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Exercise Perception and Lifestyle of Adults in the Context of Sarcopenia

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ABSTRACT

This study has two principal objectives. The first is to examine the frequency of sarcopenia in adults. The second is to compare the perceived exercise and lifestyle habits of individuals who have been identified as having sarcopenia and those who have not. The study population comprised 156 individuals above the age of 50 years and residing in the community. SARC-F questionnaire was used to assess sarcopenia. Pittsburgh Sleep Quality Index (PSQI) and Physical Activity Scale for the Elderly (PASE) were used to assess the lifestyle of the participants. Participants with and without sarcopenia were divided into two groups and lifestyle and exercise perception data were compared. Among the participants, 79 people (50.6%) were found to have sarcopenia and 77 people (49.4%) did not have sarcopenia. The benefit score and barrier score for exercise were found to be statistically higher in the group without sarcopenia than in the group with sarcopenia ($p<0.05$). The participants with sarcopenia were found to engage in a reduced level of physical activity and to spend a greater proportion of their time engaged upon sedentary pursuits ($p<0.05$). Smoking status and sleep quality were similar between the groups ($p>0.05$). Individuals with sarcopenia tend to perceive the benefits of exercise more favourably than those without sarcopenia. Despite reporting fewer barriers to exercise, individuals with sarcopenia tend to have a more sedentary lifestyle. It may be the case that their sedentary lifestyle is a consequence of their weak muscles.

Sarkopeni Bağlamında Yetişkinlerin Egzersiz Algısı ve Yaşam Tarzı

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ÖZET

Bu çalışmanın amacı iki yönlüdür: birincisi, yetişkinlerde sarkopeni prevalansını incelemek; ikincisi, sarkopenisi olan ve olmayan bireylerin algılanan egzersiz ve yaşam tarzı alışkanlıklarını karşılaştırmak. 50 yaş ve üzeri toplumda yaşayan 156 kişi çalışmaya dâhil edilmiştir. Sarkopeniyi değerlendirmek için SARC-F anketi kullanılmıştır. Katılımcıların yaşam tarzını değerlendirmek için Pittsburg Uyku Kalite İndeksi ve Yaşlılar İçin Fiziksel Aktivite Anketi kullanılmıştır. Sarkopenisi olan ve olmayan katılımcılar iki gruba ayrılmış yaşam tarzı ve egzersiz algısı verileri karşılaştırılmıştır. Katılımcılar arasında 79 kişide (%50,6) sarkopeni olduğu, 77 kişide (%49,4) ise sarkopeni olmadığı tespit edilmiştir. Sarkopeni olan grupta egzersiz yarar ve egzersiz engel puanların sarkopenisi olmayan gruba göre istatistiksel olarak anlamlı derecede yüksek bulunmuştur ($p<0,05$). Sarkopenisi olan katılımcıların daha düşük düzeyde fiziksel aktivitede bulundukları ve sedanter uğraşlara daha fazla zaman ayırdıkları görülmüştür ($p<0,05$). Sigara içme durumu ve uyku kalitesi gruplar arasında benzer bulunmuştur ($p>0,05$). Sarkopenisi olan bireyler, egzersizin faydalarını sarkopenisi olmayanlara göre daha olumlu algılama eğilimindedir. Egzersiz yapmanın önünde daha az engel olduğunu bildirmelerine rağmen, sarkopenili bireyler daha hareketsiz bir yaşam tarzına sahip olma eğilimindedir. Hareketsiz yaşam tarzları zayıf kaslarının bir sonucu olabilir.

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INTRODUCTION

The term sarcopenia is used in medical literature to describe a reduction in skeletal muscle mass that occurs as a natural consequence of the ageing process. This phenomenon has been observed to affect the fast-twitch type 2 muscle fibres to a greater extent than other muscle types. This loss is progressive and generalised. Although sarcopenia is classified as a disease corresponding to code M62.84 in the tenth edition of the International Classification of Diseases, it is, in fact, a syndrome resulting from a number of different, interacting factors. The onset of sarcopenia occurs during adulthood, resulting in diminished musculoskeletal functionality, muscle performance in later life (Jung et al., 2023). Sarcopenia represents a significant health concern that has a deleterious effect on quality of life (Beaudart et al., 2023), enhances health expenses (Bruyère et al., 2019), and is associated with an increased risk of frailty and mortality (Xu et al., 2022). Although sarcopenia is expressed as muscle loss, research has shown that it also causes some health problems. These health problems have been reported as dysphagia, cognitive impairment, diabetes, hypertension, osteoporosis, liver disease, and depression (Xia et al., 2020). The set of criteria developed by the European Working Group on Sarcopenia in the Elderly (EWGSOP2) (Cruz-Jentoft et al., 2019) or the five-item Strength, Assistance in Walking, Standing from a Chair, Climbing Stairs and Falling (SARC-F) can be used to determine the sarcopenia (Nishikawa et al., 2021). The causes of sarcoenia have not yet been fully revealed, and therapeutic approaches are recommended instead of pharmacological approaches in its treatment (Kwak & Kwon, 2019). Inactivity and malnutrition are among the modifiable risk factors for sarcopenia. For this reason exercise is the primary intervention to prevent and treat sarcopenia (Cho et al., 2022).

