Research Article

Investigation of Occupational Performance and Life Habits in Older Adults with Early Stages of Alzheimer's Disease in Tehran

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Running title: Occupational Performance and Life Habits in Alzheimer's Disease.

Abstract

Background and aim: The aim of this study was to investigate the occupational performance and life habits of elderly adults with early stages of Alzheimer’s disease.

Methods: This study was cross-sectional research. Participants were elderly adults, aged 65-85 years with Alzheimer's disease that refer to Roozbeh and Ziaeian Hospital and Kahrizak Charity in Tehran, Iran in 2022. Seventy patients (36 male, 34 female) were recruited based on convenience sampling method. The Canadian Occupational Performance Measure and Life Habits Questionnaire were used to determine the occupational performance and life habits. Data were analyzed using t independent T test and Mann-Whitney test using $SPSS_{21}$.

Result: The mean age of elderly male and female was 72.02 ± 3.74 and 71.14 ± 4.09 years, respectively. 68.3% of the priorities of occupational performance was related to the self-care. In male the priorities of self-care were 76.7% and in female it was 59.4%. No significant gender difference was found in satisfaction with occupational performance (P>0.05). (P>0.05). In the Life Habit Questionnaire, fitness had the highest participation level, while communication had the lowest. A significant gender difference was observed in participation levels in daily activities (P<0.05).
Conclusion: The results showed that the most important occupational performance priorities of elderly adults with Alzheimer's disease was self-care. The highest level of participation among the daily activities was related to the fitness and the lowest was communication. This study could help occupational therapists identify the priorities, habits, and participation levels of men and women with early Alzheimer's in daily activities.
Keywords: Alzheimer's disease, Aging, Occupational performance, Life habits.

Introduction:

Alzheimer’s disease (AD) is the most common cause of dementia and a neurological condition characterized by cognitive, behavioral and functional disorders. It starts slowly and progresses gradually. Diagnosis of AD requires dysfunction or restriction of activities of daily livings (ADLs) (1). The global prevalence of the disease has so far been estimated at 24 million, and it is predicted that by 2050 this rate will increase to 4 times (2). The prevalence of AD in Iran was estimated at 2.3% (3). Various environmental and hereditary factors contribute to the progress of AD, but evidence suggests that high blood pressure is the only risk factor for the appearance of the disease in the Iranian population (4). People with AD suffer from cognitive disorders, such as executive function disorders, problem solving disorder, memory and attention (1). As the disease progresses, motor dysfunction gradually manifests itself, so that these people have bradykinesia, parkinsonian walking pattern, lower limb dysfunction (5), instability and fine motor coordination disorders (6). Studies showed that cognitive decline, including difficulty in orientation ،short-term memory and apraxia could affect the occupations and the life habits (7,8). Occupation is often used as the equivalent of “Activity” in the International Classification of Functioning, Disability and Health (ICF) (9). Occupation includes three domains of self-care, productivity, and leisure (10). The activity and its modification improve the ability of people with AD in self-care and leisure. Engagement of people with AD in meaningful activities help them to experience better satisfaction and quality of life (QOL) (11).

Life habits are" habits that ensure the survival and development of a person in society throughout his/her life" and they include activities ranging from ADLs to social roles (12). A dynamic lifestyle pattern in people with AD leads to decrease in destructive behaviors and need a lot of care, consequently to decrease caregiver stress (13). There is extensive evidence of the beneficial effect of physical activity in AD patients. Elderly adults with high physical activity are less at risk of falling and death (13-14). Understanding of occupational performance and life habits of AD patients is really importance to occupational therapists (15). Occupational therapists strive to involve AD patients in meaningful activities, leisure, exercise and error reduction technique into the daily schedule to increase Occupational Performance (OP) and to prevent cognitive and motor decline (16).

Simón-Vicente et.al (2023) identified occupational performance problems and their relationship to QOL, motor performance, cognitive function, behavioral problems ،age and sex in Huntington's patients. Results showed that there was a relation between QOL and the number of occupational performance problems on the sub scale of self-care, and that people with lower QOL reported more occupational performance problems and there wasn't a difference between sub-scales of the self-care, productivity, or leisure and gender. However, women reported better satisfaction in self-

care than men. In addition, the results of this study showed an association between self-care satisfaction and total satisfaction based on the Canadian Occupational Performance Measure (COPM) and there was a significant and negative relationship with cognitive function (17). Kobayashi and et.al. (2022) identify occupational performance problems in elderly adults with Parkinson's disease based on the COPM. The results of the study showed that leisure, cooking, walking, doing housework and taking care of household items were the most frequently reported occupational performance problems (18). Studies also showed that client-centered approaches might promote patient motivation to participate and engagement in the interventions and improved social interaction and interest in people with AD (19).

