

Original Article

Exploring the relationship of cognitive and physical health with volunteering among community dwelling elderly

Explorando a relação entre saúde cognitiva e física com o voluntariado entre idosos que vivem na comunidade

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Abstract

Introduction: The increasing population of older people globally causes specific problems for both individuals and society. While reduced cognitive function and reduced physical fitness are related to aging, some older adults have non-pronounced disabilities and inevitably have much spare time affording them to engage in a variety of activities like volunteering which benefits them and their community. **Objective:** The present study aimed to explore the relationship between cognitive and physical health to volunteering among community dwelling retired individuals in Iran. **Method:** In this cross-sectional study, 296 retired community dwelling older adults over age 60 were selected as multi-step convenience sampling method and filled out the questionnaires voluntarily. The Montreal Cognitive Assessment (MoCA) was used to assess cognitive function, and the Short-Form 36 (SF36) Health Survey and the General Health Questionnaire (GHQ) were completed by the participants to assess their physical fitness and their mental health status. The demographic information was also assessed using the Demographic Information Questionnaire. **Results:** The study results indicated that the older adults who have better cognitive function ($r=0.367$, $P<0.001$, $U=0.6316$) and physical fitness ($r=0.189$, $P=0.001$, 2.8582) participate more in volunteering. **Conclusion:** Participation in volunteering is directly and significantly related to the cognitive functioning, physical fitness, and quality of life of selected older people in Iran. Volunteering is inversely related to anxiety and insomnia, depression, and social dysfunction among these selected retired Iranians.

Keywords: Volunteers, Community Integration, Senior Centers, Cognitive Function, Physical Fitness.

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Resumo

Introdução: O aumento da população de idosos globalmente causa problemas específicos tanto para os indivíduos quanto para a sociedade. Embora o declínio da função cognitiva e da aptidão física estejam associados ao envelhecimento, alguns idosos não apresentam deficiências acentuadas e, inevitavelmente, tem bastante tempo livre, o que lhes permite se engajar em diversas atividades, como o voluntariado, que é benéfico para eles e para a comunidade. **Objetivo:** O presente estudo propõe explorar a relação entre função cognitiva e aptidão física e trabalho voluntário entre idosos residentes em comunidades. **Método:** Neste estudo transversal, 296 indivíduos aposentados residentes em comunidade no Irã com mais de 60 anos foram selecionados por meio do método de amostragem por conveniência em múltiplas etapas e preencheram os questionários voluntariamente. A Avaliação Cognitiva de Montreal (MoCA) foi usada para avaliar a função cognitiva e a Pesquisa de Saúde Short-Form 36 (SF36) e o Questionário de Saúde Geral (GHQ) foram preenchidos pelos participantes para avaliar sua aptidão física e seu estado de saúde mental. As informações demográficas também foram avaliadas usando o Questionário de Informações Demográficas. **Resultados:** Os resultados do estudo indicaram que os idosos que têm melhor função cognitiva ($r=0,367$, $P<0,001$, $U=0,6316$) e aptidão física ($r=0,189$, $P=0,001$, $2,8582$) participam mais do voluntariado. **Conclusão:** A participação no voluntariado está direta e significativamente relacionada ao funcionamento cognitivo, aptidão física e qualidade de vida dos idosos iranianos selecionados. A participação no voluntariado está inversamente relacionada à ansiedade e insônia, depressão e disfunção social entre esses indivíduos.

Palavras-chave: Voluntariado, Integração Comunitária, Centros Comunitários para Idosos, Função Cognitiva, Aptidão Física.

Background and Objective

Based on the definition of the World Health Organization, aging results from the impact of the accumulation of a wide variety of molecular and cellular damages in people over time. This leads to a gradual decrease in physical and mental capacities, increasing the risk of acquiring diseases and ultimately death (Harman, 2001; Zanjari & Sadeghi, 2022). The global population is rapidly becoming older, thereby seeing more people who are living longer. When the world's population reached seven billion in 2012, 562 million people (or 8%) were at 65 years of age or over. In 2015, the older adults population raised by 55 million, and the ratio of the older adults population reached 8.5% of the whole population. With the exponential increase of the older adult population in recent years, especially in Asia and Latin America, we will potentially witness a 236 million increase for people aged 65 years and over in the next ten years (Harman, 2001). In developing countries, such as Iran, although people who are 60-year-old and older constitute less than 10% of the population (Zanjari & Sadeghi, 2022), this ratio is expected to grow rapidly from 2030 onwards, reaching about one-third of Iran's population in 2050 (Zanjari & Sadeghi, 2022).

Increasing elderly population causes specific problems for individuals and society (Washburn, 1986; Harper, 2014). High costs of care for and protection of the older adults,

participation restrictions, reduced economic production stemming from disability, and depression among the older adults severely decrease their quality of life (Herring, 1989; Harper, 2014). A distinctive characteristic of this group in metropolises is loneliness. These individuals also have much spare time as far as they face problems concerning how to spend it. At the same time, it should be noted that many of these individuals are not disabled and can still engage in a variety of activities, which on the one hand, are very beneficial for them and prevent depression and premature disability and on the other hand, can grant many benefits such as financial benefits to the society. One of the suggested strategies in this regard is to lay the ground for the older adults' volunteering to reinforce social capital (Herring, 1989; Dury et al., 2015).