Although sarcopenia is known as an age-related syndrome, it is not solely a consequence of the ageing process. It is the consequence of a number of factors, including genetic predisposition and lifestyle habits that develop throughout an individual's lifespan (Cruz-Jentoft & Sayer, 2019). It is important to identify these lifestyle habits because most of them are preventable risk factors. The main lifestyle habits associated with sarcopenia are sedentary behavior (Mo et al., 2023) and malnutrition (Robinson et al., 2023). A number of additional precipitating factors for sarcopenia in older individuals living in the community have been identified, including marital status, disability, low body weight, smoking, alcohol use, sleeping long or short, and living alone (Gao et al., 2021). Despite all that it is not well known why community-dwelling older adults do not adopt sedentary behavior. Studies examining physical activity barriers (Spiteri et al., 2019) and exercise perceptions (Che et al., 2022) were not examined from the perspective of sarcopenia. Exercise perception effects physical activity habits.

This study has two principal objectives. The first is to examine the frequency of sarcopenia in adults who live in the community. The second is to compare the perceived exercise and lifestyle habits of individuals who have been identified as having sarcopenia and those who have not.

METHOD

Research Design

The research was cross-sectional in nature. Participants were grouped as having or not having sarcopenia according to the results of the sarcopenia screening. A comparison was made between the general information, lifestyle habits and perceived level of exercise of both groups.

Research Sample/Study Group/Participants

In order to determine the sample size required for the study, the prevalence of sarcopenia in adults over the age of 50 was taken into account (Almohaisen et al., 2022). The resulting figure was 185 individuals. Participants were selected from among the older people living in the community by convenience sampling method. The study population comprised 188 adults aged 50-87 years who were living independently in the community. Participants were selected through convenience sampling. The study population consisted of subjects aged 50 years or older who were living a self-sufficient lifestyle within the community. The exclusion criterion of the study was determined as cognitive loss that would not be suitable for data collection. 38 people who were thought to have cognitive loss because they had scores below 25 on the mini mental state test were underwent exclusion from the study. A total of 156 participants were included in the analysis, consisting of 79 individuals with sarcopenia and 77 individuals without sarcopenia.

Research Instruments and Processes

The research data was collected through face-to-face interviews between November 2022 and February 2023. In order to ascertain the age of the participants, the researchers inquired about their year of birth Furthermore, the gender of the participants was documented, and their weight and height were ascertained for the purpose of calculating their body mass index (BMI). Participants were questioned about whether they smoked cigarettes or not and whether they drank alcohol or not. The Fagerström Test for Nicotine Dependence was employed to ascertain the degree of dependence among participants who smoked (Heatherton et al., 1991). The examination comprises 6 questions, each of which is assigned a distinct value. An increase in the total score obtained as a result of the evaluation of this test indicates high dependence (Uysal et al., 2004).

