

An Investigation of High School Students' Attitudes Toward Sports and Internet Addiction Levels

Sena Gültekin¹ 

Funda Koçak¹ 

¹Ankara University, Faculty of Sports Sciences, Ankara-Türkiye.

Abstract

This study focuses on examining the relationship between high school students' attitudes toward sports and their internet addiction levels. A total of 598 high school students (328 females, 270 males) selected via convenience sampling method voluntarily participated in the study, which was designed in the correlational research model. In data collection, a Personal Information Form, the "Attitude Toward Sports Scale" and the "Young Internet Addiction Test-Short Form" were used. Within the scope of statistical evaluations, in addition to normality tests, Cronbach's Alpha, independent samples t-test, One-Way ANOVA, MANOVA, and Pearson correlation analysis were utilized. The analysis results revealed that both internet addiction and attitude toward sports scores showed a significant difference according to the gender variable. While no significant difference was detected in students' internet addiction levels according to academic achievement level, significant differences were recorded in their attitudes toward sports. This differentiation was observed to be in favor of high academic achievement in the psychosocial and mental development subdimensions. Furthermore, statistically significant differentiations were recorded in the scale scores depending on active sports participation status and daily internet usage duration variables. The correlation analysis results demonstrated a negative and low-level significant relationship between students' internet addiction levels and their attitudes toward sports. These findings indicate that active participation in sports is associated with lower levels of internet addiction and points to a potential protective role that should be tested in longitudinal or experimental research.

Keywords: Addiction, attitude, high school student, internet addiction, sports

Introduction

Today, internet use is rapidly becoming widespread in Türkiye, as it is throughout the world. According to the Household Information Technologies report published by the Turkish Statistical Institute in 2025, the internet usage rate in Türkiye has reached 90.9% of the population (Turkish Statistical Institute [TurkStat], 2025). Considering the internet access opportunities and usage rates, it is observed that accessibility is a fundamental factor in the increase of individuals' online activities. When used effectively, the internet provides various advantages for purposes such as education, socialization, entrepreneurship, foreign language learning, and database research, while improving the quality of life of individuals through online methods and rapid access to information (Kassab et al., 2020; Rayan et al., 2017). However, intensive use can also lead to the weakening of social communication and social deviations (Gao et al., 2022; Ye et al., 2023). Although easy and fast accessibility is seen as the most important advantage of the internet as it offers an unrestricted area of use, this rapid communication structure that knows no boundaries of time and space can lead to social deviations and physical inactivity, especially in children and adolescents (Zhou et al., 2022). Considering that internet use encompasses both positive and negative effects, it can be said that excessive internet use and the resulting internet addiction is an inevitable global trend. Inactivity triggered by this uncontrolled

Corresponding Author: Funda Koçak, fkocak@ankara.edu.tr

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increase in internet use and other related risks are becoming a primary problem for today's adolescents (Wang et al., 2022). In the face of this negative outlook, sports, which support physical, social, and mental development, stand out as one of the protective mechanisms against the risks created by internet use.

Sports, which ensure the multi-faceted development of the individual, contribute to socialization, support leadership skills, and are effective in spending leisure time productively, is an endeavor that should be maintained throughout educational life. In this context, determining the attitude toward sports at every educational level is important for the healthy development of the individual. While a large portion of the studies examining attitudes toward sports in the literature focus on university students (Baş et al., 2025; Koçak et al., 2015), it is observed that at the primary and secondary school levels, the focus is on determining attitudes toward physical education classes (Mızrak et al., 2017). Although the psychological benefits of sports participation or the behavioral causes of internet addiction have been extensively investigated separately in the literature before, studies addressing these two phenomena together in a high school sample are limited. In the study, sports are addressed with a focus on behavioral addiction in a sample of high school students who are experiencing the developmentally most sensitive period. Secondly, while many previous studies focused on active athlete groups or university students, this study covers the general high school population, where lifestyle habits are in a critical transition period. Therefore, this research provides a descriptive perspective on the relationship between attitude toward sports and internet addiction. Because attitudes toward sports are affected by different variables, there is a need for research at every level. The aim of this research is to examine the relationship between high school students' attitudes toward sports and internet addiction.

Theoretical Framework

When global internet usage statistics are examined, it is seen that approximately 74% of the world population has internet access in 2025 (International Telecommunication Union [ITU], 2025). Although it is known that young people tend to be online more than adults, 90.9% of the public in Türkiye uses the internet (Turkish Statistical Institute, 2025). In Türkiye, where the daily internet usage time is 7.13 hours, weekly social media use is 25.4 hours, and this rate is above the world average (Meltwater & We Are Social, 2025). A significant increase in internet use has been observed worldwide, especially in the last 5 years. During and after the Covid-19 pandemic, the internet became a necessity for the continuity of education and training. In this process, internet use was further reinforced with infrastructure improvements and free access opportunities. Excessive internet use has brought with it the problem of internet addiction.

