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Investigation of the relationship between exercise addiction and self-esteem on psychological health in former male athletes

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Abstract

Background: Exercise addiction can significantly affect the psychological and physical health of male athletes and may be associated with self-esteem. Professionals working in sports organizations are often required to maintain high levels of physical activity, which may influence these factors. This study aimed to examine the relationship between exercise addiction and self-esteem in former male athletes, considering demographic variables. **Methods**: This cross-sectional study comprised 301 male individuals employed in sports organizations, with a mean age of 34.85 years. A relational survey model was used to examine the associations between exercise addiction, self-esteem and demographic factors. The data were collected through online surveys, utilizing the Rosenberg Self-Esteem Scale and the Exercise Addiction Scale, and statistical analyses included descriptive statistics, independent t-tests, (analysis of variance) ANOVA and correlation analyses. **Results**: The findings revealed that self-esteem was positively correlated with age and income level ($p < 0.05$), with higher self-esteem observed in individuals with greater income and longer engagement in sports. Additionally, individuals who had participated in sports for a longer duration exhibited higher levels of exercise addiction. **Conclusions**: These findings indicate that demographic characteristics play a significant role in shaping self-esteem and exercise addiction in former athletes. Interventions aimed at enhancing psychological well-being and behavioral health in sports professionals should be tailored to account for individual demographic factors to maximize their effectiveness.

Keywords

Exercise addiction; Self-esteem; Athlete psychology

1. Introduction

As societies become increasingly influenced by modernization, sedentary lifestyles have become more prevalent due to the conveniences provided by technological advancements. In contrast, while these developments have enhanced daily life, they have also contributed to various challenges, including increased individualization, physical health issues and psychological distress [1].

The motivations for engaging in sports vary among individuals and are influenced by multiple factors, including the desire for social interaction, body image concerns, physical activity needs, fear of loneliness, and the pursuit of a more active and healthier lifestyle [2, 3]. Beyond its physical benefits, participation in sports plays a crucial role in personal and social development, fostering qualities such as self-discipline, resilience and motivation for progress [4]. Self-esteem, defined as an individual's acceptance of themselves and their perception of their own worth, is a key psychological factor that influences attitudes, expectations and overall life satisfaction. Its de-

velopment is shaped by various intrinsic and extrinsic factors [5, 6]. While high self-esteem is associated with a strong and positive self-view, fostering confidence and ambition, low self-esteem is linked to negative self-perceptions and feelings of inadequacy [7]. Individuals with high self-esteem tend to exhibit greater emotional resilience, a positive outlook on life, and a well-integrated holistic self-concept. However, in some cases, they may seek close relationships to assert their superiority, while in others, feelings of insufficiency may lead to social withdrawal and isolation [8].

High self-esteem among employees in sports organizations has been shown to enhance organizational efficiency and contribute significantly to achieving strategic goals [9]. Eather *et al.* [10] (2023) reported that while high self-esteem in employees positively impacts sports organizations, low self-esteem can have detrimental effects, potentially hindering the organization from reaching its intended objectives. In addition, professionals in sports organizations, which are structured to organize, manage and promote sports activities, typically work in environments that demand high levels of physical activity.

Exercise is recognized as a key factor in fostering self-confidence [11]. It involves a structured regimen of planned, repetitive physical activities aimed at maintaining or improving various aspects of physical fitness, such as endurance, agility, flexibility and muscular strength. As awareness of the benefits of physical activity grows, an increasing number of individuals are engaging in regular exercise to maintain a healthy lifestyle [12]. Although exercise is widely acknowledged for its positive effects on quality of life, studies indicate that excessive and compulsive exercise can lead to negative psychological consequences. In particular, former professional athletes appear to be more susceptible to such behaviors, often placing high importance on physical activity even after retiring from competitive sports [13]. In some cases, excessive exercise can develop into an addiction, often described as the "dark side" of physical activity, and has been classified as a behavioral disorder that adversely affects psychological health [14]. Beyond its physical benefits, exercise is also recognized for its impact on mental and emotional well-being [15]. Numerous studies highlight the role of sports in improving quality of life, enhancing self-esteem, and serving as an effective means of coping with stress [11–16].

