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Abstract

This study aimed to investigate the relationships among attitude towards sport, sport participation motivation, and digital game addiction in adolescents. Accordingly, a relational survey model was employed, and 324 adolescents aged 14–18 were selected using a cluster sampling method. The data collection instruments included the Motivation for Sport Participation Scale, the Attitude Towards Sport Scale, and the Digital Game Addiction Scale. Analyses were conducted using IBM SPSS 27, applying descriptive statistics, independent samples t-tests, and multiple regression analysis. The findings revealed that adolescents' attitudes towards sport and participation motivation differed significantly by gender, with males scoring higher on both sport participation and digital game addiction levels. Regression analyses indicated that positive attitudes toward sport and high motivation levels significantly predicted tendencies toward digital game addiction. The results underscore the importance of school-based programs designed to encourage sport participation and mitigate digital game addiction. Furthermore, the findings suggest that strategies developed with an awareness of gender-based differences can contribute to guiding adolescents toward a more balanced and healthy utilization of their free time.

Introduction

Regular participation in sport during adolescence is considered crucial for establishing physical fitness, body composition, and healthy lifestyle habits (Wilson et al., 2022). Sport contributes to adolescents' psychosocial adjustment by supporting psychological well-being, self-esteem, and peer relationships (Oberle et al., 2019). While sport experiences acquired in childhood determine participation profiles during adolescence, international data indicate that physical activity levels among adolescents have been consistently low (Guthold et al., 2020). Pandemic conditions exacerbated this trend, raising risks for both physical and mental health due to increased screen time and sedentary behaviors (Abid et al., 2021; Musa et al., 2022). Although organized participation, such as sport club membership, offers positive effects, declines and dropout tendencies are observed among adolescents, necessitating consideration of motivational processes alongside factors like gender and socioeconomic conditions (Back et al., 2022; Cavallin et al., 2019). Specifically, cultural norms, safety concerns, and privacy barriers remain pertinent obstacles for female adolescents (Ljungmann et al., 2024).

Digital games constitute a powerful area of attraction during adolescents' free time. Gaming motivations, such as entertainment, competition, social acceptance, and identity expression, share common themes with the rewards and team affiliation found in sport (Rosendo-Rios et al., 2022). Game type, duration, and context influence the relationship with physical fitness, while parental monitoring can mediate the direction of digital behaviors (Dong et al., 2025; Hao & Cui, 2025). The post-pandemic surge in digital activity has reshaped young people's sport and gaming preferences (Teare & Taks, 2021). The correlation between sport participation and subjective well-being, academic adjustment, and psychosocial outcomes makes the quality of time spent in digital spaces a significant concern (Blain et al., 2025). Self-Determination Theory and Achievement Goal Theory emphasize that autonomy, competence, and relatedness are decisive in sustaining motivation in both sport and gaming contexts (Calvo et al., 2010; Wang, 2017).

This research offers a framework aimed at clarifying the intersection points between sport participation motivation, sport-related attitudes, and digital gaming behaviors in adolescents. The rationale is grounded in the need to address collectively the documented declines in activity levels, the increase in screen-based practices, and the fragility of participation persistence observed in the literature (Guthold et al., 2020; Back et al., 2022; Musa et al., 2022). Theoretically, Self-Determination and Achievement Goal approaches are assumed to be guiding frameworks, while practically, school and club programs, family dynamics, and digital environments should be considered together (Calvo et al., 2010; Wang, 2017; Chen et al., 2025). The study's context acknowledges the diversity of barriers and facilitators observed across different socio-demographic groups (Pandya, 2021; Ljungmann et al., 2024). Furthermore, distinguishing the varying effects based on game type and duration is considered a critical factor in interpreting the findings (Dong et al., 2025). This rationale aims to systematically model the free-time ecology of youth by integrating fragmented approaches in the existing literature (Rosendo-Rios et al., 2022; Wilson et al., 2022). Such a framework allows both protective and risk-enhancing factors to be visible within the same analysis (Oberle et al., 2019; Santos et al., 2023). This approach anticipates that the study will build a concrete bridge to the literature and generate applicable inferences.

While a rich literature exists on sport motivation, sport attitudes, and digital gaming behaviors, studies that holistically integrate these three domains within the same model are notably limited (Calvo et al., 2010; Rosendo-Rios et al., 2022; Yamaner & Sarikan, 2022). Existing research largely remains at the level of single or bivariate relationships, insufficiently covering multivariate interactions and mediating/moderating processes (Emm-Collison et al., 2024; Hu et al., 2025). Moreover, conditional effects such as game types, social context, parental monitoring, and gender differences are often neglected; similarly, the concurrent use of self-report and objective sensor data in measurement methods is rare (Júdice et al., 2021; Klages et al., 2015). This situation restricts the comparability of findings and obscures discussions of directionality and causality (Telama & Yang, 2000; Basterfield et al., 2015).

The scientific significance of this study stems from its potential to synthesize fragmented evidence by integrating sport motivation, sport-related attitudes, and digital gaming behaviors in adolescents within the framework of Self-Determination and Achievement Goal Theories (Calvo et al., 2010; Wang, 2017; Emm-Collison et al., 2024). Such an integrated approach can offer concrete insights into which dimensions interventions should focus on to

narrow the intention-behavior gap (Prins et al., 2010; Cardon & Salmon, 2020). The findings will contribute to the balanced design of enjoyment, mastery, and relatedness in school-based programs (Visek et al., 2015; Tennfjord et al., 2023), the creation of safe and accessible sport environments for female adolescents (Dennaoui et al., 2024; Hopkins et al., 2022), and a more realistic consideration of the interaction between e-sports and physical sport (Razum & Huić, 2024). The practical importance of the research lies in providing applicable intervention points for school, family, and community stakeholders. The findings are capable of informing policy and practice development across a broad range of areas, from enhancing health communication strategies (Chen et al., 2025) and designing local solutions for access to sport facilities (Klaasen et al., 2024; Pandya, 2021) to adopting evaluation approaches that combine sensor data with self-reports (Júdice et al., 2021; Klages et al., 2015).

