Original Article

The Prevalence of Alzheimer's disease Preventive Behaviors in Elderly People, Yazd, Iran

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A B S T R A C T

Introduction: Alzheimer's disease (AD) is a chronic condition characterized by gradual decline of mental abilities and behavioral disorders, which decreases the quality of life in elderly people. The aim of this study was to evaluate behaviors that may prevent elderly people from AD in Yazd.

Methods: This cross-sectional study was conducted on 220 people aged from 60 to 70 years in Yazd. Cluster random sampling method was used for selecting the participants. Data collection instrument was a researcher-made questionnaire that included demographic information and questions on AD preventive behaviors (physical activity, mental activity, nutrition, and social interaction). The score range of each part and the overall behavior score was from zero to 100. Data were analyzed by SPSS statistical software and application of descriptive and inferential statistical methods.

Results: The mean score of preventive behaviors was 44.6. The highest mean score (56.48) was for nutrition while the lowest mean score (32.03) was for mental activity. Only 15 % of the studied elderly consumed fruit regularly in their diet, which was followed by consumption of vegetable, 11.4 % and fish 9.1 %. There was a significant positive correlation between education level and behavior score (p < 0.001). However, there was no statistically significant gender difference (p > 0.05) in mean scores of the overall behavior and scores of married older adults compared to those of divorced or single, had a statistically significant difference (p = 0.007).

Conclusion: The overall AD preventive behaviors in elderly are undesirable, remarkably as noted in physical and mental domains. The majority of participants did not regularly have fruits, vegetables, and fish in their daily and weekly diets. Numerous socio-demographic factors affect these behaviors. More studies are required to identify barriers of healthy behaviors.

Keywords: Elderly, Alzheimer's disease, Prevention, Behavior

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Introduction

With increase of the elder population, prevalence of chronic diseases related to aging has also increased throughout the world, so that 82 % of older adults have at least one chronic disease and 65% suffer from several chronic diseases (1).

Alzheimer's disease (AD) as a chronic disorder related to aging causes disability in older people and has had a growing trend in the last century (2). AD was the most common cause of dementia about a century ago, which covered 75 % of all dementia cases. Currently, more than 35 million people around the world suffer from AD and it is expected for this disease to have a significant growth even in high-income countries (3). In Iran, the population is toward aging and by taking the relationship between AD and age increase into account, it is predicated that in the next two to three decades 8 - 10 % of older people population will be involved in AD (4). People older than 60 who have AD, spent 11.2 % of their years of life with disabilities. Total fees paid for medications and health cares of the elderly with AD are three times more than other seniors (3). Since no effective treatment has been found for this disease, prevention and lifestyle modification are necessary (5). Studies have shown that AD as well as other chronic diseases arise as a result of multiple factors. Age is the greatest risk factor for AD though not considered as a normal part of aging (3).

Although no randomized clinical trials have yet demonstrated that regular physical activity prevent dementia; and defining the optimal preventive and therapeutic strategies in terms of type, duration, and intensity of physical activity remain an open question, several studies have identified a wide range of potential and modifiable risk factors for this disease including lifestyle factors such as physical inactivity, poor nutrition, lack of brain cognitive stimulation, and poor social connections that can increase the risk of developing AD in the elderly (6).

Even low-intensity exercises such as walking are associated with reduced risk of dementia (7). Physical activity not only plays a role in promoting general health and vascular health, but also is effective on promoting plasticity of the brain or may be on genes that maintain cognitive function (8). Several studies indicated that elderly people who have had regular physical activity or exercise during their lives, had decreased risk of dementia (9-11).

Diets rich in fish, fruits, and vegetables that contain antioxidants and unsaturated fatty acids reduce the risk of AD (6). Results of Martinez study, on 552 older people during 6.5 years, showed that people exposed to a Mediterranean diet had better cognitive condition than the control group (12).

