








## Relationships between Perceived Social Support and Physical Activity with Mood, Physical Fitness and Cognitive Status of Elderly in Golestan Province

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### Abstract

**Background:** Due to advances in medicine and technology in recent years, the number of elderly has increased substantially in most countries. As a result, addressing factors influencing the elderly population to improve their physical, psychological, and cognitive status is of great importance. Therefore, the purpose of this study was to determine the relationship between perceived social support and physical activity with the mood, physical fitness, and cognitive status of elderly people.

**Methods:** This cross-sectional study was conducted from April to September 2019 in Golestan province, Northeast of Iran. The sample consisted of 142 people over 60 years old (including 131 women and 11 men) who were selected using a random sampling method from Gorgan, Gonbad Kavous, Aliabad Katoul, and Azadshahr cities of Golestan province in 2019. Data was gathered using: Perceived Social Support Scale, Geriatric Depression Scale, Wechsler Memory Scale, Rapid Assessment of Physical Activity Questionnaire, and Rikli and Jones' physical fitness test for the elderly. Data were analyzed in SPSS-22 and Spearman correlation coefficient used to study the cooperation between variables.

**Results:** The finding showed that the mean age of participants was 66.56 years old and perceived social support had significant correlation with depression ( $r=-0.48$ ,  $P<0.001$ ) and memory ( $r=0.24$ ,  $P=0.003$ ). There was a significant correlation between physical activity and physical fitness ( $r=0.18$ ,  $P=0.049$ ), but no significant correlation were observed between physical activity with depression and memory. In addition, physical fitness had significant correlation with depression ( $r=0.27$ ,  $P=0.001$ ) and memory ( $r=0.27$ ,  $P=0.001$ ).

**Conclusion:** Perceived social support and physical activity can be considered important factors for improving the mood-cognitive-physical status of the elderly. Therefore, gerontologists, physiotherapists, and occupational therapists can improve the mood-cognitive-physical status of the elderly by improving social relationships and physical activity.

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### Highlights:

#### What is current knowledge?

According to the existing literature, no study has examined the relationship between perceived social support and physical activity with the physical and cognitive functions, as well as the mood status of the elderly in Golestan province, in which the people from different cultures and races are living in and has unique cultural and social characteristics.

#### What is new here?

This study show that perceived social support and physical activity can be considered important factors for improving the mood-cognitive-physical status of the elderly in Golestan province.

### Introduction

The advances in medicine and technology have led to increased life expectancy all over the world (1). According to the United Nation's data, the number of elderly people - people over 65 years of age - has increased substantially in most countries in recent years, and is projected to grow in the future to almost 1.5 billion by 2050. In Iran, it is expected that about 9.6 percent of the population will be over 65 years by 2030 (2). Therefore, addressing the challenges facing the aging population and using appropriate factors to improve the physical, psychological, and cognitive status of the elderly is of great importance (3). Two important components in improving the quality of life of the elderly include social support and physical activity. In the present study, the effect of these two components on the mood-cognitive-physical status of the elderly has been investigated.

Perceiving support from family or friends is one of the issues that can affect the quality of life of older people. The elderly need to be in touch with others to seek help when they need it and have the appropriate social support (4). Social support is a multidimensional structure that encompasses several quantitative (such as social network size and intensity of support behavior) and qualitative (such as contact satisfaction and perceived support if needed) (4). Social support can be considered as a factor affecting the health of the elderly. Some studies showed that perceived social support affects positively the psychological and physical health of the elderly (5) and high levels of perceived social support are associated with lower rates of mental disorder (6). There has also been a relationship

between perceived positive social support and higher cognitive performance among the elderly (7). It has been shown that social support had positive effects on the physical and mental health of older women (8). Moreover, it has been demonstrated that people with higher social support have better health status (9). On the other hand, perceived social support has a positive effect on one's physical, mental and social status and ultimately leads to increased cognitive functioning and health (10). Therefore, the perceived social support component can be considered as an important variable in elderly health.

Moreover, one of the simplest and least costly ways to prevent and treat physical complications and maintain the cognitive functions of the elderly is to perform physical activity. Research has shown that physical exercise is an effective factor in preventing imbalances, motor disability, and cognitive impairment in the elderly (11). It has been shown that physical activity is useful for improving cognitive function in healthy elderly (12), as well as it improves the quality of life (13). Additionally, it has been demonstrated that physical activity decreases symptoms of depression and increases the quality of life and self-esteem in the elderly (14). Physical activity also reduces fatigue (15) and loneliness (16) in the elderly. Based on previous studies, it can be concluded that physical activity is associated with better mental health in late adulthood.