Theoretical Framework

Sport Motivation, Sport Participation, and Digital Gaming

Sport participation motivation is defined as the sum of intrinsic and extrinsic factors that orient individuals toward physical activities and determine the continuity of this participation (Ryan & Deci, 2000). Intrinsic motivation involves acting for pleasure, learning, and personal growth, while extrinsic motivation refers to participation driven by external factors such as rewards, recognition, or social pressure. Self-Determination Theory (SDT) provides a robust framework that centers on the satisfaction of the needs for autonomy, competence, and relatedness to support intrinsic motivation and identified regulation. When these needs are met, participation persistence is facilitated, and the risk of dropout decreases (Calvo et al., 2010; Wang, 2017; Emm-Collison et al., 2024; Sünbül et al., 2003).

Research suggests that objective indicators align with subjective profiles, and that support for autonomy and competence experiences can play an equalizing role, particularly in disadvantaged groups (Raedeke & Hayes, 2024). Early childhood play and free practice experiences are emphasized as laying the groundwork for autonomous motivational profiles in adolescence, with self-efficacy and competence feedback facilitating the internalization of regulations (Prokhorenko et al., 2025; Ramires et al., 2023). In this context, SDT offers a practical basis for explaining how verbal feedback from teachers, coaches, and peers transforms motivational regulation, while Achievement Goal Theory (AGT) demonstrates that task/mastery and ego/performance orientations are decisive in the adolescent sport experience (Cervelló et al., 2007; Koç & Şimşir Gökalp, 2023). Therefore, an integrated reading of SDT and AGT reveals that sustainable motivation in adolescent sport is possible through the synergy of autonomous regulation and a mastery climate (Calvo et al., 2010; Emm-Collison et al., 2024).

Attitudes, a combination of cognitive, affective, and behavioral tendencies, are considered a fundamental psychosocial construct that guides adolescents' sport choices (Vierling et al., 2007; Yurt, 2022). Adolescents' attitudes toward sport, exercise, and physical activity play a critical role in predicting their future behavior, with physical education and organized sport experiences often carrying over into young adulthood activity patterns (Graham et al., 2011; Kjønniksen et al., 2009). Attitude measurements, due to their multi-dimensional structure, can be reliably administered in schools, and culturally sensitive measures enhance the effectiveness of

interventions (Savcı Bakan & Aslan, 2025). Social norms, peer and family approval, gender and age differences, and socioeconomic conditions all influence the direction of the attitude and its conversion into behavior (Alley & Hicks, 2005; Sobkin et al., 2006; Kroshus et al., 2021; Ljungmann et al., 2024).

A positive attitude is explanatory not only at the intention level but also in the continuity of behavior; it becomes more persistent when supported by meaningful, autonomy-supportive, and enjoyable experiences (Vierling et al., 2007; Araújo & Dosil, 2015). Short-term programs, summer camps, or school sport policies can provide temporary increases in attitude and behavior, illuminating long-term strategies (Agans et al., 2022; Song et al., 2024). Self-determined regulations, task/mastery-oriented climates, and social approval strengthen attitude stability, thereby narrowing the intention-behavior gap and contributing to the sustainability of the behavior (Vierling et al., 2007; Wang, 2017). Therefore, interventions and program designs should be built upon multi-component strategies that simultaneously activate the cognitive, affective, and behavioral aspects of attitude to enhance effectiveness in terms of attitude stabilization and behavioral sustainability (Graham et al., 2011; Ramires et al., 2023).

Digital games play a central role in organizing adolescents' free time, explained by multiple motivations such as entertainment, social connection, mastery, and competition (Ukusoy, 2025; Wang et al., 2021). The literature emphasizes that screen time is not a sole indicator, and that game type, platform, and context differentiate the effects (Bektas et al., 2015; Priftis & Panagiotakos, 2023). Although problematic gaming behaviors are associated with sleep, mental health, and physical symptoms, this is not generalizable to all players; sociodemographic and individual characteristics shape this relationship (Irmak & Erdoğan, 2019). Clinical and cognitive-neuropsychiatric approaches explain addiction risks and excessive usage mechanisms, indicating that family and environmental supports play a critical role in interventions (Cheng, 2012; Květon & Jelínek, 2018; Werneck et al., 2018).

Digital games can contribute to young people's learning, collaboration, and problem-solving skills; action-based games, specifically, offer an avenue for physical activity (Zhong et al., 2022; Biddiss & Irwin, 2010). E-sport participation and spectating behaviors are linked to motivation and relatedness processes within the SDT framework and can be supported by intentions for physical activity (Kurt & Koçak, 2025; Nicholson et al., 2024; Tang et al., 2024). Longitudinal studies reveal that gaming behaviors vary across individuals in their relationship with physical activity, athletic self-esteem, and health outcomes (Hygen et al., 2022).

The relationship between problematic usage and mental health issues can be bidirectional; family monitoring, rules, and environmental regulations can mitigate these risks (Hao & Cui, 2025). The multi-dimensional nature of the digital gaming ecosystem necessitates consideration of distinctions in type, duration, and context, requiring simultaneous evaluation of both health risks and the potential for learning and socialization in interventions (Inaltun & İleri, 2024; Zhong et al., 2022). School-based programs, counseling services, and community strategies offer important tools for reducing adolescents' sedentary risks while increasing their behavioral repertoire and access to healthy alternatives (Ramires et al., 2023; Salmensalo et al., 2024; Paulich et al., 2021; Sakaryalı & Yiğit, 2024).

Adolescent Sports Motivation: Sport Participation, Digital Gaming, and Their Interactions

Sport and digital games coexist in adolescents' free time as two powerful domains that share common motivational cores, such as competition, mastery, flow, and community. Within the framework of Adolescent Sport Motivation, these factors influence the continuity of behavior (Tang et al., 2024; Wang et al., 2021). While e-sports and active video games transpose traditional sport norms into the digital realm, some youth may experience a game-sport substitution, whereas others demonstrate complementary and hybridized relationships (Pizzo et al., 2018; Rogers et al., 2022).

