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Original Article

RELATIONSHIP BETWEEN PHYSICAL ACTIVITY LEVEL AND LIFE SATISFACTION IN YOUNG AND MIDDLE-AGED ADULTS AND OLDER ADULTS

RELAÇÃO ENTRE O NÍVEL ATIVIDADE FÍSICA COM A SATISFAÇÃO COM A VIDA DE ADULTOS JOVENS E DE MEIA-IDADE E PESSOAS IDOSAS

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ABSTRACT
This study examined the relationship between physical activity level and life satisfaction among young adults, middle-aged adults, and older adults. Conducted online between June and August 2024, the study included 182 participants aged 18 and older residing in various regions of Brazil. The International Physical Activity Questionnaire and the Life Satisfaction Scale were used. Data analysis was performed using the Kruskal-Wallis test and Spearman correlation, with a significance level of $p < 0.05$. Results showed that 44.0% of participants were irregularly active, 42.9% were active, and 13.1% were very active. Significant differences were found among age groups in weekly moderate physical activity time and sitting time during weekdays and weekends. Participants aged 30 to 45 reported less moderate activity time, while younger participants (18 to 29 years) had more sitting time. A positive correlation was observed between life satisfaction and moderate-to-vigorous physical activity time and a negative correlation with sedentary behavior, although all correlations were weak. Physical activity was associated with higher life satisfaction, particularly among individuals with moderate to vigorous activity levels, highlighting the importance of promoting physical activity across all age groups to enhance quality of life.
Keywords: Aging. Motor activity. Well-being

RESUMO
Este estudo teve como objetivo verificar a relação entre o nível de atividade física e satisfação com a vida em adultos jovens, de meia-idade e idosos. Realizado online entre junho e agosto de 2024, o estudo incluiu 182 participantes com idade mínima de 18 anos, residentes em diversas regiões do Brasil. Foi utilizado o Questionário Internacional de Atividade Física e a Escala de Satisfação com a Vida. A análise dos dados foi realizada pelo teste Kruskal-Wallis e correlação de Spearman, com significância de $p < 0,05$. Os resultados mostraram que 44,0% dos participantes eram irregularmente ativos, enquanto 42,9% eram ativos e 13,1% muito ativos. Houve diferença significativa entre as faixas etárias no tempo de atividade física moderada semanal e no tempo sentado durante a semana e nos finais de semana. Participantes de 30 a 45 anos reportaram menor tempo de atividade moderada, enquanto jovens (18 a 29 anos) apresentaram maior tempo sentado. Observou-se correlação positiva entre satisfação com a vida e tempo de atividade física moderada e vigorosa, e negativa com comportamento sedentário, embora todas as correlações fossem fracas. A prática de atividade física está associada a maior satisfação com a vida, especialmente entre indivíduos com níveis moderados a vigorosos, destacando a importância de promover a atividade física em todas as faixas etárias para uma melhor qualidade de vida.
Palavras-chave: Envelhecimento. Atividade motora. Bem-estar.

Introduction

Regular physical activity (PA) has been widely associated with improvements in mental health and life satisfaction (LS), as it provides physiological, psychological, and social benefits that can reduce symptoms of anxiety and depression and promote feelings of well-being[1,2]. Studies indicate that PA, especially in outdoor environments and with social components, is directly linked to a more positive perception of life and overall satisfaction, significantly influencing quality of life and subjective well-being[3–5]. Thus, PA emerges as a health-promoting practice and a means to improve contentment and the evaluation people make about their lives at any age[6].

As Nowak et al.[7] noted, active individuals feel more energetic in their daily activities. PA improves overall health, benefiting the cardiovascular system and reducing dyslipidemia. Furthermore, investing in PA can also lower healthcare costs, generating benefits for individuals and society as a whole[8].

Despite evidence of PA's benefits, a decrease in PA levels is observed with advancing age, often associated with physical limitations and a sedentary culture[6-9]. This decline in PA levels can have negative consequences, such as increased health problems and reduced LS across different age groups[10]. Interestingly, even young people, who theoretically would have greater energy for PA, have exhibited sedentary behaviors. This reality points to a possible connection between sedentary lifestyles, dissatisfaction with life, and health problems affecting individuals of all ages[11].

