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Assessing the quality of environmental design of nursing homes for people with dementia: development of a new tool

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Abstract

Objective To develop an environmental audit tool suitable for use across the spectrum of people with dementia. **Method** The existing Environmental Audit Tool was supplemented with items describing the environmental needs of people in the final stages of dementia. Two independent raters assessed 30 aged care homes using this draft tool and the Therapeutic Environment Screening Survey for Nursing Homes (TESS-NH). The Environmental Audit Tool-High Care, comprising eight sub-scales with acceptable levels of internal reliability, was constructed. Validity was assessed against the TESS-NH and the EAT-HC's ability to differentiate units specifically for people with dementia from other residential care units. **Results** The EAT-HC sub-scales' inter-rater reliability (ICC) ranged from 0.52 to 0.92. Correlations with the TESS-NH were highly significant. The EAT-HC total score differentiated between dementia-specific homes and others. **Conclusion** The EAT-HC can validly and reliably assess environmental features required by a wide range of people with dementia.

Disciplines

Medicine and Health Sciences | Social and Behavioral Sciences

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Assessing the quality of environmental design of nursing homes for people with dementia: development of a new tool

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Abstract

Objective: To develop an environmental audit tool suitable for use across the spectrum of people with dementia.

Method: The existing Environmental Audit Tool was supplemented with items describing the environmental needs of people in the final stages of dementia. Two independent raters assessed 30 aged care homes using this draft tool and the Therapeutic Environment Screening Survey for Nursing Homes (TESS-NH). The Environmental Audit Tool-High Care, comprising eight internally reliable sub-scales with acceptable levels of internal reliability was constructed. Validity was assessed against the TESS-NH and the EAT-HC's ability to differentiate units specifically for people with dementia from others.

Results: The EAT-HC sub-scales inter-rater reliability (ICC) ranged from 0.52 to 0.92. Correlations with the TESS-NH were highly significant. The EAT-HC total score differentiated between dementia specific homes and others.

Conclusion: The EAT-HC can validly and reliably assess environmental features required by a wide range of people with dementia.

Key Words: Assessment: Dementia: Environment Design: Nursing Homes

Key Points:

- The number of aged care beds occupied by people with dementia is increasing steadily.
- There is a need for environmental audit tools that are relevant to the needs of people in the final stages of dementia as well as those who are mobile.
- The Environmental Audit Tool – High Care (EAT – HC) has been developed to meet this need.
- The EAT-HC is available from the Dementia Collaborative Research Centre – Assessment and Better Care (DCRC-ABC) web site

Objectives

The Australian Institute of Health and Welfare estimate that 30% of people with dementia live in residential aged care facilities (RACF) (1). There are more than 104,000 people with a diagnosis of dementia in Australian aged care homes (2). The demand for residential aged care places for people with dementia is estimated to grow at 4% per annum between now and 2029 (3).

Tools have been developed to evaluate the quality of the physical environment in which these people live (4). However they tend to reflect American or European styles of care. The Environmental Audit Tool (EAT) (5-7) has been used extensively in the provision of Australian Government funded consultancy services delivered by the Dementia Training Study Centres and the Dementia Behaviour Management Advisory Services and in research projects (8-11). However the EAT was developed with the needs of the mobile person with dementia in mind.

The objective of this study was to develop and evaluate a new scale to capture information on the features of the built environment that are required by a broad range of people with dementia, including those who are immobile and/or reaching the end of their lives.

Method

The 72 items of the original EAT were supplemented with 56 items developed from the Dementia Collaborative Research Centre – Assessment and Better Care project ‘Defining the desirable characteristics of physical environments for the delivery of support and care to people in the final stages of dementia’(12) and the experience of the authors in auditing many aged care facilities. The items were organised around the ten principles used in the EAT (6).

