International Journal of Turkish Sport and Exercise Psychology
Uluslararası Türk Spor ve Egzersiz Psikolojisi Dergisi
Journal homepage: http://aeraipark.org.tr/tr/pub/ijtsep

Research article

Examining the Impact of Mental and Physical Engagement on Quality of Life in Older Adults

Fatih KOC[1], K. Alparslan ERMAN[2],

[1] *Akdeniz University, Institute of Medical Science, Movement and Training Department (Phd), Antalya*
[2] *Akdeniz University, Faculty of Sport Sciences, Sports Management Department, Antalya*

ARTICLE INFO

Article history:
Received: 21 March 2025
Received in revised form:5 May 2025
Accepted: 13 May 2025
Available online: 31 June 2025

Keywords
Eldery,
Physical Exercise,
Mental Exercise,
Quailty of Life

DOI: 10.55376/ijtsep.1662247

ABSTRACT

The present study set out to assess the impact of both physical and cognitive exercises on the quality of life in individuals aged 60 and above, while also examining the relationships between these exercises and other relevant variables. Methodology: The research involved 324 participants, all over the age of 60, with a gender distribution of 64.2% female and 35.8% male. Data were collected using the "Personal Information and Physical and Cognitive Activity Level Questionnaire for the Elderly," the "Physical Activity Scale for the Elderly (PASE)," and the "Quality of Life Scale for the Elderly (CASP-19)." Results: The findings revealed that individuals who participated in both physical and cognitive exercises reported a significantly higher quality of life compared to those who did not engage in any form of exercise. Furthermore, it was observed that participants engaging in physical exercise tended to have higher income levels than those focusing solely on cognitive exercises. Conclusion: The results emphasize the importance of incorporating both physical and cognitive exercises into interventions aimed at enhancing the quality of life for older adults. These findings highlight the multifaceted benefits of such exercises, which not only promote physical well-being but also contribute to mental and social health. Consequently, these findings underscore the pivotal role of exercise in promoting comprehensive health and well-being in individuals aged 60 and above.

This study was produced from a master's thesis.

Araştırma makalesi

Yaşlı Yetişkinlerde Zihinsel ve Fiziksel Katılımın Yaşam Kalitesi Üzerindeki Etkisinin İncelenmesi

Fatih KOÇ[1], K. Alparslan ERMAN[2],

[1] *Akdeniz Üniversitesi, Sağlık Bilimleri Enstitüsü, Hareket ve Antrenman Anabilim Dalı (Doktora), Antalya*
[2] *Akdeniz Üniversitesi, Spor Bilimleri Fakültesi, Spor Yöneticiliği Bölümü, Antalya*

MAKALE BİLGİSİ

Makale geçmişi:
Gönderim: 21 Mart 2025
Düzeltme: 5 Mayıs 2025
Kabul: 13 Mayıs 2025
Online yayınlama: 31 Haziran 2025

