and provided with support documents they had to perform an audit of their facility on their own (without the assistance of an expert consultant). Likewise, whilst the iPhone Plus participants had access to supporting literature to use the BEAT_D app, they were required to perform the audit independently. Table 7 presents the proportions of the samples of participants who actually used the environmental assessment.

Table 7: Adoption – Personal Use of the EAT or BEAT-D

<table>
<thead>
<tr>
<th>Indicators of Adoption</th>
<th>iPhone Plus</th>
<th>Workshop</th>
<th>Consultancy</th>
</tr>
</thead>
<tbody>
<tr>
<td>‘Have you conducted an environmental assessment of your workplace using the EAT?’</td>
<td>7/9 (78%)</td>
<td>10/38 (26%)</td>
<td>30/40* (75%)</td>
</tr>
<tr>
<td>If no: Do you intend to conduct an assessment of your workplace using the EAT?</td>
<td>2/9 (22%)</td>
<td>11/38 (29%)</td>
<td>4/40* (10%)</td>
</tr>
</tbody>
</table>
Modification of the RACF Environment to improve ED for people with dementia

Table 8 presents the proportions of the samples of participants, who had undertaken environmental modifications as a result of the interventions, i.e. had adopted the process.

<table>
<thead>
<tr>
<th>Item</th>
<th>IPhone Plus</th>
<th>Workshop</th>
<th>Consultancy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Have you made any environmental modifications at your workplace since participating in the Dementia Training and Study Centre program?</td>
<td>5/9 (56%)</td>
<td>14/38 (37%)</td>
<td>19/40 (48%)</td>
</tr>
<tr>
<td>'Was the EAT useful in informing these modifications?'</td>
<td>YES: 80% (4/5)</td>
<td>YES: 8/14 (57%)</td>
<td>YES: 16/19 (84%)</td>
</tr>
</tbody>
</table>

Table 9 describes the modifications that had been undertaken.

<table>
<thead>
<tr>
<th>IPhone Plus</th>
<th>Workshop</th>
<th>Consultancy</th>
</tr>
</thead>
</table>
| '-'Design and staffing reviews.' -'Ours is a more unusual project in that the project is construction of a 30 bed sub-acute rehabilitation unit and audit was undertaken close to completion which allowed little opportunity for change'. -'Greater opportunity for community to feel comfortable in the grounds especially if they have children visitors. Alfresco outdoor dining space so that family and visitor could share a meal with the patient. Increased outdoor | '-'Working on rearranging the outside courtyard' -'Creation of areas for private and 1:1 use.' -'Bathroom doors are being painted to differentiate them from the bedroom doors.' -'Evaluation process have been introduced' -'Have incorporated many of the ideas in our building development' -'Improved signage introducing domestic activities.' -'Residents residential corridors made more resident friendly.' | '-'Plans are being made to divide the unit into two separate units.' -'Entry to facility have been made inviting. Wall Colours changed. Doors to storage areas painted to blend in with walls. Seating placed along hall areas.' -'Ensuite change of door. Activity areas set aside are now for one quiet area and one more active area.' -'Internal refurbishment of Day Centre & outside garden area.' -'Furniture placement, colours of walls , resident engagement, noise modification' -'Bathroom / shower doors painted to highlight them, doors to e.g. medication
<table>
<thead>
<tr>
<th>iPhone Plus</th>
<th>Workshop</th>
<th>Consultancy</th>
</tr>
</thead>
<tbody>
<tr>
<td>activities and points of interest while seated or wandering, such as raised garden beds and garden art...change of toilet paper dispenser to a fitting that is more familiar and domestic. Improved way finding signage, keep it simple.'-‘Small cluster of chairs in lounge area... Removed the big chairs that made people be lined up'- ‘Large one way “picture” sticker on nurses station “window”, individual themed seating in hallways (travel corner/nature corner) as places to ‘be alone’... Toilet doors have signs. Shared toilets have had self-closing hinges removed and encouraging to leave doors open... Sign on our sensory room door - making available for visitors/family to utilise with their loved ones...Experimenting with seating arrangements... Increased cues at peoples’ room entrances- colour/number plaques, name/photos, etc.-‘Room and toilet signs.’</td>
<td>line with the recommendations’ -‘We are more aware of the EAT principles when designing’ -‘Lace curtains removed to increase visual access to outside plans for walking path formulated lounge rearranged so residents can see into the kitchen/dining area’ -‘Negotiating with facility manager to be able to control lighting in the dementia support wing independent of the rest of the unit/hospital - decrease stimuli purchase of plants and planters and clothesline’ -‘Toilet (changes to colour toilet seats)... More familiar resources located in different areas i.e.: picture frames.’</td>
<td>room, fire exits painted to blend in with wall colour. Lounge / dining room created. Signage to rooms changed.' -‘Kitchen/ Meal Preparation Area. Outdoor area including a vegetable garden. Signage in service. Areas for communal gathering and private areas. Line of site within service area.’ - -‘Gardening modifications to create a safe environment and structured wandering’ -‘Bathroom design so toilet can be seen from bed’ -‘Reducing kitchen noise, better room selection for new/ existing residents, diversional therapy programs, design completed for 12 bed secure facility’ -‘Using signage to highlight toilet. On review the toilet signs where all different.’ -‘Following advice we did not proceed with kitchen modifications (shutters to prevent access)’ -‘provided two small areas for quiet time, with views to the outside providing a more positive meal time experience’ -‘Toilet roll holder focus of the unit which is rehabilitation to be highlighted’ -‘Internal colours, circular motion for wandering’ -‘Quiet lounge areas, delineating dining and lounge areas’ -‘Toilet rolls’</td>
</tr>
</tbody>
</table>
Future Intentions to Modify the Environment

Participants who had not yet made any changes in their RACF environment were asked to indicate if they intended to in the future, and if so, what modifications were planned. In response, 3/4 (75%) iPhone Plus, 7/23 (30%) Workshop and 16/21 (76%) consultancy indicated that they intended to make ED modifications in the near future. Plans for future modification included large redesign of new builds, and smaller refurbishments such as better lighting, sensory paintings, improved outdoor space, highlighting

Barriers to KT

Table 10 presents the responses to the survey item on the barriers experienced in the use of the assessment tool, the most commonly reported barrier- ‘I don’t have the authority to modify the environment of my workplace’ was experienced by 24% (9/38) of workshop participants only. Respondents to the survey from the iPhone plus intervention did not nominate any barriers to its use.

Table 10: Barriers to the use of the EAT or the BEAT_D App

<table>
<thead>
<tr>
<th>Items</th>
<th>IPhone Plus</th>
<th>Workshop</th>
<th>Consultancy</th>
</tr>
</thead>
<tbody>
<tr>
<td>‘I don’t have the authority in my workplace.’</td>
<td>0</td>
<td>9/38 (23.7%)</td>
<td>0</td>
</tr>
<tr>
<td>‘I don’t feel I will be able to act on the information the EAT will provide me with.’</td>
<td>0</td>
<td>2/38 (5.3%)</td>
<td>2/40 (5%)</td>
</tr>
<tr>
<td>‘I intend to audit the environment with another tool.’</td>
<td>0</td>
<td>2/38 (5.3%)</td>
<td>2/40 (5%)</td>
</tr>
<tr>
<td>‘I don’t have the confidence’</td>
<td>0</td>
<td>2/38 (5.3%)</td>
<td>1/40 (2.5%)</td>
</tr>
<tr>
<td>‘I don’t have the skills’</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>‘I don’t think the EAT will provide useful information’</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Survey respondents who indicated they had not made any changes in their RACF were also asked to identify any barriers to making modifications. Workshop respondents were again the most likely to report barriers; with the most frequent issue nominated as ‘I don’t have the authority to modify the environment of my workplace’ as reported in Table 11.
Table 11: Barriers to making modifications to the RACF environment