A few studies have been done on the occupational performance and life habit of elderly adults with AD and furthermore, any research has not been conducted on this topic previously in Tehran, Iran. Considering that the engagement of the individual in the occupations and life habits is considered as an essential part of the lives of individuals, which guarantees their health and welfare (20), and also, more knowledge is needed regarding AD patients' perceptions of problems in occupational performance that might hinder participation in meaningful activity. Increasing the level of engagement in occupational performance and life habits among elderly adults with AD is an area of concern for occupational therapists in primary care.

During the COVID-19 pandemic and the recommendation of specialists to the presence of less elderly adults in the community and quarantine them at home ،the amount of mobility and social connections is restricted and changes are made to their daily schedules of life. On the other hand, the level of engagement of the elderly adults in various activities has decreased and may change the life habits of the elderly adults with AD. Therefore, the aim of this study was to determine the occupational performance and life habits of 65-85-year-olds with AD in Tehran, Iran.

Methods:

Participants

This study was a cross-sectional and descriptive-analytical research. The statistical population were elderly adults aged 65-85 years with AD that refer to Roozbeh and Ziaeian Hospitals and Kahrizak Charity in Tehran, Iran in 2022. In total, 70 elderly adults, including 36 male and 34, were recruited based on convenience sampling method. The study was approved by the Ethics Committee of Tehran University of Medical Sciences (TUMS) with the code IR.TUMS.FNM.REC.1400.143. The inclusion criteria were the AD Index (NIA) at stage 1 (19), at least 6 months since the onset of AD and the age between 65 to 85 years. The exclusion criteria were considered the unwillingness to continue the cooperation of older people with AD at each stage of the study (21). At first, the method and purpose of the study were fully explained to the elderly adults and their caregivers and they were assured that the information gained from them will be saved confidentially. Patient with AD signed a written informed consent form. The questionnaire was then completed with some demographic information, including age, sex, AD types, duration of illness, medications, and duration of use of rehabilitation services. In the following, interviews with patients on occupational performance were conducted using the COPM. Then the Life Habits were assessed by Life-Habit Questionnaire (Life-H). All stages of the research were carried out in a quiet environment, away from noise and individually. If the client was deprived of reading and writing literacy or had developed dysarthria as a result of AD, the occupational therapist or a close relative would help him/her. Data collection was carried out by the Master's degree student with 3 years of work experiences.

Outcome Measure:

The COPM is a unique tool, designed for occupational therapists to determine the changes in self-client perception in their occupational performance over time. This measurement is divided into

three areas of self-care, productivity and leisure, and each area into subcategories (22). COPM is performed as a semi-structured interview and can be performed with an experienced therapist for only 20-30 minutes. Several studies of this high-validity tool have been reported as an applied assessment in the elderly population (23, 24). The Persian version of this measurement was translated by Dehghan et.al, (2014) into Persian and was reported its content validity 80.95±0.222 and also have acceptable repeatability (25).

The Life Habits Questionnaire (Life-H) is one client-centered questionnaire that identifies problems of daily activities and social participation.This questionnaire has two forms; long and short. the long form has 240 items and the short form has 77 items, which in 12 sections examines daily activities and social roles. These twelve sections include 1- Nutrition 2- Fitness 3- Personal Care 4- Communication 5- Housing 6- Mobility 7- Responsibilities 8- Interpersonal relationships 9- Community life 10- Education 11- Employment 12- Recreation. The questionnaire was completed by both patients and their caregivers. The scoring of the Life H questionnaire is from 0-9, which shows the degree of difficulty and the type of help. zero indicates complete limitation in participation and a maximum score of 9 indicates that there is a desirable social participation (26). In the Life-H questionnaire, scores in each section were calculated separately. Formal validity and content of the Persian version of Life-H were reported (CVI=0.88) and its test-retest reliability (95%=ICC) by Nouri Mombeyni et al. (2014) for the elderly adults (27).