Collectively, exercise addiction and self-confidence have a significant influence on psychological health. While excessive physical activity associated with exercise addiction can lead to psychological distress, including stress and anxiety [17, 18], high self-confidence enables individuals to express themselves more effectively and cope with emotional challenges. Additionally, exercise addiction may cause individuals to base their self-worth primarily on physical appearance, leading to emotional instability [19]. The impact of these factors on psychological health appears to be influenced by various demographic characteristics [12–20], including emotional regulation, stress management, relationship quality and overall life satisfaction [18]. Individuals with good psychological health are better equipped to manage negative emotions, find purpose in life and sustain personal development. They also benefit from strong social support networks and exhibit traits such as mental well-being, positive thinking and problem-solving skills [21, 22]. Notably, studies suggest that age and income level play a crucial role in these dynamics. For instance, increasing age has been associated with both higher exercise dependence and lower self-confidence [11, 20, 23], while individuals with higher income levels may have greater access to psychological support and healthier lifestyle choices [24]. These findings indicate that the effects of exercise dependence and self-confidence on psychological health vary across demographic groups.

Given the potential risks associated with exercise addiction, it is essential to identify contributing factors. This study aims to examine the relationship between self-esteem and exercise addiction among male athletes working in sports organizations and to explore how these variables differ based on demographic characteristics. We hypothesized that self-esteem may influence the development of exercise addiction. Additionally, existing literature suggests that gender plays a significant role, with men exhibiting higher levels of exercise addiction and self-confidence [25]. Moreover, variations in age, income level, and educational background have been reported to influence these associations [25–27].

2. Materials and methods

2.1 Method

This study employed a descriptive research design. Data were collected using a structured survey consisting of three sections. The first section included a Personal Information Form, which gathered demographic details such as age, marital status, education level, income level and duration of sports participation. The second section utilized the Rosenberg Self-Esteem Scale (RSS), originally developed by Morris Rosenberg in 1963, to assess self-esteem. The third section incorporated the Exercise Addiction Scale (EAS), developed by Tekkurşun and Türkeli in 2019, to evaluate exercise addiction [28]. A cross-sectional design with a relational survey model was used to explore the associations between these psychological variables using descriptive statistics, independent t-tests, ANOVA, and correlation analyses to identify significant relationships.

The study was reviewed and approved by the Aydın Adnan Menderes University Social and Human Sciences Research Ethics Committee and complied with the Declaration of Helsinki. The research protocol was also approved by the Social and Human Research Ethics Committee of Aydın Adnan Menderes University (Approval Date: 01 December 2023, Approval Number: 31906847/50.04.04-09).

2.2 Research design

This study aims to investigate the relationship between self-esteem and exercise addiction in male athletes working in sports organizations. A cross-sectional design was employed to assess how demographic characteristics, including age, income level, and duration of sports participation, influence these psychological variables. To further explore these associations, the study utilized a relational survey model, a research approach designed to examine the relationships between variables by analyzing existing conditions within a specific timeframe, allowing for the identification of correlations and providing insights into how self-esteem and exercise addiction interact under varying demographic conditions [29].

2.3 Participants

G*Power (3.1.9.2 software, Psychonomic Society, Essen, NRW, Germany) analysis indicated that a minimum sample size of 280 participants would be sufficient for the study. The final sample comprised 301 male athletes employed in various sports organizations. The participants were recruited using the snowball sampling method and completed the survey via Google Forms. All participants had previously competed in a licensed sport, with 121 engaging in individual sports and 159 in team sports. The data were collected between April and July 2024, and only individuals with a history of professional sports participation were included, without distinguishing between individual and team sports. Participation in the study was entirely voluntary. The age range of participants was 20 years and older, with a mean age of 34.85 years (standard deviation = 8.941). The age distribution was as follows:

5.31% (n = 16) were aged 20–24 years, 43.85% (n = 132) were aged 25–29 years, 16.27% (n = 49) were aged 30–34 years, 11.96% (n = 36) were aged 35–39 years, and 55.59% (n = 68) were aged 40 years and above. Regarding marital status, 40.86% (n = 123) were married, while 59.13% (n = 178) were single. In terms of educational attainment, 10.29% (n = 31) were high school graduates, 11.30% (n = 34) held an associate degree, 59.14% (n = 178) had a bachelor's degree and 21.26% (n = 64) had completed postgraduate education. Income levels varied among participants, with 24.9% (n = 75) earning between 11,000–20,000 ₺, 21.6% (n = 65) earning between 21,000–30,000 ₺ and 53.5% (n = 161) earning 31,000 ₺ or more. The duration of sports engagement also varied, with 14.0% (n = 42) having participated in sports for 1–2 years, 16.9% (n = 51) for 3–5 years and 69.1% (n = 208) for 6 years or more. This broad demographic distribution provides a diverse dataset, allowing for a comprehensive evaluation of the research findings.

2.4 Data collection tools

2.4.1 Rosenberg self-esteem scale (RSS)

The participants' self-esteem levels were assessed using the Rosenberg Self-Esteem Scale (RSS), originally developed by Morris Rosenberg and standardized in 1963. The Turkish adaptation, conducted by Çuhadaroğlu (1986) on a sample of 205 high school students, demonstrated satisfactory psychometric properties, with a Cronbach's alpha reliability coefficient of 0.75 and a test-retest reliability coefficient of 0.71. In the present study, the internal consistency coefficient (Cronbach's alpha) was calculated as 0.81, indicating good reliability.

The RSS is a 10-item self-report measure designed to evaluate self-esteem. Each item is rated on a four-point Likert scale: "1 = Very true", "2 = True", "3 = False" and "4 = Very false". The scale assesses the extent to which individuals value themselves and hold positive self-perceptions. It was initially developed in 1965 as a general measure of self-esteem and was later adapted into Turkish by Çuhadaroğlu (1986). The RSS, originally a 63-item scale, consists of 12 multiple-choice subscales, among which the Self-Esteem subscale was used in this study. The Turkish version, referred to as "RÖSÖ", maintains a 10-item, four-point Likert-type structure. The scale's validity coefficient was reported as 0.71, while the test-retest reliability coefficient was 0.75, confirming its reliability and validity for use in Turkish samples.

When scoring the scale, the answers to each question that contribute to the total score are indicated with an "*" sign on the scale. The scoring process involves evaluating specific groups of questions together. The first, second and third questions are assessed as a group, and if at least two of these three questions receive a score, one point is assigned. Similarly, the fourth and fifth questions are evaluated together, and selecting a scoring option for either question results in earning one point. The ninth and tenth questions follow the same scoring method as the fourth and fifth questions. In contrast, the sixth, seventh and eighth questions are each scored individually, with each contributing one point independently. Once all responses are scored, the total score ranges from zero to six. Individuals who score between zero and one are classified as having high self-esteem, while those scoring between two and four are considered to have a moderate level of self-esteem. A score between five and six indicates low self-esteem.

2.4.2 Exercise addiction scale

The Exercise Addiction Scale is a psychometric instrument designed to assess addiction levels in individuals' exercise behaviors. The validity and reliability of the scale were established by Tekkurşun and Türkeli in 2019 [29]. It consists of 17 items, categorized into three sub-dimensions: "Excessive Focus and Emotional Change", "Postponement of Individual-Social Needs and Conflict" and "Tolerance Development and Passion". Each item is rated on a five-point Likert scale, ranging from "1 = Strongly Disagree", "2 = Partially Disagree", "3 = Moderately Agree", "4 = Agree" and "5 = Strongly Agree". The internal consistency of the scale was found to be 0.88 in its original validation study, while the Cronbach's alpha reliability coefficient in the present study was 0.87, indicating high reliability. The total exercise addiction score is calculated by summing the responses across all items. The scores range from 1 to 85 and are classified into five categories: normal group (1–17 points), low-risk group (18–34 points), risk group (35–51 points), dependent group (52–69 points) and highly dependent group (70–85 points).

