

A Comparison of Cognitive and Functional Care Differences in Four Long-term Care Settings

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Matching residential setting with cognitive and physical abilities is crucial for the provision of a supportive long-term care (LTC) environment. This study compares the cognitive and functional care differences of LTC residents on skilled nursing units designed for dementia care, chronic care, or ambulatory care, and an assisted living setting using the Minimum Data Set (MDS) Texas Index of Level for Effort (TILE) clinical categories (heavy care, rehabilitation/restorative, clinically unstable, clinically stable), MDS Activities of Daily Living (ADL), and Mini-Mental State Examination (MMSE). The goal of the comparison was to find a parsimonious approach for determining resident placement in LTC using the MDS and MMSE. Using a descriptive comparative design, the study took place at a not-for-profit, urban, continuing care retirement

center (CCRC) with a 120-bed skilled nursing facility and a 34-unit assisted living facility. Sixty residents, 15 from each of the 3 skilled nursing units and assisted living unit, consented to participate. To understand the differences in the MDS and MMSE scores between units, a Level of Care Algorithm was constructed to analyze resident placement. Results revealed that MDS and MMSE scores placed greater than 75% of elders who had extremely poor cognitive or physical function but did not discriminate well for residents with moderate cognitive and/or physical impairment. For these residents, interaction between institutional philosophy (aging in place versus moving to a new location); resource availability; and elder, family, and staff values and preferences may have influenced placement. (*J Am Med Dir Assoc* 2006; 7: 96–101)

SCENARIO

Son/Daughter

We are exhausted taking care of Mom. She can't take care of herself. We go by her house every day just to make sure she is OK. She needs some help, more than we can do for her. Maybe she can move into one of the little cottages and someone can check on her every once in awhile. That would be enough, just someone to check on her frequently. We can't take away too much of Mom's independence because she has always been self-sufficient. She raised us by herself.

Admission Assessment

Mrs. Smith is an 88-year-old widow who has been living alone in her own home for 20 years. Her son and daughter live in the same city and have been checking on her daily for the past 2 years to make sure she gets out of bed, bathes, dresses, and eats. For the past 2 months, these daily checks have been taking more and more time. Their mother needs help, but just how much help is the question.

Should Mrs. Smith be relocated to a long-term care (LTC) facility? If so, what level of care should be recommended to meet her needs?

BACKGROUND

The difficult decision to relocate to a retirement facility typically comes secondary to declines in cognitive and/or functional status.¹⁻⁴ Decisions to enter a LTC facility are often made without knowledge of what types of residential care are available and what factors should be considered when choosing a LTC setting. Information must be provided to match residential setting with cognitive and functional abilities for the provision of a supportive environment. If a setting is too restrictive, then quality of life may be diminished

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because of loss of independence. If a setting is too autonomous, then quality of life may be diminished because of failure to meet care needs. In addition, mismatching places a greater cost burden on the health care system.

Values and preferences of the elder, family, and staff also guide housing decisions.^{5,6} In addition, some elders prefer family members to make decisions while others prefer active involvement in their own care decisions.⁷ Preferences may be stated when considering specific facilities, but the clinical judgment of the LTC staff frequently overshadows selection of a particular care environment. Clinical judgment may be facilitated by the use of assessment tools prior to recommending a particular residential setting. Only one tool, the Resident Profile, was found in the literature that combines physical parameters, functional performance, mental health, cognitive status, and social support into a cut-off score for assisted living versus skilled nursing.⁸ The tool is difficult to locate and, as a result, not widely used in the clinical setting for making placement decisions. In addition, differences in care needs exist among residents in skilled nursing. This study compares the cognitive and physical care differences of LTC residents on units designed for dementia care, chronic care, ambulatory care, and assisted living using the Minimum Data Set (MDS) Texas Index of Level for Effort (TILE) clinical categories (heavy care, rehabilitation/restorative, clinically unstable, clinically stable), MDS Activities of Daily Living (ADL), and Mini-Mental State Examination (MMSE).