<table>
<thead>
<tr>
<th>Barriers</th>
<th>iPhone Plus</th>
<th>Workshop</th>
<th>Consultancy</th>
</tr>
</thead>
<tbody>
<tr>
<td>'I don't have the authority to modify the environment of my workplace.'</td>
<td>1/9 (11%)</td>
<td>11/38 (29%)</td>
<td>1/40 (2.5%)</td>
</tr>
<tr>
<td>'I don't have the money to modify the environment of my workplace.'</td>
<td>0</td>
<td>3/38 (7.9%)</td>
<td>1/40 (2.5%)</td>
</tr>
<tr>
<td>'I don't have the ability to use the EAT feedback to modify the environment of my workplace.'</td>
<td>0</td>
<td>2/38 (5.3%)</td>
<td>0</td>
</tr>
<tr>
<td>'I don't feel modifying the environment will achieve anything useful for residents with dementia.'</td>
<td>0</td>
<td>1/38 (2.6%)</td>
<td>1/40 (2.5%)</td>
</tr>
</tbody>
</table>

**Interview Results**

**Telephone Interview Participant Demographics**

Table 12 presents the demographics of the participants who participated in a post-intervention telephone interview. Across all three intervention groups, the majority of participants were female, in management roles, with a mean age between 46-50 years, and with postgraduate qualifications. More than 60% of all participants had worked in the dementia sector for 10 or more years.
Table 12: Telephone interview participant demographics

<table>
<thead>
<tr>
<th></th>
<th>iPhone Plus n = 10</th>
<th>Workshop n = 10</th>
<th>On-site Consultant n = 10</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td>F = 80%; M = 20%</td>
<td>F = 80%; M = 20%</td>
<td>F = 70%; M = 30%</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td>Mean: 46.6 yrs, SD: 7.25 yrs, Range: 36-57</td>
<td>Mean: 50.4 yrs, SD: 7.58 yrs, Range: 40-63</td>
<td>Mean: 49.7 yrs, SD: 8.02 yrs, Range: 35-60</td>
</tr>
<tr>
<td><strong>Role at Work</strong></td>
<td>Management: 50%, Clinical: 20%, Education/Researcher: 20%, Other: 10%</td>
<td>Management: 40%, Clinical: 40%, Education/Researcher: 10%, Other: 10%</td>
<td>Management: 70%, Clinical: 10%, Education/Researcher: 10%, Other: 10%</td>
</tr>
<tr>
<td><strong>Highest Level of Education</strong></td>
<td>Postgrad: 50%, Graduate Degree: 20%, Grad Cert: 20%, Other: 10%</td>
<td>Postgrad: 50%, Graduate Degree: 30%, Grad Cert: 10%, TAFE / Tech: 10%</td>
<td>Postgrad Degree: 30%, Graduate Degree: 30%, Grad Cert: 30%, TAFE / Tech: 10%</td>
</tr>
<tr>
<td><strong>Years Spent in Dementia Sector</strong></td>
<td>0-4 yrs: 20%, 5-9 yrs: 10%, 10-14 yrs: 10%, Over 15 yrs: 50%</td>
<td>0-4 yrs: 10%, 5-9 yrs: 30%, 10-14 yrs: 20%, Over 15 yrs: 30%, I do not work in this sector: 10%*</td>
<td>0-4 yrs: 0%, 5-9 yrs: 20%, 10-14 yrs: 40%, Over 15 yrs: 40%</td>
</tr>
</tbody>
</table>

*Participant was attempting to set up a ‘Dementia Farm’

**iPhone Plus - Interviews**

Of the ten people who took part in an interview:

- 5/10 had downloaded the app but did not upload audit data to receive a recommendations report
- 1/10 downloaded the app, audited their environment and uploaded the audit data to receive a report. However, these respondents did not respond to the invitation to participate in the teleconference with Prof Fleming.
- 4/10 had taken part in the full consultancy – including downloading the app, uploaded data & receiving a report and responded to the invitation to participate in a tele consultancy.

**Motivation and Goals of participants**

The primary motivation for the use of the iPhone Plus service was to access a tool that would enable an evidence-based, systematic evaluation of a RACF environment. The tool was sought out by interviewees as a resource to inform and facilitate evidence-based practice in ED for people with dementia. Responses suggest that their general knowledge of the ED principles was already reasonably established. However, they lacked a systematic way to apply this knowledge to assess and modify the environments within which they worked, and had gone actively seeking tools to assist them with assessment and implementation.
Awareness

iPhone Plus interviewees had become aware of the BEAT-D iPhone app via a number of channels including: the conduct of general ‘App-searches’ on dementia; seminars; journal articles; Stirling University/Hammond Care websites; industry publications; the Dementia Behaviour Advisory Service; and via the DTSC ED workshops. Once located, participants were impressed with the utility of the app and agreed that it was useful to inform their approach;

“It is very professional. This had not been my specialty so I now have a better understanding of aged care and the sort of things... [in the environment]... that are particularly important for dementia.” (3)

“It increased my knowledge and understanding of some of the thought processes around the design concerns for the building.” (8)

Agreement

There was evidence that interviewees from the iPhone Plus intervention already had high levels of ‘agreement’ that improving the environment in RACFs was important. This was evident in their motivation for participation and their already established intention to make changes in the RACFs within which they worked.

It was believed that use of an ‘evidence-based’ approach would assist in gaining the organisational support for funding to implement changes in the environment. Participants described the purpose of downloading the app as:

“To have an evidence-based assessment of our environmental changes, not just opinion based” (7)

“For information to support evidence-based practice which we used to inform design reviews for the development of two new facilities.’ (1)

One participant was also interested in knowing how their facility rated when compared to others:

“I work in aged care and the RACF I work in; I wanted to know how it rated” (3).

Another motivation was for the support of Person-Centred Care (PCC). In this, interviewees recognised that changing the environment went beyond the physical ‘walls’ and into the experiences of the person with dementia.

“It [changing the environment] will also prompt changes to care practices or managing the direct environment of the resident. It is not just about knocking out walls”. (4).

“It was all about the environment. Improving the environment for the older person with dementia” (6)
Whilst agreement and motivation of interviewees was high at the commencement of the intervention, comments suggest ‘agreement’ had also been reinforced through both the use of the app and the ability to observe the value and impact of the changes made to the practice environment.

“…I’ve now seen what a huge difference is makes by making small changes to the environment that might make a huge difference for someone with dementia. It doesn’t have to be a huge costly measure. It could be more basic things.” (9)

**Adoption and Adherence**

The BEAT-D was used by iPhone Plus interviewees who were in the process of either designing or refurbishing facilities. Table 13 summarises the changes made.

