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Original Study

Intensity of Occupational Therapy Utilization in Nursing Home Residents: The Role of Sensory Impairments

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A B S T R A C T

Objectives: Unaddressed functional limitations in nursing home (NH) residents can lead to unnecessary, excess disability that negatively affects residents' quality of life. In order to enhance functioning, NH residents can receive rehabilitation such as occupational therapy (OT). However, little is known about factors that may aid or hinder full therapy utilization in NH residents. Hence, our study investigated sensory impairments (vision and hearing) and other important health-related variables (eg, cognitive functioning) as predictors of intensity of OT utilization.
Design: Retrospective study with data extraction from electronic medical records (EMRs).
Setting: Skilled nursing facility.
Participants: A sample of newly admitted NH residents ($N = 121$).
Measurements: Single items for sociodemographic variables and clinician-rated extent of sensory difficulties (hearing and vision) as well as pain presence based on Minimum Data Set (MDS 3.0) assessments in EMRs. MDS 3.0 scales assess cognitive functioning, depressive symptoms, and functional dependency. Total hours of OT received during 90 days postadmission to the NH were extracted from the EMRs.
Results: A regression analysis demonstrated that better admission hearing and cognitive functioning, fewer admission depressive symptoms, and higher admission functional dependence were associated with more intense OT utilization—more hours used—over a 90-day period.
Conclusion: This study emphasizes the importance of assessing and addressing hearing difficulties and depression in NH residents in order to optimize utilization of beneficial OT services and to promote most optimal independent functioning and quality of life.

Long-stay nursing home (NH) residents typically have multiple comorbidities that influence the course and outcomes of care. Two common comorbidities that are often under-diagnosed and under-treated among NH residents are vision and hearing impairment. Yet, these conditions could potentially interfere with residents utilizing therapies, such as occupational or physical therapy, which are designed to maintain and improve residents' everyday functioning.

Age-related hearing and vision impairment are common chronic conditions among older adults. Some studies find that about 90% of NH residents have hearing loss,[1] and up to 50% of residents have some level of vision loss.[2] Vision impairment in NH residents is not only due to age-related eye diseases—including macular degeneration, cataract, glaucoma, and diabetic retinopathy—but also due to uncorrected refractive error and untreated disease such as not undergoing cataract surgery.[3] The devastating impact of hearing and vision loss on the quality of life of older adults has been well documented. Both age-related vision and hearing loss are associated with a heightened risk for functional disability,[4–6] depression,[5–7] and reduced social interactions.[5,8,9] In addition, vision impairment is associated with increased risk for falls[10] and hip fractures,[11] cognitive decline,[12] and even mortality risk.[13]

In the United States, to optimize independent functioning and participation, NH residents with demonstrated functional decline can receive physical and occupational therapy (OT) reimbursed by the government-sponsored health coverage for older adults. OT is effective in improving functional abilities in older adults with health conditions such as rheumatoid arthritis, stroke, and dementia.[14–16] However, despite the wealth of studies demonstrating the positive effects of OT on functioning in older adults, there has been little systematic research examining the impact of sensory impairments on older adults' ability to utilize therapeutic services (such as OT in

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particular) in NH populations. It is likely that sensory impairments have a negative impact on full utilization of therapeutic services in NH residents, as there is evidence that, for example, vision loss hinders the full utilization of physical rehabilitation in geriatric health care settings. For instance, Lieberman and colleagues[17] found that length of stay in a rehabilitation unit after a hip fracture was significantly lower in older adult patients with vision impairments when compared to those without vision impairments. Furthermore, research with patients undergoing short-term rehabilitation in postacute care settings of NH indicates that patients with vision impairment are less likely to take full advantage of the allowed reimbursable OT.[18]

Hence, the purpose of our study was to examine the effects of sensory impairments on intensity of OT utilization in a long-stay NH setting. Specifically, we aimed to determine the effects of the extent of vision and hearing impairments on OT hours used when controlling for sociodemographic variables and other health-related factors in a sample of long-stay NH residents.

Methods

Procedures

Electronic medical records (EMRs) of 121 residents who had been newly admitted to an urban NH for long-stay nursing care over a previous 18-month period were reviewed for this retrospective study. Medical record data collected at admission (outlined below) and data on OT utilization from admission to 90 days postadmission were extracted for this study. The study protocol was approved by two Institutional Review Boards and conducted at a geriatric health care organization based in New York City.

