

Original Article

The Effect of Physical Activity on Loneliness in the ElderlySelcuk Tosun Alime¹Lok Neslihan¹Lok Sefa^{2*}¹ University of Selcuk, Konya, 42130, Turkey² University of Selcuk, (Corresponding author) Konya, 42130, Turkey

DOI: 10.29081/gsjesh.2021.22.1.10

Keywords: *Older Adults, Physical activity, Loneliness***Abstract**

The aim of this study is to determine the level of physical activity and loneliness in older adults and to examine the relationship between these variables. The sample size of the study consists of 137 older adults. The mean age of the participants is $70,12 \pm 3,32$. It was determined that 71.5% of the elderly individuals were in the physically inactive (<600 MET-min/week) group. The mean score of the loneliness scale of the elderly was found to be 15.93 ± 2.00 . The mean score of the loneliness scale of those who were not physically active (inactive) was found to be higher than the mean score of the loneliness scale of those with a low level of physical activity, and the difference was found to be statistically significant. As a result, it was determined that elderly individuals who do not engage in physical activity have a higher mean score on the loneliness scale.

1. Introduction

The world population is getting older and the proportion of elderly people in the countries is increasing. The elderly population, which was 962 million worldwide in 2017, is expected to double by 2050 to reach 2.1 billion (UN, 2017). In our country, the elderly population rate is 9.5% in 2020 and it is estimated that these rates will be 11.0% in 2025, 12.9% in 2030 and 16.3% in 2040 (Turkish Statistical Institute (TIK, 2021). Increasing age causes negative health consequences. Accordingly, the feeling of loneliness, which adversely affects the health and quality of life, and the deterioration in physical activity may accompany aging (Krause-Parello, Gulick, & Basın, 2019). With the predicted increase in the elderly population worldwide, the prevalence of these problems may also worsen.

Elderly individuals aged 65 and over often experience the loss of spouse and

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friends, leading to feelings of loneliness with retirement from work (Liu, Gou, & Zuo, 2016). Loneliness reflects an unpleasant, subjective situation that lacks the desired affection and closeness to an important or close person or close friends (Schrempft et al., 2019). At the same time, studies conducted with older adults reported that living alone is not an indicator of loneliness, and many people living alone show frequent social contact and active social participation in community organizations (Ong, Uchino, & Wethington, 2016). In a study, it was reported that as individuals get older, the prevalence of loneliness increases, and 43.2% of individuals aged 65 and over feel lonely for at least a while (Perissinotto, Stijacic Cenzer, & Covinsky, 2012). Risk factors for loneliness include loss of social partners, shyness, introversion, depression, male gender and physical health symptoms, restricted mobility, low income, limited education, living alone, occasional participation in social activities, and physical inactivity (Ong et al. al., 2016; Krause-Parello et al., 2019; Liu et al., 2016).

Continuous physical activity is reported to be associated with a range of beneficial outcomes such as reduced cardiovascular risk, reduced disability and frailty, beneficial metabolic profiles, greater independence, and quality of life (Schrempft et al.2019). Older individuals may experience problems with physical activity such as walking, standing, bending, carrying heavy items, and shopping difficulties. Since the exercise capacity (physical fitness) of older people tends to decrease with age, they need a physical activity plan that fits their limits (Krause-Parello et al. 2019). Because the links between social relationships and physical activity can be particularly important. It has been reported that while mobility problems and disorders in activities of daily living in elderly people can restrict social activity and increase feelings of loneliness, they may also be associated with low physical activity (Davis et al., 2014). As a matter of fact, it has been reported that physical inactivity is a risk factor for loneliness (Netz et al. 2013). In a longitudinal study, it was reported that low, moderate and / or intense physical activity is associated with loneliness (Kobayashi & Steptoe, 2018). Unlike the results of this study, it was reported in one study that there was no relationship between loneliness and physical activity or sedentary behavior (Schrempft et al. 2019). Considering the results of this study, this study will create a database for the studies to be carried out in this field. This study determines the level of physical activity and loneliness in elderly people; it was conducted to examine the relationship between these variables.

2. Material and methods

The purpose of research: This study determines the level of physical activity and loneliness in elderly people; it was conducted to examine the relationship between these variables.

Research questions

1. What are the sociodemographic characteristics of adults?
2. Does the level of loneliness change according to the socio-demographic characteristics of adults?

3. Does the level of physical activity change according to the socio-demographic characteristics of adults?

4. Is there a relationship between physical activity level and loneliness?

Design

This study is descriptively planned as relational.

Setting and study group of the research:

The study was conducted with individuals over the age of 65 residing in the Selçuklu district of Konya. Sample size in the study G *Power 3.1.9.2 analysis program with 0.27 effect size, 90% power, 5% margin of error, and the mean score of the "Loneliness Scale for the Elderly" in the study of Kalinkara and Sarı (2019) (11.55 ± 2.68).) is calculated as 137. The sample size of the study consisted of 137 elderly individuals over 65 years of age. The determined sample size was reached with the snowball sample selection method, one of the improbable sample selection methods (Sharma, 2017).