**Table 13: Changes made to the environment**

<table>
<thead>
<tr>
<th>IPHONE PLUS interviewees</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moving dementia-ward to ground floor (1)</td>
</tr>
<tr>
<td>Improve the garden area (1,3,5,10)</td>
</tr>
<tr>
<td>Improve furnishings and equipment selection (1,9,10)</td>
</tr>
<tr>
<td>Improve lighting (1, 3)</td>
</tr>
<tr>
<td>Improve toilet (1,3,9)</td>
</tr>
<tr>
<td>Increase colour contrast (1,9,10)</td>
</tr>
<tr>
<td>Open up the nurses station (1)</td>
</tr>
<tr>
<td>Improve visual cues (3,6)</td>
</tr>
<tr>
<td>Improve recreational area (10)</td>
</tr>
<tr>
<td>Improve décor (3)</td>
</tr>
<tr>
<td>Provide familiar objects (3, 6, 10)</td>
</tr>
<tr>
<td>Improve dining room layout (4,6)</td>
</tr>
<tr>
<td>Simplify wardrobes (4)</td>
</tr>
<tr>
<td>Lower signs (4)</td>
</tr>
<tr>
<td>Improve access to outdoors (9, 10)</td>
</tr>
</tbody>
</table>

The use of the BEAT_D app, associated report and telephone consultation facilitated ‘adoption’ of ED changes in a number of ways. Firstly, by informing or highlighting
areas for action across all relevant domains. Secondly it also provided a ‘validation’ for design choices and a confidence that changes being made were based on evidence:

“We knew that the environment need to be changed and [the EAT] provided the ‘what’, and the ‘how to’ and a validation of that.” (2)

“Can we improve on what we are doing?...I thought if I do the [EAT] audit there might be something that we haven’t considered….signs, lighting, noise, colours, it just made you stop and think, did we look at that?” (3)

“I wanted to see if the design was going to be an effective design moving forward, if it was best practice for people living with dementia.” (8)

“I think people like to know that it’s something that has been researched properly, so through a university where qualified people have developed it. I find there’s no arguments then. Because it’s validated in a way, and I like that about the app as well, it’s obviously been researched well and put together by experts in the field. And that’s important.” (9)

Interviewees also utilised the information gained by the iPhone app to inform their staff about the ED principles and were able to use information gained through the audit in staff education:

“I found that a lot of people, in particular nurses and health care professionals in aged care facilities, myself included, lacked knowledge about how to make the environment better for someone with dementia…I think it [the EAT] is a good trigger for professionals to know….that someone being aggressive may be saying they want to go outside….we did a lot of education with staff around being aware of the environment…and I felt it was a really good tool to use for that” (9).

Generally, interviewees believed that the tool was an efficient aid in planning ED changes and broadened the scope of environmental concerns considered within everyday practice beyond a task-based philosophy of care towards person-centred approaches.

“The iPhone app significantly helped us review our strategy for ED changes” (1).

“It’s made me, being from a more medical and task-oriented job, it gives me more scope with my practice.” (9)

Another manager highlighted the value of the intervention in regard to her gaining support from nursing staff at the frontline of care and solidifying the direction the facility need to take:

“It’s been very positive amongst the staff, who for a while have said the environments not great but we’ve really not had a way to measure or identify
what those issues are, so this is really brought it to the forefront that there are significant issues. It’s really raised awareness of the environment amongst staff… It’s an objective feedback on what might be able to be done and what might not work. Give us direction. And asking the question, can it really be done? And is the organisation prepared to move in that direction?” (2)

There is evidence that the use of the EAT had changed the philosophy of care and method of environmental modifications over the longer-term for several interviewees. Several interviewees have adopted the EAT in their future endeavours beyond their initial download and use. There is also evidence that the philosophy of care has shifted towards a more PCC approach and that interviewees were keen to learn more and use the app in the future.

“The other three projects have definitely been given guidance from the app. The thinking has allowed us to do that right from the word go. We can’t tick all the boxes, but the report has been very, very helpful. “(1)

“What we were doing has lived on a little, it wasn’t just the environment, we were changing practises around restraint, so I know that those changes have lived on, it was part of the whole journey. “(6)

“Now we are prioritising what is posing a real risk and what is significantly decreasing quality of life for residents, and what we can live with.”(7)

Further evidence for participant adherence to the principles are seen in their recommendation of the app to colleagues. The passing on of the knowledge of ED suggested a shift of the working culture towards a more evidence-based practice philosophy informed by the evidence of environmental design:

“I run quite a few education workshops on dementia and I regularly refer people to it” (10).

“But I did share it with a friend of mine who is a Facility Manager of a hostel. She had not been exposed to anything like this before, and they are looking at extensions to their building, so I told her to download it and have a look at it before you actually start and it might make you think different about how you go about it”.(3)

Barriers

In addition to common issues such as financial barriers, lack of a philosophy of care and/or organisational support, there were specific barriers regarding the use of the IPhone Plus. See Table 14 below.
Table 14: Barriers identified by iPhone Plus interviewed participants

<table>
<thead>
<tr>
<th>IPHONE PLUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small iPhone size (photos difficult to see) – Better on Ipad (2)</td>
</tr>
<tr>
<td>File size of report (with photos) was large and difficult to manage and print from 92)</td>
</tr>
<tr>
<td>Limited Time (1-10)</td>
</tr>
<tr>
<td>Staff attitudes (2, 4, 5)</td>
</tr>
<tr>
<td>Lack of Evidence-based culture (2, 4, 5)</td>
</tr>
</tbody>
</table>

Facilitators

Tool usability emerged as a significant theme within the 10 interviews. One participant (3) complimented the tool as having user-friendly language. This was in contrast to the research literature which is “often written by academics with little or no hands on experience…it doesn’t translate”.

Portability was also acknowledged as a benefit:

“I’m not that techno-minded….but the ease of having an app that you can do on the move is a great thing”

“I think it is a really good idea to have it in the portable format, because the reality is you can give it to half a dozen people to take around and the less paper-based stuff the better. I like that it is electronic. That was for me, a winner. (7)

“Now that it is an app on the iPhone it is very transferrable and usable, but it is all around the evidence in dementia care to improve the environment. I’ve been reading the publications for years now so to be able to put evidence into practice” (6)

The iPhone app was described by one participant as “an ideal platform” (7). They went further to say that the app allowed them to “step right back and look at the whole environment to make more global decisions to enhance Person Centred Care’. Interviewees felt encouraged in their design endeavours to utilise evidence-based practice for ED design and felt that the recommendations were plausible and flexible within the limitations of time and budget-restricted aged care facilities:

“I think it was a clear tool to guide thinking of what’s best practice in our design and operation…it was really clear that these are the things we need to do. I think it was quite realistic in some of the constraints you deal with…I think people need to be encouraged a lot more in the design review stage“(1).
The need for communication and collaboration within multiple levels of a facility was a key theme generated in these interviews. These were in regard to a team approach, further expert consultation, use of multiple services, and the need to have a unified philosophy of care. On several occasions, interviewees mentioned that both the audit and the design phases were conducted by multiple staff members in a collaborative fashion. There was also the belief that collaboration with management can reduce resistance to change and encourage a continuously improving philosophy of care. Further, there was the belief that the whole team needed to be on board with environmental design as it was a philosophy of care change not just a change to the physical environment.

“The idea of using the app is not just to use it alone but use it in a team approach. The team will be informed around the evidence along the journey” (6).

“The push-back is from some people that are threatened, my past management felt threatened by the whole experience. But we’ve worked through that, through informing them in facilitation, making sure management was included in the journey” (6).

“If they’re not going to get on board, they need to get off the train” (10).

Expert consultation received via the telephone seemed to improve the tendency for interviewees to adhere to the ED principles.

“The report was good…but then I had a conversation with Richard and we made specific plans for the improvement, we could then circulate all of these and use them for continuous improvement” (6).

Overall, iPhone Plus interviewees felt that their awareness of ED principles had been improved by downloading and using the EAT app. Those who received the associated report and telephone consultancy found it supported the learning and translation of the ED principles into practice. Importantly, the use of the app, the report and the teleconference also provided users with the ‘evidence’ needed to gain organisational support for making changes in the RACF environment. In this way, the intervention not only changed the thinking and practice of the individual interviewees, but was also utilised to change the thinking and promote the required actions of the organisations within which the interviewees worked.