Measures

Sociodemographic variables extracted included age, gender, and ethnicity/race. Ethnicity/race was dichotomized as minority (1 = Black/African American, Hispanic/Latino, Asian) or non-minority (0 = White/Caucasians).

At admission, the level of hearing difficulty and vision impairment was rated by staff designated to complete the Minimum Data Set (MDS 3.0). Hearing is rated using a 4-point Likert scale (0 = adequate, 1 = minimal difficulty, 2 = moderate difficulty, 3 = highly impaired) and vision on a 5-point Likert scale (0 = adequate, 1 = impaired, 2 = moderately impaired, 3 = highly impaired, 4 = severely impaired).

Cognitive functioning was assessed at admission by staff using the Brief Interview for Mental Status[19] (BIMS), which is also completed as part of MDS 3.0 documentation. The BIMS is a simple performance-based cognitive screen consisting of three sections: (1) repetition of three words, (2) temporal orientation, and (3) recall.

For an indicator of depressive symptomatology, we also extracted PHQ-9[20] scores from the residents' MDS 3.0 admission assessments. The PHQ-9 items are either asked from residents or completed by staff who report the extent to which the resident has been bothered by feelings of depression such as feeling down, depressed, or hopeless over the past 2 weeks, using a 4-point Likert type scale (0 = never or 1 day, 1 = 2-6 days, 2 = 7-11 days, 3 = 12-14 days). One hundred seven residents had a self-assessment, and 14 had a staff assessment (proxy assessment).

Functional dependency levels at admission were also ascertained via the MDS 3.0, which utilizes the Activities of Daily Living Scale adapted for the MDS 3.0 (MDS-ADL[21]). The scale allows clinicians to rate a resident's degree of difficulty in performing 11 daily tasks, including bathing and dressing. Ratings for each task can range from 0 (independent) to 4 (total dependence), with higher scores denoting more functional dependence. A weighted score was calculated for each resident by adding the scores of the items that were answered for each resident by the number of items answered for each resident. This yielded functional dependence scores with values ranging from 0 to 4.

A single item of the MDS 3.0 Pain Assessment Interview was used as an indicator of the presence of pain. The item asks residents to indicate if they had pain or hurting at any time in the last 5 days (yes = 1; no = 0).

To obtain an indicator of intensity of OT utilization, we extracted hours of OT received during the 90-day postadmission period from residents' EMRs.

Data Analyses

Descriptive analyses were run on all study variables. We computed a correlation matrix to examine the interrelationships between the sociodemographic and health-related variables, including hearing and vision quality (independent variables) with the outcome variable OT use (in hours). Furthermore, we ran a multiple regression analysis to determine the effects of independent variables on the outcome variable. Therefore, to identify correlates of OT utilization, we entered sociodemographic variables (ie, age, gender, and race) and admission health indicators (ie, cognitive function, depressive symptomatology, functional dependency, experience of pain, hearing difficulty, and vision impairment) into the regression analysis.

Results

Participant Characteristics

Table 1 presents sociodemographic and health-related characteristics of participants at admission including percentages, means, standard deviations, and actual ranges (whenever appropriate). The average age of participants was 83, two-thirds were women, and about one-half were members of an ethnic minority group. Eighty percent of residents were rated as having adequate hearing, and a little over 60% were rated as having adequate vision. Upon admission to the NH, participants were highly functionally dependent as indicated by an average weighted score of 3, which translates to needing "extensive assistance" with activities of daily living (ADLs).

Correlational Analyses

Table 2 depicts bivariate relationships between predictor variables and the outcome variable. On a bivariate level, more OT hours used over a 90-day period were significantly associated with the following

Table 1
Sociodemographic, Health, and Service Related-Characteristics ($N = 121$)

Variables	%	Mean (SD)	Actual Range
Age		82.87 (8.49)	63-102
Gender (female)	66.9		
Minority status (yes)	53.8		
Admission hearing difficulty			
Adequate	80.2		
Minimal difficulty	14.0		
Moderate difficulty	5.8		
Admission vision impairment			
Adequate	63.6		
Impaired	25.6		
Moderately impaired	6.6		
Highly impaired	4.2		
Admission cognitive function (BIMS)		9.26 (4.73)	0-15.00
Admission depressive symptoms (PHQ-9)		1.17 (2.39)	0-9.36
Admission pain presence (yes)	43.9		
Admission functional dependency (ADL)		3.05 (0.33)	1.80-4.00
Occupational therapy utilization (hours)		18.72 (8.83)	0.58-42.38