EXAMINING THE RELATIONSHIP BETWEEN TECHNOLOGICAL SPORTS PRODUCT ADDICTION AND BODY APPRECIATION IN ATHLETES

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Abstract

The aim of this study is to examine the relationship between technological sports product appreciation and body appreciation among athletes. The research was conducted using a descriptive relational survey model. The population consists of athletes, while the sample comprises 245 actively participating athletes selected through a random sampling method. Data were collected using a personal information form, the Technological Sports Product Addiction Scale, and the Body Appreciation Scale. Data analysis was performed using SPSS 26.0. Variables such as gender, artificial intelligence application usage, and type of sport were examined using t-test, ANOVA, Tukey, and Pearson correlation tests. The findings revealed that addiction levels to technological sports products were significantly higher among male athletes and those using AI applications, whereas body appreciation was notably higher among athletes engaged in individual sports. No significant differences were found based on age or income level. The study highlights the impact of technology use on athletes' psychology and body perception and suggests the development of strategies to promote the conscious and balanced use of digital tools in sports.

Keywords: Sports Goods, Addiction, Technology, Body Appreciation.

1. INTRODUCTION

The rapid integration of digital technologies into everyday life has substantially reshaped contemporary sports practices. In particular, the widespread use of wearable technologies and AI-supported sport applications has transformed how athletes monitor their performance and manage their training routines. Devices such as smartwatches, fitness bands, heart-rate monitors, telemetric sensors, and data-driven performance analysis systems enable athletes to receive real-time feedback, track physiological indicators, and observe performance fluctuations in a measurable manner (Kılıç, 2017;

Fang & Chang, 2016). As a result, these tools have begun to influence athletes' daily habits, exercise motivation, and physical activity patterns, creating a new technology-centered training environment.

However, the intensive and uncontrolled use of such devices has been associated with several emerging psychological concerns, including technology-related behavioral dependency, digital monitoring anxiety, body-image pressure, and disruptions in self-evaluation (Griffiths, 1995; Kaewkannate & Kim, 2018; Maksymenko & Murmanova, 2024). The continuous feedback loops provided by wearable technologies may lead individuals to assess their performance primarily through numerical data, which can trigger fluctuations in self-esteem and an excessive preoccupation with appearance (Kryuchkova & Ignatova, 2023). Similarly, body comparisons facilitated by social media and online communities have been shown to increase body dissatisfaction, especially among younger athletes (Castillo, 2013; Perin & Limberger, 2024). Although the literature indicates that technology use can enhance physical activity and support psychological well-being, elevated levels of technological dependence may contribute to body-image problems, exercise addiction, and psychological strain (Zamani Sani et al., 2016; Kettunen & Kari, 2018). A notable gap in the existing literature is the limited number of studies that examine the combined effects of wearable technologies and AI-supported applications on athletes' psychological perceptions, body appreciation, and self-evaluation processes. Many studies focus on either technological dependence or body image in isolation, leaving the interaction between the two largely unexplored.

Given this gap, investigating the relationship between dependence on technological sport products and athletes' body appreciation has become increasingly relevant within the context of digitalized training practices. Since body appreciation is closely linked to athletic performance, psychological well-being, self-efficacy, and motivation, analyzing these two constructs together offers meaningful scholarly value. Accordingly, this study aims to examine the interaction between technology-based sport behaviors and athletes' body perceptions within a comprehensive theoretical framework.

2. METHOD

Research model and sample

In this study, a descriptive survey design was employed, as the primary aim was to identify and characterize the existing situation. Survey designs seek to describe a phenomenon as it currently exists or as it existed in the past, without manipulating or altering any conditions (Karasar, 1999). The population of the research consisted of active athletes, and the sample was composed of 245 individuals selected from this population through a simple random sampling method. Ethical approval for the study was granted by the "Ondokuz Mayıs University Rectorate Social and Human Sciences Ethics Committee" on the 25th of April 2025, under decision number 2025-644.