The Turkish version of the SARC-F questionnaire was used to screen participants for sarcopenia (Kış & Karaca, 2021). The questionnaire comprises five items. Each item of the SARC-F is assigned a score between 0 and 2 points, with the overall score ranging from 0 to 10. A SARC-F score of 4 points or more is considered 'sarcopenia' by Malmstrom et al. (2016). The Pittsburgh Sleep Quality Index (PSQI) was employed to evaluate the subjective sleep quality and disturbances experienced by the participants. The PUQI is used to assess sleep in the last month. Total score varies between 0-21. The PSQI has the following subscales: sleep disturbances, habitual sleep efficiency, sleep duration, daytime dysfunction, use of sleeping medication, sleep latency and subjective sleep quality. A high score on PSQI indicates poor sleep quality. It was devised by Buysse et al. (1989), the Turkish adaptation of PUQI has been demonstrated to be reliable and valid (MY, 1996). The Exercise Benefits/Barriers Scale was employed to ascertain the participants' perceptions of their exercise habits. The scale is comprised of a series of 43 items. The scale comprises four response options, namely "strongly agree," "agree," "disagree," and "strongly disagree." The total score on the scale is within the range of 43 to 172. The scale is comprised of two distinct subgroups, namely, benefit and barrier, which can be utilized independently. In the benefit subgroup, the score can range from 29 to 116. A higher score in the benefit subgroup is indicative of a more favourable perception of exercise. In contrast, the range for the barrier scale is between 14 and 56, with an increase in the score indicating a reduction in the perceived barriers to exercise. The scale has been developed by Sechrist et al. (1987). The Turkish version is reliable and valid (Ortabag et al., 2010). The Physical Activity Scale for the Elderly (PASE) was employed to determine participants' sedentary behavior and physical activity levels. The scale includes two multiple-choice questions that question the duration and frequency of sedentary behavior of elderly individuals in the previous week, and one open-ended question that questions the type of activity performed. It also includes work-related activities, household activities and leisure time activities

to evaluate their physical activity. The score range to be received on the scale is between 0-400. An increase in score indicates more physically active lifestyle (Ayvat et al., 2017; Washburn et al., 1993).

Data Analysis

The data were subjected to statistical analysis using IBM SPSS Statistics Version 21. Gender, smoking, sedentary frequency and sedentary period were categorical variables, and were expressed as numbers and percentages. The aim was to compare participants with and without sarcopenia. The Pearson chi-square test was employed for numerical and ordinal data, which were expressed as mean and standard deviation. Age, BMI, benefit scores and barrier scores were found to be normally distributed; thus, the independent groups t-test was used for comparison of participants with and without sarcopenia. The PASE activity scores, PUQI scores and Fagerström Nicotine Dependency test scores were identified as non-normally distributed data; therefore, the Mann-Whitney U test was employed for comparison of participants with and without sarcopenia. The level of statistical significance was set at 0.05.

RESULTS

Among the participants, 79 people (50.6%) were found to have sarcopenia and 77 people (49.4%) did not have sarcopenia. The findings revealed that the mean age, number of female participants, and frequency of sedentary behaviour were statistically higher in the group sarcopenia compared to the group no sarcopenia. The Fagerstörm cigarette addiction survey scores of smokers were lower. BMI and the number of smokers were similar in participants with and without sarcopenia ($p<0.05$). There was no statistically significant difference in Fagerström nicotine dependence test scores were compared between participants aged 65 years and over with and without sarcopenia ($p=0.691$). It was determined that only 6 of the participants consumed alcohol. 4 of these people do not have sarcopenia, and 2 of them have sarcopenia. For this reason, statistical analysis was not performed with a small number of data. It was established that individuals within the sarcopenia cohort exhibited elevated PSQI scores for both subjective sleep quality and sleep latency ($p<0.05$), while other PSQI sub-scores and total scores remained comparable ($p>0.05$) (Table 1). It was established that the scores obtained on the exercise benefit and barrier scales by participants with sarcopenia were statistically significantly different from those obtained by participants without sarcopenia ($p<0.05$). When the physical activities of the participants were evaluated, it was calculated that the scores of housework activities, work-related activities and leisure activities were higher in the group without sarcopenia ($p <0.05$). Among those with sarcopenia, only 4 people work voluntarily or for a fee. 24 (36.4%) of those without sarcopenia are working. Sedentary frequencies of participants with and without sarcopenia are different ($p<0.05$) (Table 1). The most common activities was determined as watching television (98%), spending time on the mobile phone or computer (11%), doing handicrafts (15%), reading (11%), chatting with relatives (4%), and preparing for meals (1%).

