

The Comparison of Physical Activity, Fatigue and Quality of Life in Different Age Groups

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ABSTRACT

Objective: The purpose of this study is to compare the levels of physical activity, fatigue, and quality of life of healthy individuals belonging to different age groups.

Methods: A total of 107 healthy individuals participated in the study, of which 39 were young (aged between 18 and 39), 42 were middle-aged (aged between 40 and 64), and 26 were elderly (over 65 years old). While physical activity was measured using the International Physical Activity Questionnaire, fatigue level was evaluated using the Fatigue Assessment Scale, and quality of life with the World Health Organization Quality of Life Instruments.

Results: A statistically significant difference has been detected between three groups with regards to the levels of physical activity, fatigue, and quality of life ($p < 0.05$). The physical activity levels of the elderly individuals were lower than those of the middle-aged individuals, while their fatigue levels were higher. The quality of life which was related to physical health and social relationships of the young and the middle-aged were similar and higher than those of the elderly individuals. Middle-aged individuals had a higher psychological health-related quality of life than elderly individuals, but their environment – and physical health-related quality of life was higher than both young and elderly individuals.

Conclusion: It has been concluded that elderly age group is associated with the lowest levels of physical activity and quality of life and the highest level of fatigue. We think that by getting elderly to adopt habit of exercise, the decrease in levels of physical activity and quality of life, and increase in fatigue level can be prevented.

Keywords: Age, physical activity, fatigue, quality of life.

1. INTRODUCTION

Physical activity is “defined as any movement of the body that requires energy expenditure” (1). Physical activities positively affect the physical and mental health of individuals, is useful in both the prevention and treatment of diseases, and refers to a linear relationship with health (2,3). Besides reducing the risk of developing many diseases, physical activities have psychological benefits such as alleviating depression, stress, and anxiety, as well as positively affecting socialization (4). Considering its prevalence and impacts on health and inactivity; which have serious and far-reaching outcomes in the economic, environmental, and social realms of life and is one of the leading five crucial risk factors in terms of chronic diseases and global mortality, should be regarded as a pandemic (5). It is believed that physical inactivity is the main cause of about 30% of ischemic heart diseases, 27% of diabetes cases, and approximately 21 to 25% of breast and colon cancer cases (6). Studies show that physical activity, as well as mass and muscle strength decrease with age (7). After

the age of 30, muscular strength starts to decrease at the rate of 10 to 15% every decade, and this process accelerates after the age of 50. Despite being not life-threatening, the loss of muscle mass makes daily activities difficult and causes the level of physical activity to decrease (8).

Fatigue is a significant symptom in various medical and neurological disorders (9). Fatigue, defined as muscle fatigue, is a symptom commonly noticed during exercise activities; however, it can also manifest itself as a secondary symptom of many diseases and health conditions during daily activities (10). Studies in the literature suggest that physical inactivity predisposes to increased fatigue (10), while physical activity contributes to the ability of both healthy individuals and patients of all ages to resist fatigue by increasing muscle strength and functionality (11,12). Findings regarding the relationship between age and fatigue are precarious (13). While some studies state that there is no relationship between age and fatigue (14), some others concluded that

the level of fatigue increases by aging (15). It was also found in some studies that older people have lower levels of fatigue (16).

Quality of life is defined "as the perception of an individual's goals, expectations, standards and concerns regarding her/his sociocultural status" (17). It is observed in all relevant studies that physical activity greatly affects the quality of life. It is an ordinary result of the studies in the literature that regular physical activity provides to be physically stronger, to own a better quality of life, and to be better physically and psychologically (18).

It is highly expected to encounter many studies in the literature investigating the change in the levels of physical activity, fatigue, and quality of life with age, but there are no studies that compare the levels of physical activity, fatigue, and quality of life among healthy individuals of different age groups, as far as we know. Therefore, this study intent to compare young, middle-aged, and elderly individuals in terms of their levels of physical activity, fatigue, and quality of life.