Data collection tools

As data collection tools, a "personal information form" developed by the researchers, the Technological Sport Products Addiction Scale, and the Body Appreciation Scale were utilized. The personal information form included questions regarding gender, income level, use of artificial intelligence applications, age, and type of sport in which the participants were engaged.

Technological Sporting Goods Addiction Scale

The measurement instrument developed by Çar et al. (2025) was designed to assess individuals' tendencies toward excessive use of and dependence on sports technologies. The scale evaluates how frequently and to what extent athletes use technological sport products — such as smartwatches, mobile fitness applications, and performance-tracking devices — and how this usage affects their daily routines, training habits, and psychological well-being. Based on the concept of technological dependency in the literature, the instrument is administered using a five-point Likert-type format (1 = strongly disagree, 5 = strongly agree). If a Turkish adaptation has been conducted, the scale's validity and reliability have been supported through empirical studies, making it suitable for use with athlete populations. Its subdimensions address themes such as frequency of use, loss of control, and technology-induced stress.

The Body Appreciation Scale

The Body Appreciation Scale is a psychometric instrument developed to assess individuals' positive evaluations and acceptance of their physical appearance. The scale

is based on the body image measurement tools originally created by Avalos et al. (2005) and later adapted into Turkish by Bakalım and Taşdelen-Karçay (2016). It examines how individuals appreciate various aspects of their bodies — such as their abdomen, legs, muscular structure, and overall weight. The instrument employs a five-point Likert-type response format (1 = not appreciative at all, 5 = fully appreciative), and higher scores reflect a stronger sense of body appreciation. This scale is frequently used in research with athlete populations to evaluate positive body perception and attitudes toward one's physical self.

2.1. Data analysis

Table 1. Internal consistency coefficients of participants' responses to scale items

Scale	Internal consistency coefficients	Assessment
Technological Sporting Goods Addiction Scale	0,918	Highly Reliable
Tracking–Promotion	0,872	Highly Reliable
Tolerance	0,908	Highly Reliable
Conflict	0,852	Moderately Reliable
Salience	0,854	Moderately Reliable
Body Appreciation Scale	0,967	Highly Reliable
General Body Appreciation	0,957	Highly Reliable
Body Image Investment	0,886	Moderately Reliable

For the statistical evaluation of the data, the assumption of normality was first examined using the Kolmogorov–Smirnov and Shapiro–Wilk tests ($p > 0.05$). In the study, differences in the total scale scores across gender, the use of artificial intelligence applications, and type of sport were analyzed using the Student's t-test, while differences based on income level were assessed through One-Way Analysis of Variance (ANOVA) followed by Tukey's post-hoc test. The relationships among age, body appreciation scores, and Technological Sporting Goods Addiction Scale scores were determined using the Pearson correlation coefficient. All statistical procedures were carried out using the SPSS 26.0 statistical software package. The findings are presented

as frequency (n, %), mean, and standard deviation values, and statistical significance was set at $p < 0.05$.