Aging causes some health-related concerns, including reduced cognitive function (Sartori et al., 2012) and reduced physical fitness (Birle et al., 2021; Miller et al., 2002) in the older adults. Given this reality, it is essential to improve healthcare for the elderly, invest in skills development, prevent disease, maintain remaining skills, and help them strengthen them to remain socially and economically active (Cruz et al., 2022).

Cognition is the most complex brain function resulting from the organization and interactions between multiple systems and subsystems (Birle et al., 2021). The central nervous system (CNS) and cognitive function undergo changes with aging. Harada et al. (2013) propose that the loss of neurons and reduced cognitive function begin in the third decade of individuals' lives. Moreover, some cognitive functions such as attention, short-term and long-term memory, and central executive functions seem more susceptible to these damages (Cassilhas et al., 2007; Harada et al., 2013). With aging, some changes occur in basic processes of the body, such as changes in sensory function, processing speed, working memory, and also the interactions between these processes. Evidence indicates that older individuals use more compensatory methods for working memory and long-term memory to do their tasks than younger individuals (Sartori et al., 2012).

Another essential factor playing a crucial role in the independence of the older adults is physical fitness. Physical fitness is a variety of features associated with the ability to perform physical activities. Furthermore, physical fitness is characterized by 1) the ability to perform daily activities efficiently and effectively and 2) showing traits and capacities associated with a low risk of developing hypokinetic diseases (Wilder et al., 2006). Low physical fitness is regarded as a risk factor for cardiovascular and musculoskeletal health conditions such as; muscle atrophy, and increased risk of falling among the older adults (Hilgenkamp et al., 2012; Park et al., 2007). Evidence shows that even moderate physical activities until old age also have positive consequences for the older adults' health, particularly their physical fitness (Tan et al., 2009; Carr et al., 2018).

Voluntary activities like environmental projects such as maintaining trails, planting trees, and cleaning parks, may be important for individual fitness because of their potential for high levels of physical activity (Librett et al., 2005). Volunteering refers to any activity to which free time is allocated in the interest of another person, group, or organization; this is not in the sense that volunteers do not benefit from their activity, and it is discussable that the benefit includes (material or non-material) rewards for them. However, some researchers believe that if the performed activity is really voluntary, it involves no reward (Luria et al., 2017). Volunteering can be classified into two categories: formal and informal. *Formal* refers to participation in unpaid activities

concerning special organizations or institutions e.g., a retired physician works in a charity center for children with cancer without receiving a fee, while *informal* includes any direct assistance not related to official organizations e.g., as helping homeless people, helping friends, neighbors, cooking and distributing offerings on any occasion to name a few (Machado, 2020).

Volunteering depends on the society's context and culture (Bathini & Vohra, 2014). Nuances in volunteering activities can be associated to political contexts, socioeconomic status, and cultural differences. What is valuable in one country may be less important in another; citizens often adjust their behaviors, priorities, and expectations based on the dominant culture, and volunteering is no exception to this rule (Carr et al., 2018; Machado, 2020; Proulx et al., 2018). In Iranian society, the majority of activities that produce contribution to society are dependent and structured around religious values (Norouzi & Boudlaie, 2021). Local studies have recently described the relationship of volunteering among Iranian older adults to their quality of life (Sangsefidi et al., 2023; Rezaeipandari et al., 2020; Marashi et al., 2017). Relating volunteering to cultural values and societal expectations is understudied in Iran. It is therefore important for us to delve into studying this area, specifically in examining the relationship between volunteering (as an activity) and the cognitive and physical functioning of community dwelling, retired Iranian older adults.

Method

Participants

The target population consisted of retired community dwelling older adults aged over 60 in Iran (n=296). Given that the present study examined elderly people living in Iran, elderly people whose cognitive score based on the MoCA test was higher than 26, and who did not have any mental problems based on the GHQ-28 questionnaire, and who did not have obvious physical problems that prevents them from participating in society and performing activities independently, were included in the study. The older adults who did not fill out the questionnaires properly or were non-Iranian were excluded from the study. The participation of the older adults was done with consent. Those who did not want to cooperate were excluded from the study. People's information was collected by the aforementioned questionnaires and kept with confidentiality.

In this study, convenience sampling was employed in order to achieve equal regional and geographical access in Tehran, the metropolitan area of Tehran was divided into five districts: North, South, East, West, and Center. This approach ensured geographical representation across socio-economic sectors. Then, one district was selected in each of these districts. By visiting all five districts of Tehran, about 30 samples of active elderly people participating in volunteering and 30 samples of inactive elderly people were collected from each district. we were able to collect an equal number of male and female samples (15 of each). In the present study, the first author (MSc of Occupational Therapy) and the fourth author (MSc student of Occupational Therapy) collected data over a 4-month period (November 7, 2022 - March 13, 2023). A total of 311 data sets were collected, among which 8 had incomplete information and 7 were not considered Iranian. This concludes a total of 296 complete data sets for analyses.