2. METHODS

2.1. Individuals

A total of 107 individuals who live in various cities in Turkey, of which 39 were young (between the ages of 18 and 39), 42 were middle-aged (between the ages of 40 and 64), and 26 were elderly (over the age of 65), included in the study. Each participant was enlightened about the content of the study, the consent form for their voluntary participation in the study was read online, and the approvals of the participants were obtained. The approval from the ethics committee of Sivas Cumhuriyet University was obtained with the decision dated 18.11.2020 and numbered 2020-11/17. Evaluation forms and questionnaires were performed with participants using the online questionnaire method. The demographic information of the individuals (age, height, body weight, gender was recorded, and those with a body mass index (BMI) of over 35 kg/m² and having any systemic, neurological, or orthopedic disorders limiting physical activity were excluded from the study.

2.2. Measurements

The International Physical Activity Questionnaire-Short Form (IPAQ-SF) was used to evaluate the level of physical activity. This questionnaire evaluates the physical activity levels of individuals in the last seven days in four categories of vigorous activities, moderate activities, walking, and sitting. The total weekly MET-min/week score is counted by multiplying the metabolic equivalent of task (MET) values (vigorous = 8 MET, moderate = 4 MET, walking = 3.3 MET), the period of the activities (minutes), and the frequency of the activities (number of days) (19).

The fatigue levels were assessed using the Fatigue Assessment Scale (FAS). The FAS questionnaire is a one-dimensional scale for fatigue testing and consists of 10 statements, of which five examine physical fatigue and the other five examine mental health. The intensity of fatigue, presented by the total score, is between 10 and 50 (20,21). The FAS includes 10 statements with 5 options, ranging between "1 = never" and "5 = always." Except for statements 4 (I have enough energy for everyday life) and 10 (When I am doing something, I can concentrate quite well), the remaining 8 statements are negative. Thus, the scores of the options chosen for statements 4 and 10 are reversed before the analysis of the data ("1 = always" and "5 = never") (21,22).

The World Health Organization Quality of Life Instrument, Short Form (WHOQOL-BREF) was employed to ascertain the quality of life (19). The WHOQOL-BREF scale measures the quality of life in four basic dimensions: physical health, psychological health, social relationships, and environmental health (19,23). This scale consists of 26 items and has a 5-point rating type, with answers ranging from "1 = Not Satisfied at all" to "5 = Very Satisfied." High scores indicate a high quality of life. In the Turkish adaptation of the form, another question related to the environment was added, so it includes a total of 27 questions (24).

2.3. Statistical Analysis

Statistical analysis of the study was carried out using the "Statistical Package for Social Sciences" (SPSS) Version 22.0 (SPSS inc., Chicago, IL, USA) software. The normal distribution of the data was analyzed using visual (histograms and probability graphs) and analytical methods (Kolmogorov-Smirnov Test and Shapiro-Wilk Test). The Kruskal-Wallis Test was conducted to discover the differences between three different age groups. In the analysis of the statistical significance, the type 1 error level was taken as 5%. Pairwise comparisons were analyzed using the Mann Whitney U Test. Bonferonni correction was applied and the p significance value to be used for pairwise comparisons was determined as 0.017.

3. RESULTS

Although there was a statistically significant difference between the three groups in terms of body weight and BMI ($p < 0.05$, Table 1), no significant difference was detected in terms of height ($p > 0.05$, Table 1). The difference in body weight between the groups was resulting from the difference between the young and the elderly participants ($p = 0.001$), the body weight of the elderly of which was higher than those of the younger participants. The difference in the BMI was due to the difference between the young and elderly participants ($p < 0.001$) and the difference between the middle-aged participants and elderly participants ($p = 0.010$). Accordingly, the BMIs of the elderly participants were higher than those of the young and the middle-aged participants.

As for the difference between the physical activity levels in the three groups, there was a statistically difference between them ($p < 0.05$, Table 2). This stemmed from the difference in the levels of physical activity between the middle-aged and the elderly participants ($p = 0.009$). So, the physical activity levels of the elderly participants were found to be lower than those of the middle-aged participants.

Table 1. Demographic information of the participants.