Statistical analysis

The Shapiro-Wilk test was used to examine the normal distribution of the data. Then independent T test and Mann-Whitney test were performed to compare the significant difference between two different groups. Significance level was set at $p < 0.05$. IBM SPSS Statistics version 21 was used for the statistical analysis.

Findings:

Seventy patients were enrolled in the study, that were 36 male and 34 female elderly adults (65-85 yrs.) Diagnosed with AD. Demographic data of individuals participating in this research is given in Table 1.

Table 1: Demographic and clinical characteristics of participants

Variables		**Male (Mean ±SD)**	**Female (Mean±SD)**	**Total**	**p-value**
Age (year)		72.02±3.74	71.14±4.09	71.60±3.91	0.25*
Education	**Illiterate**	55.60(20)	47.1(16)	49.30(36)	0.90**
	Elementary	27.80 (10)	32.4(11)	28.80 (21)	
	High school	8.3 (3)	8.8 (3)	8.20 (6)	
	Diploma and higher degree	8.3 (3)	11.8 (4)	9.60 (7)	
Marital status	**married**	58.3 (21)	47.10 (16)	50.70 (37)	0.34**
	Divorced	41.7 (15)	52.9 (18)	49.30 (33)	

* Results from Mann-Whitney test

**Results from Chi-square Statistical Tests

Distribution of priorities occupational performance showed that 68.3 percent of priorities were related to self-care (76.7% male and 59.4% female). Also, the frequency of occupational performance priorities on the three sub-scales of personal care, functional mobility, and community management were 40.9%, 10%, and 17.4% respectively. So, the most frequently was personal care. Both groups of male and female showed similar occupational performance

priorities in the area of personal care. 17.1 % of participants' priorities of occupational performance were leisure. This was 23.3% and 10.6% in male and female, respectively. The frequency of male occupational performance priorities on three sub-scales of quiet recreation, active recreation and socialization respectively 8.3%, 8.9% and 6.1% and in female 3.5% in all three sub-scales. These results showed that leisure-related occupations were more important in male than in female.

Due to the abnormal distribution of performance and satisfaction scores, the Mann-Whitney test was used to compare between groups of variables. Mean performance and satisfaction scores were reported in male respectively 5.31±0.94 and 5.04 ±1.41 and in female 4.84± 1.41 and 4.63 ± 1.34. There was a significant difference between performance and satisfaction scores between genders (Table 2-3).

Table 2: Comparison of performance scores and gender -with Mann-Whitney test

Area of occupational performance		**Male (Mean±SD)**	**Female (Mean±SD)**	U test	p-value
Self-care		5.35±1.44	4.86±1.43	5696.00	≤0.01
	Personal care	5.65±1.47	5.01±1.53	1980.00	≤0.01
	Functional mobility	5.05±1.56	4.79±1.18	139.00	0.78
	Community Management	4.95±1.20	4.37±1.16	264.00	0.02
Productivity		-	4.71±1.51	-	-
	Paid/unpaid	-	-	-	-
	Household management	-	4.71±1.51	-	-
	Play/school	-	-	-	-
Leisure		5.05±0.98	5.11±0.96	377.00	0.98
	Quiet Recreation	4.60±0.73	4.67±0.81	45.00	1.00
	Active Recreation	5.31±0.94	5.50±0.83	46.50	0.90
	socialization	5.27+1.19	5.17±1.16	30.00	0.75
Total score		5.28±1.35	4.84±1.41	12802.50	≤0.01

P-value: p>0/05

Table 3: Comparison of satisfaction scores between genders with Mann-Whitney test

Area of occupational performance		**Male (Mean±SD)**	**Female(Mean±SD)**	U test	p-value
Self-care		5.14±1.45	4.62±1.34	5651.00	≤0.01
	Personal care	5.39±1.57	4.76±1.31	1979.00	≤0.01
	Functional mobility	4.81±1.60	4.50±1.65	131.50	0.59
	Community Management	4.86±1.04	4.21±1.13	277.00	0.04
Productivity		-	4.55±1.44	-	-
	Paid/unpaid	-	-	-	-
	Household	-	4.55±1.44	-	-

	management				
	Play/school	-	-	-	-
Leisure		4.71±1.21	4.89±1.02	342.00	0.54
	Quiet Recreation	4.53±1.12	4.83±0.75	39.00	0.62
	Active Recreation	5.13±1.31	5.17±1.32	43.50	0.72
	socialization	4.36±1.12	4.67±1.03	28.00	0.59
Total score		5.04±1.41	4.63±1.34	13040.50	≤0.01

P-value: p<0/05

Since any occupational performance priorities in male with AD weren't in productivity. A comparison of performance and satisfaction scores between genders was not possible. As mentioned above, 30% of the goals of female with AD were related to this sub-scale, specifically to the field of household management, and performance and satisfaction scores was 4.71±1.51 and 4.55 +1.44, respectively.