The concept of internet addiction first emerged in the literature in 1995 when psychiatrist Dr. Ivan Goldberg posted an ironic note on the online psychiatric bulletin board PsyCom.net, aiming to take a dig at the rigid diagnostic criteria of the newly released 4th edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) of the American Psychiatric Association (APA) (Dalal & Basu, 2016). Subsequently, Young (1996) defined internet addiction as "an individual's uncontrollable urge to be online even though they are not under the influence of any addictive substance." Brand et al. (2016) define internet-addicted individuals as "users who use the internet repeatedly over a certain period of time, whose cognitive, emotional, and behavioral activities, and even physiological activities, deviate from real life, and who cannot reduce or stop internet use despite suffering serious harm." It is known that excessive internet use leads to behavioral, psychological, and physical problems (Seki et al., 2019). There are many studies in the literature indicating that internet addiction leads to psychological problems such as loneliness, anxiety disorder, depression, and shyness (Biolcati & Cani, 2015; Pontes et al., 2014). Meta-analyses conducted on a global scale (Cheng & Li, 2014) and Asian-European comparative studies (Mak et al., 2014) reveal that addiction rates differ according to socio-cultural factors. When current clinical guidelines are examined following the introduction of the concept of internet addiction into the literature, it is observed that in the American Psychiatric Association's (APA, 2013) DSM-5 and the World Health Organization's (WHO, 2022) International Classification of Diseases (ICD-11) guidelines, rather than a generalized definition of internet addiction, the definition and investigation of specific areas within digital use, such as gaming disorder, are recommended. Alongside this approach of clinical

authorities, the presence of high school students, who are in a developmentally critical period, within the digital ecosystem is not limited solely to digital games. Social media use, online content consumption, and the time spent on the general network as a whole increase the risk of problematic internet use. Accordingly, the present study aims to address adolescents' general addiction tendencies in the digital world along the axis of internet addiction as an umbrella concept, and to examine the protective role of active sports participation and positive attitudes toward sports in mitigating this risky behavioral pattern through a holistic approach.

Research shows that participation in sports may have a reducing effect on internet addiction and that sports can be used as a tool in the treatment of addiction types (Park et al., 2016). However, some studies examining the relationship between exercise and internet use have reported that there are no significant differences or, contrary to expectations, that digital game addiction is high (Hazar et al., 2017; Şenışık & Hastürk, 2011). These contradictory findings increase the importance of determining students' attitudes toward sports for their physical and psychological health. When the literature is examined, it is seen that in some studies, variables such as gender and taking part in school teams significantly differentiate the attitude toward sports (Yıldırım et al., 2018). Furthermore, there are findings suggesting that as the income level increases or the time spent on social media rises, the attitude toward sports may weaken (Yıldırım et al., 2018). With developing technology directing people toward an inactive lifestyle, sports have become an inseparable part of life. The attitude toward sports, which is acquired from an early age to keep individuals away from bad habits and to enable them to be physically, mentally, and socially healthy in their daily lives, is important (Koçak, 2014). Triandis' (1971) Tripartite Model of Attitudes was taken as a basis to define the attitude developed by high school students toward sports. According to Triandis (1971), attitude is the sum of cognitive evaluations, affective responses such as liking or disliking, and behavioral intentions developed by an individual toward a situation, a specific object, or a behavior. This theoretical framework provides a strong ground for explaining the relationship between high school students' attitudes toward sports and internet addiction, which is another behavioral pattern. For instance, students' belief that sports are beneficial for health and personal development enables them to develop positive attitudes toward sports. When examined from the perspective of the Theory of Planned Behavior (Ajzen, 1991), positive attitude and intention toward sports guide the individual toward active physical participation behavior, while theoretically suppressing the intention to turn to the internet. Therefore, a strong attitude structure toward cognitive, affective, and physical development regarding sports in high school students may constitute a behavioral alternative model for suppressing the factors that cause the use of the internet at an addictive level. This research aims to examine the relationship between high school students' attitudes toward sports and their internet addiction levels. In line with this aim, the following hypotheses have been developed:

H1. High school students' attitudes toward sports and internet addiction levels show a significant difference according to the variables of gender, grade level, academic achievement level, daily internet usage time, and sports participation status.

H2. There is a negative relationship between high school students' attitudes toward sports and their internet addiction.

Method

Research Model

The research was designed using a cross-sectional correlational research design, a quantitative approach frequently operationalized as the relational survey model in national methodology literature (Karasar, 2012). In survey models, the phenomenon, object, or individuals subject to the research are described as they exist within their own conditions without any intervention or manipulation. The cross-sectional correlational design specifically allows for assessing the relationships between variables measured at a single point in time to determine whether they covary and, if so, the direction and magnitude of this relationship. Since the concurrent relationship between high school students' attitudes toward sports and

their internet addiction levels was examined without longitudinal follow-up or causal manipulation, a cross-sectional correlational design was adopted as the most appropriate methodology.

Ethics Committee Approval

The study followed the ethical principles set out in the Declaration of Helsinki. Ethical approval for the study was obtained from the Ethics Committee of Ankara University (Decision No. 09/44, dated 13 September 2022). Official institutional permission for data collection was subsequently secured from the Ministry of National Education. Permission to use the measurement instruments was obtained from the corresponding authors. Before administering the scales, written informed consent was obtained from the parents/legal guardians of all participating students, and written assent was obtained from the student participants themselves. Throughout the research process, all procedures were conducted in strict accordance with the Higher Education Institutions Scientific Research and Publication Ethics Directive.

