



**AOTA Critically Appraised Topics and Papers Series**  
**Alzheimer's Disease**

*\*A product of the American Occupational Therapy Association's  
Evidence-Based Literature Review Project*

**CRITICALLY APPRAISED PAPER (CAP)**

***Focused Question***

**What is the evidence for the effect of interventions designed to modify and maintain perceptual abilities on the occupational performance of persons with dementia?**

Elmståhl, S., Annerstedt, L., & Åhlund, O. (1997). How should group living unit for demented elderly be designed to decrease psychiatric symptoms? *Alzheimer Disease and Associated Disorders*, 11, 47–52.

**PROBLEM STATEMENT (JUSTIFICATION OF THE NEED FOR THE STUDY)**

State the problem the authors are investigating in this study.

Group living facilities in Sweden are intermediate settings between home care and nursing home care. They are usually built for six to eight residents, with private space for each person, along with common areas including a living room, kitchen, dining room, and laundry shared by residents and staff. While it is known that the physical design of environments influences behaviors of people with dementia, there have been no studies of the influence of the design of group living units on social interactions or other outcomes.

**RESEARCH OBJECTIVE(S)**

List study objectives.

“The aim of the present study was to evaluate the possible influence of the design of group living units on behavioral reactions in demented elderly patients” (p. 48).

Describe how the research objectives address the focused question.

The physical design of a space directly targets perception of the person with dementia. Design can use remaining perceptual abilities to enable remaining occupational performance abilities. It might also impede the use of remaining abilities. By focusing on evaluating the design of units, this study may provide insights into how perception can be targeted through environmental design to influence occupational performance outcomes.

**DESIGN TYPE:**

Cohort study – 3 groups based on floor plans of the group living facilities

**Level of Evidence:**

II

Limitations (appropriateness of study design):

Was the study design type appropriate for the knowledge level about this topic? *If no, explain.*

Yes

No  It may have been possible to randomly allocate participants to design groups. It is not clear how allocation decisions were made.

**SAMPLE SELECTION**

**Inclusion Criteria**

Inclusion criteria not clearly provided. All people with dementia allocated to 18 group living units in the city of Malmö, Sweden were included. To be admitted to a group living facility, a care planning team judged that the patient’s home care situation was insufficient, and a diagnosis of dementia was confirmed.

**Exclusion Criteria**

NR

NR = Not reported

Sample Selection Biases: *If yes, explain.*

Volunteers/Referrals

Yes

No

Attention

Yes

No

Others (list and explain):

**SAMPLE CHARACTERISTICS**

N= 105

% Dropouts	0		
# (%) Male	12 (11.4%)	# (%) Female	93 (88.6%)
Ethnicity	NR		
Disease/disability diagnosis	Alzheimer’s-type dementia (37%); vascular dementia (58%), other dementia (5%)		

Check appropriate group:

<20/study group	20–50/study group	51–100/study group	101–149/study group	150–200/study group
✓				

NOTE: Group sizes were highly variable because of the number of units in particular designs. There were 18 units in total; 14 units (with 66 residents) were in corridor-like designs (Group A); 1 unit (with 8 residents) was in an L-shaped unit (Group B); and 3 units were either a square or H-shaped design (Group C) with 31 residents.

Sample Characteristics Bias: If no, explain.

If there is more than one study group, was there a similarity between the groups?

Yes	At baseline, there were no significant differences among the three groups in age, diagnosis, severity of dementia, independence in activities of daily living (ADL), Mini-Mental State Examination (MMSE) score. Differences were noted in three specific psychiatric symptoms (lack of vitality, restlessness, and time disorientation).
No	<input type="text"/>

Were the reasons for the dropouts reported?

Yes	N/A
No	<input type="text"/>

**INTERVENTION(S)**—Included are only those interventions relevant to answering the evidence-based question.

*Add groups if necessary*

Group 1

Brief Description	Group A
Setting	Corridor-like unit design
Who Delivered?	Not applicable
Frequency?	Observation at 3 points over a 3-month period
Duration?	3 months

Group 2

Brief Description	Group B
Setting	L-shaped unit design
Who Delivered?	Not applicable
Frequency?	Observation at 3 points over a 3-month period
Duration?	3 months

Group 3

Brief Description	Group C
Setting	Square or H-shaped unit design
Who Delivered?	Not applicable
Frequency?	Observation at 3 points over a 3-month period
Duration?	3 months

Intervention Biases: *Explain, if needed.*

Contamination

Yes

No

Co-intervention

Yes  The authors do not make clear whether or not ward floor plan is the only difference in intervention between the 3 groups of residents. It is possible that other factors may have co-existed, e.g., proximity to shopping districts, staffing levels, and so on.

No

Timing

Yes

No

Site

Yes

No

Use of different therapists to provide intervention

Yes  As per comment under co-intervention, it is not clear that all other aspects of the units were the same except for the floor plan.

No

**MEASURES AND OUTCOMES**—Included are measures relevant to answering the focused question.

Name of measure:

Organic Brain Syndrome (OBS) scale

Outcome(s) measured (what was measured?):

Confusional symptoms (39 items) and symptoms of disorientation (15 items)

Is the measure reliable (as reported in article)?

Yes

No

NR

Is the measure valid (as reported in article)?

Yes

No

NR

How frequently was the measure used for each group in the study?

Baseline (2 months prior to admission); 6 and 12 months post-admission

Measurement Biases

Were the evaluators blinded to treatment status? If no, explain.