Anahtar kelimeler
Yaşlılık,
Fiziksel Egzersiz,
Zihinsel Egzersiz,
Yaşam Kalitesi

ÖZET

Bu çalışma, fiziksel ve zihinsel egzersizlerin 60 yaş ve üzeri bireylerin yaşam kalitesi üzerindeki etkilerini değerlendirmeyi ve aynı zamanda bu egzersizlerle diğer ilgili parametreler arasındaki ilişkileri incelemeyi amaçlamaktadır. Metodoloji: Araştırmaya, Antalya il sınırları içinde yaşayan 60 yaş ve üzeri 324 birey (n=324) katılmış olup, katılımcıların %64,2'si kadın, %35,8'i ise erkektir. Veri toplama aracı olarak, "Kişisel Bilgiler ve Yaşlılar İçin Fiziksel ve Bilişsel Aktivite Düzeyi Anketi", "Yaşlılar İçin Fiziksel Aktivite Ölçeği (PASE)" ve "Yaşlılarda Yaşam Kalitesi Ölçeği (CASP-19)" kullanılmıştır. Çalışmadan elde edilen bulgular hem fiziksel hem de zihinsel egzersiz yapan bireylerin, herhangi bir egzersiz türüne katılmayanlara kıyasla belirgin şekilde daha yüksek yaşam kalitesine sahip olduklarını göstermektedir. Ayrıca, fiziksel egzersiz yapan katılımcıların, yalnızca zihinsel egzersizlere odaklananlara göre daha yüksek gelir düzeyine sahip olma eğiliminde oldukları gözlemlenmiştir. Sonuç: Bu bulgular, yaşlı yetişkinlerin yaşam kalitesini artırmak amacıyla tasarlanan müdahalelerde hem fiziksel hem de bilişsel egzersizlerin önemli olabileceğini vurgulamaktadır. Elde edilen sonuçların önemi, bu tür egzersizlerin sadece fiziksel sağlığı iyileştirmekle kalmayıp, aynı zamanda zihinsel ve sosyal yönlere de katkı sağladığı söylenebilir. Bu bağlamda, 60 yaş ve üzeri bireylerde kapsamlı sağlık ve yaşam kalitesi düzeylerinin iyileştirilmesine yönelik müdahalelerde, ilgili egzersiz türlerinin önemli bir etki ve gelişim gösterdiği görülebilir.

Bu çalışma yüksek lisans tezinden üretilmiştir.

Introduction

The quality of life in older adults is often diminished when compared to that of younger individuals, primarily due to the progressive deterioration of health and the age-related decline in both physical and cognitive functions (Jivraj et al., 2014). These declines contribute to increased dependence, as well as heightened morbidity and mortality rates (Njegovan et al., 2001; Panza et al., 2018). The aging process (Morley, 2016) is characterized by a complex interplay of physical and cognitive impairments (Clouston et al., 2013), emphasizing the crucial role of maintaining both domains to promote healthy aging. The rapid growth of the elderly population further accentuates the need for effective healthcare strategies to mitigate the increasing burden on healthcare systems (Vincent & Velkoff, 2010).

The rising prevalence of Alzheimer's disease (AD), integrate with the limited efficacy of current treatments (Castellani & Perry, 2012), underscores the urgent need for the early detection of biomarkers indicative of mild cognitive impairment (MCI) or AD (Sperling et al., 2013). Emerging evidence suggests that a reduction in walking speed often precedes cognitive decline (Best et al., 2016; Mielke et al., 2012), supporting the hypothesis that a unified process underlies the age-related changes in both physical and cognitive functions (Christensen et al., 2001). Moreover, the positive effects of physical exercise on cognitive performance in older adults have been well-documented, specific molecular pathways and neural substrates mediate these benefits (Cotman et al., 2007). However, the optimal parameters and underlying mechanisms of exercise continue to be a subject of ongoing research (Rea, 2017; Oberg, 2007).

Moderate to high levels of physical activity have been shown to reduce the risk of cognitive decline by approximately 26% to 38% (Guure et al., 2017; Sofi et al., 2011). The concept of successful aging encompasses a multifaceted array of factors, including improvements in clinical health, physical fitness, and cognitive function. These improvements collectively lead to an overall enhancement of health perceptions and quality of life (Tkatch et al., 2016). Despite the limited efficacy of current treatments in halting the progression of dementia (World Health Organization [WHO], 2012), enhancing the quality of life for individuals with dementia remains a critical objective (Moniz-Cook et al., 2008). Furthermore, factors such as mood, social relationships, and socioeconomic status have been identified as significant determinants of quality of life (Layte et al., 2013).

The objective of this study is to evaluate the impact of physical and mental activity levels on the quality of life of older adults and to explore the relationships between these levels and other factors. The structure of the research study is delineated in Figure 1.