	Young (n=39)	Middle-aged (n=42)	Elderly (n=26)	p	
Body weight (kg) (Median /IQR)	65 (58 /80)	75 (68 / 80)	80 (73 / 86)	0.002* ¥	
Height (cm) (Median /IQR)	167 (160/ 174)	167 (160 /173)	166.5 (161/174)	0.884	
BMI (kg/cm ²) (Median /IQR)	24.2 (22.6/27.3)	25.65 (24.1/27.7)	28.15 (26/30.5)	<0.001* ¥ ¢	
Gender	Female (%)	27 (69.2)	23 (54.8)	10 (38.5)	
	Male (%)	12 (30.8)	19 (45.2)	16 (61.5)	

Significance of the difference between * the three groups, ¥ young and elderly, ¢ middle-aged and elderly (* Kruskal–Wallis Test, ¥ – ¢ – ¶ Mann Whitney U Test); BMI: Body Mass Index; IQR: interquartile range, n: number.

A statistically significant difference was observed between the three groups in terms of fatigue levels ($p < 0.05$, Table 2). This difference was caused by the difference in fatigue levels between the middle-aged participants and the elderly participants ($p = 0.001$). Fatigue levels of elderly individuals were found to be higher than those of the middle-aged individuals.

Table 2. Comparison of physical activity level, fatigue level and quality of life by age groups.

	Young (n=39)	Middle-aged (n=42)	Elderly (n=26)	p
IPAQ-SF (Median /IQR)	570 (231/2140)	693 (396 / 1080)	396 (198 / 594)	0.035* ¢
FAS (Median /IQR)	22 (20 / 28)	21 (14 / 24)	25.5 (22 / 29)	0.003* ¢
PH	15.42 (13.14/16.57)	15.14 (13.71/17.14)	12.57 (10.85/14.28)	<0.001* ¥ ¢
	14 (12/16)	15.67 (13.33/17.33)	12.66 (11.33/14.66)	0.002* ¢
SR	13.33 (12/16)	14.66 (13.33/16)	11.33 (9.33/12)	<0.001* ¥ ¢
	13.5 (12.5 /14.5)	15 (13 / 16.5)	12.75 (11 /14.5)	0.006* ¶ ¢

Significance of the difference between * the three groups, young and middle-aged, ¥ young and elderly, ¢ middle-aged and elderly (* Kruskal–Wallis Test, ¥ – ¢ – ¶ Mann Whitney U Test); IPAQ-SF: International Physical Activity Questionnaire – Short Form; FAS: Fatigue Assessment Scale; WHOQOL-BREF: World Health Organization Quality of Life Instrument, Short Form; PH: physical health; PS: psychological health; SR: social relationships; EH: environmental health; IQR: interquartile range.

According to scores obtained from quality of life questionnaire, it was observed that there was a significant difference between the three groups in the sense of the four sub-parameters ($p < 0.05$, Table 2). The difference in terms of the WHOQOL-physical health was due to the difference between the values obtained for the young and the elderly participants ($p < 0.001$) as well as the middle-aged and the elderly participants ($p < 0.001$). Therefore, it was seen that the young and the middle-aged participants had similar levels of physical health-related quality of life, which is higher than those of the elderly participants. In terms of the WHOQOL-psychological health, the results obtained for the middle-aged and the elderly participants were different ($p = 0.001$). Accordingly, the middle-aged participants were observed to have higher levels of psychological health-related quality of life than those of the elderly participants. The difference in terms of the WHOQOL-social relationships was due to the difference between the values obtained for the young and the elderly participants ($p < 0.001$) and the middle-aged and elderly participants ($p < 0.001$). So, it was discovered that young and middle-aged participants had similar levels of social relations-related quality of life, which is higher than those of the elderly participants. As for the difference in terms of the WHOQOL-environment, it was due to the difference between the values obtained for the young and the middle-aged participants ($p = 0.016$) and the middle-aged and elderly participants ($p = 0.004$). Consequently, it was observed that the environment-related quality of life of the middle-aged participants was higher than those of the young and elderly participants.