**Recommendations for Improving the iPhone app**

Interviewees made some recommendations in regards to improving the intervention to better meet their needs. Firstly, there was a desire for more in depth information regarding scoring systems and the literature behind the app.

“I think if I would be helpful if it allowed you to put comments in” (3).
“The report was just a rating scale and there was not too much expansion on that... An explanation of, say you had a rating scale of 1-3, and you get a score of 2, why? And how that can be improved on” (4).

Interviewees showed insight into the use of the principles in various settings. It was suggested that the BEAT_D app was well suited to both regional and urban settings, but may do well to further consider the challenges that may exist in urban areas due to space limitations. That said, there was the desire to expand the principles to include more auditing of external areas, rather than a focus on internal spaces.

“The app was very typical of a more regional type facility, out of the city, where you’ve got lots of space and ground, whereas there needed to be more consideration around urban areas” (1).

“One of the limitations was around the focus on the internal environment; I wanted to change the external environment as well... Maybe that is the next step. It could be adapted for more focus on the outside environment. Also, the literature that comes with it, journal articles and everything, there is a lot of evidence there” (6).

Workshop Interviews

Motivation and goals of interviewees

Interviewees became aware of the DTSC ED workshops through their workplace via posters/flyer/personnel or through individual research to identify courses of interest. Motivations for self-selection in an ED workshop were varied and included: knowing how to make improvements to care, increasing resident involvement, desire for knowledge of latest research, general learning, increasing skills, validation of past ED choices, improve resident wellbeing, opportunity for ideas, promote resident independence, person-centred care, consultation, and strategic direction for redesigning. There was no unifying motivation for attending workshops, they appeared to suit a variety of purposes:

“Looking at best quality care... Best practice care for people with dementia and how we can do better” (1).

“Wanted to know what was out there, what was happening and what we were going to be doing for the tsunami of dementia that is coming” (2).

“More insight whether we were on the right track” (4).

“To learn more about the latest research... looking for an evidence base best practice” (9).
Awareness

It would appear that interviewees who selected to the workshop intervention had a lower awareness of ED principles than either the iPhone Plus or Consultancy groups. However, most interviewees agreed that there knowledge of both ED principles and strategies to improve the environmental had been improved by the workshop:

“I wasn’t aware of any of the principles. We basically [though about] our design on logic. Not so much on knowledge. So it was great. The whole workshop I found very educational and informative and some more investigation and research” (4).

Many mentioned that the insights were transformative to their thinking in ‘opening eyes to look at things in more detail...a different model of care (3)’.

Agreement

Interviewees spoke of having a greater sense of agreement that ED changes were possible and achievable after participating in the workshops. The experience had provided a sense of direction to their ED endeavours and they felt more confident in in developing ideas that were appropriate for their facility and the scope of their resources. Furthermore it was suggested that hearing from ‘the author himself’ added to the value of core messages and solidified ED direction for PCC.

“Just to have that sense of direction and guidance has been really great...we can improve the quality of life for our people with dementia, It reiterated for me, especially hearing it from the author himself” (1).

“I actually attended with our director of care and we just said ‘oh my God, this stuff’s fantastic’. The workshop wasn’t only about building a facility and implementing this. Okay we’ve got a facility. How can we improve what we’ve got because in reality we can’t start demolishing the building? What can we do with what we’ve got and that was fantastic. My goals for the day were very much achieved by the afternoon. Thoroughly enjoyable” (5).

Of particular note was the change in perspective that the environment includes more than the physical context and extends to the philosophy of care and interpersonal communication.

“It gave us a good idea about the sort of things that are best practice. We have incorporated those ideas into our view and certainly our discussion around the better practice in that facility” (1).

Adoption and Adherence

Some interviewees had utilised the EAT after attending the workshop. This was a way to both confirm that the current environment met the ‘standards’, as well as a means to generate ideas about things they may need to change.
The audit report post workshop was used as validation of previous environmental choices; “we didn’t do any changes as such because it ticked all the boxes. It was just to see that we were on the right track (4)”.

Others used workshop information and the EAT as a compliment to practice; “I’ve sort of used that a little bit in the unit as a reference. Just for my own reference really. Are we doing this? Do we have that?” (5)

Interviewees from the workshops also went on to use the EAT to inform modifications to the environment. Within the 10 interviewees, six had made or planned to make modifications of the environment. Of those who had/planned changes, the ideas for modification reflected the specific needs of each facility. Changes were more likely to be minor or small changes to the RACF environment, rather than larger refurbishments or new builds. They also included changes to care practices and activities for people with dementia, for example, changing the activities residents were able to participate in or focusing on communication with residents. This information is presented in Table 15.

Table 15: Changes made to existing buildings

<table>
<thead>
<tr>
<th>WORKSHOP interviewees</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improve visual access (1, 3, 10)</td>
</tr>
<tr>
<td>Provide planned Wandering (10, )</td>
</tr>
<tr>
<td>Improve communication (1)</td>
</tr>
<tr>
<td>Improve décor (1, 5, 8, 10)</td>
</tr>
<tr>
<td>Increase familiarity (5, 10)</td>
</tr>
<tr>
<td>Improve access to the outdoors (1)</td>
</tr>
<tr>
<td>Introduce animals, specifically chickens (1)</td>
</tr>
<tr>
<td>Provide a vegetable garden (1)</td>
</tr>
<tr>
<td>Improve facilities for community engagement (2)</td>
</tr>
<tr>
<td>Provide a diversional therapy Box (2)</td>
</tr>
<tr>
<td>Improve lighting (1,3)</td>
</tr>
<tr>
<td>Improve safety features (2)</td>
</tr>
<tr>
<td>Reduce restraint (3)</td>
</tr>
<tr>
<td>Improve access to and visibility of toilets (3)</td>
</tr>
<tr>
<td>Increase colour contrast (5, 10)</td>
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The experience of implementing these changes had been very positive for those interviewed and reinforced agreement with the value of the ED principles. The experience also reinforced learnings that the environment and the philosophy of care are interlinked:

“[we did] some simple things like making sure people can see the kitchen, turning their chairs around, that sort of thing has helped and what it has done is made us focus a lot more on what’s happening on the communication and interpersonal level” (1).

“Everything that we’ve brought back from the workshop… that we are wanting to do … is ultimately happening. We are into reduction [in the use] of restraints big time and this has helped immensely” (3).

One workshop interviewee also discussed how they had used their knowledge to influence the thinking of other staff, and of family and relatives:

“We actually have an in service for staff saying this is what we’ve learnt, this is what we are going to implement, evaluate to see if this is working and so far it’s working quite well. And not only that but the relatives are saying, ‘Wow, OK so this is why you’ve made these changes. You are making this change for this reason.’ … We haven’t had many instances of residents urinating in different places. It’s confined to the toilet. I think that the toilet change and having the doors open just made a huge difference” (5).

Another participant had also set up monthly meetings in the facility to discuss ED and to involve multiple levels of staff. During these meetings they focused on how design can contribute to wellbeing and how to move towards a person-centred philosophy of care.

“We have started these monthly meetings… say look this is the evidence, this is the assessment. These are the issues and these are the things we need to focus on. So it’s given us some direction and focus for those things… And people have gone from being really antsy and hot under the collar in the first couple of meetings to being really helpful in their brainstorming and thinking about other ideas, … brainstorming in how we can change life for these people” (1).