Materials

The participants' demographic information was collected alongside the following questionnaires: Montreal Cognitive Assessment (MoCA), the Short-Form 36 (SF36) Health Survey, and the General Health Questionnaire (GHQ). These questionnaires were completed to measure the cognitive functioning and the physical functioning of the participants. The participation in volunteering activities was determined through the demographic data collection via closed-ended interviewing.

The Demographic Information Questionnaire: This questionnaire asked for the following information such as sex, age, occupation before retirement, education level, duration of residence in Tehran, cigarette use, alcohol use, taking medicines, and questions concerning participation in volunteering (Carr et al., 2018; Luria et al., 2017).

The questions concerning participation in volunteering include:

- "How many hours have you spent volunteering approximately over the last 12 months?" (the group with no hours of participation in volunteering, 1-99 hours of participation in volunteering, 100-199 hours of participation in volunteering, and more than 200 hours of participation in volunteering)
- "In what kind of volunteering have you participated" (For example; religious, educational, health-related, or other charitable organizations.)?
- "How many years have you been participating in volunteering?"

It is worth noting that all the questions about participation in volunteering were drawn from the study of Proulx et al. (2018).

The MoCA or Montreal Test is a widely used assessment for screening cognitive impairments designed by Ziad Nasreddine in 1996 in Montreal, Quebec and indicated the higher sensitivity of the MoCA than the Mini-Mental State Examination (MMSE) in cognitive impairment screening in the older adults (Nasreddine et al., 2005). This test consists of 30 scores range between 0 and 30. A score of 26 or higher is considered normal cognitive functioning (Nasreddine et al., 2005). The validity and reliability of this test have been investigated in Iran by Rashedi et al. (2021). The MoCA had a sensitivity of 94% for screening cognitive impairments in the older adults, while the MMSE had a sensitivity of 61% (Rashedi et al., 2021).

The SF36 Health Survey is a 36-item short questionnaire and a general tool for measuring quality of life that measures eight variables: 1) Physical functioning, 2) social functioning, 3) role limitations due to physical problems, 4) role limitations due to emotional problems, 5) mental health, 6) energy and vitality, 7) pain, and 8) general perception of health (Ware Junior & Sherbourne, 1992). A higher score denoted better physical functioning without limitations, and a lower score denoted worse physical functioning with severe limitations. The scoring of three levels included: Without limitations in physical functioning (24-30), somewhat limited (17-23), severe limitations, or very limited activity (10-16) (Ware Junior & Sherbourne, 1992). The validity and reliability of this questionnaire have been investigated and confirmed by Montazeri et al. with Cronbach's alpha coefficient of 0.70 (Montazeri et al., 2005; Lins & Carvalho, 2016).

The GHQ-28 is a measure of the client's current mental health, and has been widely used in various settings and cultures. This questionnaire was originally formulated as a

60-question tool, but at present, a spectrum of shortened versions of the questionnaire (GHQ-12, GHQ-20, GHQ-28, and GHQ-30) is available. This scale measures whether the respondent has recently experienced a special symptom or behavior. Each item is rated on a four-point scale (not at all, at a normal level, more than normal, and much more than normal). The most common scoring methods are dichotomous (0-0-1-1) and Likert (0-1-2-3) (Montazeri et al., 2003). The sensitivity and specificity of this questionnaire were reported by to be 84.7% and 93.8%, respectively in Iran (Noorbala et al., 2009; Poorolajal et al., 2017).

Data analysis

Univariate and multivariate analyses as well as simple and multiple logistic regressions were used to determine the factors related to participation in volunteering. The results of these analyses were provided as the crude odds ratio (OR) and adjusted odds ratio (aOR) with 95% confidence intervals (95% CI). Given the non-normality of the data, the Mann-Whitney U test was used; the effect size r for the Mann-Whitney U test was also reported; r values equal to 0.1-0.3, 0.3-0.5, and >0.5 denote low, moderate, and high effect sizes, respectively. The data were analyzed using IBM SPSS Statistics software version 26, and a significance level of 0.05 was considered.

The present study was conducted after obtaining the necessary permits and with the approval of the ethics committee of Shahid Beheshti University of Medical Sciences on September 11, 2023 with the code of ethics (IR.SBMU.RETECH.REC.1402.102).

Results

Comparison of demographic characteristics between people with and without participation in voluntary work

The demographic characteristics of the elderly are shown separately in Table 1. According to the chi-square test results, the proportion of women in the elderly who participated in voluntary work was significantly higher than the elderly who did not participate in voluntary work (72.8% vs. 51.0%; $P<0.001$). Compared to the elderly who did not participate in voluntary work, the level of education was higher in people who participated in voluntary work ($P<0.001$). In other social-individual variables, there was no statistically significant difference between the two studied groups.