Table 1
Data Grouped According to the Presence of Sarcopenia

		No Sarcopenia	Sarcopenia	P
Age (years)		59.71±8.83	68.66±9.81	**0.001**[1]
Body Mass Index (kg/m^2)		28.02±3.97	31.72±29.15	0.111[1]
Gender n(%)	Female	30(39.0)	53(67.1)	**0.001**[2]
	Male	47(61.0)	26(32.9)	
Smoking n(%)	Yes	36(41.9)	50(58.1)	0.053[2]
	No	41(58.6)	29(41.4)	
Participants who smoke	Fagerström Nicotine Dependency test scores	2.82±3.30	1.00±2.39	**0.016**[3]
Pittsburgh Sleep Quality Index	Subjective sleep quality	1.16±0.71	1.44±0.85	**0.033**[3]
	Sleep duration	0.78±0.86	0.58±0.91	0.054[3]
	Sleep latency	1.37±0.88	1.80±1.01	**0.007**[3]
	Habitual sleep efficiency	0.55±0.92	0.67±0.96	0.392[3]
	Sleep disturbances.	1.78±0.69	1.91±0.74	0.170[3]
	Use of sleeping medication	0.12±0.49	0.18±0.60	0.418[3]
	Daytime dysfunction	0.95±0.91	1.09±0.96	0.355[3]
	Total score	6.56±3.20	7.39±3.28	0.160[3]
Exercise Benefits/Barriers Scale	Benefits score	86.22±16.74	76.96±18.32	**0.007**[1]
	Barriers score	39.54±6.22	35.91±6.13	**0.003**[1]
PASE Sedentary Frequency n(%)	Seldom (1-2 days)	26(33.8)	19(24.1)	**0.001**[2]
	Sometimes (3-4 days)	39(50.6)	27(34.2)	
	Often (5-7 days)	12(15.6)	33(41.8)	
PASE Sedentary Period n(%)	Less than 1 hour	3(3.9)	5(6.3)	0.079[2]
	1 but less than 2 hours	6(7.8)	6(7.6)	
	2-4 hours	35(45.5)	14(17.7)	
	More than 4 hours	33(42.9)	54(68.4)	
PASE Activity Scores	Leisure time activity	73.00±70.64	39.78±41.65	**0.001**[3]
	Household activity	76.38±38.55	56.76±43.81	**0.001**[3]
	Work-related activity	10.08±10.60	3.00±7.48	**0.001**[3]
	Total score	166.11±84.23	100.98±76.95	**0.003**[3]

[1]t test in independent groups. [2]Pearson chi square test. [3]Mann Whitney U test.Numerical and ordinal data are reported with mean and standard deviation.PASE: Physical Activity Scele for Elderly

DISCUSSION

The prevalence of sarcopenia was found to be approximately 50% among the study participants. Participants with and without sarcopenia had similar sleep quality. Individuals with sarcopenia exhibited a more profound comprehension of the advantages of exercise and encountered fewer impediments to exercise participation than those without sarcopenia. However, they exhibited a higher prevalence of sedentary behaviour, including prolonged sitting time and a greater proportion of their daily activity being spent on technology-based activities. Additionally. the number of participants engaged in

voluntary or paid work was relatively low.

Frequency of sarcopenia observed in this study is greater than that documented in the existing literature (Almohaisen et al., 2022; Petermann-Rocha et al., 2022; Yuan & Larsson, 2023). In Petterman-Rocha et al. (2022)'s meta-analysis of the findings of 263 studies involving participants over the age of 18. it was reported as 8-36% for those under the age of 60 and 10-27% for those aged 60 and over. This study included participants between the ages of 50-87. Sarcopenia is known to begin around the age of forty (Cruz-Jentoft & Sayer, 2019). The initial assumption is that the disparate prevalences observed in the literature are attributable to variations in measurement methodologies. However, a systematic review has indicated that the prevalence of sarcopenia in individuals aged 50 years and above is 16% according to the Asian Working Group for Sarcopenia (AWGS) criteria, 12% according to the European Working Group on Sarcopenia in Older People (EWGSOP) criteria, and 11% according to the SARC-F survey (Almohaisen et al., 2022). In light of the aforementioned data, it can be concluded that the discrepancy with the literature is not attributable to the measurement method. A systematic review of studies conducted in China in 2024 revealed an increase in the prevalence of sarcopenia in older adults when the years of publication were taken into account. Specifically. the prevalence increased from 19% in the period 2014-2018 to 2% in the period 2014-2018 and 21.4% in the period 2019-2024 (Meng et al., 2024). In a study conducted in Turkey and published in 2024. the prevalence of sarcopenia was calculated as 31.9% (Bozkurt &Vardal, 2024). which is higher than the literature. However. this data is still lower than the prevalence observed in our study. Furthermore. the increasing prevalence of sarcopenia over time does not fully explain the observed difference. A study reporting similar prevalence as our study includes elderly people over the age of 65 and those who have just been discharged from the hospital (Tan You Mei et al., 2024). It should be noted that the participants in this study were individuals living independently in the community. However, data on the participants' comorbidities were not collected, which may have introduced a confounding factor. Additionally, our findings indicate that the majority of participants with sarcopenia were female and their average age was higher than participants without sarcopenia. It should be noted that comparable observations have been documented in the existing literature on the subject (Franco et al., 2024; Yang et al., 2022).