The literature highlights that LS significantly influences people's daily lives, impacting their perspective and reactions to challenging situations[12-13]. Individuals with low satisfaction tend to interpret situations more negatively, reducing their enthusiasm to tackle and solve problems[14]. Conversely, those with high LS levels report better quality of life, approach problems positively, and have a lower incidence of chronic pain[15].

The regular practice of PA is directly associated with increased LS, as it stimulates serotonin production, contributing to a more positive perception of life[15]. However, although the general benefits of PA for LS are well established, it remains unclear whether this relationship is uniform across different stages of adulthood. Life stages are marked by distinct challenges, responsibilities, and psychosocial demands, which may modulate how individuals experience and benefit from PA. For instance, young adults often face academic or career pressures, while older adults may deal with retirement or health-related concerns. These contextual differences may influence the strength or nature of the PA–LS association depending on the age group.

Therefore, understanding whether and how this relationship varies by age is essential for designing more precise and effective health promotion strategies. It allows for age-tailored interventions that consider specific motivational and environmental factors relevant to each group, thereby enhancing adherence to PA and maximizing its benefits.

This study aims to fill this gap by investigating the relationship between PA levels and LS among young, middle-aged, and older adults, contributing to the development of interventions that promote physical and psychological health at different life stages.

Methods

This quantitative, analytical, observational, and cross-sectional study was approved by the Research Ethics Committee on Human Subjects of Cesumar University under opinion number 1.742.192.

Participants

The research sample consisted of 182 adults (≥18 years old) residing in various regions of Brazil, selected through non-probabilistic, intentional, and convenience sampling due to the online nature of the study. Inclusion criteria required a minimum age of 18 years, access to electronic devices with internet connectivity, and willingness to voluntarily participate by fully completing the questionnaire. Additionally, participants from different age groups were included, categorized as young adults (18–39 years), middle-aged adults (40–59 years), and older adults (60 years or older), to explore potential differences in the relationship between PA and LS in each group.

Exclusion criteria included individuals with cognitive or motor limitations that could hinder understanding or completion of the online questionnaire and people who did not reside

in Brazil. This approach ensured a diverse and representative sample within the study's limitations, enabling a comprehensive analysis of the relationship between PA and LS across different stages of adulthood.

Instruments

A questionnaire was administered with questions related to age, age group, sex, and PA practice. The level of PA was assessed using the short version of the International Physical Activity Questionnaire (IPAQ). This instrument comprises seven open-ended questions, and its data allow for the estimation of time spent per week in different dimensions of PA (walking and moderate- and vigorous-intensity physical efforts) and physical inactivity (sitting position). The instrument's classification system categorized participants as sedentary, irregularly active, active, or very active[16].

The Satisfaction with Life Scale proposed by Diener et al.[17] assessed LS. This scale consists of five items, with responses rated on a seven-point Likert scale ranging from 1 = strongly disagree to 7 = strongly agree. The purpose of this scale is to evaluate individuals' judgments about their own LS, allowing them to determine, based on their values and interests, the aspects to be considered in expressing such satisfaction. With a possible total score of 35 points, the closer the score is to this maximum, the higher the individual's LS.

Data collection procedure

Data collection was conducted online between June and August 2024. The questionnaires were made available via the Google Forms platform, allowing remote completion and facilitating access to a diverse audience. Before starting the questionnaire, participants who agreed to participate in the study had to read and sign the Free and Informed Consent Form (FICF) embedded in the online form. Only after accepting the FICF did participants gain access to the questionnaire questions.

To maximize the study's reach, the invitation link and form were widely disseminated through the researchers' social media channels, enabling the sample to include individuals from various regions of Brazil. This online methodology facilitated swift and accessible data collection, adhering to ethical principles and ensuring voluntary and informed participation from respondents.

Data Analysis

Frequency and percentage were used for categorical variables in data analysis. For numerical variables, normality was initially assessed using the Kolmogorov-Smirnov test. The data did not present a normal distribution, so the Median (Md) and Quartiles (Q1; Q3) were used to measure central tendency and dispersion. In inferential statistics, the Kruskal-Wallis test, followed by Dunn's Post Hoc test, was employed to compare LS levels, PA duration and frequency, and sedentary behavior across age groups. Spearman's correlation coefficient was used to analyze the relationship between age, LS level, PA duration and frequency, and sedentary behavior.