Investigating the factors associated with participation in volunteering using logistic regression

The factors associated with participation in volunteering using simple (unadjusted) logistic regression are shown in Table 2. According to the crude OR values, the odds of participation in volunteering in females was 2.57 times that of males (95% CI: 1.58-4.17, $OR=2.57$). With increased education level, the odds of participation in volunteering increased so that the odds of participation in volunteering in the elderly with under diploma, diploma, and university education levels were 2.81, 5.86, and 7.41, respectively, compared to the illiterate elderly. In univariate analyses, other personal characteristics of the elderly had no statistically significant association with their participation in volunteering.

Table 1. The comparison of demographic characteristics between the elderly with and without participation in volunteering.

Variable	Participation in Volunteering		2 χ Test Statistic	P-Value
	No (N=149)	Yes (N=147)		
Age (year)				
60-75	116 (77.9)	123 (83.7)	1.61	0.204
<75	33 (22.1)	24 (16.3)		
Gender				
Male	73 (49.0)	40 (27.2)	14.88	>0.001
Female	76 (51.0)	107 (72.8)		
Education level				
Illiterate	27 (18.1)	7 (4.8)	24.86	>0.001
Under diploma	70 (47.0)	51 (34.8)		
Diploma	27 (18.1)	41 (27.9)		
University	25 (16.8)	48 (32.7)		
Cigarette use				
No	143 (96.0)	145 (98.6)	2.00	0.157
Yes	6 (4.0)	2 (1.4)		
Taking medicines				
No	77 (51.7)	88 (59.9)	2.01	0.156
Yes	72 (48.3)	59 (40.1)		
Length of dwelling in Tehran				
Less than 15 years	4 (2.7)	5 (3.4)	0.13	0.720
More than 15 years	145 (97.3)	142 (96.6)		
Dwelling in the district				
15 years and less	27 (18.1)	25 (17.0)	0.06	0.801
More than 15 years	122 (81.9)	122 (83.0)		

Note. Values are shown as “(percentage) frequency.

Multiple (adjusted) logistic regression analysis was carried out to identify the independent factors concerning participation in volunteering among the elderly. The results indicated that the female gender (95% CI: 2.46-15.31, aOR=6.14), diploma education (95% CI: 1.58-13.03, aOR=4.54), and university education (95% CI: 2.41-22.59, aOR=7.38) were associated with higher odds of participation in volunteering compared to illiteracy. However, this difference was not statistically significant ($P=0.074$). In the multivariate analysis, other personal characteristics of the elderly had no statistically significant relationship with their participation in volunteering.

Comparison of the scores of the Montreal Cognitive Assessment, the 28-Item General Health Questionnaire, and the Short-Form 36 Health Survey between the elderly with and without participation in volunteering

Considering that the assumption of normality is not met for all investigated variables ($P<0.05$), in this section, the scores of the MoCA, GHQ-28, and SF-36 between the

elderly with and without participation in volunteering were compared using the Mann-Whitney U test. As seen in Table 3, the values [(interquartile range) median] of the MoCA scores were significantly higher in the elderly participating in volunteering [(21-27) 25] than in those not participating in volunteering [(17-24) 21] ($r=0.367$, $P<0.001$, $U=0.6316$); The effect size for cognitive function ($r=0.367$) was moderate.

Table 2. Factors associated with participation in volunteering in the elderly using logistic regression.

Variable	Simple Logistic Regression		Multiple Logistic Regression	
	OR (95% CI)	P-value	aOR (95% CI)	P-value
Age (year)				
60-75	1 (reference)		1 (reference)	
<75	0.69 (0.38-1.23)	0.206	1.36 (0.86-2.75)	0.386
Gender				
Male	1 (reference)		1 (reference)	
Female	2.57 (1.58-4.17)	>0.001	6.14 (2.46-15.31)	>0.001
Education level				
Illiterate	1 (reference)		1 (reference)	
Under diploma	2.81 (1.14-6.96)	0.025	2.29 (0.86-6.12)	0.099
Diploma	5.86 (2.24-15.34)	>0.001	4.54 (1.58-13.03)	0.005
University	7.41 (2.83-19.37)	>0.001	7.38 (2.41-22.59)	>0.001
Cigarette use				
No	1 (reference)		1 (reference)	
Yes	0.33 (0.07-1.66)	0.177	0.33 (0.06-1.83)	0.205
Taking medicines				
No	1 (reference)		1 (reference)	
Yes	0.72 (0.45-1.14)	0.157	0.73 (0.43-1.25)	0.253
Duration of dwelling in Tehran				
Less than 15 years	1 (reference)		1 (reference)	
More than 15 years	0.78 (0.21-2.98)	0.720	0.82 (0.13-5.02)	0.832
Dwelling in the district				
15 years and less	1 (reference)		1 (reference)	
More than 15 years	1.08 (0.59-1.97)	0.801	1.09 (0.52-2.29)	0.814

Note. OR: odds ratio; aOR: adjusted odds ratio; CI: confidence interval.