Sleep quality of participants with and without sarcopenia was found to be similar. Subjective sleep quality is worse and sleep latency is longer in participants with sarcopenia. In a study investigating the relationship between sarcopenia and subjective sleep quality, it was reported that daytime dysfunction and sleep latency were higher in participants with in individuals with sarcopenia than in individuals without sarcopenia (Locquet et al., 2018). The link between sleep duration and sarcopenia has been the subject of greater investigation than the link between sleep quality and this issue. There are systematic reviews and studies showing that the prevalence of sarcopenia increases with more (Shibuki et al., 2023) and less sleep duration (Rubio-Arias et al., 2019). New research is necessary because there is not yet a full consensus on sleep.

Insufficient physical activity and sedentary life. leisure screen time are risk factors for sarcopenia (Hämäläinen et al., 2024; Liu et al., 2024; Mo,...et al.. 2023). The findings of present study indicate that individuals with sarcopenia tend to exhibit positive attitudes and beliefs about exercise. and encounter fewer barriers to engaging in physical activity. This is surprising because, again, in this study. participants with sarcopenia were found to spend more sedentary time and have insufficient physical activity habits. The reason for this difference between thought and action may be the presence of sarcopenia or health problems that we did not question in this study. Although all of the participants were people living independently in society. It is known that conditions such as arthritis. pain. and poor eyesight cause people to avoid exercising (Hurst et al., 2023). When examined, the exercise benefit/barrier survey questions include questions that question people's physical disabilities, environmental barriers, economic barriers, emotional barriers and social barriers. These are the vast

majority of previously reported physical activity barriers (Spiteri et al., 2019). The present study indicates that individuals with sarcopenia tend to exhibit positive attitudes and beliefs about exercise. and encounter fewer barriers to engaging in physical activity. New research is required that will allow the evaluation of many factors such as past experiences, life habits, kinesiophobia, and fear of injury together.

CONCLUSION AND SUGGESTIONS

In this study, adults with and without sarcopenia were examined for unhealthy lifestyle behaviours such as smoking, poor sleep, and sedentary pursuits. Only one factor, namely a more sedentary lifestyle, distinguished participants who exhibited sarcopenia from those who did not. As a result of the assessment of perceived benefits of exercise and barriers. It was concluded that the reason for this difference was not due to the person perceiving insufficient benefits of exercise and more barriers. Perhaps the reason for their sedentary life is their weak muscles. New research questioning the preference for a sedentary life is therefore needed.

LIMITATIONS

This study did not screen for sarcopenia according to the EWGSOP2 criteria. Participants were selected from among the older people living in the community by convenience sampling method. Although the sample size is appropriate, new multicentre studies are required for prevalence studies. In the present study, the groups exhibiting sarcopenia were found to be non-homogeneous with regard to age and gender. This is an anticipated outcome, and it is possible that it may have had a bearing on the results obtained in relation to lifestyle and exercise perceptions. Furthermore, the potential impact of factors such as frailty, comorbidities and kinesiophobia on the physical activity habits of individuals within this adult demographic was not addressed. These factors may have led the participants to adopt a sedentary lifestyle. Only exercise attitudes and habits were analysed from the perspective of sarcopenia.

Ethic Approval

The research has been approved by the Ethics Committee of Çankırı Karatekin University (Date:28.06.2022 Number:26) in accordance with the ethical standards set out in the University's research ethics policy. The research project was undertaken in accordance with the ethical principles set forth in the Declaration of Helsinki. An informed consent form was obtained from the cases from which the research data were obtained.

Conflict of interest

The authors have no conflict of interest to declare.

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Authorship Contributions

Design: T.A., N.Ş., C.T., M.Y.G., Data Collection or Processing: T.A., N.Ş., C.T., M.Y.G., Analysis or Interpretation: T.A., N.Ş., C.T., M.Y.G., Literature Search: T.A., N.Ş., C.T., M.Y.G., Writing: T.A.

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