The Chi-square test was applied to analyze the association of PA level with sex and age group. A significance level of $p < 0.05$ was adopted for all tests. All analyses were performed using JASP software version 0.18.3.

Results

According to the data in Table 1, the study included 182 participants, comprising males (n = 118) and females (n = 64), aged between 18 and 85 years (M = 41.38; SD = 14.71). Regarding age groups, 32.4% of participants were between 46 and 59 years old, 29.7% were between 18 and 29, 27.5% were between 30 and 45, and 10.4% were 60 or older. Finally, 54.4% of individuals reported engaging in physical exercise, while 45.6% reported not practicing physical exercise.

Table 1. Sociodemographic Profile of Research Participants. 2024.

VARIABLES	*f*	%
Gender		
Male	118	64.8
Female	64	35.2
Age Range		
18 to 29 years	54	29.7
30 to 45 years	50	27.5
46 to 59 years	59	32.4
60 years or older	19	10.4
Engagement in Physical Exercise		
Yes	99	54.4
No	83	45.6

Source: The authors.

Table 2 presents the descriptive analysis of LS levels, the duration and frequency of physical activity, and sedentary behavior. Participants showed a median LS score of 260.0 (Q1 = 21.0; Q3 = 29.0). Regarding the duration and frequency of PA, the following medians were observed: walking days = 3.0 (Q1 = 2.0; Q3 = 5.0); walking time per day = 30.0 minutes (Q1 = 20.0; Q3 = 40.0); walking time per week = 100.0 minutes (Q1 = 40.0; Q3 = 180.0); moderate activity days = 2.0 (Q1 = 0.0; Q3 = 3.2); moderate activity time per day = 30.0 minutes (Q1 = 0.0; Q3 = 60.0); moderate activity time per week = 77.5 minutes (Q1 = 0.0; Q3 = 180.0); vigorous activity days = 0.0 (Q1 = 0.0; Q3 = 2.0); vigorous activity time per day = 0.0 minutes (Q1 = 0.0; Q3 = 40.0); vigorous activity time per week = 0.0 minutes (Q1 = 0.0; Q3 = 90.0). Finally, the median sitting time during weekdays and weekends was 300.0 minutes (Q1 = 180.0; Q3 = 480.0) and 360.0 minutes (Q1 = 240.0; Q3 = 600.0), respectively.

Table 2. Descriptive Analysis of Life Satisfaction Level, Physical Activity Duration and Frequency, and Sedentary Behavior Among Research Participants. 2024.

VARIABLES	Median	Q1-Q3
Life Satisfaction	26.0	21.0-29.0
Duration and frequency of physical activity		
Walking days	3.0	2.0-5.0
Walking time per day (min.)	30.0	20.0-40.0
Walking time per week (min.)	100.0	40.0-180.0
Days of moderate activities	2.0	0.0-3.2
Time of moderate activities per day (min.)	30.0	0.0-60.0
Time of moderate activities per week (min.)	77.5	0.0-180.0
Days of vigorous activities	0.0	0.0-2.0
Time of vigorous activities per day (min.)	0.0	0.0-40.0
Time of vigorous activities per week (min.)	0.0	0.0-90.0
Sedentary Behavior		
Sitting time during the week (min.)	300.0	180.0-480.0
Sitting time during the weekend (min.)	360.0	240.0-600.0

Note: min.: minutes.
Source: The authors.

Figure 1 illustrates the prevalence of PA levels among the study participants. It shows that 44.0% of individuals are irregularly active, 42.9% are active, and only 13.1% are physically active.