Data Collection Techniques and Tools

The data were collected by survey method between 30 March-30 April 2021. In collecting data; The personal information form that questioned socio-demographic characteristics and prepared by the researchers, the International Physical Activity Questionnaire and the Loneliness Scale for the Elderly were used.

Personal Information Form

The Personal Information Form, which was created by the researchers based on the literature, consists of seven questions that evaluate the sociodemographic characteristics of individuals (Dahlberg, Andersson & Lennartsson, 2018; Cheung, Wright-St Clair, Chacko & Barak, 2019; Kang Park & Wallace Hernandez, 2018).

International Physical Activity Questionnaire (UFAA)

In this study, the International Physical Activity Questionnaire (IPAQ) short form will be used to determine the physical activity levels of individuals. International validity and reliability studies Craig et al. (2003), validity and reliability studies in Turkey were carried out by Sağlam (2010) to university students. There are 7 questions in total in the questionnaire. The 1st and 2nd questions inquire about vigorous activities, the 3rd and 4th questions about moderate activities, the 5th and 6th questions about the time spent by the individual on walking, and the 7th questions about sitting. In the evaluation of all activities, the criterion is that each activity is done at least 10 minutes at a time. A score is obtained as "MET-minute / week" by multiplying the minute, day and MET value (multiples of resting oxygen consumption). In the calculation of energy consumption related to physical activities, the weekly duration (minutes) of each activity was multiplied by the BAT energy values created for the International Physical Activity Questionnaire. The walking time (minutes) was multiplied by 3.3 MET in calculating the walking score. In the calculation, 4 METs were taken for moderate activity and 8 MET values for vigorous activity. Thus, the energy consumption for each individual for intense, moderate, walking, sitting, and total physical activities was obtained in MET-min / Week. According to the total physical activity score, the physical activity levels of the participants were

“inactive (less than 600 MET-min / week), moderate (minimally active) (between 600-3000 MET-min / week) and very active (3000 MET-min / week and above)” (Craig et al., 2003; Sağlam et al. 2010).

Loneliness Scale for the Elderly

Developed by Gierveld and Kamphuis (1985) to measure the sense of loneliness, and revised by Tilburg and Gierveld in 1999 (Gierveld & Tilburg., 1999), the scale is a measurement tool developed based on the cognitive behavioral approach. The adaptation of the scale to Turkish, its validity and reliability study were carried out by Akgül and Yeşilyaprak (2015). The Cronbach alpha of the scale is $\alpha = .85$. The test-retest result of the scale is $r = .93$. The scale consists of 11 items aiming to measure social and emotional loneliness. The degree to which the situation is experienced by each statement in the scale is determined by 3-point Likert-type grading. The way of scoring the items of the scale is as follows: 0 for yes, 1 for possible, 2 for no. Of the scale items, 5 of them are straight coded (1, 4, 7, 8, 11) and 6 of them are reverse coded (2, 3, 5, 6, 9, 10). To determine the general loneliness score; emotional loneliness (2, 3, 5, 6, 9, 10) score is added to social loneliness (1, 4, 7, 8, 11) score. The lowest score that can be obtained from the scale is 0, the highest score is 22. It is commented that as the score obtained from the scale increases, the level of loneliness of the person increases. (Akgül & Yeşilyaprak, 2015).

Data Analysis

The data of the study were evaluated using the SPSS for Windows 22.0 (Statistical Package for Social Science) statistical package program. Unit number (n), percentage (%), mean \pm standard deviation (mean (SD)) values were used as summary statistics. Normal distribution of data was evaluated by Kolmogorov-Smirnov test and Q-Q graph. T-test and variance analysis were used in independent groups for normally distributed data. Results were evaluated at 95% confidence interval and $p < 0.05$ significance level.

Ethical Procedure

Ethical permission was obtained from the Faculty of Sport Sciences Ethics Committee (Date: 25.03.2021, Decision number: 59) for the ethical permission of the study. Before starting the research, the informed consent form of the individuals was read and their consent was obtained.

3. Results and Discussions

The average age of the participants is 70.12 ± 3.32 , 53.3% are men, 46.7% are women, 31.6% are high school graduates, 56.9% are married, 43.1% are It was determined that 44.5% of them perceived their income as bad, 56.2% perceived their health as bad, 78.1% had any chronic disease and 31.4% lived alone.

When the loneliness scale levels for the elderly were evaluated with the physical activity questionnaire of the participants, it was found that 71.5% were in the physically inactive (inactive) group, and 28.5% were in the group with low physical activity (less active). The mean score of the loneliness scale for the elderly was found to be 15.93 ± 2.006 (Table 1).