Research Group

According to data from the Ministry of National Education, there are 241,206 students enrolled in public high schools and 58,975 students enrolled in private high schools in Ankara, amounting to a total high school population of 300,181 students (Ministry of National Education, 2023). In the Gölbaşı district, which constitutes the target population of the study, there are a total of 10833 high school students, comprising 5375 in public high schools and 5458 in private high schools. The sample of the study, designed in the correlational survey model, consists of a total of 598 high school students ($M_{age}=15.31\pm1.05$), including 328 females ($M_{age}=15.31 \pm 1.06$) and 270 males ($M_{age}=15.32 \pm 1.04$). In this study, convenience sampling, which is one of the non-probability sampling methods, was preferred for the data collection process. Since high school students, who are the target population of the study, are minors, obtaining parental consent was a prerequisite for the data collection process; therefore, convenience sampling was selected as the most practical and applicable method. In the literature, it is emphasized that when the primary purpose of a study is to test theoretical relationships between variables, convenience sampling is an acceptable and common methodological choice (Bryman, 2016).

Table 1. Personal information of the participants

Independent Variables	f	%
Gender		
Female	328	54.8
Male	270	45.2
Grade Level		
9th Grade	137	22.9
10th Grade	217	36.3
11th Grade	176	29.4
12th Grade	68	11.4
Academic Achievement		
Low	128	21.4
Moderate	334	55.9
High	136	22.7
Daily Internet Usage Duration		
2 hours and less	216	36.1
3-4 hours	293	49.0
5 hours and above	89	14.9
Sports participation status		
Yes	375	62.7
No	223	37.3
Total	598	100

Accordingly, the study was conducted with data collected from a total of three high schools, one private and two public, located in the Gölbaşı district of Ankara, where official permission processes and coordination with school administrations could be achieved in the most efficient manner. An a priori power analysis was conducted using GPower V3.1. Based on a medium effect size ($f = .25$ for ANOVA; $d = .50$ for independent samples t -test), an alpha level of .05, and a desired statistical power of .95, the minimum required sample sizes were approximately 280 participants for the four-group ANOVA and

210 participants for the independent samples t-test. The final sample consisted of 598 participants, indicating that the study was adequately powered to detect medium-sized effects. Although this situation limits the direct generalizability of the study's findings to the general high school population across Turkey, the obtained sample size of 598 individuals provides a statistically sufficient power to describe the core dynamics of the relationships between attitude toward sports and internet addiction. The inclusion of both public and private school students in the sample allowed for the socioeconomic background diversity to be reflected in the data to a certain extent. The personal information of the participants is shown in Table 1.

Data Collection Tools

In the research, a personal information form, the Attitude Scale Toward Sports (ASTS), and the Young Internet Addiction Test-Short Form (IAT-SF) were used as data collection tools. The personal information form consists of questions aimed at determining participants' information regarding gender, grade level, academic achievement level, daily internet usage time, and sports participation. In the research, students' academic achievements and daily internet use durations were determined through structured, self-report questions included in the Personal Information Form. The academic achievement variable was classified into three categories based on the students' weighted grade point averages (GPA) at the end of the previous semester, to be compatible with the passing grade system of the Ministry of National Education. Accordingly, those with a GPA between 0-49.99 were included in the low, those between 50.00-84.99 in the medium, and those between 85.00-100 in the high academic achievement group. Daily internet use duration refers to the average hours students spend in front of a digital screen (social media, gaming, browsing the internet, etc.) during their leisure time outside of school, and it was categorized by offering clear time intervals as 2 hours and less, 3-4 hours, and 5 hours and above. In survey research conducted in social sciences and on adolescent populations, such self-report categorical classifications are widely accepted and considered reliable methods in the literature for obtaining rapid and direct data from large samples (Bryman, 2016; Creswell & Creswell, 2018).

Attitude Scale Toward Sports (ASTS)

The ASTS was used to measure high school students' attitudes toward sports in the research. The scale, developed by Koçak (2014), consists of 3 sub-dimensions, psychosocial development, physical development, and mental development, and 22 items. There are 12 items in the psychosocial sub-dimension, 6 in the physical development subdimension, and 4 in the mental development sub-dimension. The scale is rated on a 5-point Likert scale as strongly disagree (1), slightly agree (2), moderately agree (3), agree (4), and strongly agree (5). The Cronbach's alpha values of the original form of the ASTS were found to range between .77 and .87 for the subdimensions.

Confirmatory Factor Analysis (CFA) was applied to test the structural validity of the ASTS, which was developed for university students, in the high school sample. The analysis was conducted using IBM SPSS AMOS 24 software based on the maximum likelihood estimation method. Prior to the analysis, the suitability of the scale items for the cognitive level and language structure of high school students was evaluated by two faculty members specialized in the field of sports sciences, and it was confirmed that the items were appropriate for the target audience. In line with the modification suggestions obtained from the initial CFA, a covariance was established between the error terms of items 1 and 3, which belong to the "Psychosocial Development" sub-dimension. These two items (Item 1: "*Helps to cope with stress*" and Item 3: "*Makes people happy*") were determined to be theoretically and semantically interrelated. In the sports psychology literature, coping with stress and experiencing happiness are deeply intertwined indicators of psychological well-being and emotional regulation through physical activity. Therefore, sharing a high degree of common variance within the same latent construct justified the error covariance on a solid theoretical basis rather than relying solely on statistical convenience. As a result of the analysis performed after the modification, the standardized factor loadings of the items were found to range between .58 and .84, and all loadings were statistically significant ($p < .001$). These findings indicate that all items adequately represent the relevant latent construct. The final model fit index values were calculated as follows: $\chi^2 = 145.35$, $df = 85$, $\chi^2/df = 1.71$, $RMSEA = .067$, $CFI = .97$, IFI

χ^2/df ratio below 2 indicates excellent fit, while an RMSEA value below the .08 threshold indicates good fit (Hu and Bentler, 1999). Furthermore, the fact that CFI and IFI values were above .95, and GFI, AGFI, and NFI values were .90 and above, proves that the scale has structural validity in the sample group consisting of high school students and can be used reliably in academic studies (Schermelleh-Engel et al., 2003).