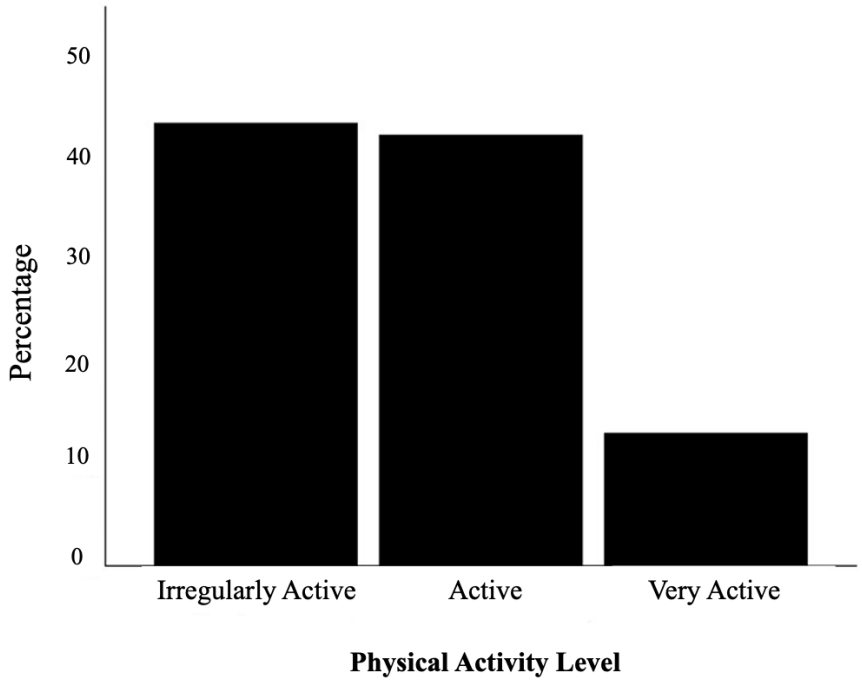

Figure 1. Prevalence of Physical Activity Levels Among Research Participants. 2024.
Source: The authors.

When comparing LS levels, PA duration and frequency, and sedentary behavior across age groups (Table 3), significant differences were found only in weekly moderate PA time ($p = 0.014$), sitting time during weekdays ($p = 0.001$), and sitting time on weekends ($p < 0.001$). Participants aged 30 to 45 reported less weekly moderate PA time than those aged 18 to 29 and 46 to 59.

Regarding sedentary behavior, participants aged 18 to 29 reported more sitting time on weekdays than older participants (46 to 59 years and 60 years or older). Additionally, individuals aged 30 to 45 reported more sitting time on weekdays than older adults (60 years or older). Finally, younger participants reported more weekend sitting time than all other groups.

Table 3. Comparison of Life Satisfaction Level, Physical Activity Duration and Frequency, and Sedentary Behavior Across Age Groups. 2024.

Variables	Age range				p
	18 to 29 years (n = 54)	**30 to 45 years (n = 50)**	**46 to 59 years (n = 59)**	**60 years or older (n = 19)**	
	Md (Q1-Q3)	Md (Q1-Q3)	Md (Q1-Q3)	Md (Q1-Q3)	
Life Satisfaction	26.0 (21.0; 29.2)	24.5 (19.0; 29.0)	26.0 (21.0; 18.0)	28.0 (24.0; 31.0)	0.071
Walking Days	4.0 (2.0; 5.0)	3.0 (2.0; 4.0)	3.0 (2.0; 5.0)	4.0 (2.0; 5.0)	0.756
Walking Time per Day (min.)	27.5 (20.0; 40.0)	22.5 (15.0; 40.0)	30.0 (20.0; 40.0)	30.0 (20.0; 40.0)	0.338
Walking Time per Week (min.)	100.0 (37.5; 152.5)	85.0 (37.5; 133.7)	90.0 (40.0; 210.0)	120.0 (60.0; 200.0)	0.547
Moderate Activity Days	2.5 (0.0; 5.0)	1.5 (0.0; 3.0)	2.0 (0.0; 3.0)	2.0 (0.0; 3.0)	0.178
Moderate Activity Time per Day	42.5 (0,0; 60.0)	20.0 (0.0; 41.2)[a]	40.0 (0.0; 60.0)	30.0 (0.0; 60.0)	**0.014***
Moderate Activity Time per Week (min.)	110.0 (0.0; 285.0)	30.0 (0.0; 150.0)	80.0 (0.0; 200.0)	90.0 (0.0; 135.0)	0.059
Vigorous Activity Days	0.0 (0.0; 3.0)	0.0 (0.0; 2.0)	0.0 (0.0; 2.0)	2.0 (0.0; 3.0)	0.356
Vigorous Activity Time per Day (min.)	0.0 (0.0; 32.5)	0.0 (0.0; 30.0)	0.0 (0.0; 40.0)	30.0 (0.0; 60.0)	0.207
Vigorous Activity Time per Week (min.)	0.0 (0.0; 120.0)	0.0 (0.0; 65.0)	0.0 (0.0; 80.0)	60.0 (0.0; 180.0)	0.316
Sitting Time During the Week (min.)	480.0 (225.0; 600.0)[b]	300.0 (180.0; 480.0)[c]	240.0 (120.0; 480.0)	150.0 (120.0; 360.0)	**0.001***
Sitting Time During the Weekend (min.)	480.0 (300.0; 720.0)[d]	360.0 (240.0; 480,0)	300.0 (180.0; 480.0)	240.0 (120.0; 360.0)	**<0.001***