The values [(interquartile range) median] of the GHQ-28 total score in the elderly participating in volunteering [(11-19) 14] were significantly lower than those not participating in volunteering [13-26.5] 17] ($r=0.241$, $P<0.001$, $U=0.7908$); the effect size was at a low level. Similar results were found concerning the subscales of physical symptoms ($r=0.173$, $P=0.003$, $U=5.8777$), anxiety and insomnia ($r=0.143$, $P=0.014$, $U=5.9148$), social dysfunction ($r=0.311$, $P<0.001$, $U=5.7532$), and depression ($r=0.219$, $P>0.001$, $U=5.8625$); given the effect size values, the greatest difference was observed in the social dysfunction subscale.

The values [(interquartile range) median] of the score of physical functioning in the elderly participating in volunteering [(90-80)] were significantly higher than those not participating in volunteering [(70-95) 85] ($r=0.189$, $P=0.001$, $U=2.8582$); the effect size

was at a low level. The values of the scores of role limitations due to physical fitness status ($r=0.218$, $P<0.001$, $U=0.8358$) and role limitations due to emotional problems ($r=0.161$, $P=0.006$, $U=5.9126$) were significantly lower in the elderly participating in volunteering than in those not participating in volunteering; the effect size values were at low levels. The values of the scores of energy and vitality ($r=0.165$, $P=0.005$, $U=0.8870$), emotional health ($r=0.165$, $P=0.005$, $U=0.8870$), social functioning ($r=0.239$, $P<0.001$, $U=5.8571$), and pain ($r=0.153$, $P=0.009$, $U=0.9094$) were significantly higher in the elderly participating in volunteering than in those not participating in volunteering; all effect size values were at low levels. The scores of the general health subscale were higher in the elderly participating in volunteering than in those not participating in volunteering; however, this difference was not statistically significant ($r=0.110$, $P=0.058$, $U=5.9562$); the effect size value was at a low level. Comparison of the Scores of the Montreal Cognitive Assessment, the 28-Item General Health Questionnaire, and the Short-Form 36 Health Survey between the Elderly with and without Participation in Volunteering are presented in Figure 1, 2 and 3 respectively.

Table 3. The comparison of the scores of the MoCA, GHQ-28, and SF-36 between the elderly with and without participation in volunteering.

		Participation in Volunteering		U Statistic	P ^a	Effect Size (r)
		No	Yes			
MoCA				0.6316	>0.001	0.367
	Mean (SD)	20.2 (5.2)	23.8 (5.2)			
	(Interquartile range) median	(17-24) 21	(21-27) 25			
The physical symptoms subscale				5.8777	0.003	0.173
	mean(SD)	4.79 (3.56)	3.57 (2.87)			
	(Interquartile range) median	(2-7) 4	(1-5) 3			
The anxiety and insomnia subscale				5.9148	0.014	0.143
	mean (SD)	5.89 (4.49)	4.53 (3.59)			
	(Interquartile range) median	(2-8.5) 5	(2-7) 4			
GHQ-28 The social dysfunction subscale				5.7532	>0.001	0.311
	mean (SD)	8.09 (2.01)	7.08 (1.27)			
	(Interquartile range) median	(7-8) 7	(7-7) 7			
The depression subscale				5.8625	>0.001	0.219
	mean (SD)	1.91 (3.09)	0.54 (1.28)			
	(Interquartile range) median	(0-3) 0	(0-1) 0			
GHQ-28 total score				0.7908	>0.001	0.241
	mean (SD)	20.64 (10.80)	15.75 (7.04)			
	(Interquartile range) median	(13-26.5) 17	(11-19) 14			

Table 3. Continued...

		Participation in Volunteering		U Statistic	P [†]	Effect Size (r)
		No	Yes			
SF-36	Physical functioning			5.8582	0.001	0.189
		mean (SD)	78.9 (20.6) 85.8 (15.0)			
		(Interquartile range) median	(70-95) 85 (80-95) 90			
	Role limitations due to physical fitness status			0.8358	>0.001	0.218
		mean (SD)	45.0 (42.5) 27.0 (36.6)			
		(Interquartile range) median	(0-100) 25 (0-50) 0			
	Role limitations due to emotional problems			5.9126	0.006	0.161
		mean (SD)	38.6 (44.0) 24.5 (37.5)			
		(Interquartile range) median	(0-100) 0 (0-33.3) 0			
	Energy and vitality			0.8870	0.005	0.165
		mean (SD)	63.5 (22.0) 71.4 (15.3)			
		(Interquartile range) median	(50-8-) 65 (60-80) 70			
	Emotional fitness			5.9396	0.034	0.123
		mean (SD)	68.5 (20.2) 74.6 (14.4)			
		(Interquartile range) median	(56-84) 72 (68-84) 76			
	Social functioning			5.8571	>0.001	0.239
		mean (SD)	86.6 (21.0) 95.0 (13.0)			
		(Interquartile range) median	(75-100) (100-100) 100 100			
	Pain			0.9094	0.009	0.153
		mean (SD)	70.1 (31.5) 80.4 (24.6)			
		(Interquartile range) median	(47.5-100) (67.5-100) 80 90			
	General health			0.9562	0.058	0.110
		mean (SD)	61.8 (22.7) 67.0 (21.6)			
		(Interquartile range) median	(50-80) 65 (50-85) 70			