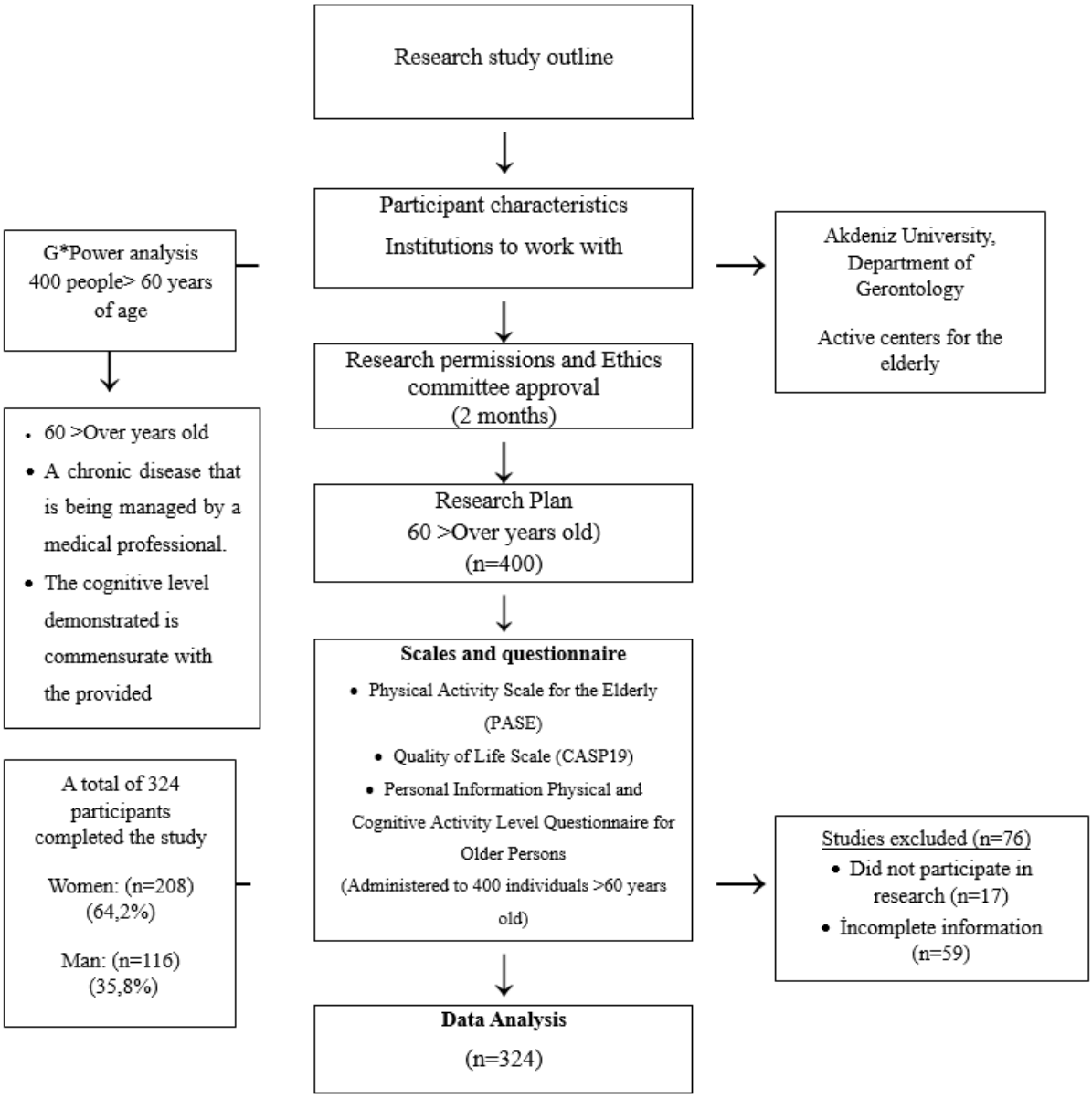

Figure 1. İllustrates the research outline

Method

Participants

The study comprised 324 individuals aged 60 and above from Akdeniz University's Gerontology Department and Active Elderly Centres in Antalya, which provide social, cultural, and educational services. Participants were selected based on the following criteria: the absence of chronic diseases, the capacity to follow instructions, the absence of motor limitations, independent walking ability, and the absence of sensory impairments. The sample size was determined via G*Power analysis.