It has been shown that differences in physical activity levels can not only be due to biological factors, but also social, cultural, individual, and psychological factors are interconnected with, and may even precede biological factors. These include self-efficacy and social support (17). Studies on the relationship between social support and participation in physical activity showed a positive and significant relationship. Friends and peer support were a stronger social determinant of physical activity than family support (18). However, some studies have also shown an indirect relationship between social support and participation in physical activity (19). Some research stated that the development and promotion of physical activity in the elderly should be achieved through the support of family and friends (20).

Since Iran has started aging in the population, it is important to consider and address the social and communication needs of the elderly which can have direct effects on their health and well-being. According to the existing literature, no study has examined the relationship between perceived social support and physical activity with the physical and cognitive functions, as well as the mood

status of the elderly in Golestan province, in which the people from different cultures and races are living in and has unique cultural and social characteristics. Therefore, the purpose of this study was to determine the relationships between perceived social support and physical activity with the mood, physical fitness, and cognitive status of elderly people.

**Methods**

This was a cross-sectional study that was conducted from April to September 2019 in Golestan province, Northeast of Iran. The statistical sample consisted of 142 elderlies over 60 years old (131 females and 11 males with mean age of 66.56 years) from Gorgan (n=49), Gonbad Kavous (n=45), Aliabad Katoul (n=26), and Azadshahr (n=22) cities of Golestan province in 2019 who were selected by random sampling method. Inclusion criteria were age over 60 years old; do not have any acute physical and psychological problems such as amputation, spinal problems, Alzheimer, Parkinson; and being a member of the daily nursing centers in Golestan province. Once we conducted our experiment, the number of older adults who had registered in all daily nursing centers in Golestan province and met our criteria was 230 elderlies. Of them, according to G\*Power statistical software with an effect size, power of test 80%, and a significant level of 0.05, we selected 142 elderlies as a statistical sample (21). All participants gave written informed consent and the protocol of this study was approved by the University Research Ethics Committee.

Data were collected by second and third authors using questionnaire consisted of demographic characteristics (including age, gender, marital status, and the presence of acute physical and psychological problems), Perceived Social Support Scale, Geriatric Depression Scale (GDS), Wechsler Memory Scale, and Rapid Assessment of Physical Activity (RAPA) Questionnaire.

Perceived Social Support Scale (22) consisted of 12 items and the items are evaluated by a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). The total score of the questionnaire is between 12 and 84. Psychometric characteristics and construct validity of the original questionnaire were evaluated and approved by its designers (22) and its internal consistency was positively evaluated with r=0.90 (22). Moreover, a high level of intra-class correlation coefficient was reported for the Persian version of the questionnaire, r=0.89 (23).

The Geriatric Depression Scale (24) consists of 15 items scored 1 (yes) or 0 (No). Of the 15 items, 10 indicated the presence of depression when answered positively, while the rest (question numbers 1, 5, 7, 11, 13) indicated depression when answered negatively. Scores of 0-4 are considered normal, 5-8 indicate mild depression; 9-11 indicate moderate depression and 12-15 indicate severe depression. The validity and reliability of the tool have been supported by its designers (24) and its internal consistency was reported as r=0.90 (24). In addition, a high level of intra-class correlation coefficient was reported for the Persian version of the questionnaire, r=0.90 (25).

Wechsler Memory Scale was used to measure cognitive function (26). This scale consists of seven tests of general memory, orientation, mental control, logical memory, forward and reverses digits' repetition, visual memory, and associative learning. This scale is designed to assess learning and memory abilities in the age range from 16 to 89 years. Scores of 70 and below are in the risky range, and scores above 70 are in the normal range. Psychometric characteristics and construct validity of the original questionnaire were evaluated and approved by its designers (26) and its internal consistency was positively evaluated with r=0.90 (26). In addition, a high level of intra-class correlation coefficient was reported for the Persian version of the questionnaire, r=0.85 (27).

The Rapid Assessment of Physical Activity Questionnaire (aerobic part) consisting of 7 questions was used to examine physical activity (28). The questions asked about the amount and intensity of physical activity the person usually does and rated from no (scored as 0) to yes (scored as 1). The global score of this questionnaire is between 0-7 ranging from sedentary to active. Construct validity of the original questionnaire was evaluated and approved by its designers with r = 0.85 (28). In this study, the validity of this questionnaire was confirmed by 7 experts and its reliability was r=0.70.

Rikli and Jones' fitness tests for the elderly were used to assess physical fitness (29). In this study, a 30-second sitting and standing test was used (29). The reliability of this test was evaluated positively by Rikli and Jones with r=0.84 (20). The test involves standing and sitting in a chair for 30 seconds. A standard chair (40 cm high) was used for this test. To do this test, the person was first to sit on the chair, place the hands on the chest and sit on the chair while looking forward. After a "1, 2, 3 starts" command, the person should get up from the chair and sit on it as quickly as possible. The number of sit-ups during the 30 seconds was considered as the test score. A digital timer was used to measure the time.