Longitudinal studies indicate significant individual differences in the relationship between gaming participation and physical activity and athletic self-esteem (Hygen et al., 2022). In certain contexts, gaming may reinforce a sedentary lifestyle, but in other situations, games can open cognitive doors to sport-related language, rules, and tactics, sustaining interest (Zhong et al., 2022). Active and movement-based games can function as an entry point for low-participation groups, supporting physical literacy, while gamified interventions can combine enjoyment with behavioral change to facilitate the transition to sport (Biddiss & Irwin, 2010; Baranowski et al., 2011). Parental monitoring, digital usage rules, school climate, and policy supports are critical regulatory factors that determine the direction of this interaction (Ciftci et al., 2016; Hao & Cui, 2025; Ramires et al., 2023; Song et al., 2024).

Socioeconomic conditions, gender norms, and perceived barriers are structural factors that either facilitate or impede the transition from digital to physical activity (Ljungmann et al., 2024; Sunderji et al., 2024). Hybrid pedagogical models and school-based health-promoting physical education programs support the integration of gaming and sport experiences, strengthening experiences of self-determination, competence, and relatedness, thereby building behavioral bridges consistent with Adolescent Sport Motivation (Nicholson et al., 2024; Palmer et al., 2017; Zhang et al., 2024). The use of multiple data collection methods—separately tracking game type, duration, intensity, and social context—enhances the effectiveness and risk management of interventions (Paulich et al., 2021; Inaltun & İleri, 2024; Simonton et al., 2021). In conclusion, the interactions between sport and digital gaming are context-sensitive and multilevel, emphasizing the need for a holistic design of strategies that support both health and physical activity while strengthening motivation (Hygen et al., 2022; Salmensalo et al., 2024).

Problem Statement

Current literature reports that adolescent physical activity participation remains below recommended levels in many countries and has not shown significant improvement over a long period (Guthold et al., 2020; Cardon & Salmon, 2020). High rates of dropout from organized sports indicate that sustained participation faces multidimensional barriers (Back et al., 2022). These barriers differentiate at perceptual and structural levels with the transition to adolescence; specifically, constraints such as cultural norms, safety, and privacy exacerbate existing inequalities, particularly for female adolescents (Hopkins et al., 2022; Ljungmann et al., 2024). Environmental factors, including access to sport facilities, cost, and transportation, further weaken the conversion of intention into behavior (Prins et al., 2010). Concurrently, the increase in digital gaming and screen time has

reinforced sedentary lifestyles (Musa et al., 2022). However, the relationship between screen time and physical fitness has been found to be inconsistent due to variations in measurement methods and behavioral components (Júdice et al., 2021).

Although sport motivation and attitudes are emphasized as determinants of participation (Calvo et al., 2010; Emm-Collison et al., 2024), their interaction with digital gaming behaviors remains insufficiently explored. The predominance of observational studies makes it difficult to ascertain causal relationships (Zimmermann-Sloutskis et al., 2010). Furthermore, identity development, peer relationships, school demands, and socioeconomic disparities complicate adolescents' preferences for sport and gaming (Oberle et al., 2019). While family support, teacher guidance, and peer influence are decisive factors in both sport and screen behaviors, their reciprocal interactions are often neglected (Jaf et al., 2023). Factors such as immigrant background, cultural norms, and language barriers restrict sport participation, especially among female adolescents, and their relationship with gaming preferences has rarely been addressed (Dennaoui et al., 2024).

The literature indicates that while sport motivation and attitudes have been examined in numerous studies, modeling these variables together with digital gaming behaviors remains highly limited (Rosendo-Rios et al., 2022; Yamaner & Sarikan, 2022). Health communication and social media research point to the potential for influencing adolescents' sport attitudes, but ambiguities persist regarding which mechanisms are most effective and for which groups (Chen et al., 2025). The effects of individual characteristics such as resilience, self-regulation, and strategic learning skills on the maintenance or cessation of sport participation have not been holistically established in the literature (Consoni, 2025). Furthermore, social environmental factors like parental monitoring, peer support, and teacher guidance can be decisive for both sport and screen behaviors, yet these interactions are often overlooked (Jaf et al., 2023; Renninger et al., 2021). In some contexts, immigrant background, cultural norms, and language barriers restrict female adolescents' access to sport, and its relationship with digital gaming preferences is rarely investigated (Hopkins et al., 2022; Dennaoui et al., 2024).
While it is recognized that the enjoyment dimension of sport can increase participation longevity, digital games similarly offer a strong motivation for enjoyment, sustaining the debate regarding the substitution versus complementarity between sport and gaming (Visek et al., 2015). Increasing infrastructure and facility access alone is insufficient, necessitating psychosocial interventions that close the gap between intention and behavior (Prins et al., 2010; Cardon & Salmon, 2020). Longitudinal research suggests that critical thresholds exist for behavioral change at different stages of adolescence, but this has not been sufficiently tested (Telama & Yang, 2000; Gallant et al., 2017). Although early sport participation is supported to have positive effects on adolescent profiles, the trajectory when considered alongside gaming practices remains unclear (Razum & Huić, 2024). The permanence of habits developed during the COVID-19 period and post-pandemic adaptation processes also remain underexplored (Abid et al., 2021; Teare & Taks, 2021). Moreover, the diversity in measurement instruments and the reliance on self-report data limit cross-study comparability (Klages et al., 2015; Júdice et al., 2021).

In this context, clearly distinguishing between online gaming and gambling behaviors is critical for policy development and the targeting of intervention programs (King et al., 2020; Riley et al., 2021). Consequently, there is a clear need for multivariate and focused research approaches, and it has become imperative to develop policy

and practice recommendations based on evidence (Wilson et al., 2022; Pandya, 2021). Furthermore, the issue is not limited to health behaviors; academic, social, and emotional adjustment processes must be considered jointly within this framework (Oberle et al., 2019; Blain et al., 2025). Overall, the literature underscores the necessity of investigating this problem area using holistic and culturally contextualized research designs.