A number of the workshop interviewees also discussed changes and plans that indicated that thinking about the environment was becoming part of their everyday practice. This was evident in their intentions to use the EAT further and to make further changes within the RACF environment within which they worked.

“I’d like to see seating around the place where people can just sit and rest when they are wandering around the hall and where someone else can just sit there with them, like a bus chair or something. Not a bus station but just that idea of having a bench where people sit and they get a different view of the world… I’d really love someone to do a thesis with this, with us” (1).
One participant revealed a strong commitment to achieving best practice which included striving to be a Centre for Excellence. Over time, the participant believed, that they were becoming more confident about their adherence to the ED principles. Interestingly, this participant was working in an acute care environment, rather than an RACF.

“We are aiming to be a centre of excellence….there weren’t many acute services on board and we were quite happy to be a model for that. I don’t know if we have missed that boat or what but we are very keen. As I said we have got a very dynamic administrative stream who have their ears up and are listening and wanting to institute change” (3).

In regards to other evidence for ‘adherence’ to the ED principles, another participant had set up weekly meetings to discuss ideas for the facility and suggested that there has been a change in attitudes away from task-based to person-centred philosophies as a result.

“I think that just changes everybody’s attitude...we just have to re-allocate how we spend our time and getting that shift is what is going to be hard. That’s what we are hoping to achieve with our meetings” (1).

Another indicator of adherence to ED principles is that participants recommended the tool and the workshop to other colleagues. Workshop interviewees felt a strong need to “Spread the word” (2). Indeed, interviewees testified to having spoken to colleagues about the benefits of ED modifications, how to utilise the environment to better care, in the development of new facilities, renovations and direct referral to the tool and workshop.

“We also ran our own one for all our key managers and staff to make sure that they are coming along in the same direction and understand the principles” (10). This suggests that interviewees found value in the workshop content and wanted the information to be widespread within their facility to generate a unified philosophy of care incorporating ED principles.

"They are going to do some renovations and have proposed to maybe use that tool" (4).

“We are building a brand new facility and some of the things that I learnt on that day I have passed it onto our CEOs and the architects so they can implement it into that facility” (5).

“Encouraging people to consider the workshop and being able to feed back to them that kind of information” (6).

For one participant, this included actioning a multi-level meeting with care staff, managers and architects in the design of a facility.
“To bring together the care and the architects as well...unfortunately with the Christmas period we aren’t going to have everyone there but we will have the majority of people” (7).

**Barriers**

As well as the common issues of financial barriers, philosophy of care and organisational support there were barriers to adoption raised by workshop interviewees.

It was generally believed that staff attitudes' and a rigid nursing culture limited the success of ED principle adoption. The idea of a task-based philosophy of care was identified as a barrier to change where staff have worked “this way for 100 years... why should we change” (3).The interviewees were generally in support of a culture shift towards a person-centred care philosophy where those with dementia are respected and encouraged rather than treated as ‘the problem’ within the system.

“Staff attitude...because they are more task orientated than person orientated, it doesn’t fit...People are trained in a nursing model but this is a social model, not a nursing model and making that change is really hard” (1).

As might be expected, those who were also ‘limited' by resources or facility processes were less likely to have implemented change.

“At this stage we have just had big limitations to our budget to make changes...but we are hoping this will change in the future” (4)

There were also minor barriers identified in regard to the utility and function of the workshops. These were to do with one particular workshop where the '30 places’ available were filled by 60 people. Although this is positive in regard to enthusiasm to the program, interviewees did say the overcrowding limited their learning.

One participant [an architect] also suggested that discipline specific examples of environmental modifications would have strengthened his understanding of how to apply the ED principles in his work. As mentioned previously, several interviewees did not have iPhone/iPad access and wish for the tool to be available in other formats (e.g. windows/android) to continue their use of the EAT and ED principles.

“The major problem was that it was meant to be a thirty person workshop and I had expected that it really would be a workshop. So it didn’t turn out to be what was expected because there were too many people” (9).

“I guess the only thing that stems from my own needs that are from an architectural perspective is that. One thing that I still find a little bit difficult and it would have been helpful to have more examples of this doesn’t work but this one does” (10).
Recommendations to improve the Intervention

Workshop interviewees suggested ideas to improve the workshop in regard to the content, time and inclusion of a workbook to facilitate learning. The biggest concern was that the large amount of content to cover within the time allocated. Interviewees were happy with the content but desired more time to “tease things apart” (3). It was suggested that including a workbook for participants would help work through problem and solidify thinking. Also, it was suggested that a workbook could be used at a later stage as a reminder of what was learnt.

In regard to workshop content, desire for specificity of examples for ‘good practice’ was stated on two occasions. One participant desired “more information in terms of lighting what would be the optimum candles and lighting stuff like that would have been good as well” (7). Another wanted information on optimum levels of contrast.

In regard to the EAT, it was suggested that inclusion of a ‘certificate’ post-audit would be of benefit. It was suggested that facilities may be encouraged to get an audit done and include ED principles if there was a quality measure or certificate afterwards to add to the value of the facility within the community:

“It would probably be not a bad idea…to have some sort of thing like a certificate of compliance …to say that the dementia friendly design principles have been incorporated” (7)

Consultation Service Interviews

Motivation and goals of interviewees

Interviewees became aware of the consultation service through a variety of channels including: Aged and Community Services; email sent to managers; conference advertisements; conference attendance; Dementia Behaviour Management Advisory Service’ Alzheimer’s WA; and links with University of Wollongong and Curtin University (another of the DTSCs). All of the consultation interviewees who participated in a telephone interview had self-selected for the DTSC ED Consultancy service as they had active plans and intentions to modify existing RACF environments or to conduct new builds.

As such, motivations for participation in the program were at a high level. These included:

- Obtaining best-evidence to guide their build
- Enhancement of resident quality of life through meaningful environments
- Reduction of BPSD
- Generation of new ideas
- Improve safety
- Staff education; and
- To validate past ED decisions.
Awareness and Agreement

Consultancy interviewees were all in high agreement that it was imperative to improve the environment of the RACF within which they worked. The overarching message from interviewees was that they had set goals to improve the environment and “the goal was to enhance the quality of life” (9). All interviewees mentioned the need to improve the environment to improve resident quality of life and/or to reduce difficult behaviours. Interviewees believed that this could be achieved through modifying the environment, and they had enrolled in the consultancy service to receive guidance in regards to how to achieve it.

“What could we do to make it more dementia friendly, rather than just this stark environment that didn’t have a lot of meaning to it? For safety as well, to find out what we could be doing better so that the residents would be safer in their environment” (1).

“Guidance and direction around how to create some environmental changes…to minimise that behaviour” (4).

“There’s a massive big deficiency in terms of that particular need being provided….identification of our deficiencies, identification of future growth opportunities in terms of construction as well as service provision from a clinical perspective, and tapping into other resources – networking” (8).

There was also an interest from Consultancy interviewees in how to improve care and promote organisational change. Consultancy interviewees were not only looking for support to change their immediate environments, but also to influence the priorities and practices of staff who worked across the organisations.

“[We wanted to] Increase the level of knowledge of the clinicians, of dementia care, probably to help them prioritise it as an issue” (5).

“Learning all the correct environmental design techniques and principles so when the plans were being designed they understood what was best practice” (6).

“Staff education, there are a lot of great resources and we definitely drew from that… passing information on to the carers… to ensure that the upgrade we did would be successful with the types of dementia residents we have there” (1).