2.5 Data collection methods

All participants voluntarily took part in the study and provided written informed consent before participation. Data were collected through online surveys, which were distributed via survey links to ensure accessibility and anonymity. The participants completed the surveys anonymously in their own work environment, and the estimated time required to answer all questions in the survey was approximately 15 to 20 minutes. Self-esteem was assessed using a validated scale with well-established psychometric properties, while exercise addiction was evaluated using a standard measure designed to assess participants' exercise habits and the psychological dependency associated with these activities.

2.6 Statistical analysis

Data analysis was conducted using SPSS 27.0 (IBM Co., Ltd., Armonk, NY, USA). Descriptive statistics were used to examine the distribution patterns and central tendencies of self-esteem and exercise addiction measurements. The normality of the data was assessed by calculating skewness and kurtosis values (Table 1), which is supported by existing literature. In a previous study, George and Mallery [30] suggested that skewness and kurtosis values between −2 and +2 indicate a normal distribution. Since the values obtained in this study were within this range, the data were considered to be normally distributed. To analyze differences between groups, independent samples *t*-tests were applied for comparisons between paired groups, while one-way ANOVA was used to compare more than two groups based on demographic variables. When ANOVA results indicated significant differences, *post-hoc* Bonferroni tests were performed to determine which groups differed significantly. Correlation analyses were

T A B L E 1. Self-esteem and exercise addiction levels of male athletes.

Variables	Min	Max	Mean	Standard Deviation	Skewness	Kurtosis
Self-Esteem	1.90	4.00	3.38	0.44	−0.442	0.264
Exercise Addiction	17.00	85.00	53.53	10.56	−0.042	0.021

Min: Minimum; Max: Maximum.

conducted to further examine the relationship between self-esteem and exercise addiction, allowing for an evaluation of both the direction and strength of the linear associations between these variables.

3. Results

The self-esteem and exercise addiction levels of the 301 participants are presented in Table 1. Their self-esteem scores were found to range from 1.90 to 4.00, with a mean score of 3.38 and a standard deviation of 0.44. Based on the classification system of this scale, since the mean score was between 2 and 4, the participants' self-esteem was evaluated as moderate (Çuhadaroğlu, 1986). Their exercise addiction scores ranged from 17.00 to 85.00, with a mean score of 53.53 and a standard deviation of 10.56, and according to the scoring criteria of the Exercise Addiction Scale, individuals scoring between 52 and 69 are classified as belonging to the "Addicted Group" (Tekkurşun & Türkeli, 2019). Given that the participants' mean score fell within this range, the results indicate that, on average, they demonstrated characteristics of exercise addiction.

Table 2 presents a comparison of self-esteem and exercise addiction levels across different age groups. The mean self-esteem score for participants in the 20–24 age group was 3.04 (SD = 0.59), while the 25–29 age group had a mean score of 3.28 (SD = 0.43). The mean scores for the 30–34, 35–39 and 40 or over age groups were 3.41 (SD = 0.40), 3.42 (SD = 0.41) and 3.50 (SD = 0.41), respectively. The ANOVA results revealed statistically significant differences in self-esteem scores among the age groups ($F = 5.536, p < 0.001$). *Post-hoc* analyses indicated that participants in the 20–24 age group had significantly lower self-esteem scores compared to those in the 30–34, 35–39 and 40 or over age groups. Additionally, the 40 or over age group had significantly higher self-esteem scores than the 25–29 age group. In contrast, no significant differences were observed in exercise addiction scores across age groups ($F = 1.823, p = 0.124$), with mean scores ranging between 51.88 and 55.37. These findings suggest that while self-esteem levels varied significantly across different age groups, exercise addiction levels remained relatively stable, indicating that age had a notable effect on self-esteem but did not influence exercise addiction.