3. RESULTS

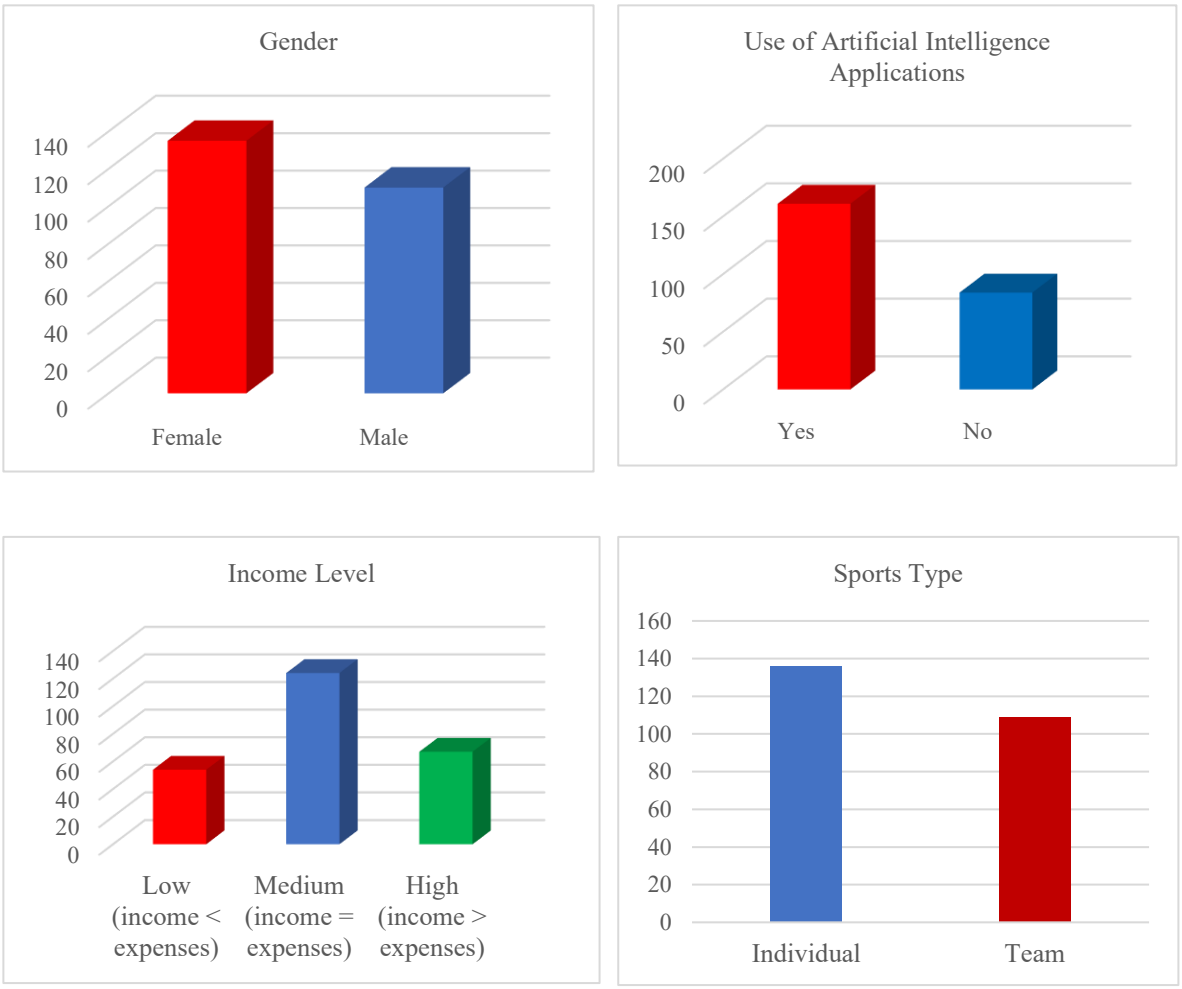

Figure 1. Frequency distributions of demographic characteristics of participants

Of the individuals who voluntarily participated in the study, 55.1% were female, 65.7% used artificial intelligence applications, 50.6% declared their income level as medium, and 55.5% were individual athletes (Figure 1).

Table 2. Technological sports product addiction and body appreciation level by gender

Scales and Subdimensions	Gender	n	Mean	SD	p
Technological SportingGoods Addiction Scale	Female	135	50,33	11,77	0,065
	Male	110	53,08	11,29	

Tracking–Promotion	Female	135	12,58	2,94	0,050
	Male	110	13,31	2,85	
Tolerance	Female	135	12,56	2,95	0,196
	Male	110	13,05	2,93	
Conflict	Female	135	12,62	2,98	0,051
	Male	110	13,36	2,90	
Salience	Female	135	12,58	3,07	0,040
	Male	110	13,36	2,82	
Body Appreciation Scale	Female	135	30,79	5,21	0,820
	Male	110	30,94	5,10	
General Body Appreciation	Female	135	23,99	4,09	0,822
	Male	110	24,11	3,95	
Body Image Investment	Female	135	6,79	1,22	0,825
	Male	110	6,83	1,22	

No statistically significant differences were found between genders in terms of the total score of the Technological Sports Products Addiction Scale (p=0.065), tolerance (p=0.196), and conflict (p=0.051) sub-dimensions. Statistically significant differences were found between genders in terms of the follow-up-promotion (p=0.050) and salience (p=0.040) sub-dimensions. Men had higher mean scores than women (Table 2). No significant differences were found between genders in the total score of the Body Appreciation Scale (p=0.820), general body appreciation (p=0.822), and body image investment (p=0.825) sub-dimensions.