Young Internet Addiction Test-Short Form (IAT-SF)

Developed by Young (2004) and converted into a short form by Pawlikowski et al. (2013), the IAT-SF was adapted into Turkish by Kutlu et al. (2016). The Cronbach's alpha value of the original form of the IAT-SF was found to be .86 for the single-factor structure in adolescents. The scale consists of 12 items and a single sub-dimension. It is a 5-point Likert-type scale rated as Never (1), Rarely (2), Occasionally (3), Frequently (4), and very frequently (5). According to the reliability analysis conducted within the scope of the current study, the internal consistency coefficient of the scale was calculated as .91.

Data Collection Process

Prior to the research, the purpose of the study was explained in detail to the students included in the sample; they were informed that their participation was entirely voluntary and that they could withdraw from the process at any time without providing any justification. Accordingly, the necessary legal and ethical permission processes were completed using the Information and Voluntary Participation Form for students and the Parental Informed Consent Form for their legal representatives. During the stage of filling out the forms, necessary planning was made under the supervision of the teachers responsible for the classes and in a manner that would not disrupt class hours (before or after class). Filling out the scale took approximately 10-15 minutes. The research data were collected between 1 February and 30 March 2023. This time frame coincides with the normalization period following the prolonged lockdowns and social isolation processes brought about by the COVID-19 pandemic. During the pandemic period, high school students' education, socialization, and leisure activities shifted largely to the screen, and this situation increased internet addiction risks on a global scale. The period when the data were collected reflects a transitional phase where students physically returned to schools, but the pandemic-period habits could not be completely abandoned. Therefore, the level of internet addiction and the level of attitude toward sports obtained in the study possess a periodical uniqueness in terms of containing the behavioral characteristics of the pandemic and the new lifestyle brought by the normalization process, namely the new normal

Data Analysis

Whether the data were normally distributed was examined using skewness and kurtosis values. Within the scope of the research, Cronbach's Alpha values regarding the reliability coefficient of the data obtained from the scale were included. CFA was used to test the structural validity of the ASTS in the high school sample, and descriptive statistical methods were used to determine the descriptive characteristics of the participants. Data were analyzed using MANOVA, One-Way ANOVA, and t-test for independent samples. To determine between which groups the significant difference existed, the Tukey test, one of the Post Hoc tests, was applied. To determine the relationship between internet addiction and attitudes toward sports, the Pearson Correlation Coefficient test was applied. In addition to the statistical significance of the differences observed between internet addiction and attitudes toward sports according to the categories of the independent variables, effect size coefficients were calculated to determine the practical significance and explanatory power of these differences. In this regard, Cohen's d coefficient was reported for two-group comparisons (t-test), whereas partial eta-squared (η_p^2) values were reported as the statistical effect indicator for multi-group comparisons and multivariate analyses of variance (ANOVA and MANOVA). In interpreting the effect sizes, the criteria suggested by Cohen (1988) (for Cohen's d: 0.20 small, 0.50 medium, 0.80 large; for η_p^2 : .01 small, .06 medium, .14 large) were taken as a basis. The values regarding ASTS and IAT-SF are shown in Table 2. Table 2 shows the distribution of ASTS and IAT-SF scores. The normality of the data was confirmed via skewness and kurtosis values. To meet the parametric assumptions of multivariate analysis, the homogeneity of variances was verified via Levene's test ($p > .05$), and the homogeneity of covariance

matrices was confirmed via Box's M test ($p > .05$). As a result of the skewness and kurtosis tests, it is observed that the research data are distributed between -1.5 and +1.5. According to the analyses performed, the data show a normal distribution. The Cronbach's Alpha values for the "ASTS" scale were determined as .90 for the psychosocial development sub-dimension, .81 for the physical development sub-dimension, .89 for the mental development sub-dimension, and .93 for the total. The Cronbach's Alpha value for the "IAT-SF" scale was calculated as .91.

Table 2. Distribution of ASTS and IAT-SF scores

Constructs	Mean	SD	Skewness	Kurtosis	Cronbach's Alfa
Psychosocial Development	3.83	0.79	-1.022	.833	.90
Physical Development	4.09	0.78	-.719	-.164	.81
Mental Development	3.33	1.15	-.651	.358	.89
ASTS Total	3.81	0.74	-1.001	1.001	.93
IAT-SF	2.39	0.66	-1.145	1.231	.91

Results

In this section, the statistical analysis results of the data obtained from the scales applied to examine the relationship between high school students' internet addiction levels and their attitudes toward sports are presented. The results obtained are presented in line with the hypotheses of the research.