1. Be safe and secure
2. Be small
3. Be simple with good visual access
4. Have unnecessary stimulation reduced
5. Have helpful stimuli highlighted
6. Provide for planned wandering
7. Be familiar
8. Provide opportunities for a range of social interactions
9. Encourage links with the community

10. Be domestic in nature (Broadened in this study to ‘Support the values and goals of care’ to reflect the fact that the facility managers and residents have a right to select goals of care that do not focus on involvement in domestic activities, particularly in high care settings where the immobility of the residents and the extent of their cognitive decline makes this very difficult,)

The items were formatted to provide clear directions on scoring, e.g.

| Be simple with good visual access | Scoring key | Score |
|---|------------------------------|--------------|
| Can the dining room(s) used by most residents be seen into from where staff spend most of their time? (NA=no dining room) | Yes = 1 No = 0 NA = NA | |

| Enhance helpful stimulation | Scoring key | Score |
|--|---|--------------|
| What percentage of residents have a window that provides an attractive view to the outside from their bed? | 25% or less = 0 26%-50% = 1 51%-75% = 2 76% or more =3 | |

A convenience sample of 30 residential aged care homes in NSW was established in which to assess the inter-rater reliability and validity of the combined items. The sample size was determined by reference to the graph provided by Streiner and Norman (13) and by the application of the formula provided by Walter to optimise the number of observations required in inter-rater reliability studies (14) to achieve a power of 80% assuming that the EAT-HC has an inter-rater reliability that is similar to the EAT, i.e. an ICC above 0.9.

Approval for the research was obtained from the University of Wollongong Human Research Ethics Committee.

The Therapeutic Environment Screening Survey for Nursing Homes (TESS-NH) (15) was selected for the validation of the EAT-HC. It was originally validated in 44 nursing homes (15) and has been used in many research projects evaluating the quality of environments for people with dementia. A comparison of its psychometrics with the EAT and useability in the Australian context is available (5). The TESS-NH provides a Global Rating of the quality of the environment and a summary scale, the Special Care Unit Environmental Quality Scale (SCUEQS). While the frequent use of the TESS-NH in research warrants its position as the current gold standard of dementia care environmental assessment tools, its items reflect a very clinical approach to care which reduces its usefulness in the Australian context where dementia care environments aim to be more familiar and homelike.

Two inexperienced raters were employed to audit the facilities to simulate the likelihood that the EAT-HC will be used by people with little experience of carrying out environmental audits. The raters were introduced to the EAT-HC and the TESS-NH by RF. They were provided with handbooks on both the EAT-HC and the TESS-NH. RF and the raters then conducted an audit of an RACF and discussed the similarities and differences between the results. The raters then conducted two more audits, discussing their results with each other and with RF. They were then considered to have had an adequate introduction to the use of the EAT-HC and the TESS-NH.

The raters independently evaluated the environments used to accommodate people with dementia in the sample. They rotated the order of the assessments to counteract the influence of a knowledge of the TESS-NH results on the EAT-HC ratings and vice versa.

The data were analysed using IBM SPSS statistics 19.

The analysis identified fifty items that had poor levels of agreement between the raters (<70% of agreement or Kappa <0.2). These were eliminated from further analysis aimed at maximising the internal consistency of the sub-scales. Cronbach's alpha was calculated on each sub-scale and those items that were reducing internal consistency were considered for elimination. Items were retained if they were likely to capture important information, relevant to identifying features in the environment that could be improved, provided they did not render the internal consistency unacceptable by reducing Cronbach's alpha to below 0.6.

The revised version of the EAT-HC was then compared with the SCUEGS and Global Scores of the TESS-NH to establish its validity.

Results

The sample of 30 residential facilities included a wide range of provision of high care accommodation for people with dementia (Table 1). The mean EAT-HC score for the 14 units that provided dementia specific accommodation was significantly higher ($p=0.018$, 2-tailed) than for the other units.

