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# Examining the Relationship between Physical Activity Attitudes, Technology Addiction, and Well-Being in High School Students

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# Examining the Relationship between Physical Activity Attitudes, Technology Addiction, and Well-Being in High School Students

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## Abstract

This study was conducted with the aim of simultaneously describing the patterns among physical activity attitudes, technology addiction, and psychological well-being in high school students and investigating whether these variables differ by gender. Data were collected from a total of 320 participants aged 13–17, located in four different provinces across various regions of Turkey. Data were gathered using *the Youth Physical Activity Attitude Scale (YPAAS), the Technology Addiction Scale (TAS),* and *the Subjective/Psychological Well-Being Scale*. Data were analyzed with SPSS 27.0; following checks for normality of distributions, *descriptive statistics, independent samples t-tests for gender comparison*, and *Pearson product-moment correlation* were applied for inter-variable relationships. The findings indicate that students' positive physical activity attitudes and psychological well-being generally trend at a moderate level. Components of technology addiction are also found to be at a moderate level, with relatively higher scores observed in the sub-dimensions of social networking and online gaming use. In gender-based comparisons, no significant differences were determined for physical activity attitudes or psychological well-being; however, significant differences were found in some sub-dimensions of technology addiction. Correlation analyses revealed that a positive physical activity attitude is significantly negatively correlated with indicators of technology addiction and positively correlated with psychological well-being. Conversely, negative attitude exhibited relationships in the opposite direction. The findings suggest that in school-based interventions, it may be beneficial to concurrently target components that reinforce physical activity and enhance digital self-regulation.

## Introduction

Adolescence is a sensitive developmental period where an individual's attitudes toward physical activity, patterns of interaction with technology, and indicators of subjective well-being are rapidly shaped. The attitude patterns formed during this phase serve as a bridge between intention and behavior, shaping young people's mobility habits in the long term (Poobalan et al., 2012). Family interactions and parenting styles can both strengthen and weaken

adolescents' conceptualizations of an active life and their motivational resources (Butun, 2025). Similarly, the school environment, the quality of physical education classes, and peer norms play a decisive role in establishing beliefs and emotional tendencies toward physical activity (Arslan Kabasakal & Geri, 2024).

The level of walkability in the urban environment, access to open spaces, and perceptions of safety are among the contextual factors that support attitudes toward and participation in physical activity (Horacek et al., 2018). Globally, sedentary lifestyles are increasing among youth, yet messaging frameworks and role model narratives that encourage mobility are shown to have positive effects on attitudes (Crozier et al., 2018). In the Turkish context, the exam-centric school system, digital media usage, and limited free time conditions affect the time adolescents dedicate to physical activity and their emotional valuation of these activities (Uğurlu et al., 2023). Body image, peer comparisons, and gender roles are influential in shaping the intentions and emotional responses to physical activity in high school students (Grieser et al., 2006). When these elements are considered together, attitudes toward physical activity are understood to be nourished not only by cognitive evaluations but also by affective components such as belonging, self-efficacy, and enjoyment (Rose et al., 2019).

Adolescents' participation in extracurricular activities is directly linked to the physical and social opportunities of the school environment, and this relationship can vary across cultures (Burton et al., 2020). The centrality of digital technologies in daily life constricts the time available for physical activity, putting adolescents' attention resources under constant competition (Tarafdar et al., 2020). The combination of technology's functions—entertainment, social validation, and escape—can shift the balance between immediate and delayed gratification, weakening the stability of attitudes (Ning et al., 2011). Therefore, examining attitudes toward physical activity alongside digital habits and school-based experiences is viewed as a strategic necessity for health promotion policies (Marx et al., 2017). The literature suggests that positive emotional responses to physical movement are related to life satisfaction and school engagement (Tomyn & Cummins, 2011). Consequently, understanding physical activity attitudes in adolescence must involve an interactive consideration of the family, school, and digital culture, not just individual tendencies.