Table 3. One-way ANOVA and independent samples *t*-test results of students' IAT-SF scores according to the gender, grade level, academic achievement, daily internet usage and sports participation variables

Constructs	Variables	<i>n</i>	Mean	<i>SD</i>	<i>F/t</i>	<i>p</i>	
IAT-SF	Gender	Female	328	2.47	0.69	3.44	.01*
		Male	270	2.29	0.61		
	Grade Level	9th Grade	137	2.41	0.60	1.66	.173
		10th Grade	217	2.45	0.70		
		11th Grade	176	2.35	0.67		
		12th Grade	68	2.26	0.58		
	Academic Achievement	Low	128	2.55	0.80	2.36	.094
		Moderate	334	2.40	0.65		
		High	136	2.31	0.64		
	Daily Internet Usage	2 hours and less	216	2.19	0.53	48.00	.001*
		3-4 hours	293	2.45	0.59		
		5 hours and above	89	2.92	0.70		
	Sports participation	Yes	375	2.32	0.66	-3.51	.01*
		No	223	2.51	0.65		

When the results of the independent samples *t*-test and One-Way ANOVA analyses conducted to determine whether IAT-SF scores differ according to the independent variables of the study were examined (Table 3), it was found that the gender variable was associated with a statistically significant differentiation in the internet addiction scores of high school students ($t_{(596)} = 3.44$, $p = .001$, Cohen's $d = 0.28$). When the mean scores are examined, it is observed that the internet addiction levels of female students ($M = 2.47$, $SD = 0.69$), are significantly higher than those of male students ($M = 2.29$, $SD = 0.61$), and the effect size of this observed difference is at a small level.

When the analysis results regarding the students' grade level variable were examined, it was determined that grade level did not create a statistically significant difference in IAT-SF scores and had no practical significance ($F_{(3, 594)} = 1.66$, $p = .173$, $\eta_p^2 = .008$). Similarly, it was determined that the academic achievement level variable did not cause a statistically significant differentiation on the IAT-SF scores ($F_{(2, 595)} = 2.36$, $p = .094$, $\eta_p^2 = .007$).

In contrast, it was found that the daily internet usage duration variable created a highly significant difference in IAT-SF scores from both a statistical and practical perspective ($F_{(2, 595)} = 48.00, p < .001, \eta_p^2 = .141$). According to the results of the post-hoc Tukey test conducted to determine the source of the significant differences between the groups, the internet addiction scores of students using the internet for 5 hours and above ($M = 2.92, SD = 0.70$) were significantly higher than those using it for 3–4 hours ($M = 2.45, SD = 0.59$) and 2 hours and less ($M = 2.19, SD = 0.53$). Furthermore, students using the internet for 3–4 hours had significantly higher addiction scores than those using it for 2 hours and less. These results indicate that internet addiction scores increase linearly with daily internet usage duration, and the effect size of this differentiation is at a large level.

Finally, it was determined that the sports participation status of the participants was associated with a statistically significant differentiation in internet addiction scores ($t_{(596)} = -3.51, p < .001$, Cohen's $d = 0.29$). Considering the mean values, it was revealed that the internet addiction scores of students who actively participate in sports ($M = 2.32, SD = 0.66$) were significantly lower than the scores of their peers who do not participate in sports ($M = 2.51, SD = 0.65$) and the effect size observed between the groups according to sports participation status was at a small level.

The results regarding whether the participants' ASTS subsdimension scores differ according to the independent variables of the study are presented in Table 4. When the analysis results were examined, it was observed that the gender variable had a statistically significant multivariate main effect on the ASTS subsdimensions ($Wilks' Lambda = .953; F_{(3, 594)} = 9.676, p < .001, \eta_p^2 = .047$). This obtained effect size value indicates that the practical significance of gender on attitudes toward sports is at a small level. According to the follow-up univariate analyses conducted to determine which subsdimensions contributed to the multivariate significance, statistically significant differences were found between genders in the subsdimensions of psychosocial development ($F_{(1, 596)} = 11.36, p = .001, \eta_p^2 = .019$) and mental development ($F_{(1, 596)} = 19.74, p < .001, \eta_p^2 = .032$). In both subsdimensions, the sports attitude mean scores of male students were significantly higher than those of female students.

When the grade level variable was examined, it was determined that this variable did not have a statistically significant main effect on the ASTS subsdimensions ($Wilks' Lambda = .986; F_{(9, 1440)} = .954, p = .476, \eta_p^2 = .005$).

It was found that the academic achievement variable did not have a statistically significant multivariate main effect on the ASTS subsdimensions. Follow-up univariate analyses revealed statistically significant differences based on academic achievement levels in psychosocial development and mental development whereas no significant difference was detected in the physical development subsdimension. According to the results of the post-hoc Tukey test conducted to determine the source of these differences, students with high academic achievement levels exhibited significantly more positive attitudes toward sports compared to those with lower levels, and the effect size of this difference was at a small level. To evaluate whether high school students' attitudes toward sports differed significantly across academic achievement levels, MANOVA was conducted. The multivariate main effect of academic achievement on the subsdimensions of the ASTS displayed a marginal trend toward statistical significance ($Wilks' Lambda = .979; F_{(6, 1186)} = 2.098, p = .051, \eta_p^2 = .011$). Based on this marginal trend, exploratory follow-up univariate ANOVA tests were examined.

The univariate results revealed statistically significant differences across academic achievement levels in the psychosocial development subsdimension ($F_{(2, 595)} = 5.02, p = .014, \eta_p^2 = .014$) and the mental development subsdimension ($F_{(2, 595)} = 5.20, p = .018, \eta_p^2 = .013$). In contrast, no statistically significant difference was observed in the physical development subsdimension ($F_{(2, 595)} = 2.36, p = .095, \eta_p^2 = .008$). Post-hoc Tukey pairwise comparisons indicated that students with high academic achievement levels reported significantly higher scores in both psychosocial development and mental development subsdimensions compared to students with low academic achievement levels, with small effect sizes ($\eta_p^2 < .02$).