Adoption and Adherence

The majority of consultancy respondents had made modifications to their environments at the time of the interview. Most also reported changes had occurred within the philosophy of care at not only a facility level, but also to include the management at an organisational level. Table 16 summarises the changes.
Table 16: Changes made to existing buildings or designs for new builds

<table>
<thead>
<tr>
<th>CONSULTANCY SERVICE Interviewees</th>
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<tbody>
<tr>
<td>Provide smaller social areas (1,4, 5, 6,9)</td>
</tr>
<tr>
<td>Improve layout (2,6,9)</td>
</tr>
<tr>
<td>Provide opportunities for planned wandering (5, 10)</td>
</tr>
<tr>
<td>Visual cues/access (1,5,6,7, 10)</td>
</tr>
<tr>
<td>Provide access to outdoors (2, 6, 7,9)</td>
</tr>
<tr>
<td>Improve garden (2, 4, 6, 7,9, 10)</td>
</tr>
<tr>
<td>Toilet (e.g. contrast, visual access) (1, 5)</td>
</tr>
<tr>
<td>Improve dining (e.g. not on trays) (2)</td>
</tr>
<tr>
<td>Entertainment/ activities (2, 6)</td>
</tr>
<tr>
<td>Improve lighting (6,10)</td>
</tr>
<tr>
<td>Improve décor (2,4,6,7,9, 10)</td>
</tr>
<tr>
<td>Wardrobe modification (2)</td>
</tr>
<tr>
<td>Increase colour contrast (2,4,10)</td>
</tr>
<tr>
<td>Introduce animals e.g., fish tank (2)</td>
</tr>
</tbody>
</table>

Interviewees were enthusiastic about the nature and impact of these changes in their RACFs.

“Rather than having one big social area where the residents all sat around a TV, change the layout the smaller areas, a reading room, music room, TV room, or just a chill out room looking at the ocean. We put a letterbox at the front of the front of the cottage and fill it with brochures, and residents come and collect the mail each day. Now there is a geranium plant growing around the letterbox. We’re looking at all the pictures to update and make them more vibrant. Also a memory box outside the resident’s rooms to help them identify their room” (1).

“I wanted a better environment for the residents and a lighter and much more user friendly environment for the residents and staff so that it enhances really the lifestyle for the residents and um for the staff working with the residents it makes life better and enjoyable and I wanted a better environment for them
as well and for the residents. It was looking at the building plus we’re doing gardens as well so it’s a whole project” (10).

Several interviewees spoke of having an organisational influence as a result of participation in the consultation service. Participation had strengthened their knowledge, plans and gave an evidence based report from ‘specialists’ to present to committees and key stakeholders. Furthermore, they felt more capable to present ideas because they believed them economically plausible within the budget and

“In fact, most of them aren’t any more expensive than what we would normally do anyway” (5).

“It was fairly easily done and we said look this is the report from specialists in this design... It was good backing for us to actually ask for changes” (6).

Several interviewees have utilised the EAT and environmental design principles in other domains of aged care. These included non-dementia units, state level health projects and other RACF projects.

“No, in fact we’ve gone further. Using the principles we learnt from the Consultancy Service, we’ve taken it to a non-dementia level too. We’re trying to incorporate the ED changes across the other two levels [of the RACF] and upgrade them. We’re going to try and copy everything we’ve done but with minor tweaks” (3).

“But since that job I’ve actually joined Health Infrastructure at a state level and we’ve been able to influence that design across all the projects now” (5).

**Barriers**

Financial barriers were identified on several occasions within consultation service interviewees. Although interviewees had diverse plans for ED adoption this was often limited because of funds access or delayed until funds became available:

“It comes down to the dollars. Any vision I had in changing the structure of the building and the recommendations from the EAT, you can’t do anything unless you have money” (1).

“Financial barriers. We have an existing dementia unit at another facility and the changes to that haven’t happened yet because of the cost” (2).

Other felt limited by delays experienced between audit/consultation and generation of recommendations. Interviewees were keen to start changes but needed to wait for the report before they knew they were making evidence-based changes.

“There was a significant time delay between the service and receiving the report. That was the only issue” (2).
Furthermore, interviewees felt that further specificity in the recommendations provided would have been useful.

“It doesn’t go to the next level and be very specific in relation to it and sometimes providers are looking for that so you know a more prescriptive solution to it all… some of it is obviously interpretive as well” (9).

Barriers to modification attempts were identified in relation to the presence of the residents during changes, phase of building development, resident wellbeing, regulation restrictions and knowledge base of managers. It was suggested that having residents moving in and out of the environment as changes were being made was difficult. This was more so for the workers than the residents who were ‘having a great time’ watching and interacting with painters. There were however some concerns that noise of construction could impact resident wellbeing or could induce agitation. This made it difficult having to move residents to another part of the facility during the day.

“Getting the job done with the residents still there. I have to say that’s been the hardest part of my area; coordinating painting jobs with full occupancy. That was the hardest part” (3).

“We didn’t want it to rush it too much with the residents … when we do loud things, noisy things so we don’t want to interrupt their life” (10).

It was suggested that working with an older building proved burdensome because the changes to core structures was highly limited. It was believed that the earlier that ED principles could be incorporated (e.g. at design stage), the more benefits it would have to development:

“There were a lot of things that if we were planning it from scratch that we would have actually changed” (6).

There were also two concerns in regards to the role of managers within ED endeavours. The first was the need for managers to be educated on ED principles to support staff in attempts to improve the environment. Interviewees felt that including managers throughout the process facilitated support for ED changes. The second was the burden of “juggling massive amounts of regulations and requirements” (8) to get changes to the environment through the board:

“The general manager was very, very keen. He actually came to Richard’s session and his eyes were opened widely after Richard’s presentation so he has embraced that whole dementia focus as well…but the paper work and the rigmarole in getting these things achieved in still significant” (5).

Overall, in regards to barriers, there were common issues raised such as financial barriers, philosophy of care and organisational support. See Table 17 below.

Table 17: Barriers identified by Consultancy Service interviewed participants
Facilitators

Interviewees within the consultancy service emphasised the role of the expert advice in translating the recommendations report into practical, workable strategies. The advice was helpful in clarifying and extending the ideas in regards to what changes were desirable and possible:

“It has helped me immensely, and I really mean this. We had a few ideas that we started with, we soon realised with the consultation that our ideas possibly wouldn’t work...We didn’t have a circular path/walkway, we had a T-section....we’ve made a circular path coming indoors and outdoors. We’d never had that idea on our own” (3).

“Everyone who has been involved has been so appreciative of the advice and help we’ve got...you couldn’t have done more to help. ....If you could get more funding to get more involved, that’d be great. S...this was excellent and felt it is very much wanted out there. We feel lucky we got the Consultancy Service and have been able to implement the changes. The responses we’ve had from it have been phenomenal” (3).

Some interviewees also had an education session for staff as part of the consultation service. This had benefits for the organisational work philosophy. Furthermore, it appeared that more involvement in the consultation process produced greater benefits.

“It had worked quite well particularly with the staff that had been through the whole process...an education session with him [the consultant] certainly helped the local staff. ....You put the right environment at the right practice, then you can really move forward in leaps and bounds for it” (9).

Recommendations for improving the Intervention

Ideas to improve the consultation were mentions by several interviewees. The generation of ideas shows great insight into the utility of ED principles and is a reflection of longer-term adherence to the principles. As previously mentioned, time delay between consultation and report generation was one barrier to ED
endeavours. It was suggested that this could be shortened to continue staff enthusiasm.

There was a reoccurring recommendation from several interview interviewees in regard to feedback. Interviewees were enthusiastic to have a follow-up consultation to validate their design in line with ED principles and to continue development in line with best practice:

“That discussion – it needs more follow-up of some description to see how you’re going and this is what we’ve done, what do you think, just to give the staff a bit of encouragement they’re going in the right direction. I think a follow-up assessment at six months or something like that would be very positive” (4).