The MDS and MMSE are frequently used to assess functional and cognitive status. No studies have tested their combined effectiveness in matching care needs with residential setting. These tools have the advantage over multidimensional tools because of their simplicity and current widespread use. Because a recommended setting may not be the client's or family's preference, easily understood criteria can also assist potential residents and family members to openly discuss matching of care needs with resources. Examining differences in MDS and MMSE scores of LTC residents is the first step in testing the usefulness of these tools in placement of residents according to care needs.

PURPOSE OF THE STUDY/RESEARCH QUESTIONS

The purpose of this study was to compare LTC residents' cognitive and physical care differences on skilled nursing units and an assisted living unit using tools currently in the clinical setting. The following research questions guided the study:

1. Is there a difference in MDS TILE clinical categories based on resident location?
2. Is there a difference in MMSE categories based on resident location?
3. Is there a difference in MDS ADL scores based on resident location when age is controlled?

RESIDENT LOCATION

LTC nursing care is typically provided on units where residents are clustered according to type or intensity of care needed. Residents living on 3 types of skilled nursing units and 1 assisted living unit participated in this study. The skilled

nursing units were designed and staffed to meet specialized resident cognitive and/or physical care needs: (1) dementia care provided nursing care to residents with moderate to severe cognitive impairment requiring moderate to extensive physical assistance to complete ADL, (2) chronic care provided nursing care to residents with physical conditions requiring extensive physical assistance to complete ADL, and (3) ambulatory care provided nursing care to residents with physical conditions requiring moderate physical assistance to complete ADL. In assisted living, residents were expected to meet their physical care needs with minimal assistance.

The 3 skilled nursing units are located in one building and the assisted living facility is attached, allowing for relocation as physical care needs increase. Staff do not rotate and differences in resident care needs are handled on an individual basis in consultation with family.

CONCEPTUAL FRAMEWORK

Lawton's model of person and environment (P-E) fit provides a framework for the study.⁹ Application of the model to the elderly rests with the view that a person's ability to cope with the environment declines with age or disability. In this study, functional decline (measured by the MDS ADL subscale) and cognitive decline (measured by the MMSE) result in care needs (reflected by the MDS TILE clinical category). Care needs are deficits in one or more activities of daily living that sustain life and prevent injury. The ability to mobilize resources to meet care needs is a predictor of well being.⁹

METHODS

Design

A descriptive comparative design was used. Differences in selected MDS and MMSE data between residents in 3 skilled nursing units designed for dementia care, chronic care, and ambulatory care, and residents living in an assisted living setting were examined. The objective of this research was to examine how useful selected MDS and MMSE data were in explaining resident location.

Setting

The study took place at a not-for-profit, urban, continuing care retirement center (CCRC) with a 120-bed skilled nursing facility and a 34-unit assisted living facility. Residents are required to be 55 years of age or older (unless living with a spouse who is 55 years of age or older) and are predominantly female.

Sample

After Institutional Review Board approval, a listing of skilled nursing unit and assisted living residents was obtained. Subjects had to be living on one of these units to be included in the study. Subjects were excluded if they were unwilling to answer questions or MDS data were absent or incomplete. The sample included 4 groups of 15 from each area. Simple random sampling was used to select potential subjects. Guardians were contacted by phone and mailed a consent form. Once completed, resident assent was required. If a guardian

was not designated for clinical care, an MMSE score of 24 or higher determined capacity to consent. Eighty-nine residents and/or their guardians were contacted before 15 subjects from each of the 3 skilled nursing units and assisted living unit consented (N = 60; total response rate = 67%; male response rate = 61%; female response rate = 70%). The 33% rate of refusal (72% guardians, 28% subjects) is of concern because it may be related to the resident's cognitive and/or physical decline. No data were collected on potential subjects who refused to participate.