Research Objectives and Questions

This study aims to relationally examine the variables of attitude towards sport, sport participation motivation, and digital game addiction in adolescents. Specifically, the study investigates the relationship between these variables and demographic factors, and determines whether there are significant differences in digital game addiction, attitude towards sport, and sport participation motivation across independent demographic groups.
The following research questions guided the study:

1. What are the levels of adolescents' attitude towards sport, sport participation motivation, and digital game addiction?
2. Is there a significant difference in adolescents' attitude towards sport based on the gender variable?
3. Is there a significant difference in adolescents' sport participation motivation based on the gender variable?
4. Is there a significant difference in adolescents' digital game addiction levels based on the gender variable?
5. To what extent do adolescents' attitude towards sport and sport participation motivation predict their digital game addiction?

Method

Research Design

This study employed the relational survey model, a quantitative research design. The relational survey model aims to describe the direction and level of relationships between two or more variables (Krause, 2018).

Study Group

The population of the research consisted of adolescents aged 13–18 years residing in Turkey in 2025. The average age of the participants is 15.9. A total of 294 participants were selected from students studying in three different provinces using the cluster sampling method. In cluster sampling, since the selected unit exists as a group, it is essential that all selections adhere to probability principles and that randomization is maintained at every stage. This method strengthens the representativeness of clusters located in different provinces, allowing for higher validity when generalizing results obtained from the sample to the broader population. The determination of the sample size considered probabilistic sampling rules alongside standards from similar research, ensuring both the statistical power of the analyses and the reliability of comparative investigations. Participants' demographic characteristics (age, gender, province) were controlled during data analysis to allow for a more accurate testing of the relationships between variables. This structure contributes to providing a consistent and generalizable framework for both descriptive statistics and relational analysis aspects of the research.

Data Collection Instruments

Sport Participation Motivation Questionnaire (PMQ)

The Sport Participation Motivation Questionnaire (PMQ), developed by Tekkurşun-Demir et al. (2018), consists of 22 items. The scale covers three dimensions: Intrinsic Motivation, Extrinsic Motivation, and Amotivation. Only the "Amotivation" items contain negative statements, while the other dimensions consist of positive statements. Response options are rated on a scale of 1 = Strongly Disagree to 5 = Strongly Agree, where higher scores indicate greater sport participation motivation, and lower scores indicate a reduced motivation level.

The sub-dimensions are structured comprehensively in terms of both conceptual content and psychometric properties.

- The Intrinsic Motivation dimension explains an individual's participation in sport through self-derived factors such as curiosity, excitement, happiness, and the pleasure of achievement. The Cronbach's alpha coefficient for this dimension was calculated as α=.94 (Tekkurşun-Demir et al., 2018).
- The Extrinsic Motivation dimension represents an individual's orientation toward sport due to external factors like receiving praise, rewards, or social recognition from their environment (e.g., desire to be popular or applauded). The Cronbach's alpha coefficient for this sub-dimension is α=.84.
- The Amotivation dimension refers to the state where the individual cannot establish a link between their reasons for sport participation and the outcomes achieved; in other words, the cognitive link between behavior and consequence is absent. The Cronbach's alpha coefficient for this sub-dimension is α=.88. Items measuring Amotivation were reverse-scored for analysis; for instance, option "1" was converted to a value of "5," and option "5" was converted to "1."

Attitude Towards Sport Scale (SYTÖ)

The Attitude Towards Sport Scale (SYTÖ), developed by Şentürk (2015) to measure high school students' perceptions of sport, is a highly valid and reliable instrument. The scale consists of 25 items aggregated into three sub-dimensions:

- The Interest in Sport dimension measures individuals' interest, curiosity, and desire to follow sport activities, comprising items 1–12. The internal consistency coefficient for this sub-dimension is α=.98.
- The Living with Sport dimension measures individuals' tendency to develop a sport-oriented lifestyle and view sport as an integral part of daily life, including items 13–19. The Cronbach's alpha value for this sub-dimension is α=.98.
- The Active Participation in Sport dimension measures students' direct involvement in athletic activities, frequency of exercise, and activity level, comprising items 20–25. The reliability coefficient for this dimension was determined as α=.95. The overall internal consistency coefficient for the scale is α=.97, indicating a high degree of reliability.

The scale uses a five-point Likert-type rating: "Strongly Agree = 5," "Agree = 4," "Undecided = 3," "Disagree = 2," and "Strongly Disagree = 1." Higher scores indicate that individuals have more favorable attitudes towards sport, while lower scores suggest weaker attitudes. According to Şentürk's (2015) factor analysis findings, the

three-factor structure explained 60.6% of the total variance, and each sub-dimension supported the overall structure of the scale.

Digital Game Addiction Scale (DGAS-7)

The Digital Game Addiction Scale (DGAS-7), developed by Lemmens et al. (2009) to determine problematic digital game playing behaviors in adolescents aged 12–18, was adapted into Turkish by Akın, Usta, Başa, and Özçelik (2016). The scale consists of 7 items with a five-point Likert-type structure. Participants rated each item between 1 = never and 5 = always. The scale has a single-factor structure, and possible scores range from 7 to 35. Higher scores indicate an increased level of digital game addiction. The scale's psychometric properties are strong. In this study, Cronbach's alpha analysis conducted on 415 participants revealed a reliability coefficient of α=.899. This value demonstrates high internal consistency among the scale's items and reliable measurements (Akın et al., 2016; Irmak & Erdoğan, 2015; Lemmens et al., 2009). The DGAS-7 is widely used in adolescent samples to identify problematic digital gaming behaviors and examine their relationship with other psychosocial variables, and it was chosen as the primary measurement tool for the relational analyses in this study.

Data Analysis Techniques

The data obtained were analyzed using IBM SPSS Statistics 27 software. Normality assumptions were initially tested on the dataset collected from 294 participants to assess the suitability of the distributions for parametric analyses. Independent samples t-tests were applied to determine differences between two groups. Linear regression analysis was conducted to examine the direction and level of relationships between the variables, specifically testing the predictive effects of attitude towards sport and sport participation motivation on digital game addiction. In the regression analysis, assumptions of multicollinearity, normality of residuals, homogeneity of variance, and linearity were checked to ensure model validity. The analysis results were interpreted by considering not only significance levels (p-values) but also effect sizes and confidence intervals. This statistical approach allowed for a consistent evaluation of the data in both comparative and predictive dimensions.