Tablo 1. Characteristics of participants

Age (year)	319	67,42±4,9
Height (cm)	324	163,62±8,94
Weight (kg)	324	71,43±12,43
BKI	324	26,68±4,49

The mean age of the group was 67.42±4.9 years, the mean weight was 71.43±12,43 kg, and the mean body mass index was 26.68±4.49. Of the group, 208 (64.2%) were female, 116 (35.8%) were male, and the mean BMI was 26.68±4.49.

Assessments

This research was approved by the Ethics Committee of Social and Human Sciences Research and Publication Ethics Board of Akdeniz University, dated 26.09.2019 and numbered 174. The study population comprised individuals aged 60 and above from the Akdeniz University Faculty of Health Sciences, Department of Gerontology, and elderly adults residing in institutions offering activities and services in Antalya.Prior to participation, institutional and scale permissions were obtained. The research team thoroughly explained the study's objectives and significance to participants. "In accordance with the Helsinki Declaration on Human Rights, all volunteers provided written informed consent.Participants completed a series of questionnaires and scales, including the "Personal Information and Physical and Cognitive Activity Level Questionnaire," the "Physical Activity Scale for the Elderly" (PASE), and the "Quality of Life Scale."

Personal Information Physical and Cognitive Activity Level Questionnaire for Older Persons

A comprehensive questionnaire was developed to assess personal information, physical and cognitive activity levels, and types of activities engaged in by elderly individuals. The questionnaire measures the weekly frequency of physical and cognitive activities, daily exercise duration, and activity types. Physical activities include walking, household tasks, swimming, and outdoor sports, while cognitive activities involve card games, chess, backgammon, checkers, and memory exercises. The data obtained from this questionnaire are expected to provide valuable insights into the health impacts of these activities and highlight potential areas for improvement in aging.

Physical Assessments

In 1993, Richard et al. Developed the Physical Activity Scale for the Elderly (PASE) with the aim of objectively evaluating physical activity levels in the domains of leisure, housework, and work. Later, Ayvat et al. Adapted the scale into Turkish, categorizing activities by frequency and intensity (light, medium, heavy) (Ayvat, Kılınç, & Kırdı, 2017). The scale consists of 12 questions that assess the frequency and duration of leisure and home-based work activities. It uses categorical durations and binary responses for household and work tasks, with the PASE score calculated by multiplying the hours spent on physical activity by the activity level. Higher scores indicate increased physical activity, ranging from 0 to 400 or beyond (Richard et al., 1993)

Quality of Life Scale

Quality of life involves individual values that vary among people. Physical health is related to economic status and social life. Emotional well-being is influenced by psychological factors, abilities, intelligence, and one’s perspective on life. A scale was developed to assess the quality of life in the elderly (Hyde et al., 2003). The Turkish version of the scale was created by Türkoğlu and Adıbelli in 2014. It consists of 19 questions and four sub-dimensions: 'Control,' 'Autonomy,' 'Pleasure,' and 'Self-actualization.' Responses are rated from 0 for 'never' to 3 for 'always,' with items 1, 2, and 8 being reverse coded. Higher scores indicate an improved quality of life (Türkoğlu & Adıbelli, 2014)."

Data Analysis

Prior to the data collection stage, the execution of descriptive statistics and normality tests revealed that the dependent variables were not normally distributed. As a result, non-parametric statistical methods were performed. The chi-square test was conducted to assess relationships between categorical variables, the Mann-Whitney U test was used to compare the medians of two independent groups, and the Kruskal-Wallis test was employed to compare the medians of three or more groups. Additionally, Spearman's rank correlation test was conducted to evaluate monotonic relationships between parameters, with correlation coefficients calculated to assess the strength and direction of these relationships.