A high level of complex mental activity throughout life is associated with a reduced rate of the hippocampus' atrophy (13). A longitudinal study showed that AD occurs seven years later in people with high cognitive storage, such as high education level compared to people with low cognitive storage (14).

Poor social networks or social disengagement in late life is associated with increasing risk of dementia. The risk of dementia and AD in the elderly increases with social isolation and less satisfying relationship with family and friends. Rich social networking leads to emotional and intellectual stimulation that can influence cognitive function and various health outcomes through behavioral, psychological, and physiological patterns (15).

Therefore, it seems that improving healthy lifestyle plays a crucial role to decrease the prevalence of AD. So, assessing the preventive behavior against this disease can lead to planning and implementation of appropriate and effective interventions for improving these behaviors. Considering the few studies (16) in Iran to investigate preventive behaviors and by taking into account that they were just limited to sampling of elderly who referred to a hospital and health care facilities, this study aimed to evaluate the prevalence of AD preventive behaviors in community dwelling elderlies in Yazd, Iran.

Methods

Procedure and sampling

This descriptive analytic study was conducted in Yazd, Iran, in the last quarter of 2016. A sample size of 220 participants was recruited to participate in the study. Cluster random sampling was applied to recruit the participants. First, 11 health centers were selected as clusters and then 20 eligible elderlies from each health center were enrolled. Entry requirements were, age range of 60 to 70 years, lack of AD through physician confirmation, no history of stroke, lack of mental disability(Mini-Mental State Examination scores lower than 27), being able to answer questions (psychologically and physically), and volunteer to participate in the study.

Instruments

A researcher-made questionnaire was applied as the data collection instrument. Content validity of the questionnaire was confirmed by a panel of 7 experts including three psychiatrics, two health educationist and two gerontologists. To confirm reliability of the instrument, questionnaire was initially completed by 20 elderly people who were not included in the study later and alpha coefficient of AD preventive behaviors was calculated as 0.71. The questionnaire included demographic data and 25 questions for measuring preventive behaviors as follows:

5 questions in the field of physical activity, for example (Do you do fast walking or any intense activity that increases your heart rate at least 3 to 5 days per week?); 10 questions in nutrition (Asking about consumption of fresh fruit and vegetables, fish and seafood at least twice a week, etc.), 5 questions exploring cognitive activity (Do you play intellectual games such as chess or do a crossword puzzle, in your

leisure time?, etc.), and finally 5 questions asking social interaction (Do you actively participate in collective activities?, and so on). Participants were supposed to answer questions based on a four-point Likert scale (i.e., never, rarely, sometimes, always).To make the scores comparable between areas, the scores were calculated from 100. Also the total possible score range for preventive behaviors was from zero to 100.

Ethical considerations

The ethics commitee in Shahid Sadoughi University of Medical Sciences, Yazd, Iran, approved the study protocol (IR.SSU.SPH.REC.1394.86). Meanwhile, informed consent was obtained from the participants after explaining the aim of the study for them and they were insured for the confidentiality of their information. Moreover, participation in the study was voluntarily.

Statistical analysis

After data collection, they were entered to SPSS software version 21, and then analyzed by Pearson correlation test, independent samples t-test, and ANOVA at the significant level of 0.05.

Results

The average age of participants was 64.75 ± 3.65; and 70.5 % were female. Of them 70.2 % were married and 47.7 % had basic literacy (reading and writing), 60.9 % housewives, 21.8 % retired, and 46.4 % were at moderate income-level (Table 1).

Less than a tenth had regular exercise, 15 % always consumed Fruit 2 to 4 times a day, vegetables consumption was 11.4 %, with a little less weekly consumption of fish in their diet (9.1 %). Surprisingly, 78.2 % never played brain activities in their leisure time, like crossword puzzles, play chess, or other brain teasers. Table 2 shows frequency distribution of different aspects of preventive behaviors of AD.