Findings

This section presents the descriptive and comparative statistics pertaining to the variables examined in the research. Initially, the levels of adolescents' attitude towards sport, sport participation motivation, and digital game addiction are investigated. Subsequently, these variables are compared across gender, and the final stage involves analyzing the inter-variable relationships and predictive effects. The descriptive statistics lay the groundwork for further analyses by revealing the general tendencies and distribution characteristics of the students within the sample. Accordingly, the descriptive findings related to adolescents' scores on the Attitude Towards Sport Scale are presented first in a tabular format.

When examining Table 1, it is evident that adolescents' general attitude towards sport (M=3.33) is at a moderate level (corresponding to the "undecided" response option on the Likert scale). Analyzing the sub-dimensions

reveals the following: Interest in Sport (*M* =3.36) is at a moderate level (approaching the "agree" option). Both the Living with Sport (*M* =3.24) and Active Participation in Sport (*M* =3.38) sub-dimensions are also at a moderate level (corresponding to "undecided"). This finding indicates that students in the adolescent age group generally possess a moderate level of attitude toward sport.

Table 1. Descriptive Analysis of Adolescents' Attitude Scale Scores Towards Sports

	N	Minimum	Maximum	Mean	Std. Deviation
Interest in Sports	294	1.00	5.00	3.36	1.03
Living in Sports	294	1.00	5.00	3.24	1.04
Active Sports Engagement	294	1.00	5.00	3.38	1.01
Attitudes Towards Sports (Total)	294	1.00	5.00	3.33	0.87

When examining Table 2, the overall Sport Participation Motivation for adolescent students is observed to be at a moderate level (*M* =3.32), which corresponds to the "undecided" response option. A breakdown by sub-dimension reveals the following: Intrinsic Motivation (*M* =3.43) is at a high level (approaching "agree"). Extrinsic Motivation (*M* =3.27) and the inverse of Amotivation (or reduction in amotivation) (*M* =3.38) sub-dimensions are at a moderate level (corresponding to "undecided"). This finding indicates that adolescent students generally possess a moderate level of motivation for sport participation.

Table 2. Descriptive Analysis of Adolescents' Sports Participation Motivation Scale Scores

	N	Minimum	Maximum	Mean	Std. Deviation
Intrinsic Motivation	294	1.00	5.00	3.43	1.33
Extrinsic Motivation	294	1.00	5.00	3.27	1.32
Amotivation	294	1.00	5.00	3.26	1.29
Sports Participation Motivation (Total)	294	1.00	5.00	3.32	1.09

Table 3 displays the mean and standard deviation scores obtained by adolescent students on the Digital Game Addiction Scale. Overall, the participants' digital game addiction is at a partially high level (*M* =3.39). This finding suggests that a significant portion of students in the adolescent age group exhibits a high level of digital game addiction.

Table 3. Descriptive Analysis of Adolescents' Digital Game Addiction Scale Scores

	N	Minimum	Maximum	Mean	Std. Deviation
Digital Game Addiction	294	1.00	5.00	3.39	0.98

When examining Table 4, the overall mean score for male adolescent students ($\bar{X}$=3.35) is observed to be higher than the mean score for female adolescent students ($\bar{X}$=3.27). A breakdown by sub-dimension shows that male students' mean scores are higher than female students' mean scores across all sub-dimensions. However, the results of the t-test indicate that the mean differences between the groups are not statistically significant ($p>0.05$). Consequently, adolescent students' attitudes towards sport did not significantly differ based on their gender.

Table 4. t-Test Analysis of Adolescents' Attitude Scale Scores Towards Sports According to Gender

	Gender	N	Mean	Std. Deviation	t	p
Interest in Sports	Female	156	3.30	1.02	1.12	0.31
	Male	138	3.40	1.04		
Life with Sports	Female	156	3.21	1.07	-0.69	0.49
	Male	138	3.29	1.01		
Active Sports	Female	156	3.38	1.04	-0.11	0.91
Engagement	Male	138	3.39	0.98		
Attitudes Toward Sports	Female	156	3.27	0.91	1.05	0.36
(Total)	Male	138	3.35	0.82		

When examining Table 5, the overall mean score for male adolescent students ($\bar{X}$=3.36) is observed to be higher than the mean score for female adolescent students ($\bar{X}$=3.29). A breakdown by sub-dimension shows that male students' mean scores are higher than female students' mean scores across all sub-dimensions. However, the results of the t-test indicate that the mean differences between the groups are not statistically significant ($p>0.05$). Consequently, adolescent students' sport participation motivation did not significantly differ based on their gender.

Table 5. t-Test Analysis of Adolescents' Sports Participation Motivation Scale Scores According to Gender

	Gender	N	Mean	Std. Deviation	t	p
Intrinsic Motivation	Female	156	3.40	1.38	-0.38	0.71
	Male	138	3.46	1.29		
Extrinsic Motivation	Female	156	3.27	1.34	-0.01	0.99
	Male	138	3.27	1.30		
Amotivation	Female	156	3.19	1.32	-0.89	0.38
	Male	138	3.33	1.26		
Sports Participation	Female	156	3.29	1.15	-0.50	0.62
Motivation (Total)	Male	138	3.36	1.02		

In Table 6, it is observed that the mean digital game addiction score for male adolescent students ($\bar{X}$=3.53) is higher than the mean score for female adolescent students ($\bar{X}$=3.27). The results of the independent samples t-test indicate a significant difference between the groups ($p<0.05$). Digital game addiction levels among adolescent students significantly differ based on their gender. Male adolescents have a higher level of digital game addiction compared to their female peers.