In the generation raised as "digital natives," the intensity of screen-based interactions, combined with digital designs that enhance reward sensitivity, facilitates the emergence of addictive technology use patterns (Remondi et al., 2020). Social media, online games, and streaming platforms create continuous reinforcement loops that operate on the logic of the attention economy, complicating self-regulation processes for some youth (Chen et al., 2021). Technology addiction is characterized not only by long screen time but also by symptoms such as loss of control, withdrawal symptoms, and functional impairment, and is considered alongside psychosocial risks (Agarwal & Kar, 2015). The increase in online interactions during the pandemic strengthened problematic use behaviors in some student groups, shifting the balance between school life and health behaviors (Potas et al., 2022). The co-occurrence of increased screen time with insomnia, mood fluctuations, and physical inactivity can lead to impairments in well-being indicators (Sezer Efe et al., 2025).

High school students' well-being levels vary across dimensions such as self-esteem, self-efficacy, and social relationship patterns, with technology use and school pressures directly influencing these dimensions (Smith et

al., 2022; Sünbül & Gürsel, 2003). Regular participation in physical activity is consistently reported across different cultures to have protective effects on stress coping, emotion regulation, and life satisfaction, while excessive technology use is associated with negative outcomes such as loneliness, anxiety, and academic burnout (Guo et al., 2024; Ding et al., 2021). The displacement of recreational mobility by daily screen time makes it difficult for positive attitudes toward physical activity to translate into behavior (Lwin et al., 2016). In Turkey, the need to disseminate digital well-being education and increase school-based awareness initiatives is emphasized (Uslu & Özgün, 2024).

The intense exam schedule and limited free time at the high school level restrict physical activity opportunities and indirectly affect well-being (Marx et al., 2017). Interventions that support the affective and cognitive components of attitude can increase students' intention to participate when enriched with message framing and gamification techniques (Crozier et al., 2018). Similarly, developing self-regulation and attention management skills can reduce the risk of addiction and support well-being (Ning et al., 2025). Considering that well-being is related not only to physical health but also to psychological and social components, adopting an integrated approach at the family, school, and community levels becomes imperative (Sánchez-Álvarez et al., 2019). This general framework demonstrates that attitudes toward physical activity, technology addiction, and well-being in adolescence must be considered together as intersecting, context-sensitive processes.

The competition of the digital ecosystem over time and attention significantly affects the sustainability of intention in the translation of attitudes into behavior (Kuşdemir et al., 2013; Na'imah et al., 2024; Tarafdar et al., 2020). Furthermore, addictive use patterns can create indirect effects on well-being through difficulties in emotion regulation and social comparison processes (Guo et al., 2024). Family interactions and the rhythm of school life change the direction and intensity of these relationships; thus, the use of multivariate models allows for testing mediating and moderating mechanisms (Prioreschi et al., 2017). Such an approach contributes to targeting school-based health promotion policies and facilitates the development of strategies sensitive to local contexts (Burton et al., 2020).

Findings in the literature suggest that the attitude-behavior alignment can be strengthened when the school's physical and social environment is organized to support mobility (Horacek et al., 2018). Similarly, digital well-being programs are noted to reduce addiction risk by developing self-regulation skills (Bayir & Topbas, 2023). Message framing and peer-based modeling techniques reinforce adolescents' positive emotions toward physical activity, while the integration of gamified activities with pedagogical goals contributes to reducing addictive use and increasing active lifestyles (Lwin et al., 2016). Systematically supporting family involvement reflects positively on students' daily routines by increasing opportunities for mobility within the home (Kay et al., 2023). In this context, the development of multi-level, interactive, and context-sensitive intervention programs is highlighted as an important necessity for designing policies that holistically address the attitude-behavior-addiction interaction (Ning et al., 2025). This study aims to contribute analytical evidence to this necessity and develop concrete implications to guide educational practices.

The purpose of this study is to reveal the level and relationships among high school students' physical activity

attitudes, technology addiction levels, and psychological well-being, and to examine the differences in these variables based on the gender variable. Within this purpose, the study seeks answers to the following questions:

1. What are the levels of high school students' physical activity attitudes, technology addiction levels, and psychological well-being?
2. Do high school students' physical activity attitudes, technology addiction levels, and psychological well-being show a significant difference according to the gender variable?
3. What is the relationship among high school students' physical activity attitudes, technology addiction levels, and psychological well-being?

## Method

### Research Design

The primary aim of this research is to investigate the levels of subjective well-being, technology addiction, and physical activity attitudes in adolescent students. The study was designed to address these variables within both descriptive and relational survey models. The descriptive survey component aims to reveal the current status of the variables and define group differences (Creswell, 2014), while the relational survey component allows for the analysis of simultaneous relationships between the variables in line with the theoretical framework (Fraenkel, Wallen & Hyun, 2012).