Table 3 compares the levels of self-esteem and exercise addiction levels between married (n = 123) and single (n = 178) participants. The mean self-esteem score for married individuals was 3.40 (SD = 0.44), while the mean score for single individuals was 3.32 (SD = 0.45). The independent samples *t*-test showed that this difference was not statistically significant ($t = 1.456, p = 0.146$), indicating that marital status had no significant effect on self-esteem. Regarding exercise

addiction, married participants had a mean score of 52.53 (SD = 10.62), whereas single participants had a mean score of 54.22 (SD = 10.49). The difference between these groups was also not statistically significant ($t = −1.368, p = 0.173$), suggesting that marital status did not influence exercise addiction levels.

Table 4 presents a comparison of self-esteem and exercise addiction levels among participants with different educational backgrounds, including high school, associate degree, bachelor's degree and postgraduate education. The mean self-esteem scores were 3.26 (SD = 0.52) for high school graduates, 3.27 (SD = 0.45) for associate degree holders, 3.35 (SD = 0.44) for bachelor's degree holders, and 3.44 (SD = 0.38) for postgraduate participants. The results of the ANOVA test showed no statistically significant differences in self-esteem scores across educational levels ($F = 1.714, p = 0.164$), indicating that education level did not have a significant effect on self-esteem. Regarding exercise addiction, the mean score for high school graduates was 52.41 (SD = 14.43), while associate degree holders had a mean score of 54.61 (SD = 8.07). Participants with a bachelor's degree had a mean score of 53.50 (SD = 10.11), and those with postgraduate education had a mean score of 53.59 (SD = 10.91). The ANOVA test results indicated no significant differences in exercise addiction scores across educational levels ($F = 0.231, p = 0.875$). These findings suggest that education level does not have a meaningful impact on either self-esteem or exercise addiction among the participants.

Table 5 examines the self-esteem and exercise addiction levels of participants according to different income groups. The mean self-esteem score for participants earning 11,000–20,000 ₺ (n = 75) was 3.22 (SD = 0.45), while those earning 21,000–30,000 ₺ (n = 65) had a mean score of 3.29 (SD = 0.42). Participants with an income of 31,000 ₺ and above (n = 161) had a mean self-esteem score of 3.44 (SD = 0.45). The ANOVA test results revealed a statistically significant difference in self-esteem between the 11,000–20,000 ₺ group and the 31,000 ₺ and above group ($F = 7.119, p < 0.001$), indicating that individuals in the higher income group exhibited significantly higher self-esteem than those in the lowest income category. In terms of exercise addiction, the 11,000–20,000 ₺ income group had a mean score of 55.20 (SD = 10.40), while the 21,000–30,000 ₺ income group had a mean score of 50.96 (SD = 11.53). The ANOVA results showed a statistically significant difference between these two income groups ($F = 3.019, p = 0.005$), suggesting that exercise addiction levels were higher in the lowest income group compared to the middle-income group. These findings indicate that income level has a significant effect on both self-esteem and exercise addiction, with higher income associated with increased self-esteem, while individuals in the lowest income group exhibited higher levels of exercise addiction compared to those in the

TABLE 2. Comparison of self-esteem and exercise addiction levels according to age groups.

Scales	Group	n	Mean	Standard Deviation	F	p	Bonferroni
Self-Esteem							
	20–24 age (1)	16	3.04	0.59			
	25–29 age (2)	132	3.28	0.43			
	30–34 age (3)	49	3.41	0.40	5.536	<0.001	3, 4, 5 > 1; 5 > 2
	35–39 age (4)	36	3.42	0.41			
	40 or over (5)	68	3.50	0.41			
Exercise Addiction							
	20–24 age (1)	16	52.50	14.39			
	25–29 age (2)	132	55.37	10.23			
	30–34 age (3)	49	51.95	11.24	1.823	0.124	
	35–39 age (4)	36	51.88	9.38			
	40 or over (5)	68	52.20	10.00			

TABLE 3. Comparison of self-esteem and exercise addiction levels according to marital status.

Scales	n	Mean	Standard Deviation	t	p
Self-Esteem					
Married	123	3.40	0.44	1.456	0.146
Single	178	3.32	0.45		
Exercise Addiction					
Married	123	52.53	10.62	−1.368	0.173
Single	178	54.22	10.49		

TABLE 4. Comparison of self-esteem and exercise addiction levels according to education level.