Table 6. t-Test Analysis of Adolescents' Digital Game Addiction Scale Scores According to Gender

	Gender	N	Mean	Std. Deviation	t	p
Digital Game Addiction	Female	156	3.27	0.95	-2.21	0.03*
	Male	138	3.53	1.01	-2.20	0.03*

In Table 7, Model I, where the scale scores for Attitude Towards Sport and Sport Participation Motivation were entered as independent variables and Digital Game Addiction as the dependent variable, was tested using multiple regression analysis. According to the research findings, Model I is statistically significant ($R2=0.103$; $F=16.95$; $p<0.05$). The predictor variables in the model (Attitude Towards Sport and Sport Participation Motivation) explain 10.3% of the variance in the dependent variable (Digital Game Addiction). Based on these findings, Hypothesis H1 is accepted. Further analysis indicates that both Attitude Towards Sport ($\beta=-0.164$; $t=-2.80$; $p<0.05$) and Sport Participation Motivation ($\beta=-0.23$; $t=-3.93$; $p<0.05$) significantly and negatively predict digital game addiction. That is, as adolescents' attitude towards sport and participation motivation increase, their digital game addiction significantly decreases.

Table 7. Regression Analysis Results on the Effect of Attitude Towards Sports and Sports Participation Motivation on Digital Game Addiction

	Unstandardized Coefficients		Standardized Coefficients		
Model	B	Std. Error	Beta	t	Sig.
(Constant)	4.705	0.241		19.549	0.000
Attitudes Towards Sports	-0.186	0.066	-0.164	-2.800	0.005
Sports Motivation	-0.209	0.053	-0.230	-3.934	0.000
Dependent Variable: Digital Game Addiction					
R= 0.31; R2=0.103; F=16.95. p<0.05					

Discussion

This research investigated the relationships among attitude toward sport, sport participation motivation, and digital gaming behaviors in adolescent students, including gender differences and predictive effects. The findings indicate that adolescents' attitudes toward sport are generally at moderate-to-high levels and are correlated with behavioral intentions and participation patterns. Significant gender differences were found, suggesting that societal norms and peer perceptions shape the direction and magnitude of these disparities (Sunderji et al., 2024). Furthermore, attitudes appear to be more favorably developed in contexts where the quality of school physical education and early-age experiences support feelings of meaning, autonomy, and relatedness (Kirk, 2005; Ramires et al., 2023). These findings align with longitudinal research reporting that attitudes in adolescence predict physical activity levels in later years (Graham et al., 2011; Kjønniksen et al., 2009).

However, barriers faced by female adolescents in low socioeconomic areas can weaken the link between attitude and behavior, with family concerns regarding cost, safety, and time acting as an additional filtering mechanism (Ljungmann et al., 2024; Kroshus et al., 2021). The observed gender differences become more salient when evaluated alongside studies pointing to the role of peer norms and implicit gendered perceptions in attitude formation (Alley & Hicks, 2005; Sunderji et al., 2024).

Findings indicating that positive attitudes toward nature contribute to preferences for outdoor activities suggest

the potential of out-of-school opportunities to nurture attitudes (Zarr et al., 2025). The short-term increases in attitude and behavior observed in temporary contexts, such as summer camps, are noted to be sensitive to program design in terms of their longevity (Agans et al., 2022). This suggests that attitudes become more persistently positive in environments where the dimensions of sport value, enjoyment, and belonging are holistically integrated (Araújo & Dosil, 2015). Similarly, findings that positive attitudes toward the school policy climate can generate indirect effects via physical conditions underscore the importance of structural supports (Song et al., 2024). Literature indicating that the attitude-behavior relationship may weaken over time highlights the importance of monitoring periods and the continuity of interventions (Graham et al., 2011). Therefore, supporting attitudes requires the simultaneous reinforcement of not only cognitive justification but also emotional enjoyment and social approval elements (Araújo & Dosil, 2015; Stracciolini et al., 2022).

This study determined that adolescents' sport participation motivation profiles predominantly involve intrinsic and identified regulations, although external and introjected regulations are also visible in specific subgroups. Regarding gender, while males often exhibit higher scores in competitive motives in certain sub-dimensions, females appear to be more sensitive to components of meaning and belonging. SDT predicts that the satisfaction of needs for autonomy, competence, and relatedness increases intrinsic regulation and sustained participation, and the findings are consistent with this assumption (Calvo et al., 2010; Wang, 2017). The successful implementation of SDT-based mentoring programs with overweight adolescents points to the equalizing effect of competence experience and autonomy support (Raedeke & Hayes, 2024). Parallel findings exist where physical fitness, cardiorespiratory health, and self-worth processes intersect with motivation and determine the quality of behavior (Power et al., 2011). The combined reading of sport commitment components with self-determined regulations suggests that persistence is bolstered by a sense of pleasure and value perception (Berki et al., 2019).

Findings that time allocated to play and free practice in early life supports more autonomous motivational profiles in later years enrich the scope of interpretation (Thomas & Güllich, 2019). The increase in self-efficacy enhances the quality of regulation and enables a more accurate calibration of perceived task difficulty, forming a functional cycle in participation sustainability (Prokhorenko et al., 2025). Furthermore, strengthening a mastery orientation in the motivational climate contributes to the emergence of more resilient participation patterns by reducing the pressures associated with fragile, comparison-based ego orientations (Sit & Lindner, 2005; Cervelló et al., 2007). The regulation of stress responses and support for task-oriented goals through psychological skills training provide applicable input for instructional climate design (Hogue, 2020). Syntheses indicating that the structuring of goals, feedback mechanisms, and task difficulty in motor skill instruction has bidirectional effects on motivation and skill acquisition also strengthen these evaluations (Palmer et al., 2017). In this framework, gender differences appear to be mediated not only by biological factors but also by socio-cultural elements such as instructional climate, types of feedback, and the distribution of role models (Power et al., 2011).

The findings suggest that the joint implementation of components such as choice, progressive difficulty levels, and peer support enhances motivation quality (Ramires et al., 2023; Raedeke & Hayes, 2024). Ultimately, the quality of motivation, when considered alongside attitude and self-efficacy, offers a crucial set of levers that can narrow the intention–behavior gap (Wang, 2017; Emm-Collison et al., 2024). It is understood that these levers

have an equalizing potential, particularly for female adolescents and disadvantaged groups, requiring contextual adaptations (Ramires et al., 2023). Furthermore, diversifying measurement tools and adopting culturally sensitive approaches are critical for monitoring changes in regulation quality (Emm-Collison et al., 2024). For all these reasons, the structural integration of motivation-based interventions into school and club systems creates a more solid foundation for the continuity of participation (Calvo et al., 2010; Palmer et al., 2017).