### Research Group

The study participants consisted of 320 secondary school–high school students enrolled in state and private educational institutions in Ankara, Konya, Mersin, and Istanbul. Prior to dataset creation, participants' responses to the scale items were subjected to a preliminary review; 12 response forms with more than 5% missing items or those showing a clear central tendency pattern were excluded from the study, and analyses were conducted using data from valid participants. The participant group included 151 males (47.18%) and 169 females (52.81%), presenting a relatively balanced gender distribution. Ages ranged from 13 to 17, with a mean age of 15.23 and a standard deviation of 1.41. This participant profile, drawn from multi-center school contexts, aimed to minimally reflect the institutional and socio-cultural diversity across different provinces; however, the findings are interpreted as being limited to the existing framework of voluntary participants.

### Data Collection Instruments

To measure high school students' physical activity attitudes, technology addiction, and psychological well-being, three structured self-report scales were utilized: the Youth Physical Activity Attitude Scale (YPAAS), the Technology Addiction Scale (TAS), and the Subjective/Psychological Well-being Scale. Scale selection prioritized psychometrically supported, brief, and practically applicable instruments for the high school age group, favoring versions with Turkish validity–reliability studies and ensuring alignment with theoretical grounding in the literature. This approach aimed to strengthen construct validity and increase comparability across different provincial school contexts.

***Youth Physical Activity Attitude Scale (YPAAS)***

The Youth Physical Activity Attitude Scale, developed by Simonton et al. (2021) and adapted into Turkish by Uyhan et al. (2023), was used to measure adolescent students' attitudes toward physical activity. The YPAAS consists of 12 scaling items with 2 sub-dimensions, where participants choose the most appropriate option presented. The sub-dimensions, expressed as Positive Attitude and Negative Attitude, have very high reliability and validity values. The YPAAS uses a 5-point Likert-type rating scale designed as: "(5) Definitely Yes, (4) Mostly Yes, (3) Sometimes, (2) Mostly No, and (1) Definitely No."

***Technology Addiction Scale (TAS)***

This scale, developed by Aydın (2017) based on Young's (1996) Internet Addiction Test criteria and Griffiths's (2005) work, consists of 24 items structured into four sub-dimensions of 6 items each: (1) Social Network Addiction, (2) Instant Messaging Addiction, (3) Online Gaming Addiction, and (4) Websites Addiction. The scale uses a 5-point Likert-type format. Scores can range from a minimum of 24 (24×1) to a maximum of 120 (24×5). Scores are interpreted as: "Not Addicted" for 0 to 24 points; "Low-level Addict" for 25 to 48 points; "Moderately Addicted" for 49 to 72 points; "Quite Addicted" for 73 to 96 points; and "Completely Addicted" for 97 to 120 points. The scale's Cronbach's Alpha (α) internal consistency value is reported as 0.86; this study found the value to be 0.95.

***Psychological Well-being Scale (PES)***

The PES, developed by Dost (2004), consists of 46 items. The scale aims to determine subjective well-being levels by assessing individuals' cognitive evaluations of their lives and the frequency and intensity of positive and negative emotions experienced. The scale includes personal judgments about life domains and expressions of positive and negative emotions. The response system is a 5-point Likert scale: "(5) Completely Suitable", "(4) Mostly Suitable", "(3) Partially Suitable", "(2) Slightly Suitable", and "(1) Not Suitable At All". Item scores range from 5 to 1. The scale includes 26 positive and 20 negative statements. The lowest possible score is 46, and the highest is 230. A higher score indicates a higher level of subjective well-being. The reported Cronbach's Alpha reliability coefficient for the PES is .93. Furthermore, to find the scale's stability coefficient, the instrument was administered twice, two weeks apart, to a subsample of 39 participants, yielding a Pearson product-moment correlation coefficient of .86. The reliability coefficients suggest that the PES can be used reliably to measure adolescent students' subjective well-being levels. The internal consistency coefficient calculated within the scope of this study was .87.