Note:*Significant Difference - $p < 0.05$ (Kruskal-Wallis Test followed by Dunn's Post Hoc Test) between a) 30 to 45 years and 18 to 29 years, and 46 to 59 years; b) 18 to 29 years and 46 to 59 years, and 60 years or older; c) 30 to 45 years and 60 years or older; d) 18 to 29 years and 30 to 45 years, 46 to 59 years, and 60 years or older. min.: minutes.
Source: The authors.

. Table 4 presents the correlation between LS, weekly PA time, and sedentary behavior. Age showed a significant ($p < 0.05$) and negative correlation with sitting time during weekdays ($r = -0.29$) and weekends ($r = -0.32$). LS demonstrated a significant ($p < 0.05$) and positive correlation with weekly moderate PA time ($r = 0.22$) and vigorous PA time ($r = 0.23$), as well as a negative correlation with sitting time during weekdays ($r = -0.22$) and weekends ($r = -0.15$). It is worth noting that all correlations were weak ($r < 0.40$).

Table 4. Correlation Between Life Satisfaction, Weekly Physical Activity Time, and Sedentary Behavior. 2024.

	1	2	3	4	5	6	7
1. Age	-	0.09	0.05	-0.04	0.13	**-0.29***	**-0.32***
2. Life Satisfaction		-	0.09	**0.22***	**0.23***	**-0.22***	**-0.15***
3. Weekly Walking Time (min.)			-	0.14	0.18*	-0.09	0.06
4. Weekly Moderate Activity Time (min.)				-	0.49*	0.01	0.09
5. Weekly Vigorous Activity Time (min.)					-	-0.17*	-0.01
6. Sitting Time During the Week (min.)						-	0.48*
7. Sitting Time During the Weekend (min.)							-

Note: *Significant Correlation (Spearman's Correlation Coefficient) – $p < 0.05$. min.: minutes.

Source: The authors.

No significant association ($p > 0.05$) was found between PA level and sex or age group.

Discussion

This study found that higher levels of moderate PA were positively associated with greater LS and that sedentary behavior varied significantly across age groups. Younger adults reported more sitting time during the week and on weekends. Additionally, older participants showed higher engagement in light to moderate PA, which may reflect differences in occupational demands and health-related motivations across the lifespan.

The relationship between regular PA and LS is widely documented in the literature, reinforcing the idea that engaging in PA can significantly contribute to overall well-being and individuals' perception of satisfaction. Studies suggest that exercise, especially of moderate to vigorous intensity, is associated with the release of neurotransmitters such as serotonin and dopamine, which play a fundamental role in mood regulation and the sensation of pleasure and well-being[2,18]. In this sense, individuals who maintain an adequate level of PA tend to report higher LS and better quality of life due to exercise's positive impact on mental and emotional health[1].

Furthermore, PA is considered an important coping mechanism for daily stressors, providing a healthy way to handle adverse situations and reducing the risk of disorders such as anxiety and depression[19]. In this context, Rejeski and Mihalko[20] highlight that regular PA can serve as an emotional "release valve," helping individuals better manage stress and gain a more positive perspective on life. Thus, this study's correlation between weekly PA time and LS aligns with previous findings, indicating that PA benefits physical and psychological well-being.

The literature further suggests that PA contributes to LS through multiple mechanisms, including enhanced self-esteem, improved sleep quality, and increased control and autonomy

over one's body and routine[21,22]. In older adults, regular PA has also been linked to social engagement and reduced feelings of isolation, both of which are key predictors of LS[23]. These psychosocial pathways help explain why more physically active individuals perceive their lives more positively.