Table 3. Level of addiction to technological sports products and body appreciation according to the use of artificial intelligence applications

Scales and Subdimensions	**Use of artificial intelligence applications**	**n**	**Mean**	**SD**	**p**
Technological Sporting Goods Addiction Scale	Yes	161	55,49	10,13	<0,001
	No	84	44,05	10,55	
Tracking–Promotion	Yes	161	13,86	2,55	<0,001
	No	84	11,07	2,70	
Tolerance	Yes	161	13,78	2,55	<0,001
	No	84	10,86	2,70	
Conflict	Yes	161	13,89	2,66	<0,001
	No	84	11,15	2,70	
Salience	Yes	161	13,96	2,58	<0,001
	No	84	10,96	2,70	

Body Appreciation Scale	Yes	161	30,49	5,08	0,128
	No	84	31,55	5,25	
General Body Appreciation	Yes	161	23,74	3,95	0,099
	No	84	24,63	4,12	
Body Image Investment	Yes	161	6,75	1,23	0,315
	No	84	6,92	1,19	

Statistically significant differences were found in the total score of the technological sports products addiction scale ($p<0.001$) and the sub-dimensions of follow-up-promotion ($p<0.001$), tolerance ($p<0.001$), conflict ($p<0.001$) and salience ($p<0.001$) according to the use of artificial intelligence applications. The scores of those who used artificial intelligence applications were higher than those who did not. No significant differences were found in the total score of the body appreciation scale ($p=0.128$), general body Appreciation ($p=0.099$) and body image investment ($p=0.315$) sub-dimensions according to the use of artificial intelligence applications (Table 3).

Table 4. Technological sports product addiction and body appreciation level by income level

Scales and Subdimensions	**Income Level**	**n**	**Mean**	**SD**	**p**
Technological Sporting Goods Addiction Scale	Low (income < expenses)	54	52,87	10,84	0,084
	Medium (income = expenses)	124	52,44	11,42	
	High (income > expenses)	67	48,90	12,29	
Tracking–Promotion	Low (income < expenses)	54	13,11	2,76	0,088
	Medium (income = expenses)	124	13,18	2,84	
	High (income > expenses)	67	12,24	3,11	
Tolerance	Low (income < expenses)	54	13,19	2,69	0,129
	Medium (income = expenses)	124	12,92	2,96	
	High (income > expenses)	67	12,18	3,06	
Conflict	Low (income < expenses)	54	13,35	2,69	0,056
	Medium (income = expenses)	124	13,18	2,94	
	High (income > expenses)	67	12,22	3,14	
Salience	Low (income < expenses)	54	13,22	2,89	0,092
	Medium (income = expenses)	124	13,17	2,90	
	High (income > expenses)	67	12,25	3,13	
Body Appreciation Scale	Low (income < expenses)	54	32,00	5,14	0,144
	Medium (income = expenses)	124	30,35	4,85	
	High (income > expenses)	67	30,87	5,60	
	Low (income < expenses)	54	24,98	4,10	0,136

General Body Appreciation	Medium (income = expenses)	124	23,68	3,81	
	High (income > expenses)	67	23,97	4,27	
Body Image Investment	Low (income < expenses)	54	7,02	1,12	
	Medium (income = expenses)	124	6,67	1,12	0,168
	High (income > expenses)	67	6,90	1,43	

No statistically significant differences were found in the total score of the technological sports products addiction scale (p=0.084), follow-up-promotion (p=0.088), tolerance (p=0.129), conflict (p=0.056), and salience (p=0.092) sub-dimensions according to income level. No significant differences were found in the total score of the body scale (p=0.144), general body appreciation (p=0.136), and body image investment (p=0.168) sub-dimensions according to income level (Table 4).