Table 1: Type of unit audited

| | Frequency |
|---|-----------|
| Segregated special care unit | 5 |
| Cluster of rooms specifically for people with dementia | 9 |
| High Care without specific accommodation for people with dementia – >75% of residents have dementia | 7 |

| | |
|---|---|
| High Care without specific accommodation for people with dementia – > 50% and < 75% of residents have dementia | 5 |
| High Care without specific accommodation for people with dementia – >30% and < 50% of residents have dementia | 3 |
| Combined high and low care without specific accommodation for people with dementia – 50% of residents have dementia | 1 |

The Pearson correlations between the Total EAT-HC score and the TESS-NH Global Rating and SCUEGS scores were 0.715 and 0.338 respectively both significant at the 0.01 level.

Table 2: Internal consistency and inter-rater reliability of Environmental Audit Tool – High Care (EAT-HC) sub-scales

| | Number of items in revised EAT-HC | Internal Consistency (Cronbach's Alpha) | Inter-rater Reliability (Intra Class Correlation Coefficient) |
|---------------------------------------|-----------------------------------|---|---|
| Safety | 16 | 0.88 | 0.81** |
| Size and Scale | | | |
| Number of people | 1 | | 0.99** |
| Scale of public spaces | 1 | | 0.52* |
| Visual Access | 10 | 0.73 | 0.75** |
| Stimulus Reduction | 7 | 0.36 | 0.78** |
| Stimulus Enhancement | 19 | 0.68 | 0.91** |
| Combined stimulus management scale | 26 | 0.66 | 0.90** |
| Movement and engagement | 9 | 0.69 | 0.85** |
| Familiarity | 4 | 0.57 | 0.78** |
| Variety of spaces | 6 | 0.72 | 0.83** |
| Links to the community | 3 | 0.39 | 0.65** |
| Variety of spaces and community links | 9 | 0.62 | 0.800** |

*p=0.03 ** p<0.001

The internal consistency of six of the sub-scales, as measured with Cronbach's alpha, were satisfactory, ranging from 0.57 to 0.88 (Table 2).

Discussion

The analysis of the levels of agreement on the scoring of the items and the contribution of the items to the internal consistency of the scale resulted in the exclusion of 50 items. Three of the subscales did not have acceptable levels of internal consistency. The Size sub-scale was not internally consistent because of the poor correlations between items on size of space and numbers of people. One question for each construct was selected on the basis of its inter-rater reliability. These are included in the final scale as independent items under the heading Size and Scale.

The lack of internal consistency in the Stimulus Reduction sub-scale was addressed by combining it with the Stimulus Enhancement sub-scale to form a Stimulus Management sub-scale dealing with the spectrum of stimulus control features used to maximise helpful stimulation and minimise unhelpful stimulation. Similarly it was recognised that the Links to the Community sub-scale, containing items on provision of spaces for meeting with family, friends and other members of the community, can be seen as an extension of the Variety of Spaces principle. When these two sub-scales are combined the new sub-scale, Variety of Spaces and Community Links, has a satisfactory internal consistency of 0.62.

The final sub-scale comprises two questions designed to capture the views of the manager on how well the design of the unit supports the achievement of the goals of care. As this is simply a record of the manager's opinion it is not appropriate to calculate inter-rater reliability or internal consistency.

The analysis of the internal consistency data and the elimination of items with poor inter-rater reliability resulted in the final version of the EAT-HC containing 77 items organised around eight principles of design.

The significant correlations between the EAT-HC total score and the Global Score and SCUEGS scales from the TESS-NH support the validity of the EAT-HC. It is acknowledged that as the TESS-NH and EAT-HC were completed by the same raters it is possible that the correlations have been inflated by their knowledge of the scores given in the first assessment they used.

Validity was further assessed by comparing the mean EAT-HC scores of those units where specific accommodation for people with dementia was available and the other, non-dementia specific units. The dementia specific units scored significantly higher

on the EAT-HC indicating that the new scale is able to discriminate between dementia specific and non-specific units.

As the length and format of the EAT-HC differs from the original collection of items complete confidence in its psychometric properties requires further testing in the new format.

Conclusion

This project has resulted in the production of a new scale based on items which closely reflects the needs of people with dementia being cared for in high care units.

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