The demographic characteristics of the sample were obtained from the MDS. Participants ranged in age from 66 to 102 (mean = 87). Although residents in the chronic care unit were the oldest (mean = 89.7 years), and those in assisted living were the youngest (mean = 84.5 years), 1-way ANOVA found no significant difference in age among the 4 groups of participants (F = 1.764, df = 3, ns). Twenty-three percent of the participants had less than a high school education, 21% had a high school education, and 55% had greater than a high school education. A majority of the participants (75%) were widowed.

Instruments

The MMSE and portions of the MDS were selected because of their routine use in LTC. The MMSE is one of the most widely used instruments to assess cognition.^{10,11} MDS completion is mandated by the federal government, providing a practical way to track and retrieve resident information.¹²

MMSE

The MMSE, one of the most widely used and best studied tests of cognitive function, estimates the severity of cognitive impairment in 6 cognitive areas: orientation, registration, attention, calculation, recall, and language. Scores range from 0 to 30, 30 indicating the highest cognitive functioning. Recommended as a screening tool, a low score indicates the need for further evaluation. The following standardized cut-off levels were used: no cognitive impairment, mild cognitive impairment, or mild dementia—24 to 30; moderate cognitive impairment or moderate dementia—18 to 23; severe cognitive impairment or severe dementia—0 to 17.¹¹

MDS

The MDS was developed to perform uniform assessment on every US nursing home resident receiving federal funds for reimbursement. It concentrates on conditions that affect the physical, cognitive, and psychosocial status of LTC residents.

From the screening, clinical, and functional measures, care needs of residents are identified and plans of care initiated.^{13,14} Research has found the MDS to be an adequate source document for identifying residents' clinical needs¹⁵ and its various subscales have been correlated with other tools that measure cognition, activities of daily living,¹⁶⁻¹⁹ nutritional status,²⁰ fluid intake,²¹ and short-term mortality.²²

The MDS ADL scores functional ability. ADLs are scored from 1 to 3 according to ability to transfer, eat, and toilet, with scores ranging from 3 to 9 (the lower the score, the more independent the resident). The TILE clinical category determines resident care needs. Texas requires LTC residents to be classified into 1 of 4 TILE clinical categories (heavy care, rehabilitation/restorative, clinically unstable, and clinically stable) based on condition, functional ADL performance, and level of staff intervention.¹⁴

Procedure

MDS forms, completed by the assistant director of nursing, were available on residents' charts in the skilled nursing facility. Because the MDS is not routinely completed in assisted living, a registered nurse with experience in LTC completed the required 15 MDS forms in assisted living. MDS forms were examined for completeness by the researcher.

Residents were placed in 1 of 4 clinical categories by both the primary investigator (PI) and the research assistant based on the TILE case-mix classification and ADL score. Interrater reliability between the PI and research assistant was assessed by Cohen's kappa for clinical categories and by Pearson's r for ADL score. Based on all 60 cases, kappa = 0.879, P < .001 for clinical categories, and r = 0.982, P < .001 for ADL score. Both tests indicated high level of interrater agreement. The MMSE was conducted and recorded by the PI and research assistant for 12 (20%) randomly selected cases. Agreement between the PI's and research assistant's rating of MMSEs was 100%.

DATA ANALYSIS/RESULTS

Research Question 1

A chi-square test for contingency tables revealed a significant association between resident location and clinical category, χ^2 (9, n = 60) = 31.83, P < .001. The chronic care unit had the highest percentage of residents in the institution requiring heavy care. Dementia care and assisted living had the highest percentage of residents in the institution who

Table 1. Resident Location Versus Clinical Category, n (%)

Clinical Category	Dementia Care	Chronic Care	Ambulatory Care	Assisted Living	Total
Heavy care		9 (60)	2 (13)		11 (18)
Rehabilitation	6 (40)	3 (20)	5 (33)	3 (20)	17 (28)
Clinically unstable	1 (7)	2 (13)	3 (20)	1 (7)	7 (12)
Clinically stable	8 (53)	1 (7)	5 (33)	11 (73)	25 (41)
Total	15 (100)	15 (100)	15 (100)	15 (100)	60 (100)