Mean and standard deviation was used to descriptively report the data. Spearman correlation test was used to examine the correlations between research variables. The normal distribution of data was assessed by the Kolmogorov-Smirnov test. 'SPSS Statistics for Windows, version 16.0 (SPSS Inc., Chicago, Ill., USA)', The significance level was set at P=0.05.

**Table 1. The distribution of demographic characteristics among elderlies**

Variable	N	%
	Gender	
Male	11	8
Female	131	92
Age		
61-70	121	85
>70	21	15
Education		
Educated	43	30
Illiterate	99	70
Ethnicity		
Fars	107	75
Turkman	35	25
Marriage		
Married	85	60
Divorce	27	19
Widow	30	21
Employment		
Retired	21	15
Unemployed	121	85

**Results**

Demographic data are presented in (Table 1). Results showed that most of the participants were female (92%), 60-70 years old (85%), illiterate (70%), and Fars (70%).

Based on the results, the elderly in Golestan province have moderate to high perceived social support, low physical activity, mild depression, low fitness, and normal memory function (Table 2).

**Table 2. Descriptive statistics of research variables**

Variable	N (%)	Mean ±SD
Social Support	Low <28	4 (3)
	28< Mild <56	40 (28)
	56< High	98 (69)
Physical Activity	1= Sedentary	57 (40)
	2= Underactive	53 (37)
	3= Light activity	22 (16)
	4= Regular underactive	10 (7)
	5= Regular active	0 (0)
Depression	No depression <5	52 (37)
	5< Mild depression <10	58 (41)
	10< Depression	32 (22)
Fitness	Unacceptable ≤8	88 (62)
	8< Acceptable	54 (38)
Memory	Risky zone ≤70	44 (31)
	70< Normal	98 (69)

The results of the Kolmogorov-Smirnov test showed that data did not have a normal distribution (P<0.05). Therefore, the Spearman correlation test was used to examine the correlations between research variables.

The results of the correlations between the research variables are presented in Table 3. Regarding social support, the results showed that there was a significant inverse correlation between perceived social support and depression (r=-0.48, P<0.001) as well as a significant direct correlation between perceived social support and memory (r=0.24, P=0.003). However, no significant correlation was observed between perceived social support with physical fitness (r=0.14, P=0.088) and physical activity (r=0.29, P=0.729).

Regarding physical activity, the results showed that there was only a significant correlation between physical activity and physical fitness (r=0.18, P=0.049), but no significant correlations were observed between physical activity and depression (r=0.77, P=0.360) and memory (r=0.019, P=0.822).

Regarding the relationships between the sub-variables, the results showed that there was a significant inverse correlation between physical fitness and depression (r=-0.27, P=0.001), a direct and significant correlation between physical fitness and memory (r=0.27, P=0.001), and a significant inverse correlation between memory and depression (r=-0.25, P=0.002).

**Table 3. Results of correlations between research variables**

Variable	1	2	3	4	5
<b>1. Social Support</b>	-				
<b>2. Physical Activity</b>	r=0.29 P=0.729	-			
<b>3. Depression</b>	r=-0.48** P<0.001	r=0.77 P=0.360	-		
<b>4. Fitness</b>	r=0.14 P=0.088	r=0.18* P=0.049	r=-0.27** P=0.001	-	
<b>5. Memory</b>	r=0.24** P=0.003	r=0.019 P=0.822	r=-0.25** P=0.002	r=0.27** P=0.001	-