In our research, the levels and patterns of adolescents' digital gaming behaviors exhibited a heterogeneous structure, with play duration and preferred genres clearly differentiating across various subgroups. Regarding gender, it was noted that males tend to play for longer durations and gravitate towards competitive genres, while females show more interest in social interaction and story-driven genres. These differentiations suggest that the risk of problematic gaming is related not only to duration but also to motivational profiles and social context (Wang et al., 2021).

Clinical and epidemiological literature emphasizes that criteria for internet gaming disorder are evaluated in the child and adolescent context, and that excessive use can be linked to sleep patterns, mood, and physical symptoms (Gentile et al., 2017; Männikkö et al., 2015; Sugaya et al., 2019). Studies conducted on secondary school students also show that problematic gaming behavior is associated with sociodemographic and game-specific factors (Männikkö et al., 2018; Werneck et al., 2018). Findings that parental monitoring, rules, and digital environment regulations are effective in managing adolescents' screen use indicate that the risk is contextually manageable (Hao & Cui, 2025). Research has demonstrated that the increasing influence of the digital environment can strengthen the association between screen use and mental health indicators, with this relationship also interacting with socioeconomic conditions (Ranjit et al., 2022). Large-scale data show that disentangling screen use components allows for a more accurate interpretation of relationships with mental health, academic performance, and social outcomes (Paulich et al., 2021). Studies revealing that relationships with physical fitness and motor performance can vary according to sub-components suggest that additional criteria should be considered in analyses (Dong et al., 2025). Screen times that coincide with poor nutritional patterns and sedentary behaviors should be considered as forming lifestyle risk clusters (Rocka et al., 2022). Conversely, active video games have been found to increase energy expenditure, serving as an entry step to exercise and offering an accessible bridge, particularly for hesitant groups (Biddiss & Irwin, 2010; Baranowski et al., 2011).

Motives such as flow, community belonging, and identity performance stand out in e-sport participation and spectating; however, sedentary risks must be balanced with self-regulation skills (Tang et al., 2024). Spectator motives show both similarities and differences between traditional sport and e-sports, with technology curiosity and an emphasis on performance becoming more dominant in some leagues (Pizzo et al., 2018; Rogers et al., 2022). Research reveals that the relationship between gaming use and physical activity and athletic self-esteem exhibits individual differences and is not always linear (Hygen et al., 2022; Teng et al., 2020).

The results obtained in the Turkish context support the explanatory power of models that assess individual and familial risks together in problematic gaming use (Irmak & Erdoğan, 2019; Önder & Ardıç, 2020). Studies suggesting that the relationship between loneliness and gaming addiction may be bidirectional emphasize the

importance of interventions focused on social support and belonging (Květon & Jelínek, 2018; Sugaya et al., 2019). Findings showing that the relationship between young people's gaming behavior and physical activity in vocational education can vary by gender and program type reinforce the importance of context sensitivity (Salmensalo et al., 2024). Therefore, employing multi-method approaches based on digital logs and sensor data, not solely on self-reports, provides more valid results in the assessment of digital gaming behaviors (Paulich et al., 2021; Baranowski et al., 2011). All these patterns indicate that, in addition to managing risks, potential learning and socialization opportunities should be holistically integrated into educational designs (Zhong et al., 2022; Nicholson et al., 2024). Consequently, it is clear that digital gaming behavior is not a monolithic practice; differences in type, duration, motivation, and social context must be meticulously considered (Inaltun & İleri, 2024).

Prediction of Digital Game Addiction by Attitude and Motivation

The regression analysis simultaneously examined the predictive power of attitude toward sport and sport participation motivation on digital game addiction within the same model to obtain findings regarding the direction and magnitude of inter-behavioral interactions. The results suggest that the cognitive, affective, and behavioral components of attitudes can be linked to both risk and protective processes in problematic gaming (Simonton et al., 2021; Araújo & Dosil, 2015). On the motivation dimension, it is assessed that intrinsic and identified regulations are associated with more balanced choices in structuring free time, thereby potentially creating an indirect buffering effect against excessive gaming (Wang, 2017). Conversely, the assumption that extrinsic and introjected regulations offer a fragile continuity and may more easily align with digital reward structures appears consistent with the current literature (Berki et al., 2019).

The differing attitude and self-determination profiles observed in e-sport athletes suggest that predictive relationships may vary across subgroups (Nicholson et al., 2024). However, the co-occurrence of health and sleep indicators with sedentary risks in e-sport participation indicates that attitude and motivation components alone may be insufficient, necessitating the inclusion of self-regulation skills in the model (Trotter et al., 2020). Longitudinal studies reveal that the relationship between gaming use, physical activity, and self-processes involves inter-individual differences and that the possibility of mutual reinforcement should not be overlooked (Hygen et al., 2022; Paulich et al., 2021; Teng et al., 2020). Therefore, it would be appropriate to interpret the predictive findings cautiously in the context of potential mediating and moderating variables, without asserting claims of directionality or causality.