Among the participants, 57.7 % had high blood pressure, 40.9 % diabetes, 31.8 % heart disease, and 68.6% had bone pain or joint problems. Of them, 18.6 % had history of AD in their first degree relatives. Mean score of the preventive behaviors was 44.6. The best situation was nutrition with mean score of 56.48 and the worst situation was mental activity (32.03) (Table3).

Pearson correlation coefficient showed that there is a significant relationship between different aspects of preventative behaviors (Table 4). A significant negative correlation between age and preventive behaviors was noted ($r = -0.206$, $p = 0.002$). Moreover, there was a significant positive correlation between education and preventive behaviors ($r = 0.237$, $p < 0.0001$). A significant positive correlation was also observed between the mean of total behavior score and family size of participants($r = 0.136$, $p < 0.05$).

Table 1. Distribution of demographic characteristics of the participants

Variable		N	%
Gender	Male	65	29.5
	Female	155	70.5
Education	Illiterate	80	36.4
	Primary school	105	47.7
	Elementary	16	7.3
	school	16	7.3
	High school & diploma	3	1.4
	Academic education		
Job	Housewife	134	60.9
	Emeritus	48	21.8
	Unemployed	14	6.4
	Worker	3	1.4
	Farmer	7	3.2
	Other	5	2.3
Marital status	Married	160	72.7
	Divorced	4	1.6
	Widow	56	25.5
Living status	Alone	33	15
	With spouse	87	39.5
	With spouse & single children	70	31.6
	With married children & other	30	13.6
Economic status	Good	51	32.2
	Moderate	102	46.4
	Week	67	30.5
History of AD in first degree relative	Yes	41	18.6
	No	155	70.5
	Don't Know	24	10.9

According to one-way ANOVA, the average score of behavior among the married elderly and that of the elderly without a spouse (wife divorced and widows) showed a statistically significant difference ($p = 0.007$). Elderly with different economic status were also different in their behavior average score ($p = 0.01$) (Table 5).

Discussion

The aim of this study was to evaluate the preventative behaviors from AD in older adults aged from 60 to 70 years in the city of Yazd. The results showed that the mean score of the behaviors was 44.6 out of 100, indicating not ideal lifestyle. Daily consumption of fruits, vegetables, and fish was very low in this study so that only 35.9 % of people often or always consumed fresh fruit 2-4 times a day and 11.4 % of them used raw or cooked vegetables in their diet. In addition, 35.5 % of the elderly never use fish in their weekly diet. In Nejaddadgar et al. study, more than twice as many as the elderly used fruit and vegetables regularly and 20 % of them used fish in their diet (16). Lichtenstein et al. showed that 50 % of participants did not use vegetables and fruits (17). Spencer et al. also reported that 10.2 % of the elderly consumed fish at least three times a week in their diet (18).