Findings

Table 2. Physical exercise situation comparison

	Exercise	**n**	**No exercise**	**n**	**Z**	**P**
Weight	70.83±11.94	276	74.82±14.60	44	-1.70	0.09
BMI	26.48±4.38	276	27.86±5.10	44	-1.77	0.08
Income	3666.58±3891.78	180	2857.81±1238.31	32	-2.57	**0.01***
QL	45.28±5.7	276	42.84±6.09	44	-2.91	0.004

***p<,05**

Weight: body weight, BMI: body mass index, Income: income level, QL: life quality (measured by CAPS19)

The study revealed a statistically significant difference ($p < 0.01$) in income levels between individuals who engage in regular exercise and those who do not.

Table 3. Mental Exercise Situation Comparison

	Exercise	**n**	**No exercise**	**n**	**Z**	**P**
Weight	71.20±12.17	220	71.70±12.99	102	-0.15	0.88
BMI	26.69±4.63	220	26.67±4.63	102	-0.29	0.77
Income	3784.70±4268.95	149	3086.17±1253.04	64	-0.89	0.37
QL	45.11±5.78	220	44.69±5.89	102	-0.63	0.53

Weight: body weight, BMI: body mass index, Income: income level, QL: life quality (measured by CAPS19)

Tables 2 and 3 demonstrate that individuals who engage in physical exercise experience better income levels and quality of life compared to those who do not exercise. No significant

difference was found in the exercise status among individuals who engage in mental exercise (P<0.05).

Table 4. Comparison of physical and mental exercise status and education level

Frequency	**PE-ME -** n(%)	**PE+ME -** n(%)	**PE-ME+** n(%)	**PE+ME+** n(%)
Primary and secondary	6 (37.50)	13 (15.10)	6 (22.20)	18 (9.50)
High school	4 (25.00)	29 (33.70)	10 (37.00)	73 (38.60)
Associate degree	4 (25.00)	15 (17.40)	6 (22.20)	33 (17.50)
Graduate	2 (12.50)	29 (33.70)	5 (18.50)	65 (34.40)
Total Frequency	16 (100)	86 (100)	27 (100)	189 (100)

PE-ME-: no physical and mental exercise, PE+ME-: doing physical no mental exercise, PE-ME+: no physical doing mental exercise, PE+ME+: doing physical and mental exercise.

No significant difference was found among the participants' physical and mental exercise status and their education level (χ^2=16.13, p=0.06).

Table 5. PASE and LQ points of physical and mental exercise status

	PE-ME- (n=16)	**PE+ME-** (n=87)	**PE-ME+** (n=27)	**PE+ME+** (n=189)
BMI(kg/m)	30.25±6.04	26.08±3.51	26.27±3.85	26.70±4.75
PASE	69.37±44.89	95.79±52.87	105.25±64.12	125.09±65.53
LQ	42.38±5.52	45.07±5.87	43.19±6.59	45.36±5.63

PASE: Physical Activity Scale for Older, LQ: Life Quality, BMI (kg/m): Body mass index, PE-ME-: no physical and mental exercise, PE+ME-: doing physical no mental exercise, PE-ME+: no physical doing mental exercise, PE+ME+: doing physical and mental exercise.

The analysis of variations across- among four groups the four groups (PE-ME+, PE+ME-, PE-ME+, PE+ME+) showed that there were significant differences in BMI (X2=9.80, P=0.02), PASE score (X2=24.55, P<0.01) and LQ score (X2=8.30, P=0.04). The table below compares the PASE and LQ scores of each group with the other groups.