Table 4. MANOVA and One-way ANOVA results of students' ASTS scores according to the gender, grade level, academic achievement, daily internet usage and sports participation variables

Constructs	Variables	n	Mean	SD	F	p
Psychosocial Development	Gender	Female	328	3.73	11.36	.001*
		Male	270	3.95		
	Grade Level	9th Grade	137	3.72	2.08	.101
		10th Grade	217	3.93		
		11th Grade	176	3.79		
		12th Grade	68	3.82		
	Academic Achievement	Low	128	3.74	5.02	.007*
		Moderate	334	3.77		
		High	136	4.01		
	Daily Internet Usage	2 hours and less	216	3.93	4.22	.012*
		3-4 hours	293	3.84		
		5 hours and above	89	3.58		
	Sports participation	Yes	375	4.01	57.13	.001*
		No	223	3.52		
Physical Development	Gender	Female	328	4.09	0.009	.922
		Male	270	4.10		
	Grade Level	9th Grade	137	4.05	.323	.809
		10th Grade	217	4.13		
		11th Grade	176	4.09		
		12th Grade	68	4.09		
	Academic Achievement	Low	128	3.98	2.36	.094
		Moderate	334	4.06		
		High	136	4.22		
	Daily Internet Usage	2 hours and less	216	4.13	1.25	.290
		3-4 hours	293	4.11		
		5 hours and above	89	3.95		
	Sports participation	Yes	375	4.17	10.06	.002*
		No	223	3.96		
Mental Development	Gender	Female	328	3.14	19.74	.001*
		Male	270	3.56		
	Grade Level	9th Grade	137	3.22	1.63	.179
		10th Grade	217	3.45		
		11th Grade	176	3.24		
		12th Grade	68	3.41		
	Academic Achievement	Low	128	3.14	5.20	.006*
		Moderate	334	3.26		
		High	136	3.61		
	Daily Internet Usage	2 hours and less	216	3.45	4.55	.012*
		3-4 hours	293	3.36		
		5 hours and above	89	2.93		
	Sports participation	Yes	375	3.52	29.14	.001*
		No	223	3.01		

* $p < .05$; ** $p < .01$

It was observed that the daily internet usage duration variable did not have a statistically significant multivariate main effect on the ASTS subdimensions ($Wilks' \Lambda = .974$; $F(6, 1186) = 1.912$, $p = .074$, $\eta_p^2 = .013$). According to the follow-up univariate analyses, daily internet usage significantly affected psychosocial development ($F(2, 595) = 4.22$, $p = .015$, $\eta_p^2 = .014$) and mental development ($F(2, 595) = 4.55$,

$p = .011$, $\eta_p^2 = .015$). The results of the post-hoc Tukey test conducted to determine the source of these differences revealed that the psychosocial and mental development scores of students using the internet for 2 hours and less per day were significantly higher than those of students with heavy internet usage of 5 hours and above. Furthermore, the effect sizes for these group comparisons were observed to be at a small level.

Finally, it was determined that the sports participation variable had the highest and most statistically significant multivariate main effect on all subdimensions of the ASTS ($Wilks' \Lambda = .906$; $F_{(3, 594)} = 20.568$, $p < .001$, $\eta_p^2 = .094$). The univariate results also confirmed this dominant effect across all subdimensions, psychosocial development ($F_{(1, 596)} = 57.13$, $p < .001$), physical development ($F_{(1, 596)} = 10.06$, $p < .001$), and mental development ($F_{(1, 596)} = 29.14$, $p < .001$). These results reveal that participants who actively participate in sports exhibit significantly higher and more positive attitudes in all subdimensions compared to non-participants. It was shown that the effect size regarding this difference created by sports participation status was at a medium level.

Table 5. Relationship between students' ASTS scores and IAT-SF scores

	Psychosocial Development	Physical Development	Mental Development	ASTS Total	IAT-SF
Psychosocial Development	1				
Physical Development	.632**	1			
Mental Development	.667**	.477**	1		
ASTS Total	.948**	.786**	.804**	1	
IAT-SF	-.148**	-.087*	-.079	-.133**	1

* $p < .05$; ** $p < .01$

Table 5 presents the Pearson correlation analysis results conducted to determine the relationship between students' ASTS scores and IAT-SF scores. When the analysis results are examined, it is found that there are statistically significant negative and low-level relationships between the participants' ASTS subdimensions and total scores and their IAT-SF scores. According to the findings, it is observed that as attitudes toward sports scores increase, internet addiction scores decrease. Specifically, the relationship between the ASTS total score and IAT-SF ($r = -.133$, $p < .01$) and the relationship between the psychosocial development sub-dimension and IAT-SF ($r = -.148$, $p < .01$) were found to be significant. While a significant negative relationship was also found between the physical development sub-dimension and IAT-SF ($r = -.087$, $p < .05$), no statistically significant relationship was found between the mental development sub-dimension and internet addiction ($r = -.079$, $p > .05$).