**Data Analysis Techniques**

The distribution of scores obtained from the dependent variables (Physical Activity Attitude, Technology Addiction, and Subjective Well-being Scales) was examined and observed to be normally distributed. In line with the study's purpose, the Pearson Product-Moment Correlation Technique was primarily used to reveal the

relationships among physical activity attitudes, technology addiction, and subjective well-being. The Independent Samples t-test technique was used to compare participants' physical activity attitudes, technology addiction, and subjective well-being levels according to gender. The collected data were analyzed using the SPSS.

## Results

This section first presents the descriptive statistics for the variables, followed by comparisons by gender and a report of the inter-variable relationships. Initially, Table 1 provides the mean and distribution measures related to adolescents' levels of positive and negative attitudes toward physical activity.

Table 1. Average Scores Regarding Adolescents' Attitudes Towards Physical Activity

| Variable | N | Min | Max | Mean | Std. Deviation |
|---|---|---|---|---|---|
| Positive Physical Activity Attitude | 320 | 1 | 5 | 3.38 | 1.08 |
| Negative Physical Activity Attitude | 320 | 1 | 5 | 2.98 | 1.08 |

Table 1 presents the descriptive analyses of the scores obtained by adolescents from the two sub-dimensions of the Physical Activity Attitude Scale. The analyses determined that the participants' mean score for Positive Physical Activity Attitude is $\bar{X}$=3.38±1.09. Similarly, the mean score for Negative Physical Activity Attitude was calculated as $\bar{X}$=2.98±1.08. Given that the possible score range for the scale is 1 (lowest) to 5 (highest), it was found that adolescents' scores for Positive Physical Activity Attitude are at a moderate level. While participants' scores for Negative Physical Activity Attitude are partially low, a moderate distribution is also observed in this dimension.

Table 2 displays the descriptive analyses of the scores obtained by adolescents from the Psychological Well-being Scale. According to the analyses, the participants' mean score for Psychological Well-being was calculated as $\bar{X}$=3.39±1.11. Given that the possible score range for the scale is 1 (lowest) to 5 (highest), it was found that adolescents' scores for Psychological Well-being are at a moderate level.

Table 2. Average Scores of Adolescents' Psychological Well-Being

| | N | Minimum | Maximum | Mean | Std. Deviation |
|---|---|---|---|---|---|
| Psychological Well-Being | 320 | 1 | 5 | 3.39 | 1.11 |

Table 3 presents the descriptive analyses of the scores obtained by adolescents from the four sub-dimensions and the total score of the Technology Addiction Scale. According to the analyses, the participants' mean social network addiction score was 3.27±1.26, their mean instant messaging addiction score was 3.02±1.14, their mean website addiction score was 2.86±1.20, their mean online game addiction score was 3.16±1.17, and their mean overall scale score was 3.08±0.79. Given that the possible score range for the scale is 1 (lowest) to 5 (highest), it was found that adolescents' overall Technology Addiction levels are at a moderate level. However, it is notable that the adolescents' scores for Social Network and Online Gaming Addiction were found to be higher compared to the other technology addiction sub-dimensions.

Table 3. Average Scores of Adolescents on Technological Addiction

| | N | Minimum | Maximum | Mean | Std. Deviation |
|---|---|---|---|---|---|
| Social Network Addiction | 320 | 1 | 5 | 3.27 | 1.26 |
| Instant Messaging | 320 | 1 | 5 | 3.02 | 1.14 |
| Website Addiction | 320 | 1 | 5 | 2.86 | 1.20 |
| Online Gaming Addiction | 320 | 1 | 5 | 3.16 | 1.17 |
| Technology Addiction Total | 320 | 1.25 | 5.00 | 3.08 | 0.79 |

Table 4 presents the findings comparing the physical activity attitudes of the adolescent participants across gender. Upon examining the table, no statistically significant difference was found between male and female participants in either Positive Physical Activity Attitude or Negative Physical Activity Attitude scores ($p>0.05$). Although male participants exhibited higher scores for positive physical activity attitudes and female participants scored higher on negative physical activity attitudes, the difference between them was not significant.