Table 5. Dependence on technological sports products and body appreciation levels by type of sport

Scales and Subdimensions	Sports Type	n	Mean	SD	p
Technological Sporting Goods Addiction Scale	Individual	136	51,28	11,81	0,666
	Team	109	51,93	11,41	
Tracking–Promotion	Individual	136	12,82	2,94	0,591
	Team	109	13,02	2,90	
Tolerance	Individual	136	12,73	2,98	0,778
	Team	109	12,83	2,92	
Conflict	Individual	136	12,90	3,01	0,776
	Team	109	13,02	2,92	
Salience	Individual	136	12,83	3,07	0,559
	Team	109	13,06	2,87	
Body Appreciation Scale	Individual	136	32,81	4,90	<0,001
	Team	109	28,41	4,37	
General Body Appreciation	Individual	136	25,57	3,77	<0,001
	Team	109	22,14	3,49	
Body Image Investment	Individual	136	7,24	1,22	<0,001
	Team	109	6,28	0,98	

No statistically significant differences were found in the total score of the Technological Sporting Goods Addiction Scale (p = 0.666) or in its subdimensions — tracking–promotion (p = 0.591), tolerance (p = 0.778), conflict (p = 0.776), and salience (p = 0.559) — across different types of sports. In contrast, significant differences were observed in the Body Appreciation Scale total score (p < 0.001), the General Body

Appreciation subdimension ($p < 0.001$), and the Body Image Investment subdimension ($p < 0.001$) according to sport type (Table 5). Athletes engaged in individual sports scored higher on these measures compared with those participating in team sports.

Table 6. Correlation table of the relationship between participants' ages and their addiction to technological sports products and body appreciation levels

		Age	Technological Sporting Goods Addiction Scale	*Tracking–Promotion*	*Tolerance*	*Conflict*	*Salience*
Age	r		-0,022	-0,032	-0,038	0,009	-0,026
	p		0,733	0,620	0,558	0,889	0,689
Body Appreciation Scale	r	0,013	-0,039	-0,030	-0,064	-0,009	-0,051
	p	0,845	0,542	0,642	0,316	0,885	0,430
General Body Appreciation	r	0,026	-0,044	-0,034	-0,072	-0,012	-0,055
	p	0,683	0,495	0,597	0,263	0,858	0,390
Body Image Investment	r	-0,033	-0,021	-0,014	-0,035	-0,001	-0,032
	p	0,605	0,744	0,824	0,587	0,984	0,619

No statistically significant relationship was found between age, body appreciation and technological sports product addiction and its sub-dimensions ($p>0.05$).

4. DISCUSSION AND CONCLUSION

This study was conducted to examine the relationship between dependence on technological sporting goods and body appreciation among athletes. The findings revealed several statistically significant differences based on gender, the use of artificial intelligence (AI) applications, and type of sport.

With respect to gender, no significant differences were observed in the total score of the Technological Sporting Goods Addiction Scale or in the Tolerance and Conflict subdimensions. This suggests that male and female athletes exhibit similar overall levels of technological dependence. However, significant differences emerged in the Tracking–Promotion ($p = 0.050$) and Salience ($p = 0.040$) subdimensions, with male athletes scoring higher than females. These findings indicate that men tend to monitor technological sport products more frequently, engage more actively in promotional or follow-up behaviors, and perceive these devices as more central in their daily routines. Existing literature supports this tendency, as men often display higher

risks in digital dependency behaviors, particularly in domains involving performance tracking, gaming, and online engagement (Dumitru et al., 2018). Similarly, Burén and colleagues (2021) reported that men commonly use digital tools in a more instrumental and performance-oriented way, which may reinforce dependency-like behaviors.