Spearman correlation coefficients, \*P<0.05, \*\*P<0.01, \*\*\*P<0.001

## Discussion

The purpose of the present study was to determine the correlations between two important factors inducing perceived social support and physical activity with the mood (depression), cognitive status (memory), and physical fitness of the elderly. Regarding perceived social support, the results showed that there was a significant inverse relationship between perceived social support and depression. Although the elderly in this study did not report high social support, higher social support was associated with lower depression. This result might indicate that perceived social support affects positively the mental status of the elderly. This result is in agreement with the results of previous research which showed that perceived social support was inversely and significantly correlated with depression (5-6). Moreover, there was a direct and significant relationship between perceived social support and memory function, so that the higher the level of perceived social support, the higher the memory function of the elderly. This might indicate that perceived social support has a positive impact on the cognitive status of the elderly. These results are in line with the results of previous research (4, 7, 10). Social support in the elderly can include perceptions of support from spouses, children, relatives, and friends (5-6). The results of this study, together with the results of previous research, show that the perception of social support from important people in an elderly's life can have positive impacts on his/her psychological health and increase his/her cognitive functions. From the point of view of public health, the results of this study could have important implications for the prevention and treatment of psychological disorders in the elderly population. Focusing on interventions that can improve the quality of older people's relationships with important people in their lives as well as improve their social relationships can be of particular importance for promoting older people's health. Concerning the impact of perceived social support on the cognitive function of the elderly, the cognitive reserve hypothesis suggested that perceived support by friends and relatives may protect one's cognitive functioning and thus resulted in its slow decrement (30). Also, it has been stated that the social support of friends and relatives to the elderly can lead to persistent mental stimulation, better cognitive strategies, increased neurological development, and synaptic density in the elderly (31). Finally, it has been argued that the social support of friends and relatives can facilitate access to health care for the elderly and thus indirectly affect brain injury and other factors that underlie the cognitive function of the elderly (32). Also, the results showed that perceived social support was not significantly correlated with the physical status of the elderly (physical fitness). This result is inconsistent with results from previous studies that found a significant relationship between social support and physical function in the elderly (33).

Regarding physical activity, the results showed a significant relationship between physical activity and physical fitness in the elderly. This result is in line with the results of previous research (34). Previous research has shown that physical activity can lead to maintaining cardiovascular functions, coordination, and motor control in the elderly. In the present study, more physically active elderly achieved higher scores on the physical fitness test used in this study, which can be considered as a muscle strength test that requires neuromuscular control and coordination. This is a confirmation of the results of previous research indicating the impact of physical activity on maintaining motor control functions in the elderly (34). According to the results of this study, it seems that physical activity is a more important component than social support for promoting physical status in the elderly. Thus, it is important to encourage the elderly to engage in physical activity and adopt an active lifestyle to prevent the decline of physical function in the elderly. An active lifestyle can lead to a delay in the aging process (35). Also, performing physical activity in the years leading up to aging can have a greater impact than performing physical activity in previous years to delay the aging process (35). Therefore, public health policies can focus on promoting physical activity in the elderly, especially in the years before the onset of aging, thereby improving the quality of life of the elderly. Also, the results showed that there was no significant relationship between physical activity and depression and memory. These results are in line with the results of some previous research (36) but are not consistent with some other previous studies (11-12, 14, 37-38). The discrepancies between results appear to be related to the type of examination of the relationship between physical activity and cognitive function in the elderly.

In addition, the results of the present study showed that physical fitness had a direct and significant effect on the memory and depression of the elderly, which is consistent with the results of previous research (39). Various explanations have been given about how high physical fitness affects the psychological functions of the elderly. For example, the cardiovascular fitness hypothesis states that increased cardiovascular fitness (aerobic capacity) in the elderly improves their psychological functioning. Aerobic capacity is useful for boosting cerebral blood flow, improving oxygen and glucose utilization in the brain, accelerating the transfer of biochemical, and enhancing the activity of blood antioxidant enzymes for the rapid excretion of free radicals. Finally, these factors improve the level of psychological functioning in the elderly (40).

The most important strength of the present study was that the relationships between social support and physical activity with mental, cognitive, and physical variables were simultaneously examined in the elderly. While previous research has examined these variables separately, a simultaneous examination of these

variables in a unique statistical sample could provide a more comprehensive picture of the relationships between these variables. Furthermore, among the limitations of this research is its cross-sectional research design, which creates limitations for examining causal effects of social support and physical activity on mental, cognitive, and physical variables in the elderly.

## Conclusion

In summary, it can be concluded that perceived social support can be considered as an important factor for improving the mental and psychological status of the elderly. Physical activity is also an important factor in increasing the level of physical fitness in the elderly. Higher physical fitness in itself has a positive effect on the psychological status of the elderly. Therefore, improving social relationships and increasing social support for the elderly can be recommended as an important strategy for improving the mental and psychological status of the elderly. Also, physical activity and improvement of physical fitness of the elderly can be recommended as an effective treatment for improving the psychological status of the elderly. The results of this study can have many applications for gerontologists, sports psychologists, physiotherapists, and occupational therapists.

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## Ethical statement

This protocol study has been approved by the Research Ethics Committee of Islamic Azad University, Aliabad Katoul Branch (Code: IR/IAU/AK/REC/1398/002).

## Conflict of interest

The authors declared no conflict of interest.

## Author contributions

Conceptualization: Saeed Ghorbani. Methodology, analysis, research review and editing: Sajede Farhangnia, Farnaz Zanganeh. Writing: Saeed Ghorbani, Sahamaz Noohpishesh, Masoud Shakki. Supervision: Saeed Ghorbani.

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