Table 4. Comparison of Participants' Physical Activity Attitudes According to Gender Variable

| | Gender | N | Mean | Std. Deviation | t | p |
|---|---|---|---|---|---|---|
| Positive Physical Activity | Female | 169 | 3.34 | 1.12 | -0.14 | 0.27 |
| Attitude | Male | 151 | 3.41 | 1.02 | | |
| Negative Physical Activity | Female | 169 | 3.04 | 1.07 | 0.95 | 0.34 |
| | Male | 151 | 2.92 | 1.08 | | |

Table 5 presents the findings comparing the psychological well-being levels of the adolescent participants across gender. Upon examining the table, no statistically significant difference was found between male and female participants in their Psychological Well-being scores ($p>0.05$). Although male participants exhibited higher scores for psychological well-being, the difference between the two genders was not significant.

Table 5. Comparison of Participants' Psychological Well-Being Levels According to Gender Variable

| | Gender | N | Mean | Std. Deviation | t | p |
|---|---|---|---|---|---|---|
| Psychological Well-Being | Female | 169 | 3.36 | 1.079 | -0.80 | 0.44 |
| | Male | 151 | 3.42 | 1.127 | | |

Table 6 presents the findings comparing the technology addiction levels of the adolescent participants across gender. Upon examining the table, no statistically significant difference was found between male and female participants in their mean scores for Instant Messaging Addiction ($p>0.05$). However, significant differences were found according to the gender variable in Social Network Addiction, Website Addiction, Online Gaming Addiction, and the total score of the Technology Addiction Scale ($p<0.05$). When the group means were examined, male participants achieved higher means compared to their female counterparts on all online game addiction, website addiction, and technology addiction scales. Female participants exhibited a higher level of Social Network Addiction.

Table 6. Comparison of Participants' Technological Addiction According to Gender Variable

| | Gender | N | Mean | Std. Deviation | t | p |
|---|---|---|---|---|---|---|
| Social Network Addiction | Female | 169 | 3.47 | 1.240 | 3.16 | 0.00 |
| | Male | 151 | 3.03 | 1.246 | | |
| Instant Messaging Addiction | Female | 169 | 3.05 | 1.169 | 0.67 | 0.50 |
| | Male | 151 | 2.98 | 1.101 | | |
| Website Addiction | Female | 169 | 2.64 | 1.098 | -3.50 | 0.00 |
| | Male | 151 | 3.11 | 1.255 | | |
| Online Gaming Addiction | Female | 169 | 2.97 | 1.115 | -2.90 | 0.00 |
| | Male | 151 | 3.37 | 1.196 | | |
| Technology Addiction Total | Female | 169 | 3.00 | 0.84 | -2.01 | 0.04 |
| | Male | 151 | 3.16 | 0.74 | | |

Table 7 presents the Pearson Product-Moment Correlation coefficients calculated between adolescents' physical activity attitudes, technology addiction scores, and psychological well-being levels. According to the analysis results, a significant but negative relationship was found between positive physical activity attitudes and the subscales and total scores of the technological addiction scale. As adolescents' positive physical activity attitudes increase, their technological addiction decreases. Similarly, as participants' positive physical activity attitudes increase, their psychological well-being also increases significantly and positively. On the other hand, a significant and positive relationship was found between participants' negative physical activity scores and their technology addiction scale scores. As negative physical activity scores increase, technological addiction scores also increase. Conversely, a significant but negative relationship was found between participants' negative physical activity attitudes and their psychological well-being. In other words, as participants' negative physical activity attitudes increase, their psychological well-being decreases significantly.

Table 7. Analysis of Relationships Between Participants' Physical Activity Attitudes, Psychological Well-Being, and Technological Addiction

| | Positive Physical Activity Attitude | | Negative Physical Activity | |
|---|---|---|---|---|
| | Pearson Correlation | p | Pearson Correlation | p |
| Psychological Well-Being | .267** | 0.000 | -.186** | 0.001 |
| Social Network Addiction | -.297** | 0.000 | .253** | 0.000 |
| Instant Messaging Addiction | -.308** | 0.000 | .327** | 0.000 |
| Website Addiction | -.249** | 0.000 | .149** | 0.008 |
| Online Gaming Addiction | -.289** | 0.000 | .013* | 0.016 |
| Technology Addiction (Total) | -.430** | 0.000 | .307** | 0.000 |