Regarding body appreciation, no significant gender-based differences were found in total scores or in the General Body Appreciation and Body Image Investment subdimensions. This indicates that male and female athletes in the sample hold comparable perceptions of and attitudes toward their bodies. This result may reflect the functional and performance-driven mindset that is common among athletes, who often develop more regulated and task-oriented body perceptions. Nevertheless, earlier studies have shown that women may be more vulnerable to appearance-based comparison and digital body-image pressures (Burén et al., 2021), suggesting that contextual factors such as sport environment and training culture play a moderating role.

A prominent finding of the study relates to the use of AI applications. Athletes who used AI-supported tools scored significantly higher on both the total scale and all subdimensions — tracking,promotion, tolerance, conflict, and salience ($p < 0.001$). This indicates that AI users demonstrate stronger engagement with technological devices and exhibit more intense digital interaction patterns. Existing research aligns with these findings: Dimitrov and Sadykova (2024) and Pardeshi (2024) emphasize that AI-enhanced sport technologies deepen user involvement, while Wei et al. (2021) highlight the high engagement and dependency potential of AI-based sport solutions. However, no significant differences emerged in body appreciation scores according to AI usage. Studies by Ding (2019) and Nadikattu (2020) similarly report that AI applications do not directly modify individuals' body-related self-perceptions, suggesting that AI primarily influences performance monitoring and engagement behaviors rather than physical self-evaluation.

Income level did not produce significant differences in either technological dependency or body appreciation. Neither the total scores nor the subdimensions showed meaningful variation across income groups. This suggests that income is not a decisive predictor of technological dependence or body appreciation among athletes.

Prior research offers similar interpretations: Povey et al. (2016) reported that while income may correlate with certain social outcomes, its influence is often weaker than that of other demographic or psychosocial variables. As digital technologies have become more accessible across economic groups, income-related disparities in technology use may have diminished.

Sport type also yielded an important pattern. No significant differences were observed in technological dependency across individual versus team sports. However, significant differences were found in body appreciation, with athletes involved in individual sports scoring higher in total body appreciation, general body appreciation, and body-image investment ($p < 0.001$). This pattern may stem from the greater emphasis on bodily awareness, personal responsibility, and self-regulation inherent in individual sports (Subijana et al., 2020). Conversely, research suggests that team sports may introduce additional body-related pressures due to social comparison, positional expectations, and frequent performance evaluation by peers and coaches (Dachen, 2012).

Finally, no significant correlations were identified between age and either technological dependence or body appreciation ($p > 0.05$). Likewise, no relationship was found between technological dependency and body appreciation. This indicates that these two constructs operate independently in athlete populations. The literature supports this conclusion: Guaraldi et al. (1995) noted that body perception does not systematically vary with age, while Tornero-Quiñones et al. (2019) observed that technology-related dependency is shaped more by psychological and social factors than by demographic variables. Condello et al. (2016) also emphasized that body image concerns and technological motivations arise primarily from psychosocial contexts rather than age.

In summary, this study demonstrates that dependence on technological sporting goods is influenced by certain demographic variables — such as gender and AI use — but not by age, income level, or type of sport. Meanwhile, body appreciation appears higher among athletes participating in individual sports, yet it shows no relationship with technological dependency. Taken together, these findings suggest that while demographic factors shape technology-related behaviors to some extent, technological

dependence and body appreciation do not exhibit a direct or causal association in athletic populations.

5. RECOMMENDATIONS

In light of the findings, it is recommended that interventions aimed at reducing the risk of dependence on technological sporting goods and supporting body appreciation among athletes should focus less on fixed demographic characteristics such as age and income, and more on individual awareness, digital literacy, and psychological resilience. The higher levels of body appreciation observed among athletes engaged in individual sports highlight the importance of promoting sport practices that are based on personal goals and self-directed performance.

Future research could examine the mediating roles of variables such as media use, social comparison tendencies, and self-esteem in order to provide a more in-depth understanding of the relationship between technological dependence and body image.

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