Note. MoCA: The Montreal Cognitive Assessment. GHQ-28: The 28-item General Health Questionnaire. SF-36: The Short-Form 36 (SF36) Health Survey. SD: Standard deviation. †: The Mann-Whitney U Test. Interpretation of the effect size r: 0.1-0.3 = low, 0.3-0.5 = moderate, and <0.5 = high.

In this study, regression analysis was performed and the results of the analysis showed that those who participate in voluntary work have higher physical fitness based on SF36 scores and better cognitive functioning based on MOCA scores as well as according to GHQ-28 subscale scores, those who participate in voluntary work have lower levels of anxiety and depression and also have better social functioning.

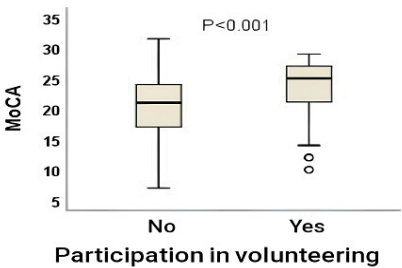


Figure 1. Comparison of the scores of the Montreal Cognitive Assessment between the elderly with and without participation in volunteering.

Note. In a box diagram, minimum, first quartile, median, third quartile, and maximum values are shown, respectively. The symbol □ denotes remote points. P-values are based on the Mann-Whitney U test.

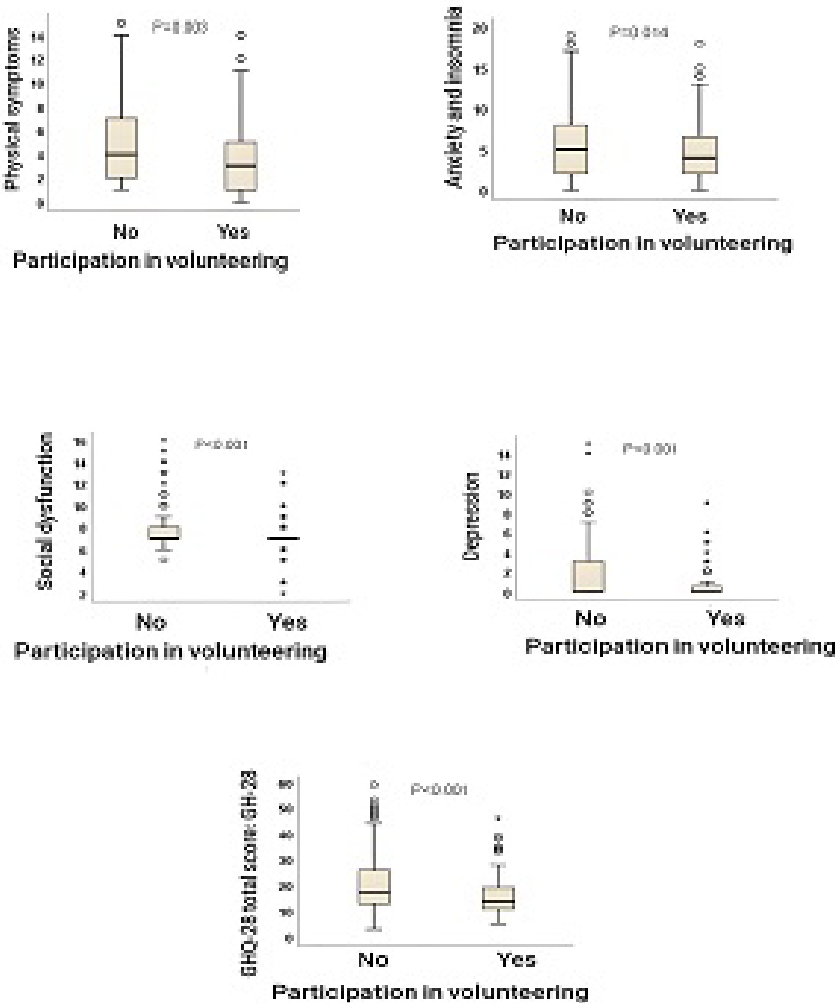


Figure 2. Comparison of the 28-item General Health Questionnaire total score and its subscales between the elderly with and without participation in volunteering.

Note. In a box diagram, minimum, first quartile, median, third quartile, and maximum values are shown, respectively. The symbols □ and ★ denote remote and extreme points. P-values are based on the Mann-Whitney U test.