Table 6. Pase And Lq Points Comparison Based on Physical and Mental Exercise Status

PASE	P+M+ Z=,P=	P+M- Z=,P=	P-M+ Z=,P=
P+M-	-3.60, 0.00**		

P-M+	-1.63, 0.10	-0.59, 0.56	
P-M-	-3.77, 0.00**	-2.18, 0.03*	-2.30, 0.02*
LQ			
P+M-	-0.33, 0.75		
P-M+	-1.96, 0.05	-1.53, 0.13	
P-M-	-2.29, 0.02*	-2.00, 0.046*	-0.90, 0.37

***P<0.05 and **P<0.01**.

PASE (Physical Activity Scale for the Older), LQ (Quality of Life), and BMI (Body Mass Index) were employed to define the four groups: PE-ME- (no physical or mental exercise), PE+ME- (engaging in physical but not mental exercise), PE-ME+ (engaging in mental but not physical exercise), and PE+ME+ (engaging in both mental and physical exercises).

The study found a significant difference (P<0.01) in PASE scores between individuals who engaged in both physical and mental exercises compared to those who did not. It was also observed in LQ that PASE scores were significantly different (P<0.05) between these two groups. Furthermore, the analysis revealed a weak positive correlation (r=0.19, P=0.001) between PASE scores and LQ among the participants.

Discussion

This study investigated the effects of physical and mental exercise on quality of life and related parameters in individuals aged 60 years and older. Because of the aging process, there is a discernible deterioration in physical and cognitive functions, which can lead to adverse health outcomes such as cardiovascular diseases, chronic illnesses, and metabolic syndromes (Franceschi et al., 2018). The research emphasizes the importance of physical activity as a factor in improving the quality of life of individuals in this age group (Erickson et al., 2013). Furthermore, finding suggests that physical activity can result in permanent structural changes in brain function (Rehage et al., 2010). The study examined the relationship between physical and mental exercises, BMI, income level, and quality of life. The data presented in Table 2 and Table 3 demonstrate a correlation between regular physical activity, higher income levels, and a superior quality of life. Consistent with previous research, this association suggests a positive correlation between income levels and physical activity (Logan et al., 2013). The relationship between education levels and exercise habits was also examined. Individuals who engaged in physical and mental exercise were generally found to have higher levels of education; however, no statistically significant difference in education levels was observed (Table 4). The positive

association between physical activity and educational level may have implications for public health and educational policies (Justine et al., 2013). The results indicated that participants who engaged in physical and mental exercise exhibited lower BMI compared to those who did not engage in such activities. A positive correlation has been identified between high levels of physical activity and a lower BMI (Tumaova, 2019). Individuals who engaged in both physical and mental exercise demonstrated superior performance on the PASE and quality of life assessments, as evidenced by (Table 5). The literature indicates that individuals who engage in physical activity tend to have higher PASE scores (Logan et al., 2013). Moreover, individuals who engaged in both types of exercise reported higher quality of life along with levels of chronic disease, stress, and depression (Table 6). However, the association between PASE and quality of life was weak (Sofi et al., 2010). There is compelling evidence that individuals aged 60 years and older can improve their quality of life by performing both cognitive and physical exercises (Hagovska & Olekszyova, 2016). Furthermore, the integration of physical and mental conditioning provides a multitude of benefits for institutions and professions that cater to the elderly. Engaging in physical exercise has been demonstrated to enhance the health, mobility, and independence of elderly individuals, thereby improving the effectiveness of care services and the overall quality of institutional care (Cress et al., 1999). The implementation of exercise programs for the elderly has been demonstrated to have a beneficial impact on employees, with a reduction in stress and an enhancement of overall well-being (Pedersen & Saltin, 2015). Regular exercise has been demonstrated to reduce the risk of disease and prevent the onset of health issues in elderly individuals. This has the potential to result in a reduction in healthcare costs and financial savings for institutions (Erickson et al., 2011). The beneficial effects of physical and mental exercise on elderly individuals have been demonstrated to enhance social connections and mitigate social isolation (Goyal et al., 2014).

Conclusion

In conclusion, the combination of physical and mental exercises offers numerous benefits for institutions and professionals serving the elderly. The implementation of these exercises can enhance the health and quality of life of elderly individuals, while also supporting employee satisfaction and job performance. Furthermore, integrating these strategies can improve service quality and operational efficiency.

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