“The only thing I was a bit disappointed was after when we’d completed it there was no follow-up” (7).

“I think it’s great and the only thing would be the follow up” (10).

The only other suggestion for improvement to the consultation service was to include a list of relevant contacts; “Those network likes, those contacts, those names” (8).

**Discussion**

This study set out to evaluate the KT potential of three environmental design interventions using a naturalistic study where participants self-selected to one of three interventions (Workshop, iPhone Plus or Consultancy Service). For the iPhone Plus service, participants also had the capacity to self-select for different components within the intervention (app download, audit data upload and teleconference).

**Reach and Participation**

In regards to intervention reach, the iPhone Plus 'BEAT-D Phone app' was downloaded by 226 people with 16 uploading audit data and receiving a report, the workshops were attended by 165 people across three states, and the consultancy service was taken up by 64 individuals during the period of the study. The three intervention clearly have the potential to impact on a large number of residential aged care facilities. The level of participation in all three interventions is also indicative to some degree of the agreement within the residential aged care sector of the need for action in the environment to improve QOL for people with dementia.

Interviews with participants who self-selected to the three interventions suggested that they may differ somewhat in their motivations and goals for taking part. iPhone Plus interviewees revealed they were typically looking for a tool to assess their RACF environment to guide an already intended refurbishment or new build. Similarly Consultancy interviewees were also currently involved in planning for, or in the
process of undertaking, ED refurbishments or new builds. In contrast, interviewees who self-selected for the workshops showed a greater variety of motivations for involvement including general learning and skill acquisition, looking for alternative strategies to promote resident quality of life and some, like the iPhone Plus and consultancy service, were also looking for strategic support for re-designing their RACF.

Awareness of and Agreement with the ED Principles

The overwhelming majority of respondents from all three groups agreed the intervention had increased their ‘Awareness’ of the ED principles. For the iPhone Plus, this is despite the fact that only 2/9 survey respondents participated in the teleconference to discuss their findings. This indicates that even without the ‘Plus’ elements of the intervention, the iPhone App has the capacity to act as a stand-alone educational aide. Workshop interviewees appeared to have been less aware of the ED principles and their potential impact than the iPhone Plus or Consultancy participants. This relatively low level of awareness provided the foundation for their experience of the workshop as being transformative or ‘eye opening’ in regard to their views.

The overwhelming majority of participants in all three intervention groups also ‘agreed’ or ‘strongly agreed’ that the ten ED principles were important for people with dementia. There was less agreement regarding the principles of ‘be small’ and ‘be domestic’. However, these were minor differences and the vast majority still indicated both were important.

Survey respondents in all three intervention groups also ‘agreed’ that participation had increased their awareness of the environmental assessment tools. iPhone Plus interviewees were particularly motivated to access a tool that could provide them with evidence to both guide an intervention and to generate evidence that could be utilised to gain support from management for the ED actions recommended. This indicates that the assessment tools may be useful for ‘advocacy’ in their own right, providing a mechanism for participants to generate broader ‘agreement’ with the ED principles and the need for specific ED actions. The assessments were also used by to compare the participant’s own facility to others and as an educational tool for other staff (iPhone Plus, Workshops). These were not anticipated outcomes.

The vast majority of survey respondents from all three intervention groups had more positive attitudes towards the use of environmental design principles to improve the QOL for people living with dementia in RACFs as a result of participating in an intervention [iPhone Plus 7/9 (78%), workshop 33/38 (87%) and consultancy 32/40 (80%)]. iPhone Plus and consultancy interviewees had been clearly motivated to take part in the interventions by their perceptions that taking action in the environment was an imperative. For consultancy interviewees there was also a sense of the need for their organisation as a whole to improve practices to enhance the environment. They saw the potential for new builds and refurbishments to assist in
building the reputation of their organisations as leaders or ‘best practice’ organisations.

The experience of taking action and witnessing the impact of interventions was also a factor that contributed to increasing the ‘agreement’ that improving the environment was an important thing to do. This suggests that the Pathman domains of awareness to agreement to adoption are not only achieved in a linear fashion, and that the experience of changing one’s practice (adoption) and witnessing a positive outcome can also contribute to a participants’ agreement that an intervention was important. Such an experience may also contribute to future intentions to repeat the favourable action in the future (adherence).

Adoption – Use of the EAT and BEAT_D

In regards to use of the EAT and BEAT_D app as an indicator of ‘Adoption’, Consultancy and iPhone Plus respondents were more likely to indicate their involvement in personal use of the tool to audit their RACF environment as a result of participating in the intervention. For consultancy respondents, this is not surprising as use of the EAT to audit the RACF is supported directly by the consultant for participants in this service. Intention to use the BEAT_D app is also assumed in those who download the app. However, it should be noted that only 16 of the 226 people who registered for the BEAT_D app went on the audit and upload their data to the service. This may suggest that additional support was required by the other 110 people who expressed some degree of intention by downloading the app but did not go on to use it. However it may also be explained by curiosity, downloading a free app just to see what it does.

Interviewees highlighted the use of the BEAT_D app and the audit report in informing their ED modifications by highlighting action areas and providing confidence and validation for design choices. Consultancy interviewees were focused not only on the specifics changes to their environments, but also on the cultural changes that would be necessary to ensure that the organisational philosophy would drive care practices that maximised the use of the environment by residents.

Without the same support just over a quarter of workshop survey respondents used the EAT to audit the RACF environment, and another 29% still intended to use it. From the interviewees, 6/10 had either made or were actively planning to make modifications. This is a reasonable rate of adoption and indicates that the workshops are able to promote environmental assessments in a significant proportion of participants. It is also worth noting, that for workshop participants, this may be an underestimate of actual use – with some of the EAT follow up telephone interviewees revealing that they had conducted an audit using the ‘hand-outs’ and ‘checklist’ provided at the workshop not realising this was the EAT.

Adoption – Modifications to the Environment
In regards to modifications of the environment, the consultancy and iPhone Plus respondents were again more likely than the workshop participants to have initiated ED modifications in their RACF environments. Lower rates for consultancy than iPhone Plus respondents was possibly explained by the nature of the planned interventions, with more ‘new builds’ and larger modifications being planned by consultancy respondents who were still in process of planning or commissioning alterations at the time of the follow-up evaluation. From the interviews, it was also evident that the nature of modifications planned by workshop participants were more likely to be minor changes to the RACF environment. One reason for this may be the fact that participants who self-selected into the workshop group did so for a variety of reasons and were not necessarily actively planning to modify the RACF environment unlike their Consultancy or iPhone Plus counterparts. Interestingly, along with minor ED modification workshop interviewees also reported implementing changes to care practices and activities for people with dementia (for example, changing the activities residents were able to participate in or focusing on communication with residents). These types of responses were not mentioned so commonly by iPhone Plus or consultancy interviewees. The broader focus on care practices within the environment may have been prompted by having less resources or organisational support for actual changes to the building, or by the relatively junior role of the respondents.

Of those who had made ED modifications, iPhone Plus and Consultancy respondents were again more likely than workshop participants to rate the EAT ‘useful’ in informing these modifications. This may be explained by the On-site access of all of the consultancy participants and the teleconference access of the iPhone Plus participants to advice from the consultant in regards to their plans for implementation.