Table 2. Resident Location Versus MMSE Category, n (%)

MMSE Category	Dementia Care	Chronic Care	Ambulatory Care	Assisted Living	Total
Severe	11 (73)	12 (80)	5 (33)	1 (7)	29 (48)
Moderate	1 (7)	2 (13)	5 (33)	3 (20)	11 (18)
None/mild	3 (20)	1 (7)	5 (33)	11 (73)	20 (33)
Total	15 (100)	15 (100)	15 (100)	15 (100)	60 (100)

were clinically stable. Rehabilitation and clinically unstable residents were found throughout the institution (Table 1).

Research Question 2

A chi-square test for contingency tables revealed a significant association between resident location and MMSE category, $\chi^2 (6, n = 60) = 25.52, P < .000$. The dementia care and chronic care units had the highest percentage of residents in the institution with severe cognitive impairment/severe dementia. Assisted living had the highest percentage of residents in the institution with no cognitive impairment/mild cognitive impairment/mild dementia. Resident cognition ranged from severe to none on all units (Table 2).

Research Question 3

This research question was tested by an analysis of covariance (ANCOVA) in which the dependent variable was ADL score, the independent variable was location, and the covariate was age. There was a significant main effect of location on ADL scores, $F (3, 55) = 19.49, P < .000$, age not being a significant covariate.

Planned comparisons following the ANCOVA revealed ADL scores in dementia care, chronic care, and ambulatory care residents were different from assisted living residents. Estimated marginal means of ADL scores adjusted for age show ADL scores were similar for dementia care (mean = 4.4, SD = 1.12) and ambulatory care (mean = 4.67, SD = 1.23), higher for chronic care (mean = 6.2, SD = 1.15), and lower for assisted living (mean = 3.1, SD = 0.52).

Table 3. Location in Facility Based on Algorithm

Location in Facility	Location in Facility Based on Algorithm			
	Dementia Care	Chronic Care	Ambulatory Care	Assisted Living
Dementia care				
Count	9	3	2	1
% based on algorithm	75%	15%	14.3%	7.1%
Chronic care				
Count	1	12	2	0
% based on algorithm	8.3%	60%	14.3%	0%
Ambulatory care				
Count	1	5	7	2
% based on algorithm	8.3%	25%	50%	14.3%
Assisted living				
Count	1	0	3	11
% based on algorithm	8.3%	0%	21.4%	78.6%

DISCUSSION

We set out to find a parsimonious approach for explaining resident placement in LTC using the MDS and MMSE. To better understand differences in resident MDS and MMSE scores, a Level of Care Algorithm (Appendix 1) was synthesized from the data. The algorithm required 2 steps for placement evaluation:

Step 1 If a resident meets one of the TILE heavy care criteria or has an ADL score ≥ 6 , placement on a chronic care skilled nursing unit is recommended.

Step 2 If a resident did not require heavy care, the MMSE and MDS ADL scores determine placement recommendations:

- MMSE score of ≤ 17 and ADL score of ≤ 5 : placement on a dementia care skilled nursing unit is recommended;
- MMSE score of ≥ 18 and ADL score of < 6 : placement on an ambulatory care skilled nursing unit is recommended;
- MMSE of ≥ 24 and ADL score of 3: placement on an assisted living unit is recommended.

Actual resident location was compared to the resident location recommended using the algorithm. The algorithm was found to agree with actual resident placement for 75% of the 15 residents on the dementia care skilled nursing unit, 60% of the 15 residents on the chronic care skilled nursing unit, 50% of the 15 residents on the ambulatory care skilled nursing unit, and 78.6% of the 15 residents on assisted living

(Table 3). These percentages highlight the ability of the selected MDS ADL and MMSE scores to place individuals at the extremes of cognitive and/or physical functioning (dementia care versus assisted living), but underscore their inability to place residents with moderate cognitive and physical impairment (chronic care versus ambulatory care). The complex interaction of cognitive and physical function cannot be completely told with MDS ADL and MMSE scores.