## Discussion

This research investigated the relationships among physical activity attitudes, technology addiction levels, and psychological well-being in high school students. The findings indicate that students' positive attitudes toward

physical activity are at a moderate level, while their negative attitudes are at a low-to-moderate level. The generally moderate level of psychological well-being suggests a relative balance, despite the demands of school life. General trends in technology addiction are also moderate, though highly gamified and socially validating digital content is found to be more attractive. This pattern suggests that both protective and risk-generating tendencies can coexist within the same individual, with behavioral balance being sensitive to environmental conditions. Environmental opportunities, social norms, and the school climate play a determining role in translating positive attitudes into behavior. The moderate level of well-being holds potential that can be enhanced through supportive peer relationships and positive school environments. The moderate risks observed in technology interaction appear reducible through the development of self-regulation and attention management skills (Mizrak, 2024). This overall picture parallels research emphasizing that physical movement is positively correlated with well-being in adolescents and that this relationship is context-sensitive (Wang et al., 2024; Chen et al., 2021).

**Gender Differences**

Gender-based findings revealed no significant difference in physical activity attitudes or psychological well-being levels. However, in technology addiction, male students showed higher overall tendencies, with a particular concentration in online gaming and digital content. Female students appeared more active in social networks focused on sharing and social validation. No significant gender difference was found in instant messaging use. This pattern indicates that digital preferences are a dynamic shaped by social roles and peer norms, rather than a fixed gender effect (Popescu et al., 2022). The similarity in physical activity attitudes suggests that school facilities may offer balanced experiences for both genders. Conversely, the differentiation in technology interaction suggests that self-regulation skills need to be targeted in different ways. Gender-sensitive school programs that inclusively regulate gamified content and social network practices could help reduce risky behaviors (Grieser et al., 2006).

**Inter-Variable Relationships**

Positive relationships were found between physical activity attitudes and psychological well-being, while negative relationships were observed with indicators of technology addiction. An increase in negative attitudes coincided with a decrease in well-being and an increase in technology addiction. The findings demonstrate that these two domains of activity, which compete over time and attention budgets, shape adolescent behavior. Movement appears to support well-being via affective and self-regulatory channels, while digital reinforcement may weaken these channels. The literature also reports that physical activity supports well-being through self-regulation and positive affect, whereas excessive digital interaction can cause impairments in attention, sleep, and social connectedness (Guo et al., 2024). The findings imply that school climate, peer relationships, and family monitoring decisively influence the direction of these relationships. Message framing and gamification-based interventions could reinforce the conversion of positive attitudes into behavior by restructuring the reward system (Lwin et al., 2016).

**Theoretical and Practical Implications**

Theoretically, the findings suggest that physical activity attitudes are associated with self-determination and self-regulation processes, thereby indirectly nurturing psychological well-being. The satisfaction of autonomy and competence, as predicted by Self-Determination Theory, strengthens attitude-behavior congruence, while technology-based reinforcements may weaken this congruence (Smith et al., 2022). The research strengthens evidence at the high school level that well-being plays a mediating role in this relationship, revealing that adolescent behaviors exhibit an intertwined structure across cognitive, affective, and social planes. The theoretical contribution is deepened by testing the explanation that addictive digital interactions create behavioral friction by suppressing signals of enjoyment and competence derived from movement (Tarafdar et al., 2020).

Practically, the findings show that school-based interventions should concurrently include components that increase movement opportunities, manage digital triggers, and transform peer norms (Kay et al., 2023). Implementing notification management, device usage protocols, and attention corridors can reduce the impact of problematic use on school functionality. Family involvement can reduce the intensity of screen-based reinforcements through shared activities and consistent household boundaries (Butun, 2025). The walkability of the school environment, safe open spaces, and variety in sports clubs facilitate the conversion of positive attitudes into behavior. Integrating digital well-being education into the curriculum can reduce addictive tendencies by increasing trigger awareness (Ning et al., 2025). Gender-sensitive content design and structural adjustments indirectly improve well-being components by supporting the attention and sleep economy (Evans et al., 2018). In conclusion, this study suggests that ecosystem-based programs that strengthen physical activity attitudes, manage digital risks, and synchronize environmental support factors can be effective at the high school level.