Scales	Group	n	Mean	Standard Deviation	F	p
Self-Esteem						
	High School	31	3.26	0.52		
	Associate Degree	34	3.27	0.45	1.714	0.164
	Bachelor's degree	178	3.35	0.44		
	Postgraduate	64	3.44	0.38		
Exercise Addiction						
	High School	31	52.41	14.43		
	Associate Degree	34	54.61	9.07	0.231	0.875
	Bachelor's degree	178	53.50	10.11		
	Postgraduate	64	53.59	10.91		

middle-income group.

Table 6 presents a comparison of self-esteem and exercise addiction levels based on the participants' duration of sports participation. In terms of self-esteem, the mean score for individuals who had engaged in sports for 1–2 years was 3.09 (SD = 0.47), while those with 3–5 years of experience had a mean score of 3.30 (SD = 0.48). Participants who had been involved in sports for 6 years or more had the highest mean self-esteem score of 3.42 (SD = 0.40). The ANOVA test results indicated that self-esteem increased significantly with longer sports participation ($F = 11.049$, $p < 0.001$), with significant differences observed particularly between the 1–2 year group and the other two groups, suggesting that prolonged sports engagement was associated with higher self-esteem. Regarding exercise addiction, the mean score for participants with 1–2 years of sports experience was 49.50 (SD = 11.07), while those in the 3–5 year group had a mean score of 47.62 (SD = 10.44). Participants who had engaged in sports for 6

TABLE 5. Comparison of self-esteem and exercise addiction levels according to income level.

Scales	Group	n	Mean	Standard Deviation	F	p	Bonferroni
Self-Esteem							
	11,000–20,000 ₺ (1)	75	3.22	0.45			
	21,000–30,000 ₺ (2)	65	3.29	0.42	7.119	<0.001	3 > 1
	31,000 ₺ and above (3)	161	3.44	0.45			
Exercise Addiction							
	11,000–20,000 ₺ (1)	75	55.20	10.40			
	21,000–30,000 ₺ (2)	65	50.96	11.53	3.019	0.005	1 > 2
	31,000 ₺ and above (3)	161	53.79	10.09			

TABLE 6. Comparison of self-esteem and exercise addiction levels according to sport duration.

Scales	Group	n	Mean	Standard Deviation	F	p	Boferroni
Self-Esteem							
	1–2 years (1)	42	3.09	0.47			
	3–5 years (2)	51	3.30	0.48	11.049	<0.001	2–3 > 1
	6 years and above (3)	208	3.42	0.40			
Exercise Addiction							
	1–2 years (1)	42	49.50	11.07			
	3–5 years (2)	51	47.62	10.44	17.564	<0.001	3 > 1; 3 > 2
	6 years and above (3)	208	55.79	9.69			

years or more had the highest exercise addiction score, with a mean of 55.79 (SD = 9.69). The ANOVA test results showed a statistically significant difference among the groups ($F = 17.554$, $p < 0.001$), with those participating in sports for 6 years or more exhibiting significantly higher exercise addiction scores than the other two groups. These findings suggest that the duration of sports participation has a significant impact on both self-esteem and exercise addiction, especially those who performed for a long time had higher scores on these two scales.

Table 7 presents the results of the correlation analysis assessing the statistical relationship between self-esteem and exercise addiction in a total of 301 participants. The analysis revealed a statistically significant positive correlation between self-esteem and exercise addiction ($r = 0.167$, $p = 0.004$), indicating that as self-esteem increases, exercise addiction levels also show a slight increase. While this finding confirms a significant relationship between the two variables, the low correlation coefficient suggests that the strength of this association is limited.

4. Discussion

This study examines the relationship between self-esteem and exercise addiction among former male athletes working in

TABLE 7. Correlation results between self-esteem and exercise addiction.

Variables	Exercise Addiction
Self-Esteem	
r	0.167
p	0.004
n	301

sports organizations and how these relationships vary across different demographic factors and reveals that participants generally exhibit a moderate level of self-esteem, suggesting that they perceive their self-worth as neither excessively high nor particularly low. Additionally, most participants were classified as exercise addicts, implying that former male athletes in sports organizations tend to engage in excessive exercise, possibly due to the nature of their work environment.