The institution in which this study was conducted used a combination of aging in place, changing location, and resident and family values and preferences to guide placement. Aging in place implies that as the older adult's needs increase, the elder will remain at their location of choice and that services will be adjusted to meet changing needs. To be successful, however, the environment must be supportive of independence through coordinated health care services.^{23,24} At this CCRC, it was not unusual for residents or their families to facilitate aging in place by paying for additional support services (eg, home health, sitters). Residents were moved to a higher level of care when care needs exceeded what could be provided by the staff or support services. Whether choosing to age in place or relocate, the resident and/or family was involved in the placement decision, with values and preferences providing the leeway for the addition of support services or transfer to a higher level of care.

Findings from this study explain how the extremes of cognitive and physical deficiencies affect resident placement in the LTC setting. However, resource availability and values and preferences may have influenced placement of residents with moderate cognitive or physical dysfunction to a greater extent than expected at the onset of the study. Future prospective studies need to include resident, family, and staff values and preferences. In addition, family and resident satisfaction or quality of life would be important outcomes for determining the impact or personal cost of resident placement on a particular unit. The algorithm derived to explain resident placement was a useful tool for teasing out the contribution of MDS clinical categories, MDS ADL, and MMSE scores for overall placement and will serve as a foundation for future prospective studies.

LIMITATIONS

Although this study occurred at a single CCRC, the sample represented 42% of the institution's skilled nursing and assisted living population. The 33% rate of refusal may have affected study results. Reasons for refusal were residents not wanting to be bothered, fear that the study results may indicate a worsening state of health, and guardians not wanting to further agitate their family member with lots of questions. These reasons relate to the study's variables, cognitive and functional decline, thus raising concern about the impact of resident refusal on study results.

This was a retrospective study of LTC residents after placement on a skilled nursing or assisted living unit. Future studies should be prospective, using control and experimental groups to determine how MDS TILE clinical categories and MDS ADL and MMSE scores combine with resident, family, and staff values and preferences to best determine placement. Best

practices are not standardized for the industry. Increased understanding of what factors are considered for placement would be useful whether used in a uniform fashion or taken into consideration for each individual resident. Standardized cut-off levels for the MMSE were used to categorize level of cognitive impairment. An MMSE score of between 24 and 30 indicated no cognitive impairment, mild cognitive impairment, or mild dementia. These cut offs have been established for screening purposes. Scoring may need to be further delineated into two additional categories, 24 to 28, equating with mild cognitive impairment or mild dementia and 29 to 30 equating with no cognitive impairment. Perhaps even this small of a change in cognition has the potential of affecting care needs.

CONCLUSION

Matching residential setting with care needs is important in maintaining an elder's life satisfaction and healthful functioning. Resident placement in this study was partially explained by the MDS and MMSE. Clearly, other factors are influencing placement decisions. Institutional philosophy and resident, family, and staff values and preferences were not examined in this study. However, they may influence the use of resources that allow care needs to be met without moving residents to a new location.

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APPENDIX 1.

LEVEL OF CARE ALGORITHM

Step One:

If any of the following criteria are met, the resident is to be admitted to the Chronic Care Skilled Nursing Unit:

1. Coma
2. Quadriplegia
3. Stage III or IV decubitus with physician-ordered decubitus care and/or wound dressings twice a day
4. Non-oral administration of 60% or more of the resident's nourishment
5. Daily oral or nasal suctioning
6. Daily tracheostomy care or suctioning
7. MDS ADL Score ≥ 6

If one of these conditions is not present, proceed to step two.

Step Two:

If MMSE ≤ 17 and MDS ADL Score ≤ 5 , admit to Dementia Care

If MMSE ≥ 18 and MDS ADL Score < 6 , admit to Ambulatory Care

If MMSE ≥ 24 and MDS ADL Score 3, admit to Assisted Living