Table 1. *Distribution of participants' physical activity level and loneliness scale scores for the elderly*

Scales	Number (n)	Percent (%)
Physical Activity Questionnaire		
Physically inactive (Inactive) (<600 MET-min / week)	98	71.5
With a low level of physical activity (600-3000 MET-min / wk) (Less Active)	39	28.5
	Mean±SD	Min-Max
Level of loneliness	15.93±2.00	10-20

The relationship between the sociodemographic characteristics of the participants and the mean scores of the loneliness scale for the elderly is given in Table 3. It was determined that the average score of the loneliness scale of women was higher than the mean score of the loneliness scale of men and the difference was statistically significant ($p < 0.05$).

Table 2. *Distribution of participants' mean scores for the elderly loneliness scale by sociodemographic characteristics*

Variables	Loneliness Ort±SS	Test value p value
Gender		
Woman	17.83±2.16	t: 0.539
Male	14.01±1.86	p:.,002*
Education Status		
Literate	16.10±1.83	
Primary school	15.95±1.46	F: 0.748
Middle School	16.24±1.93	p:0.525
High school	15.63±.,22	
Marital status		
The married	13.78±2.20	t:2.789
Single	18.12±1.70	p:0.009*
Perceived Income Level		
Good	15.95±1.98	F: 1.787
Middle	16.29±1.71	p:0.171
Bad	15.59±2.21	
Perceived Health Level		
Good	15.82±1.60	F: 2.036
Middle	15.49±2.47	p:0.135
Bad	16.22±1.66	
Presence of Chronic Disease		
Yes	15.78±2.03	t:1.678
No	16.47±1.81	p:0.096
People with whom they live		
Alone	20.47±1.54	F: 0.956
With his wife	13.72±2.48	p:0.04*
With his wife and children	13.86±1.84	
With her children	15.76±1.80	

F: One Way Anova, t: t test, U:Mann Whitney U Test, * $p < 0.05$

It was determined that the average score of the loneliness scale of singles was higher than the average score of the loneliness scale of the married people and the difference was statistically significant ($p < 0.05$). A statistically significant difference was found between the people living together and the level of loneliness, and it was determined that the difference was due to those living alone ($p < 0.05$). No statistical significance was found between loneliness and educational status, perceived income and health status, and having any chronic diseases ($p < 0.05$) (Table 2).

The physical activity status of the participants according to their sociodemographic characteristics is presented in Table 3.

Table 3. *Distribution of participants' physical activity levels by sociodemographic characteristics*

Variables	Physical Activity Levels		Test value p value
	Inactive n (%)	Minimal active n (%)	
Gender			
Woman	46(%33.6)	18(%13.1)	X ² : 0.934 p:0.007*
Male	52(%38.0)	21(%15.3)	
Education Status			
Literate	26(%19.1)	5(%3.7)	X ² : 9.273 p:0.26
Primary school	17(%12.5)	3(%2.2)	
Middle School	30(%22.1)	12(%8.8)	
High school	24(%17.6)	19(%14.0)	
Marital status			
The married	68(%49.5)	29(%21.2)	X ² : 6.751 p:0.009*
Single	30(%22.1)	10(%7.3)	
Perceived Income Level			
Good	12(%8.8)	9(%6.6)	X ² : 2.776 p:0.25
Middle	42(%30.7)	13(%9.5)	
Bad	44(%32.1)	17(%12.4)	
Perceived Health Level			
Good	9(%6.6)	2(%1.5)	X ² : 1.739 p:0.419
Middle	32(%23.4)	17(%12.4)	
Bad	57(%41.6)	20(%14.6)	
Presence of Chronic Disease			
Yes	78(%56.9)	29(%21.2)	X ² : 0.447 p:0.01*
No	20(%20.4)	10(%7.3)	
People with whom they live			
Alone	27(%19.7)	3(%2.2)	X ² : 9.204 p:0.27
With his wife	29(%21.2)	14(%10.2)	
With his wife and children	20(%14.6)	15(%10.9)	
With her children	22(%16.1)	7(%5.1)	

X²:Kikare test, *p<0,05

It was found that men were more inactive than women in terms of physical activity and the difference was statistically significant ($p < 0.05$). It was found that married people were more inactive than singles in terms of physical activity, the difference was statistically significant ($p < 0.05$). It was found that those with chronic diseases were more inactive in terms of physical activity than those who did not, and the difference was statistically significant ($p < 0.05$). There was no statistically significant difference between physical activity level and educational status, perceived income and health status, and people living with them ($p > 0.05$).

When the participants' physical activity level and the loneliness scale average were compared, the average score of the loneliness scale of those who were not physically active (inactive) was found to be higher than the average score of the loneliness scale of those with a low level of physical activity, and the difference was found to be statistically significant ($p < 0.05$). It was observed that those who did not do physical activity were more alone (Table 4).