The research findings demonstrate that age has a significant effect on self-esteem. Specifically, the self-esteem levels of participants in the 20–24 age group were significantly lower than those in the 30–34 and 35–39 age groups. Based on these findings, it can be inferred that self-esteem increases with

age, potentially due to accumulated life experiences, aligning with previous research, which has also reported a significant relationship between self-esteem and age [31, 32]. One possible explanation is that as individuals, particularly men, grow older, they gain more life experience, assume greater responsibilities, such as family and career obligations, and become more established in their social roles. Furthermore, during later stages of maturity, internal values and personal achievements may take precedence over external comparisons and anxieties, further contributing to increased self-esteem. Contrary to expectations and previous literature [13–26], this study did not find a significant association between exercise addiction and age. Several factors may explain this discrepancy. For instance, differences in sample composition, such as variations in the size or demographic characteristics of age groups, may influence the results [33]. Additionally, methodological differences in the measurement of exercise addiction, including variations in the scales used across studies, could affect how addiction is perceived and assessed. Cultural and geographical factors should also be considered, as societal norms and lifestyle differences may contribute to variations in exercise addiction. Moreover, environmental influences at the time of data collection, such as shifts in exercise habits following the COVID-19 pandemic, may have impacted exercise behaviors, further contributing to the observed findings.

Marital status was not found to have a significant effect on self-esteem or exercise addiction, as there were no statistically significant differences in self-esteem and exercise addiction scores between married and single individuals, suggesting that marital status does not play a determining role in psychological and physical health behaviors, similar to the findings of Astuti *et al.* [34], who reported no significant difference between marital status and exercise addiction. However, in contrast, a study by Wang *et al.* [35] reported a significant association between marital status and self-esteem levels. These discrepancies may be attributed to differences in sample composition, variations in the socio-demographic and socio-economic characteristics of the participants, or the fact that the present study exclusively included male participants.

Similarly, no significant differences were observed between education levels in terms of self-esteem and exercise addiction. Participants with high school, associate's degree, bachelor's degree and postgraduate education had comparable self-esteem and exercise addiction scores, indicating that education level did not have a significant effect on either variable. Consistent with these findings, a study conducted by Mert in 2019 [36] also found no significant relationship between education level and self-esteem. However, conflicting results have been reported in the literature. For instance, a study by Alhumaid and Said [37] identified a significant difference between education level and self-esteem. One possible explanation for these inconsistencies could be that self-esteem is influenced not only by education but also by personal experiences, social environment, internal motivation, and psychological factors. While education enhances intellectual abilities, other aspects of self-esteem, such as personal values, self-confidence and emotional well-being, are shaped by broader individual processes. In contemporary society, higher education is often associated with improvements in psychological well-being, socialization

and stress management [38], yet its impact on self-esteem may vary depending on individual circumstances.

The findings indicate that income level has significant effects on both self-esteem and exercise addiction, particularly when comparing the lowest income group (11,000–20,000 ₺) with the highest income group (31,000 ₺ and above). Higher income may facilitate greater engagement in exercise by providing access to gym memberships, personal trainers, and other resources that support an active and healthy lifestyle. Additionally, an increase in income level can enhance an individual's quality of life and contribute to higher self-esteem, as financial security fosters a sense of personal value and success. These findings are supported by several studies in the literature, which highlight the positive association between income level, self-esteem, and exercise participation [39–41].

The findings indicate that sports duration has significant effects on both self-esteem and exercise addiction, with individuals who have engaged in sports for longer periods achieving higher scores in both dimensions. Prolonged participation in sports can enhance individuals' professional and social success, reinforcing their self-confidence. Additionally, sustained involvement in sports fosters discipline, goal orientation, financial stability and a strong focus on achievement, all of which contribute to increased self-esteem. At the same time, individuals who have maintained regular exercise habits over an extended period may develop higher levels of exercise addiction as they integrate physical activity into their daily routines to maintain work-life balance, which aligns with previous research [42–46].