**Limitations and Future Directions**

Several limitations must be considered. The descriptive and relational survey approach restricts inferences regarding cause-and-effect relationships. The use of self-report scales introduces risks of social desirability and recall bias, potentially reducing measurement sensitivity, especially in fast-changing areas like technology use. While the cultural adaptations of the scales appear reliable, additional work is needed to test equivalence across different school types and micro-contexts. The sample is limited to students in specific provinces, potentially not reflecting the full scope of geographical and socioeconomic diversity. The cross-sectional data structure only reflects the dynamic nature of concepts like attitude and well-being, as it is not suitable for monitoring changes over time. Although technology addiction subtypes are included, more detailed qualitative methods and digital trace analysis are needed to examine content and context differences more thoroughly.

Environmental variables (school climate, safety perception) were addressed indirectly without objective environmental indicators, thus limiting contextual interpretations. Family involvement and community resources, while conceptually important, remained secondary at the measurement level, narrowing the scope of multi-level analyses. Findings regarding the gender variable indicate a need for more detailed sampling plans to examine differentiations within subgroups. Finally, the explanatory power is limited because performance-related

outcomes like school engagement and quality of life were not measured in depth. The variability of behavioral effects in the post-pandemic period may also partially affect the generalizability of the findings. While these limitations do not diminish the study's value, they indicate that the results should be interpreted cautiously and with sensitivity to context.

## Conclusion

This study integrates the concepts of physical activity attitudes, technology addiction, and well-being at the high school level within the same analytical framework, integrating these areas, which are often treated separately in the literature, and increases its theoretical explanatory power. The findings demonstrate that positive physical activity attitudes support student well-being, while problematic digital habits can weaken this relationship. This clearly highlights the need for multidimensional intervention programs within the school ecosystem. By adapting self-determination and reinforcement-based approaches to the high school environment, the research has made mediating and regulatory processes more visible, thus developing concrete recommendations for policy and practice. The findings demonstrate that the transformative power of school climate and peer norms yields more effective results when considered in conjunction with environmental factors such as walkability and accessibility. Furthermore, gender-differentiated trends were observed to vary depending on the digital medium, highlighting the importance of media-sensitive and inclusive content designs.

The evidence suggests that digital well-being training and self-regulation skills, when planned in conjunction with physical activity opportunities, create mutually reinforcing effects. The sustainability of school-based practices is significantly enhanced by such holistic approaches. Furthermore, it appears that conducting evaluation processes in short intervals and in a context-sensitive manner can yield measurable gains in student well-being and school engagement. Consequently, this study not only fills a theoretical gap in the literature but also suggests evidence-based, scalable, and culturally sensitive strategies for practitioners and decision-makers. This approach, which directly contributes to policy cycles prioritizing youth health and resilience, redefines the balance between activity, digital interaction, and well-being as a matter of resource management and proposes a workable roadmap for holistic transformation in school ecosystems.

## Recommendations

Considering the findings and limitations of the study together, it is recommended that a holistic program approach be addressed to strengthen attitudes, improve digital trigger management, and increase environmental opportunities within the school ecosystem. Future research would benefit from using longitudinal designs to more clearly elucidate the dynamics between attitudes, technology use, and well-being. Enriching in-school interventions with message framing, peer role models, and gamification elements; It is important to diversify these practices in a way that is sensitive to gender differences and digital media characteristics. Integrating digital well-being and self-regulation skills into curriculum programs, supported by practical activities such as notification management, trigger awareness, and reinforcement control, can achieve more lasting results.

Collaboration with local governments is necessary to increase walkable areas and safe open spaces around schools, diversify extracurricular clubs and sports activities, and reduce the cost of accessing these opportunities. Organizing shared activities to strengthen family engagement, establishing consistent limits on screen time at home, and establishing short-term feedback mechanisms for parents will also be important support elements. In assessment processes, it is recommended to regularly administer short scales covering the psychological and social dimensions of well-being and to link these results to performance indicators such as school engagement. Furthermore, using mixed-method approaches that combine digital usage data and self-reports will contribute to a deeper understanding of students' diverse profiles.

At a structural level, reorganizing school start times and exam schedules in terms of sleep patterns and attention spans can support students' well-being. At the policy level, it is recommended that digital well-being components be incorporated into school health programs and that resources be planned according to student risk profiles. Finally, developing models that are culturally responsive and retestable across contexts will increase both the speed and reliability of evidence-based knowledge accumulation in this area.

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