These findings reinforce the importance of public health policies encouraging regular PA across all age groups, considering its contribution to longevity and a more satisfying and meaningful life[24]. By demonstrating a positive correlation between PA and LS, this study adds to the growing body of evidence supporting PA as an essential component of psychological well-being and quality of life.

The variation in sedentary behavior across age groups, with younger individuals spending more time seated during weekdays and weekends, reflects a trend observed in the literature. Studies indicate that young adults tend to adopt more sedentary behaviors due to the intensive use of electronic devices such as smartphones and computers for work, study, or leisure[25,26]. This behavioral pattern can lead to detrimental health consequences, including an increased risk of obesity, cardiovascular problems, and deteriorated mental health due to the lack of regular physical stimulation[27].

In contrast, older adults tend to engage more in light to moderate PA, often motivated by greater awareness of the benefits of exercise for maintaining functional capacity, autonomy, and preventing chronic diseases[28,29]. Moreover, as individuals retire or reduce their work-related sedentary demands, they may replace sitting time with physical activity, contributing to healthier routines[30,31].

These results highlight the need for interventions tailored to the specific characteristics of each age group. For younger individuals, strategies to reduce sedentary time and incorporate PA into daily life—especially in the context of increasing screen time—are critical. The World Health Organization (WHO) recommends limiting sedentary behavior and promoting daily movement to mitigate long-term health risks[24]. For older adults, promoting enjoyable, accessible, and socially engaging forms of PA may be an effective strategy for improving both physical and psychological health.

Beyond its physiological and psychological effects, PA also holds important social meanings that may influence individuals' well-being and life satisfaction. Regular PA is socially constructed in many contemporary societies as a sign of self-discipline, success, and health-conscious behavior, contributing to a positive social identity and reinforcing self-worth[32]. These symbolic aspects of PA can enhance one's sense of social belonging and status, particularly when participation occurs in group or community-based settings[32].

Moreover, the visibility of an active lifestyle often aligns with prevailing norms of autonomy and productivity, especially in adulthood and older age, where maintaining physical activity is frequently associated with ideals of successful aging[33]. These social assumptions may partly explain why physically active individuals report higher levels of general well-being and LS, even when physiological benefits alone do not fully account for the variation observed[34]. Recognizing these dimensions is essential to understanding PA's broader impact and developing interventions that consider cultural and social expectations around health behaviors.

This study has some limitations that should be considered when interpreting the results. Firstly, the sample was non-probabilistic and selected for convenience, which may limit the generalizability of the findings to the broader Brazilian population. Additionally, data collection was conducted exclusively online, restricting participation to individuals with internet access and familiarity with electronic devices, potentially excluding groups with less digital access, such as some older adults and individuals from less connected regions.

Another limitation is using self-report measures to assess PA levels and sedentary behavior, which may introduce response biases, such as under- or overestimating actual activity levels. Finally, the study's cross-sectional nature precludes the analysis of causal relationships

between PA, sedentary behavior, and LS, suggesting that future longitudinal research is needed to better understand these relationships over time.

Conclusion

It is concluded that, although most participants reported being irregularly active, the practice of moderate and vigorous PA remains limited—particularly among individuals aged 30 to 45. The analysis also revealed more pronounced sedentary behavior among younger participants, suggesting a possible inversion of PA patterns across the lifespan. Although the correlations between LS and PA were weak, they indicate that higher engagement in PA may be associated with greater LS.

From a practical perspective, these findings reinforce the need for age-targeted health promotion strategies. Interventions that reduce sedentary behavior and promote regular PA among young and middle-aged adults—especially in technologically driven and work-intensive contexts—could positively impact both physical health and subjective well-being. For older adults, reinforcing social and functional PA opportunities may help maintain autonomy and LS.

Future studies should adopt longitudinal designs to understand better causal relationships between PA, sedentary behavior, and LS over time. It would also be valuable to investigate the role of mediating variables such as self-efficacy, social support, and mental health status, which may clarify the pathways linking PA to life satisfaction in different age groups. Additionally, including more diverse samples and objective measures of physical activity could enhance the generalizability and precision of future findings.

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