Table 4. Comparison of the physical activity level of the participants and the average score of the level of loneliness

Physical Activity Questionnaire	Loneliness Level Mean±SD	Test value p value
Physically inactive (Inactive) (<600 MET-min / week)	18.07±2.03	
With a low level of physical activity (600-3000 MET-min / wk) (Less Active)	13.56±1.91	F:1.795 p:0.002*

U:Mann Whitney U Test, * $p < 0.05$

Discussion

In this study, it is aimed to examine the relationship between loneliness and physical activity in elderly individuals aged 65 and over. In our study, it was found that most of the elderly individuals (71.5%) were inactive. At the same time, in our study, in terms of physical inactivity, it was found that men, those who were married, and those with any chronic diseases were more inactive. In a study similar to our study, it was found that the physical activity levels of the participants were very low, with an average of 2.4 minutes per hour in moderate / vigorous activity and 15.5 minutes per hour in light activity during the day and evening. In the same study, therefore, it was reported that participants spent an average of 42.1 (70.2%) minutes per hour on sedentary behavior (Schrempft et al. 2019). In a systematic study, it was concluded that 65-80% of the time when individuals aged 60 and over were awake were spent in sedentary behavior (Harvey, Chastin, & Skelton, 2015).

In our study, it was found that inactive elderly individuals had higher mean loneliness scores than those with low physical activity levels. In one study, while loneliness was cross-sectionally associated with low levels of moderate and / or vigorous physical activity, it was stated in a longitudinal analysis that loneliness was not associated with physical inactivity (Kobayashi & Steptoe, 2018). Unlike our study, it was stated that there was no relationship between loneliness and physical activity or sedentary behavior (Schrempft et al. 2019). In another

systematic review and meta-analysis study, it was found that physical activity level is not effective for loneliness (Shvedko et al., 2018). Unlike the results of this study, Brady et al. (2020) reported that membership in a fitness program in elderly individuals increases physical activity and indirectly reduces loneliness. In a systematic review, it is emphasized that there is a negative relationship between loneliness and physical activity levels in middle-quality loneliness studies, especially in women (Smith et al., 2017). It can be said that the inclusion of elderly people in a continuous physical activity program may have higher self-efficacy, confidence level and positively affect their health.

Studies have emphasized that besides physical activity, some sociodemographic characteristics are associated with loneliness (Dahlberg et al., 2018; Cheung et al., 2019; Yang & Gu 2020). In this study, it was found that the loneliness score averages of women were higher than men. In a study, it was stated that women felt more lonely and the difference between those who felt lonely and those who did not in terms of gender was important (Cheung et al., 2019). This situation may make men think that they are more active in social relationships and life.

In our study, it was found that the loneliness score averages of singles were higher than married ones. In the study of Dahlberg et al. (2018), not being married at the end of the follow-up was associated with five times the probability of being alone without being married. In this case, it can be said that spousal support is important in reducing loneliness of the individual. In our study, it was determined that people with whom elderly people live together are also effective on loneliness. It was found that the loneliness score averages of the individuals living alone were higher than those living with their spouse, spouse and children, and their children. On the other hand, in this study, it was determined that those living with their spouses had the lowest mean scores on loneliness. In a study, it was stated that there is a negative relationship between social support and loneliness (Kang et al., 2018). In a study evaluating the long-term predictors of loneliness, it was reported that the probability of loneliness among individuals who did not have access to social support at the beginning was more than twice as high as those with access to social support, and this situation was the same after follow-up (Dahlberg et al., 2018). These results can be said that social support is important on loneliness and increasing the social support resources of elderly people can reduce the level of loneliness.

In our study, no significant difference was found between educational status, perceived income, perceived health status, presence of chronic illness, and loneliness score average. Unlike our study, Cheung et al. (2019) reported that those who have financial difficulties and perceive their own health as bad feel more lonely, and those who do not feel lonely. In the same study, it was stated that the difference between those who feel lonely and those who do not feel themselves is important in terms of financial difficulties and perception of their own health. In Yang & Gu (2020) study, it was reported that the incidence risk of loneliness increased in those who evaluated their own health well, and that the incidence of loneliness decreased in those who had a good economic situation. The results of the study show that the economic status of elderly people and their own health

perception may have an effect on individuals' loneliness.

4. Conclusions

As a result, it was determined that elderly individuals who do not engage in physical activity (inactive) loneliness scale average score is higher. In terms of physical inactivity, it was found that males, those who were married, and those with any chronic diseases were more inactive. It was determined that the loneliness scale mean scores of women, single ones and those living alone were higher. Planning and developing group-based physical activity programs for elderly people can have positive effects on loneliness.

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