Discussion

The primary objective of this study is to examine the relationship between high school students' attitude toward sports levels and their internet addiction levels. This relationship between internet addiction and attitude toward sports was analyzed in terms of the variables of gender, grade level, academic achievement, daily internet usage duration, and sports participation status. As specified in hypothesis H1, the analysis results revealed that internet addiction levels showed significant differences according to gender, daily internet usage duration, and sports participation status; whereas attitude toward sports showed significant differences according to gender, sports participation status, daily internet usage duration, and academic achievement level. Regarding the academic achievement variable, hypothesis H1 was rejected for internet addiction, as it did not create a statistically significant difference in internet addiction, but was partially supported for attitude toward sports, as it led to significant differentiations in favor of high achievement in the psychosocial and mental development subdimensions of attitude toward sports. In contrast, no statistically significant difference was detected across grade levels in any scale or subdimension (Table 3 and Table 4). Therefore, hypothesis H1 was fully supported for the variables of gender, daily internet usage duration, and sports participation; partially supported for the academic achievement variable; and rejected for the grade level variable.

The findings indicate that attitude toward sports scores significantly differ according to gender. While this result is consistent with some studies in the literature (Balyan et al., 2012; Koçak, 2014), it contradicts the findings of many other studies. For instance, no significant difference was found according to gender in studies conducted by Belli et al. (2019), Gürbüz & Özkan (2012), Koçak et al. (2015), and Yavuz and Yücel (2019). On the other hand, Zalewska et al. (2023) emphasized that male students especially exhibited higher risk levels in terms of internet addiction. This diversity in the findings suggests that attitudes toward sports may interact not only with biological gender but also with cultural factors and access to sporting opportunities.

The internet addiction scores of students who actively participate in sports and have a higher attitude toward sports are significantly lower. Consistent with the literature (Koçak, 2014; Singh & Devi, 2013; Topal & Alıncak, 2022), this finding indicates that sports participation status is closely associated with a higher value judgment toward sports. Similarly, a study conducted by Belli et al. (2019) revealed significant differences in the dimensions of living through sports and active sports participation. Coco et al. (2025) also supported this aspect of our research by highlighting sporting activities as a distinct factor associated with a lower risk of internet addiction. This situation can be explained by the natural limitation of aimless time spent on the internet, as students who are cognitively and behaviorally oriented toward sports allocate more space to sports in their leisure time.

Regarding the grade level variable, the analysis revealed no statistically significant differences in either internet addiction levels or attitudes toward sports across the 9th, 10th, 11th, and 12th grades. While this finding overlaps with the studies of Mızrak et al. (2017) and Yavuz and Yücel (2019), it differs from the study of Yıldırım et al. (2018), which found that 9th-grade students exhibited higher attitudes. The cognitive and affective approaches of adolescents toward sports during the high school period can be evaluated as an indicator of individual interests rather than academic level transitions brought by the school. In other words, the importance that individuals attribute to sports does not undergo a structural change from the first year to the last year of high school education but maintains its relationship with more deeply rooted background variables such as familial sports culture or movement habits acquired during early childhood. Consequently, this lack of difference observed among grade levels can be interpreted as indicating that the high school curriculum or the school environment does not play a dominant role in differentiating students' general perceptions of sports, and that individual and environmental factors may gain weight holistically in attitude development.

Another important finding obtained in the study is the differentiating effect of academic achievement level on internet addiction and attitude toward sports. The analysis results revealed that high school students' academic achievement levels did not create a statistically significant difference in internet addiction. This indicates that internet use and addiction risk during adolescence have become a widespread phenomenon regardless of academic achievement. Although there are studies in the literature arguing that internet addiction shows a negative relationship with academic achievement and adversely affects academic achievement (Morahan-Martin & Schumacher, 2000), the causal direction of this relationship is not always clear. It is emphasized that internet addiction can be both a predictor and an outcome of poor academic achievement (Huang et al., 2009). This negative interaction is generally explained by sleep irregularities and concentration problems arising from internet usage patterns (Kubey et al., 2001). In contrast, just as in our study, there are also studies in the literature finding that internet addiction syndrome does not display a statistically significant relationship or difference with academic achievement level. Indeed, in the study conducted by Stavropoulos et al. (2013), it was determined that internet addiction syndrome had no statistically significant relationship with lower academic achievement. This parallel finding supports that internet addiction risk can course independently of academic performance level.

When the findings regarding daily internet usage duration are examined, it is observed that students in higher internet usage categories have lower attitudes toward sports and higher levels of internet addiction. Accordingly, it was determined that as daily internet usage duration increases, students' addiction scores also rise linearly. This result is parallel to many studies in the literature (Cai et al., 2023; Öztürk, 2022). As emphasized by Doğan et al. (2022), unaddressed internet addiction situations exhibit

a negative relationship with athletes' mental toughness and performance. Given the correlational design, causal inferences cannot be made. The low correlation coefficients indicate that the association between attitudes toward sports and internet addiction is weak and suggest that other psychosocial factors, such as peer relationships and family communication, may also be relevant. Therefore, a positive attitude toward sports should not be regarded as a solution in itself but may be considered a supportive psychosocial factor.

Throughout the study, it was observed that sports participation status has an inverse relationship with internet addiction levels. Similar results have been obtained in numerous studies (Chen et al., 2022; Han et al., 2021; Park et al., 2016; Ting et al., 2019; Ye et al., 2021). The internet addiction scores of students who actively participate in sports and have a higher attitude toward sports are significantly lower. Consistent with the literature (Koçak, 2014; Singh & Devi, 2013; Topal & Alıncak, 2022), this finding indicates that sports participation status is closely associated with a higher value judgment toward sports. Similarly, a study conducted by Belli et al. (2019) revealed significant differences in the dimensions of living through sports and active sports participation. Coco et al. (2025) also supported this aspect of our research by highlighting sporting activities as a distinct factor associated with a lower risk of internet addiction. This situation can be explained by the natural limitation of aimless time spent on the internet, as students who are cognitively and behaviorally oriented toward sports allocate more space to sports in their leisure time.