Table 2. Distribution of AD preventive behaviors

Sub-scales	Behaviors	Never N	Never %	Sometimes N	Sometimes %	Often N	Often %	Always N	Always %
Physical activity	Regular exercise	80	36.4	78	35.5	43	19.5	19	8.6
	Fast walking or vigorous activity at least 3 to 5 days a week that increases your heart rate	80	36.4	74	33.6	48	21.8	18	8.2
	Moderate walk at least half an hour in a day	59	26.8	87	39.5	52	23.6	22	10
	Physical activity of jobs	28	12.7	74	33.6	85	38.6	33	15
	Exercising through daily works	14.7	66.8	57	25.9	16	7.3	0	0
Nutrition	Having fresh fruits 2 to 4 times a day	18	8.2	123	55.9	46	20.9	33	15
	Having row or cooked vegetables 3 to 5 times a day	40	18.2	117	53.2	38	17.3	25	11.4
	Having fish and seafood 2 times a week	78	35.5	83	37.7	39	17.7	20	9.1
	Nuts as a snack	13	5.9	112	50.9	66	30	29	13.2
	Foods high in fat and saturated fats	113	51.4	83	37.7	22	10	2	0.9
	Sweets and foods containing sugar	71	32.3	118	53.6	28	12.7	3	1.4
	Fizzy drinks	122	55.5	88	40	9	4.1	1	0.5
	Fried foods	73	33.2	117	53.2	26	11.8	4	1.8
	Olive oil	68	30.9	105	47.7	38	17.3	9	4.1
	Solid oils (hydrogenated)	83	37.7	69	31.4	34	15.5	34	15.5
Mental activity	Remembering phone numbers that you often need instead of using cell phone memory	90	40.9	67	30.5	43	19.5	20	9.1
	Playing brain teaser games such as chess and crossword puzzles in leisure time	172	78.2	37	16.8	7	3.2	4	1.8
	Learn something new and remember it on a daily basis	77	35	92	41.8	40	18.2	11	5
	Maintaining or reading poetry, proverbs, or verses of the Qur'an	77	35	81	36.8	48	21.8	14	6.4
	Reviewing the past memories and retelling it for others	41	18.6	59	26.8	63	28.6	57	25.9
Social Interaction	Participate in the collective activities	26	11.8	74	33.6	87	39.5	33	15
	Participate in the collective and group exercises	120	54.5	71	32.3	25	11.4	4	1.8
	Going to picnic with family and friends	42	19.1	114	51.8	55	25	9	4.1
	Travelling with friends and family	13	5.9	79	35.9	96	43.6	32	14.5
	Socializing with neighbors	23	10.5	90	40.9	68	30.9	39	17.7

Table 3. Mean and standard deviation distribution of AD preventive behaviors and its subscales

Variable	Mean	SD	Min	Max
Physical activity	34.36	24.10	0	93.33
Nutrition	56.78	12.82	26.67	100
Mental activity	32.30	20.60	0	100
Social interaction	43.66	18.82	0	100
Total Behavior Score	44.60	12.55	14.67	97.33

Table 4. The correlation coefficients between subscales of preventive behaviors

Variable	1	2	3	4
1.Physical activity	1			
2. Nutrition	0.306[**]	1		
3. Mental activity	0.469[**]	0.345[**]	1	
4. Social interaction	0.378[**]	0.393[**]	0.384[**]	1

[**] $p < 0.001$

Table 5. Mean and standard deviation distribution of preventive behaviors based on demographic variables.

Variable		Mean	SD	p
Gender	Male	46.21	14.28	0.251
	Female	44.10	11.76	
Education	Illiterate	40.90	9.035	0.009
	Primary school	46.19	14.16	
	Elementary school	50.16	13.38	
	High school	47.48	11.28	
	Diploma & other	49.55	13.60	
Job	House wife	43.95	11.66	0.054
	Emeritus	45.13	13.82	
	Unemployed	47.55	11.49	
	Farmer	54.85	8.99	
	Self employed	46.37	6.92	
	Worker & other	53.33	14.21	
Marital status	Married	46.09	13.10	0.007
	Divorced	30.66	2.88	
	widow	41.83	10.16	

In the studies conducted by Salehi et al. (19) and Shahnazi et al. (20) the elderly didn't have appropriate use of vegetables and fruits. But in Muraki et al. study on the Japanese elderlies' life style, better results have been observed; 31 % of people used fish and 70.9 % used vegetables (21).

The results indicated that mean scores of the physical activity were too low in the elderly and only 6.8 % of participants exercised regularly which is consistent with Nejaddadgar et al. (16) and Eshaghi et al. (22) studies carried out in Isfahan, and findings of another study conducted in Yazd, in which 65% of participants were sedentary(23). But in Spencer et al. study, 60.5 % of people had at least 3 hours of exercise during the week (18) which shows a higher level of physical activity among elderlies in Western Australia compared to Iran.

In this study, 6.4 % of people had mental activity and more than three quarter did not do any kind of activity like doing puzzle or playing chess in their leisure time. In Nejaddadgar et al. study also only 38 % of the participants had regular physical and mental activities while the rest, 62 %, did not have any regular mental activity (16).