There was no significant difference between genders according to performance and satisfaction scores with occupational performance in leisure and gender. It is observed that there was no significant difference between genders in performance and satisfaction scores in quiet recreation, active recreation and socialization.

In the Life H Questionnaire in the area of daily activities, the mean scores were 5.74±0.87 and 5.34±0.58 in male and female with AD respectively. The mean scores in the area of fitness were 6.30±1.09 and 6.10±0.94 in male and female with AD respectively. The mean scores in the area of communication were 5.07±1.14 and 4.83±0.71 in male and female with AD respectively. In the area of participation in daily activities, a significant difference was observed in the scores of the personal care and mobility subscales between genders. (P<0.05). However, there was no significant difference between genders according to the score of life habits and social roles (P>0.05) (Table 4).

Table 4: Questionnaire score of life habits and sub-scales of daily activities and social roles in two groups of male and female

Variables	**Male**	**Female**	**Total**	**T****	**U***	**P-value**
	Mean ± SD	**Mean ± SD**	**Mean ± SD**			
Daily activities	5.74±0.87	5.34±0.58	5.54±0.76	-	441.00	0.04
Nutrition	6.04±1.09	5.83±0.91	5.94±1.10	0.89	-	0.37
Fitness	6.30±1.09	6.10±0.94	6.20±1.03	0.82	-	0.41
Personal care	6.37±1.17	5.41±0.76	5.90±1.00	-	10.00	≤0.01
Communication	5.07±1.14	4.83±0.71	4.95±0.96	-	575.00	0.66
Housing	5.64±1.05	5.72±1.07	5.68±1.05	-0.31	-	0.75
Mobility	6.33±1.27	5.39±0.82	5.88±1.17	-	343.50	≤0.01
Social roles	4.19±0.82	4.06±0.50	4.13±0.68	-	603.00	0.91
Responsibilities	5.12±1.10	4.57±0.78	4.85±0.99	-	435.00	0.03
Interpersonal relationship	4.99±1.71	5.58±1.11	5.28±1.47	-1.68	-	0.09
Community life	5.61±1.07	5.68±0.82	5.64±0.95	-0.28	-	0.78
Education	3.49±0.94	3.59±0.83	3.54±0.88	-	584.00	0.72
Employment	0.32±1.22	0.11±0.69	0.22±1.00	-	578.50	0.32

Recreation	5.21±0.91	5.03±0.53	5.12±0.75	1.01	-	0.31
Total score Life-H	4.97±0.79	4.72±0.49	4.85±0.67	-	520.00	0.28

* Results from Mann-Whitney test
**Results from independent T test
P<0.05

Discussion

The results of the present study showed that most of the occupational performance problems based on COPM were self-care, leisure and productivity. This finding was consistent with the study of Cetin et al. (2020) (28) and Kabul et al. (2023) (29). Cetin et al. found that among elderly adults aged 65-89, the frequency of occupational performance problems was 43% self-care, 36% productivity, and 21% leisure (28). Moreover, the study of Kabul et al. (2023) in the elderly adults with mean age of 71.3 years showed that maximum frequency of occupational performance problems were self-care, Leisure and productivity respectively. Also, the most occupational performance problems in men were personal care, community management, functional mobility, and in women included personal care, household management, and community management (29). Finding of this study showed that household management was the most important difference between men and women. Household management problems were noted in just 2.1% men, whereas 29.1% women encountered difficulties in this area. Consistent with these results, Kalldalen et.al. (2012) found that elderly women had the most difficulties with functional mobility, community management, and household management, while men struggled more with self-care and leisure activities. This study revealed that women reported more problems in the areas of household management, community management, and quiet recreation. (30). The differences in roles between men and women are the reason for this difference. For example, 61.8% women participating in the study were housewives, and inability to do housework and manage household affairs was one of the barriers to their role.