The fact that high school students participating in sports utilize their leisure time with structured physical activities naturally limits the time they can spend in front of digital screens. Beyond this, sports, by its very nature, allows adolescents to satisfy their psychological needs in the real world through face-to-face interaction, team belonging, and tangible experiences of success. All these findings and the theoretical framework suggest that sports participation status is associated with lower internet addiction scores, representing a potential protective role that warrants further examination in longitudinal or experimental studies.

In the correlation analysis conducted in line with the *H2* hypothesis (Table 5), a negative, statistically significant, but weak relationship was found between attitude toward sports and internet addiction level. This finding indicates that high school students with higher levels of positive attitude toward sports tend to have lower indicators of internet addiction. The weak correlations observed in the study indicate that attitudes toward sports share only a small proportion of variance with internet addiction among adolescents. Given the correlational design, these associations should not be interpreted as causal. This situation highlights that different psychosocial dynamics such as peer relationships, family communication, academic anxieties, or gaming motivations may play a role behind internet addiction. Therefore, although a positive attitude toward sports is not an absolute determinant on its own in its relationship with digital addiction, it can be evaluated as a supportive factor in the process, consistent with the literature. For example, although their study specifically focused on digital game addiction rather than general internet addiction, Hazar et al. (2017) similarly observed lower addiction scores among individuals who participate in sports. However, Cincik et al. (2023) emphasize that the risk of addiction varies according to the fields of study and lifestyles of individuals, reminding us that the youth population has a multidimensional vulnerability to the risk of internet addiction.

Conclusion

In conclusion, this study reveals that there is a significant and negative relationship between high school students' attitude toward sports levels and their internet addiction levels. The findings indicate that gender, daily internet usage duration, and sports participation status are primary variables showing significant differences in both internet addiction and attitude toward sports levels. In contrast, while grade level does not create a significant difference in any scale, academic achievement plays no determinant role in internet addiction but acts as a significant factor in differentiating attitude toward sports, specifically in the psychosocial and mental development subdimensions in favor of high-achieving students. According to the prominent outcomes of the research, students who actively participate in sports, have lower daily internet usage, and hold higher attitudes toward sports exhibit

significantly lower internet addiction scores. However, considering the low correlation coefficients observed in this study, there is a statistically significant but weak relationship between attitude toward sports and internet addiction levels, demonstrating that physical activity internalizations represent only a small portion of the variance in digital behaviors. In this regard, encouraging students to develop positive attitudes toward sports and participate in regular sports activities, especially during adolescence, is considered a sustainable and protective psychosocial strategy in combating internet addiction.

Despite examining the relationship between internet addiction and attitudes toward sports, this study has several limitations. The most significant methodological limitation of this research is that the data were collected solely from three high schools (one private, two public) in the Gölbaşı district of Ankara using the convenience sampling method. This situation restricts the socio-economic and geographical diversity of the sample, thereby limiting the generalizability of the findings. In future studies, there is a need for larger-scale research designs that cover different cities and regions, diversify socio-economic levels, and utilize probability sampling methods. Due to the cross-sectional design of the current study, no causal relationship inferences can be made between the variables. Longitudinal or experimental research designs are recommended to better define the causal mechanisms between adolescents' attitudes toward sports and behavioral digital addictions. Relying on categorical self-report data to measure academic achievement and daily internet usage duration in the study introduces the risk of social desirability bias, which may limit the absolute accuracy of the participants' actual behaviors and academic performance. To minimize self-report biases, the integration of objective metrics such as official institutional academic records and validated digital screen time tracking applications should be considered in future studies. Furthermore, the predominance of quantitative methods in current research makes it difficult to deeply understand individuals' internet usage motivations and the affective processes they develop toward sports. In line with these limitations and findings, recommendations for future research and practices have been developed. To balance the quantitative intensity in the current literature, it is recommended that future research utilize qualitative or mixed methods to examine students' experiences more deeply. To observe age-related differences, the scope of the research could be expanded to include primary and middle school levels, as well as groups passing through critical periods, such as 8th and 12th-grade students in the process of preparing for high school and university entrance exams. In addition to internet addiction, more comprehensive models can be established by examining the relationship of sports with different digital usage forms, such as social media addiction, digital addiction, and e-gaming addiction.

The development of supportive programs that direct students to structured after-school sports activities and peer-based recreational sports activities in schools could be evaluated. In the process of implementing the proposed interventions, establishing institutional collaborations at the local level among the Ministry of National Education, the Ministry of Youth and Sports, and local governments may increase the effectiveness of the process. In this context, under the coordination of guidance counseling services and physical education teachers in schools, identifying students in the vulnerable group regarding internet addiction risk and encouraging the integration of these students into local sports projects could offer a practical solution model.

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Author Contributions

Conceptualization: FK. Methodology: FK. Investigation: SG. Data Curation: SG. Formal Analysis: FK. Writing – Original Draft: GK. Writing – Review & Editing: FK.

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Conflict of Interest

There are no conflicts of interest in this research

Ethics Committee Approval

The study followed the ethical principles set out in the Declaration of Helsinki. Ethical approval for the study was obtained from the Ethics Committee of Ankara University (Decision No. 09/44, dated 13 September 2022).

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