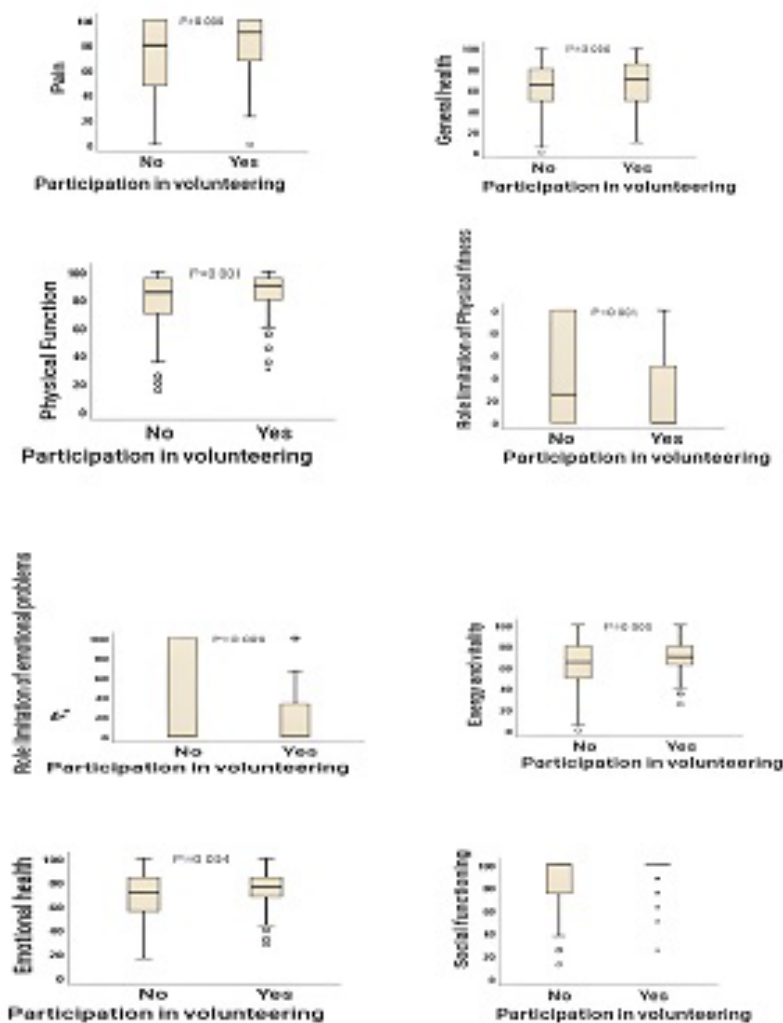


Figure 3. Comparison of the scores of the Short-Form 36 Health Survey between elderly with and without participation in volunteering.

Note. In a box diagram, minimum, first quartile, median, third quartile, and maximum values are shown, respectively. The symbols □ and ★ denote remote and extreme points. P-values are based on the Mann-Whitney U test.

Discussion

Generally, Iran is a religious country and the elderly usually do voluntary activities in the form of spiritual beliefs and values and in places such as charities and mosques (Norouzi & Boudlaie, 2021).

The results of statistical analysis of demographic information in this study showed that the proportion of women among the elderly who participate in volunteering is higher than among the elderly who do not participate in volunteering. The demographic findings of this study also showed that the level of education was higher in people who participated in volunteering.

Recent studies support that cognitive functioning and physical fitness of community dwelling older adults are directly related to participation in volunteering (Proulx et al., 2018; Gupta, 2018; McDonald et al., 2013). On the other hand, some studies have shown that participation in voluntary activities does not affect the cognitive functioning of the elderly (Corrêa et al., 2019).

The results of the analysis of MoCA scores in the older adults demonstrated better cognitive function of the older adults participating in volunteering than that of the older adults not participating in volunteering. Some studies, such as Proulx et al. (2018) and Sharifi et al. (2024), revealed that volunteering was associated with higher levels of cognitive function and culture over time (Proulx et al., 2018; Sharifi et al., 2024). This study indicates a positive and significant relationship between participation in volunteering and the cognitive functioning of the community dwelling older adults, particularly with facets of cognitive function concerning working memory and processing (Proulx et al., 2018). Volunteering is a productive activity that is beneficial not only for society but also for the volunteers' cognitive function at older ages (Proulx et al., 2018). Furthermore, the results of Gupta's (2018) study indicated that participation in volunteering considerably prevented reduced cognitive function in the older adults aged 60 years and older (Gupta, 2018). These findings promise the development of volunteering-based interventions to reinforce cognitive function. Volunteering-based interventions include participation in specific organizations or institutions such as mosques, charities to collect and package donations and public assistance, health and treatment centers for performing injections and first aid, environmental protection such as street maintenance, planting trees and cleaning parks or helping homeless people, friends, neighbors (Birle et al., 2021; Librett et al., 2005; Norouzi & Boudlaie, 2021).