The present study showed that men were more engaged in daily activities in regarding the sub-scales of this domain in the Life- H, there was a significant difference between the scores of personal care and mobility between genders, so that men with AD had more participation. This finding is in line with the study of Noori Mombeyni et al. (2019) (31). The study of Noori Mombeyni et al. (2019) showed that in healthy elderly adults the mean score of nutrition in men was higher than women ،and there was no significant difference between the scores of fitness, personal care ،communication ،housing ،mobility ،as well as the total score of participation in daily activities in men and women (31). Participation in activities such as driving, cycling follows the socio-cultural conditions so that in the past decades, driving skills and cycling among Iranian women were less noticed. Therefore, in different studies, the disproportion of cycling and driving women with general culture as a deterrent factor for Iranian women's participation (32, 33). Therefore, the dominant socio-cultural conditions in Iran can be the reason for the differences in this sub-scale between men and women with AD.

The results of this study showed that there was no difference between participation in the social roles of men and women with AD. The finding of the studies of Faraj pour Khazai et al. (2019) and Anaby et al. (2009) were in consistent with our research that did not find any difference between the social roles of elderly patients with Parkinson's, stroke, arthritis and heart problems in men and women. (34, 35). In fact, multiple roles of elderly men in Iranian families, despite their difficulties and disabilities, have maintained responsibilities such as managing the family and providing the necessities of its members (36). The results of this study showed that sub-scales of social roles, communication and interpersonal relationships in AD were the same between men and women. Studies by Faraj Pour Khazai et al. and Noori Mombeyni et al. have reported similar results in these subscales (31, 34). Based on the results of this study, there was no difference

between patients' satisfaction with daily activities, social roles and life habits of men and women. The results of Setoudeh et al (2021). study and Levasaur et al (2004). showed similar results of satisfaction with life habits and their sub-scales in AD (37, 38).
The results of this study showed that there was no difference between genders. It consists with Anaby et al. (2009). In the study of Anaby et al. (2009), there was no difference between fitness and men/women with Parkinson's and healthy elderly adults (35). Despite gender differences and interests in the type and manner of leisure activities between the two groups of elderly men and women, the evidence reports the same level of participation in these two groups. It seems that regardless of gender, abilities and motivation, participation in recreational activities is influenced by environmental and economic factors, physical disability and limited access to leisure facilities, and elderly people skip the required recreational activities (39). Therefore, the custodians of elderly health affairs in collaboration with related institutions can remove environmental barriers, increase access to recreational places and provide financial facilities to increase the participation of these people in recreational activities.

Conclusions

The results of this study showed that the most important occupational performance problems of AD were to self-care, leisure, and productivity, respectively. Among the sub-scales, most important problems in men were related to personal care, community management, functional mobility, and in women were personal care, household management, and community management. The lowest occupational performance problems in both groups (men and woman) were related to paid and unpaid work. Compared to men, women had lower performance and satisfaction scores on the overall score of COPM and the sub-scales of personal care and community management. On the other hand, the highest level of participation among the daily activities was related to the fitness and the lowest participation was related to the communication and there was a lot of difference between men and women in the responsibility. Generally, gender plays an important role in the performance and satisfaction of AD, resulting from differences in physiological differences, individual roles ،environmental barriers and cultural differences. It seems that the results of this study might provide the necessary information for occupational therapists to identify the occupational performance priorities, life habits and level of participation of patients with AD in men and women in daily occupations.
However, we encountered some limitations in our study. This study was carried out during the COVID 19 pandemic on elderly adults, and this issue made it difficult to access the samples. Furthermore, this study was conducted on selected hospitals in Tehran; so, the generalizability is limited.

Conflict of Interest

The authors declare that they have no conflict of interest.

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Authors contributions:

The Corresponding author of this manuscript is Zeinab Kadkhodaei and all of authors have contributed to the following components: (1) the conception and design of the study (**Hamid Dalvand , Zeinab Kadkhodaei**), acquisition of data (**Zahra Vahabi, Farnaz Etesam)**, analysis and interpretation of data (**Amir Almasi Hashiani, Zeinab Kadkhodaei)**, (2) drafting the article or revising it critically for important intellectual content (**Hamid Dalvand , Zeinab Kadkhodaei**), (3) final approval of the version to be submitted (**Hamid Dalvand , Zeinab Kadkhodaei**).

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