Level of education was the social factor that affected the preventive behaviors. There was a significant relationship between level of education and total score of preventive behaviors in the present study; the higher education level the elderly was in, the better adaptive behaviors they would have. This finding seems plausible as with higher levels of education public awareness of the benefits of healthy lifestyle increases. This result was consistent with the results achieved by Rezaeipandari study (24) in 2015 in Yazd. Moreover, this result has been confirmed in Shahnazi et al. (20), Najimi et al. (25), and Babak et al. (26). In the study carried out by De cocker et al. the level of education was found as an effective factor in life style behaviors (27). But in Nejaddadgar et al. study which carried out on elderlies referred to health

care centers, the score of preventive behaviors for AD between different levels of education did not show any statistically significant difference (16).

Marital status was another social factor that influenced preventive behaviors, and from this point of view, there was a statistically significant difference between married and widowed elderly in overall preventive behaviors and also the score of all four dimensions of preventive behaviors (physical activity, nutrition, mental activity, and social interaction). Social support and network communication is the effective factors on human health and quality of life so that absence of this factor in lonely elderly can affect their health. In Shahnazi et al. (20) study elderly people who lived with family or their spouse had a better score of lifestyle. Furthermore, it was reported in Babak et al. study that (26) elderly who lived alone had lower life style scores; they also got low scores in physical activity, stress management, and social interaction. But there were no relationship between marital status and lifestyle of the elderly in Nejaddadgar et al. (16), Najimi et al. (25), and Rezaeipandari et al. (24) studies.

The mean score of nutrition was 56.49 that show poor situation. Compared to the other aspects of behaviors, it had a better situation though. That may be due to the fact that more than half of the participants had at least one cardiovascular disease, such as hypertension, diabetes, and hyperlipidemia that control and treatment of which require nutritional remedies. In this study, 80 % of participants did not use fatty foods, only 14 % consumed sweet foods and sugar regularly, and rest of them rarely or never used these foods. Average use of fried foods on a regular basis was 13 %, on the other hand the average consumption of healthy food such as fruits, vegetables, and fresh fish was low. In a study conducted by Shahnazi et al. (20) the average score of nutrition was higher in comparison with other aspects of lifestyle, while average scores in Babak et al. study (26) were much lower.

There was a significant difference between the mean score of physical activity in both males and females so that men had higher scores in physical activity than women. However, in Salehi et al. study there were no difference in physical activity score of men and women (28). This was possibly caused by social and cultural conditions prevailing in the society that result most women be housewives. Another study that examined the lifestyle factors in elderly patients with high cholesterol, the average score of the physical activity was lower in men than in women (p = 0.001) (29).

Considering comorbidities, The results of this study showed no statistically significant difference in preventive behaviors among individuals with and without hypertension, diabetes, heart disease, cancer, and problems with vision and hearing (p < 0.05). But there was a statistically significant difference in people with and without depressive disease (p = 0.005), gastric disorders (p < 0.001), and bone problems (p = 0.041). In Rezaeipandari et al. study (24), comparison of lifestyle in all mentioned illnesses

showed statistically significant difference except for diabetic and cancerous patients.

History of AD in first-degree relatives illustrated not any effect on total mean score of preventive behaviors, physical activity, mental activity, and social interaction. Only there was a significant difference between people with and without family history of Alzheimer in nutrition subscale (p = 0.046). The results also were similar to Clark's study; only in nutrition dimension statistically significant difference was observed between people with and without a family history of AD (30).

Conclusion

The results of this study showed that AD preventive behaviors do not have a good situation among the elderly in Yazd, Iran. Physical activity of elderly was very low and the majority of elderly did not consume fruits, vegetables, and fish in their weekly diet, and few of them had regular intellectual activity in their leisure time. Appropriate educational programs must be designed to motivate people to perform health-related behaviors.

Study limitations

Traditional context of the participants and also self-report assessment of AD preventive behaviors are the limitations of this study that should be addressed in using the results.

Conflict of interest

The authors declare that there is no conflict of interests.

Acknowledgment

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