Furthermore, results from this study indicated a positive significant relationship between participation in volunteering and the physical fitness of the community dwelling older adults. The values of the scores of the physical functioning subscale of SF36 in the older adults participating in volunteering were significantly higher than that in the older adults not participating in volunteering, showing the better physical functioning of the older adults participating in volunteering. Other studies, such as McDonald et al. (2013), show that volunteering accompanies improved health and quality of life in different subscales. Moreover, this improvement may be particularly greater for females, current volunteers, and the older adults (McDonald et al., 2013). Carr et al.'s (2018) study also demonstrated that volunteering-based intervention programs were a major strategy to delay the development of physical disability in the older adults (Carr et al., 2018). These findings may assist in interventions developed to promote the health and well-being of the older adults in different situations (McDonald et al., 2013).

The results obtained through comparing the scores of the GHQ-28 subscales also indicated that physical symptoms, anxiety, insomnia, depression, and social dysfunction were lower in the older adults participating in volunteering. The scores of the physical symptoms, anxiety, insomnia, social dysfunction, and depression subscales in the older adults participating in volunteering were lower than those not participating in volunteering. In Musick & Wilson's (2003) study, the analysis of three data waves from the American Life Change dataset (1986, 1989, and 1994) indicated that volunteering

decreased depression levels for individuals over 65 years of age (Musick & Wilson, 2003). And according to Jiang's study one of the benefits of volunteering is increased psychosocial health, which is formed through the creation of meaningful and supportive social relationships (Jiang et al., 2021). The results of some studies revealed that participation in volunteering created opportunities for interaction and social functioning among different cultures and may accompany increased mental health (Schwingel et al., 2009).

Today, occupational therapists believe that health is supported and maintained when individuals are able to participate in occupations and activities at home, school, work, and in their community. Occupational therapy actively participates in programs and services to promote the health of communities and populations, and develops and implements occupational-based approaches that pursue population participation and engagement in occupations that promote health in the community (Estrany-Munar et al., 2021).

Since participation in volunteering is a type of community-based intervention and it is different in various cultures as well as in Iran it is in the form of religious and spiritual beliefs and activities, occupational therapists can collaborate with services and institutions such as health centers, charities, and mosques and create programs to expand participation in volunteering at the community for older adults in order to prevent isolation, cognitive and physical dysfunctions, depression, anxiety, and social dysfunction.

Suggestion

It is suggested to conduct interventional studies in the field of improving physical and cognitive symptoms and the effect on participation in volunteering in the elderly, in addition to this, interventions in the direction of participation in volunteer work and its effect on the improvement of cognitive and physical symptoms of the community dwelling older adults should be carried out so that the society as they got older, they started participating in volunteer work more than before. In addition, it is suggested to use a culturally relevant tool that reports the frequency of participation in volunteering quantitatively. Although it is suggested that future studies investigate potential mechanisms, such as social participation, sense of purpose, and neurobiological pathways as underlying mechanisms that drive the observed relationship between volunteering and cognitive performance, physical fitness, and mental health.

Limitation

In order to minimize the bias in sampling, sampling was done from all areas of Tehran city, north, south, east, west, and center but nevertheless, due to the increase in the aging population, in addition to the areas, sampling must be done from all urban areas of Tehran to report better results in the future. Another limitation of the current study is the lack of attention to potential biases in self-reported voluntary behavior, such as social desirability bias or volunteerism as a form of social capital, which is suggested to be paid more attention to in future studies. Considering that the present study is a cross-sectional descriptive study, caution should be taken in generalizing the results.

Conclusion

According to the results of the current study, cognitive and physical fitness are associated with higher volunteering rates, though causal relationships require further investigation. The other findings demonstrate that the elderly who participate more in volunteering have less depression, anxiety and better physical health and social functioning. The findings of this research also demonstrated that factors such as the elderly's sex and education level, affected their participation in volunteering in such a way that the ratio of females participating in volunteering was higher than males, and the higher education level, the higher the participation in volunteering.

Thus, according to these findings, it seems that the development of participation in volunteering-based interventions will probably positively affect the physical fitness, mental health, cognitive functioning, social functioning, and quality of life of the selected Iranian community dwelling elderly. Occupational Therapists should know that one of the strategies that may help improve the cognitive and physical symptoms of the elderly is encouraging them to participate in volunteering activities based on their cultures which in Iran is based on religion and includes participation in organizations and centers such as mosques, charities, educational and health institutions, environmental protection, as well as participation in helping the homeless, neighbors, and friends.

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Author's Contributions

Fatemeh Abdoli was responsible for the conceptualization, data curation, formal analysis, and drafting of the manuscript. Mehdi Rezaee was responsible for the conceptualization, supervision and critical revision of the manuscript for important intellectual content. Marzieh Pashmdarfard was responsible for the conceptualization, formal analysis, critical revision of the manuscript for important intellectual content, and statistical analysis. Maedeh Loabichian was responsible for the data curation. All authors approved the final version of the article.

Data Availability

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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