Of those that hadn’t made any modifications, most still expressed an intention to do so. This may be seen as another strong indicator that respondents agreed that it was important to take action, even if they had not moved to the adoption stage of the knowledge translation process. Other evidence from KT education practice in dementia (Phillipson, Reis and Fleming, 2013) suggests that ‘Knowledge Relationships’ may be one mechanism which can support this transition. In the current study, this relational support has been provided by an ‘expert consultant’. However, other mechanism of support such as the development of ‘communities of practice’ or other mentoring arrangements may also be positive in supporting change.

A number of consultancy interviewees had changed roles since their participation in the consultancy service and testified to their use of the EAT or BEAT_D in their new places of work. This indicates the generalisability of the knowledge and skills into new contexts and their potential to improve agreement and adoption in new work places.

Adherence
There is evidence from the interviewees in all interventions that participation had influenced their ongoing practice and those of others in their workplaces. This included not only repeated use of the EAT to inform specific environmental modifications in other facilities but also, the philosophy of care within the RACFs. Several IPhone interviewees had used the EAT on multiple occasions in different facilities and some had recommended it to others. There is also evidence that the philosophy of care of some IPhone interviewees shifted towards a more person-centred approach and that interviewees were keen to learn more and use the BEAT-D app again in the future. This suggests that building on the relationship established with the BEAT D users may also be useful for supporting adherence to the use of the ED principles.

One workshop interviewee discussed changes introduced such as ‘a monthly meeting in their facility to discuss ED and to involve multiple levels of staff’. These meetings focused on how design can contribute to wellbeing and how to move towards a person-centred philosophy of care. Such initiatives would appear to be mechanisms via which the use of ED principles may become part of ‘the way things are done around here’ in that facility and as such represent an outcome from the intervention that indicates success within the ‘Adherence’ domain.

Barriers to KT

Barriers to the use of the EAT or the BEAT_D were not frequently identified by survey respondents. That said, barriers to use of the BEAT_D app may have existed for the substantial number of people who downloaded the app but did not go on to use it to audit their environment and upload their data for analysis. This could have related to numerous factors – however the absence of both an ‘educational’ component (awareness raising) and activities to support the capacity of respondents to use (adopt) the app are likely to be relevant and require additional research.

Overall, Workshop survey respondents were more likely than iPhone Plus or Consultancy survey respondents to nominate barriers. These mainly related to Workshop respondents lack of authority to either audit or make changes in their workplaces, or to a lack of confidence or perceived ability to use the EAT (or the feedback obtained from use of the EAT) to modify the environment. This is likely to relate to both the nature of the respondents who self-selected to the workshops and to the lesser impact of the largely educationally focused workshop intervention.

Interestingly two survey respondents (one workshop and one consultancy) participants indicated that they had not reached a level of agreement that ‘modifying the environment will achieve anything useful for residents with dementia’. This underscores the importance of interventions achieving outcomes within Pathman’s ‘Agreement’ domain as a precursor to going on to ‘Adoption’.

Interviewees across all intervention groups raised a number of common barriers including financial barriers, philosophy of care, staff attitudes and culture, and lack of organisational support. For consultancy interviewees, financial barriers were more
likely to limit the scope of changes, rather than prevent modifications from occurring at all. Other barriers raised only by consultancy interviewees concerned delays in receiving the recommendations report from the consultant. This is interesting as it underscores an imperative for consultants to provide timely feedback and intervention when working with ‘change ready’ or in this case ‘change – active’ organisations. To enrol in the consultancy intervention it was a requirement that organisations were actively involved in initiating or planning refurbishments or new builds. As such, time delays in waiting for the consultant’s reports were impacting on an actual project timelines. The need to work within organisational timelines should be considered within future consultancy services to ensure the intervention can provide the timely feedback required by the real-time project deadlines. Other barriers raised by interviewees from the consultancy service concerned issues concerning the management of modifications and their impact on operation of facilities including on residents present during refurbishments.

Facilitators

Whilst awareness raising activities within the workshop intervention were ‘transformative’ for some of the workshop interviewees, the use of the EAT and BEAT_D app were the main facilitators of KT ‘Adoption’. Use of the tools provided interviewees with confidence that their design endeavours were evidence-based. This evidence was also utilised in advocacy for change at an organisational level. Tool usability was particularly emphasised by iPhone Plus interviewees including user friendly language and the value of the portability of the tool (BEAT_D iPhone app).

Interviewees appreciated the nature of the recommendations from the audit report. These were favoured as they were considered both plausible and flexible for implementation within a range of timeframes and budgets.

A team approach involving communication and collaboration at multiple levels within a facility or organisation was also highlighted as a facilitator of ED change. This was enhanced when it was grounded in a unified philosophy of care (usually PCC) and when ED changes were viewed within this paradigm. The engagement of a team approach appeared to be facilitated by the involvement of the expert within the consultancy intervention, but was also achieved through the facilitation of ED related meetings by motivated participants within the other two interventions.

Consultancy interviewees emphasised the role of the expert in assisting them to translate the recommendations report into practical, site specific and workable strategies. Respondents believed the expert advice had led them to make specific changes they would never have thought about had they been left to respond to the recommendations report on their own. They emphasised the impact this had on producing excellent results.

Both the iPhone Plus and consultancy service interviewees also appeared more ‘ready for change’ than those who self-selected to the workshops. This state of readiness was a significant facilitator, indicating that participants were more likely to
receive support from their organisations to utilise the knowledge gained from the interventions.

**Recommendations for modifications to the interventions**

iPhone Plus participants desired more in-depth information regarding scoring systems and the literature behind the app. Users also desired more items on the tool to assess the nature of external environments. Workshop participants would have liked to be able to access advice on ways to respond to the recommendations report. Consultancy participants emphasised a desire for additional consultations with an expert to assist them with a final assessment or ‘validation’ of their final design choices and modifications. In addition, participants from all interventions would have liked to be provided with other contacts or a list of other professionals services that they could have engaged for further advice given that follow up from the free DTSC consultants was limited or restricted.

**Conclusions and recommendations for future work**

Overall, the three interventions (iPhone Plus, workshops and consultancy service) all demonstrated a capacity to support the translation of environmental design knowledge into environmental improvements. iPhone Plus and consultation service who received advice or input from an expert (iPhone by phone and consultation service face-to-face) emphasised the value of this advice in enhancing the excellence and impact of their ED changes. Even without expert consultancy support, the use of the EAT or the BEAT_D app was also sufficient to support just over a quarter of workshop survey respondents and over half of iPhone Plus survey respondents to audit and improve their RACF environments.

The major limitations to the adoption of the new knowledge were organisational and financial. Change ready organisations appeared to be able to accommodate these limitations and develop strategies to move forward. The role of change readiness appears to be central to the success of the interventions and should repay future research into the means to identify change ready organisations and into the methods for bringing about change readiness.

The findings suggest that the Pathman model of awareness, agreement, adoption and adherence can help in the understanding of the differing contributions that can be made by the ED interventions. Encouraging the development of a tiered approach with workshops being utilised to support the early stages of KT while the iPhone plus and consultancy services support change ready organisations through the final stages.

Recommendations to improve each of the intervention types suggest the benefit of strengthening the pathways between the intervention types. This could include the marketing of the workshops as a further educational option for iPhone Plus
respondents, or marketing the consultancy service as a ‘follow-up’ option to workshop participants. Such a strategy would recognise the different needs of individuals and organisations at different stages of the ‘change’ process and the ability of the interventions to work together as part of an overall strategy, rather than being seen as being in competition with one another.

Overall, the high level of participation in all three interventions is indicative of the agreement within the residential aged care sector of the need for action in the environment to improve quality of life for people with dementia.

References