4. DISCUSSION

As a result of this study, where we compared individuals in different age groups on the basis of physical activity, fatigue level, and quality of life; it was proved that there were differences in the levels of physical activity, fatigue, and quality of life of young, middle-aged, and elderly individuals. All in all, it was found that older individuals had lower levels of physical activity and quality of life, and higher levels of fatigue.

Physical activity is a body movement with any skeletal muscle that occurs with energy expenditure (25). Hall et al. (26) explained that the level of physical activity decreased with increasing age. This study showed that age-related differences in physical activity were clear in most of the 10-year age bands for both sexes. The most outstanding age-related differences in activity appeared in groups over 60 and over 70 years of age. Each age group was significantly different from the previous one (26). In our study, it was noticed that the physical activity levels of the middle-aged individuals were higher than the physical activity levels of elderly individuals. In this respect, our findings conform to the findings of the relevant studies in the literature.

Fatigue is defined as not being able to gather the energy needed to perform a task or not having enough resources

for a task (27). The consequences of studies in the literature examining the change of fatigue with age are precarious (13). A study carried on by Cathébras et al. (28) observed no significant relationship between age and fatigue. A study by Tibblin et al. (29) found that older people had lower levels of fatigue. Researchers think that this is because individuals who are 65 years old are at the retirement age and can start living comfortably (29). In a research done by Fuhrer et al (30), it was observed that the level of fatigue increased with age. In our study, parallel to the study of Fuhrer et al., it was found that elderly participants had higher levels of fatigue than middle-aged participants. This increase in fatigue levels with age may have emerged as a result of decreasing physical activity.

According to the World Health Organization, quality of life is described as the way individuals perceive their own situation, their goals and expectations, as well as the standards within their own culture and value system (23). The concept of quality of life is multidimensional, can show a change over time, and is related to the expectations and lives of individuals (31). In the study of Onat et al. (32), it was pointed out that there was a significant linear relationship between age and quality of life, and an increase in age caused a decline in the quality of life score. In the same direction with this study, in the present study, it was seen that the elderly group emerged as the one with the lowest physical health-related, psychological health-related, social relations-related, and environment-related quality of life.

In a research done by Arslantas et al. (33) into individuals over 65 years of age, it was found that when the domain score averages of the WHOQOL-BREF Scale increased, the quality of life decreased significantly in all areas except the social relationships domain. In their study, Isikli et al. (34) evaluated the quality of life of individuals aged 35 and over, and found that the quality of life domain with the highest score regarded as the social relationships domain and the one with the lowest score regarded as the environment domain. When we look at the mean domain scores in our study, the highest score in the young age group was captured in the physical health domain and the lowest score was captured in the environment domain. In the middle age group, the highest score was seized in the physical health domain and the lowest score was seized in social relationships domain; in the elderly group, the highest score was grasped in the physical health domain and the lowest score was grasped in the social relationships domain. The most important reason for the changes in the average domain scores may be due to the differences in age and lifestyle of the participant groups. The COVID-19 pandemic can be shown as the reason why the social relationships domain is the one with the lowest score. Despite the different results found in the literature, the consensus remains that quality of life scores decrease with age.

The fact that sufficient communication could not be established with the elderly participants due to their educational and cultural backgrounds as the questionnaires

were processed in the online environment, can be regarded as a limitation for our study. This is also the reason why the number of elderly individuals who took part in the study is fewer than that of the other groups.

5. CONCLUSION

It has been found as a conclusion of this study comparing individuals of different age groups in terms of levels of physical activity, fatigue, and quality of life that the age group with the lowest physical activity level and quality of life and the highest level of fatigue is held by the elderly individuals. The findings of this study reveal the fact that the levels of physical activity, quality of life, and fatigue, which were also stated in previous studies to be associated with age, differ in elderly individuals compared to other age groups. Individuals of all ages, especially the elderly, should be reminded that the most important and effective way to prevent the decrease in physical activity and quality of life, as well as to reduce the feeling of fatigue is to make exercise a habit. Thanks to adopting the habit of exercise, both the expected decrease in the levels of physical activity and quality of life, and the increase in fatigue can be prevented.

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