A positive correlation was found between self-esteem and exercise addiction ($r = 0.167$, $p = 0.004$), indicating that as self-esteem increases, exercise addiction levels also increase slightly. Although this relationship is statistically significant, the low correlation coefficient suggests that the association between these two variables is limited. In other words, while higher self-esteem could be linked to greater exercise addiction, this relationship may not be strong, implying that other factors may also contribute to exercise addiction. Among these factors, demographic characteristics are particularly relevant, but psychological influences should not be overlooked. As social beings, individuals are shaped not only by their external environment but also by their internal psychological state. Factors such as psychological well-being, stress and anxiety management, and social support play a critical role in shaping exercise behaviors. These findings suggest that exercise addiction is influenced not only by self-esteem but also by broader psychological and social conditions. The variations observed in self-esteem and exercise addiction across different demographic characteristics further support this interpretation [20–23, 47, 48].

In summary, this study examined the effects of self-esteem and exercise addiction on psychological health among former male athletes. The findings indicate that as self-esteem increases, exercise addiction also increases, but this relationship remains weak ($r = 0.167$). The observed exercise addiction among former male athletes suggests that their focus on excessive physical activity and the pressure they experience to maintain their physical condition may negatively impact their psychological well-being. High levels of exercise addiction

were found to be associated with psychological stress, anxiety and emotional instability, while low self-esteem was linked to reduced internal satisfaction and emotional well-being. Additionally, demographic factors such as age, income level, and sports duration were found to influence self-esteem and exercise addiction levels, underscoring their role in shaping the psychological health of former male athletes.

5. Conclusions

In this study, we investigated the correlation between exercise addiction and self-esteem and how this relationship varies according to demographic characteristics. To achieve this, a sample group composed of professional male athletes working in sports organizations was selected. The findings suggest that maintaining balanced exercise habits and developing healthy self-esteem may contribute positively to the psychological well-being of former male athletes. In addition, athletes with higher self-esteem appear to prioritize their emotional and psychological well-being beyond their physical achievements. Moreover, regular exercise habits combined with healthy self-esteem may help athletes better manage stress, anxiety and emotional imbalances. Thus, providing social support and psychological guidance programs may further strengthen self-esteem in athletes, which could help them avoid an overemphasis on physical achievements, foster a more balanced self-perception, contribute to enhancing emotional and psychological health, reduce exercise addiction, and improve overall quality of life in former male athletes.

6. Recommendations

The findings of this study suggest several recommendations. The first is the development of balanced exercise habits, as maintaining a structured and regulated exercise routine is essential for the psychological well-being of former male athletes. Since excessive exercise may lead to psychological distress, athletes should be encouraged to adopt training programs that promote both physical and mental health while preventing excessive dependence on exercise.

The second recommendation is the implementation of awareness and education programs. Organizing educational initiatives can help athletes recognize the risks of exercise addiction and understand how to maintain healthy exercise routines. These programs should aim to provide athletes with the necessary knowledge to sustain their physical activity levels without compromising their psychological well-being.

Another important recommendation is the introduction of psychological support and guidance programs. Providing psychological support can help athletes strengthen their self-esteem and prevent them from focusing solely on physical achievements, as well as enhance emotional and psychological resilience.

Establishing a social support network is also crucial. Encouraging athletes to seek support from peers, coaches and teammates can improve emotional balance and contribute to higher self-esteem.

Further research should explore different sports disciplines, as this study was limited to former male athletes in sports organizations. Investigating athletes in larger and more diverse samples from various sports backgrounds can provide a broader perspective on the relationship between exercise addiction and self-esteem.

Lastly, professional psychological counseling services should be made available to athletes. Access to trained mental health professionals can help them manage stress, anxiety and emotional instability associated with excessive exercise.

This study is limited to individuals working in sports organizations with a previous sports background. Future research on exercise addiction and self-esteem should consider different parameters, such as variations across sports branches and demographic factors. Thus, our current results should be interpreted with caution, and further studies with more representative samples that account for demographic diversity, occupational status and family dynamics are necessary to enhance the generalizability of the findings.

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