Yes

No  Blinding not described.

Name of measure:

Therapeutic Environment Screen Scale (TESS)

Outcome(s) measured (what was measured?):

Physical environment

Is the measure reliable (as reported in article)?

Yes

No

NR

Is the measure valid (as reported in article)?

Yes

No

NR

How frequently was the measure used for each group in the study?

Not reported. It appears that the environment was evaluated once but it is not clear when this was completed.

Measurement Biases

Were the evaluators blinded to treatment status? If no, explain.

Yes

No  An architect evaluated each unit at the same time (between 10 a.m. and 2 p.m.). It is not stated that he or she was blinded to the purpose of the study.

Name of measure:

Berger scale

Outcome(s) measured (what was measured?):

Degree of severity of dementia

Is the measure reliable (as reported in article)?

Yes

No

NR

Is the measure valid (as reported in article)?

Yes

No

NR

How frequently was the measure used for each group in the study?

Not reported; only baseline data reported.

### Measurement Biases

Were the evaluators blinded to treatment status? *If no, explain.*

Yes

No  Blinding of assessors not mentioned

Name of measure:

Katz Index of ADL

Outcome(s) measured (what was measured?):

Physical dependency

Is the measure reliable (as reported in article)?

Yes

No

NR

Is the measure valid (as reported in article)?

Yes

No

NR

How frequently was the measure used for each group in the study?

NR; only baseline data reported.

Measurement Biases

Were the evaluators blinded to treatment status? *If no, explain.*

Yes

No  Blinding of assessors was not mentioned

Name of measure:

Mini-Mental State Examination (MMSE)

Outcome(s) measured (what was measured?):

Mental capacity

Is the measure reliable (as reported in article)?

Yes

No

NR

Is the measure valid (as reported in article)?

Yes

No

NR

How frequently was the measure used for each group in the study?

Not reported; only baseline data reported.

### Measurement Biases

Were the evaluators blinded to treatment status? *If no, explain.*

Yes

No  Blinding of assessors was not mentioned.

Recall or memory bias *If yes, explain.*

Yes

No

Others (list and explain):

Limitations (appropriateness of outcomes and measures) *If no, explain.*

Did the measures adequately measure the outcome(s)?

Yes

No  Although it appears that measures were adequate, limited information about reliability and validity is provided.

## **RESULTS**

List results of outcomes relevant to answering the focused question

Include statistical significance where appropriate ( $p < 0.05$ )

Include effect size if reported

- Time orientation: After 6 months, Group B had less time disorientation than group A ( $p < 0.05$ ).
- Own identity: After 12 months, Group A had significant reductions (within group) in identity ( $p < 0.05$ ), while the other 2 groups did not have similar reductions (between groups differences not statistically significant).

- Observed symptoms did not differ in units with ample lighting compared to the others.
- No differences were found between the amount of space or amount of activity space within a unit and confusional or disorientation symptoms.
- Larger communication areas were associated with less recent memory disorientation ( $r = -0.16, p = 0.05$ ), and less time disorientation and less identity disorientation (not statistically significant).

Was this study adequately powered (large enough to show a difference)? *If no, explain.*

Yes

No  Because one group (Group B) had only 8 residents, it is likely that power was not adequate to confidently state that other significant differences were undetected. Power calculations were not reported in the study.

Were appropriate analytic methods used? *If no, explain.*

Yes

No

Were statistics appropriately reported (in written or table format)? *If no, explain.*

Yes

No

## CONCLUSIONS

State the authors' conclusions that are applicable to answering the evidence-based question.

“The architectural design of group living units for demented elderly patients is important. A design that facilitates perceptual concept without reducing communication area is preferred” (p. 52).

Were the conclusions appropriate for the Study Design (Level of Evidence)? *If no, explain.*

Yes

No

Were the conclusions appropriate for the statistical results? *If no, explain.*

Yes

No  Because there was no significant difference in the area available for communication and most symptoms of residents, it is not clear why the authors have concluded that communication area should not be reduced. (Although this seems logical, the data from this study does not strongly support this.)

Were the conclusions appropriate given the study limitation and biases? *If no, explain.*

Yes

No

## IMPLICATIONS FOR OCCUPATIONAL THERAPY

This section provides guidance about clinical practice, program development, and other implications of the study findings as they relate to the focused question.

In terms of the occupational performance outcomes from this study (orientation to time and own identity), the results suggest that there may be value in further research on the floor plans of group living units. However, the limitations of this study make it difficult to make recommendations related to which clinical practice or design (floor layout) to focus on perception through environmental design as a means of enabling occupational performance.

This work is based on the evidence-based literature review completed in August 2005 by Lori Letts, PhD, OT Reg. (Ont.); Jacqueline Minezes, BSc (OT), OT Reg. (Ont.); Julie Berenyi, BHSc (OT) OT Reg. (Ont.); Mary Edwards, MHSc, OT Reg. (Ont.); Kathy Moros, BHSc (OT), OT Reg. (Ont.); Colleen O'Neill, BSc (OT), OT Reg. (Ont.); and Colleen O'Toole, MSc (OT), OT Reg. (Ont.).

CAP Worksheet adapted from: Critical Review Form – Quantitative Studies ©Law, M., Stewart, D., Pollack, N., Letts, L., Bosch, J., & Westmorland, M., 1998, McMaster University. Used with permission.

For more information about the Evidence-Based Literature Review Project, contact the American Occupational Therapy Association, 301-652-6611, x 2052.



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