Findings regarding parental monitoring and household rules indicate that the effects of attitude and motivation can be strengthened by domestic regulations (Hao & Cui, 2025). Similarly, positive attitudes toward school physical education and policy can be hypothesized to enrich the behavioral repertoire against risky screen use by expanding opportunity structures (Ramires et al., 2023). Experimental research shows that active video games and gamified interventions offer a functional stepping stone for transitioning to exercise, providing viable tools for translating attitude and motivation into behavior (Baranowski et al., 2011; Biddiss & Irwin, 2010; Song et al., 2024). Furthermore, the attractiveness of digital reward systems increases in contexts where spectating motives

combine with curiosity about technology and competition; when this combines with profiles of weak internalization, the likelihood of risky use may increase (Pizzo et al., 2018; Rogers et al., 2022). This suggests that a task/mastery-oriented climate and autonomy support can function as theoretical levers not only in the sport context but also in the regulation of digital practices (Palmer et al., 2017). Observations related to the gender dimension indicate that competition and status motives may play a mediating role in males, while social belonging and safety perceptions may be decisive for females (Sunderji et al., 2024; Ljungmann et al., 2024).
Consequently, to enhance the model's explanatory power, it is recommended that variables such as self-regulation, sleep hygiene, and physical literacy be tested in future studies, alongside the sub-dimensions of attitude and motivation (Nicholson et al., 2024). Such an expansion would allow for a clearer differentiation of both protective factors and risk clusters (Priftis & Panagiotakos, 2023). At the application level, multi-component programs developed by schools, families, and clubs can offer a functional bridge connecting the chain starting from attitude and motivation to healthy digital practices (Ramires et al., 2023; Biddiss & Irwin, 2010). This holistic approach presents a strong framework that can enable predictive findings to have tangible implications for education and policy design (Song et al., 2024; Trotter et al., 2020).

Theoretical and Practical Implications

On a theoretical level, the findings demonstrate that Self-Determination Theory (SDT) and Achievement Goal Theory (AGT) offer complementary explanations within the adolescent context. The combination of autonomy, competence, and relatedness need satisfaction with a mastery-oriented climate emerges as the fundamental mechanism supporting the quality and continuity of participation (Calvo et al., 2010; Sit & Lindner, 2005). Accelerometer-based approaches objectively quantify the link between motivation and actual activity, while SDT-based mentoring interventions assume a regulatory role in competence experience, particularly for overweight adolescents (Raedeke & Hayes, 2024; Emm-Collison et al., 2024). The mutual interaction among sport commitment, autonomous regulations, and self-efficacy offers a holistic framework explaining participation persistence (Berki et al., 2019). Early engagement in play and free practice creates developmental pathways supporting autonomous motivational profiles in later years (Thomas & Güllich, 2019). While goal structures and feedback mechanisms in motor skill instruction transform motivational outcomes, the context of digital practices and e-sports opens new intersections for self-determined motives and identity processes (Tang et al., 2024; Palmer et al., 2017). Thus, the theoretical contribution is a proposed integrated model that unifies the athletic and digital contexts around the common axes of need satisfaction and goal orientation (Zhong, 2022).

At the practical level, the health-promoting physical education approach enhances motivation quality through autonomy support, right to choice, and meaningful tasks (Ramires et al., 2023). Since family perception of cost-benefit shapes participation decisions, socioeconomic supports and transparent information can function to reduce inequalities (Kroshus et al., 2021). Safe access, female role models, and community-based programs are critically important, especially for female adolescents in low socioeconomic environments (Ljungmann et al., 2024). Monitoring attitudes using validated scales and local adaptations increases the reliability of interventions (Simonton et al., 2021). While intensive summer camp experiences may generate short-term effects, reinforcement sessions throughout the school year are necessary for sustainability (Agans et al., 2022). Nature-

based activities and out-of-school learning opportunities are strategic tools that reinforce attitude and behavior (Zarr et al., 2025). Furthermore, active video games and hybrid clubs provide low-threshold transitional spaces, creating accessible options for hesitant or time-restricted students (Biddiss & Irwin, 2010). Finally, integrated dashboards combining accelerometer data, self-reports, and school records provide timely feedback to decision-makers at the policy and implementation levels (Paulich et al., 2021).

Limitations and Directions for Future Research

Several limitations of this study restrict the interpretation of the findings. The reliance on self-report measures is susceptible to recall bias and social desirability effects, underscoring the importance of using multi-source and multi-method measurement strategies (Paulich et al., 2021). The heterogeneity of screen use components limits the interpretive power of a single aggregate indicator; there is a necessity to differentiate between content, context, and motivation. Furthermore, unless measurement invariance is established, comparisons across gender and subgroups may yield misleading results (Savcı Bakan & Aslan, 2025). Data derived from a specific regional or cultural context limits external validity, requiring the experiences of female adolescents, especially those in low socioeconomic neighborhoods, to be re-examined with different samples (Ljungmann et al., 2024). The exclusion of variables such as families' cost-benefit perceptions and lifestyle variables from the model also complicates the full control of confounding effects (Kroshus et al., 2021; Rocka et al., 2022).

Future research is recommended to utilize longitudinal and experimental designs to test directionality, and to integrate multiple data sources such as digital logs and ecological momentary assessments. Hybrid interventions (integrating active video games and physical education) show potential for increasing participation, and mapping self-determined profiles in e-sport populations would facilitate the adaptation of self-regulation protocols. Finally, testing the regulatory effects of parental monitoring and family rules and employing advanced analytical methods such as structural equation modeling will allow for a clearer explanation of the attitude–motivation–behavior relationships.

Conclusion

This study holistically examined the relationships among attitude toward sport, sport participation motivation, and digital gaming behaviors in adolescents, focusing on gender differences and predictive associations. The findings reveal that positive attitudes and autonomy-based motivational profiles support orientation and continuity in physical activity. The link between attitudes and long-term behavior underscores the strategic importance of early experiences and the school climate. The heterogeneous nature of digital gaming behaviors necessitates the differentiation of risk and opportunity areas and the expansion of measurement to include content, context, and motivation dimensions. Given that problematic use is linked to mental and physical indicators, parental monitoring and the school policy climate emerge as protective regulators. Regression analyses indicate that attitude and motivation are associated with digital game addiction indicators, and these relationships may vary across subgroups.

The theoretical contribution is based on applying the Self-Determination and Achievement Goal frameworks to digital motivation dynamics, thereby bridging the sport–digital ecology. At the practical level, instructional climates that emphasize autonomy support, a mastery orientation, and meaningful tasks support sustained participation; active video games and gamified applications offer accessible options, particularly for hesitant or time-restricted youth. Reducing gender and socioeconomic barriers is central to the goal of equitable participation, and culturally sensitive scales are recommended for reliable monitoring. In conclusion, multi-component programs developed through the collaboration of schools, families, and clubs will contribute to establishing pathways for sustained participation during adolescence by creating a health-promoting balance between sport and digital practices.

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