

The role of physical activity and emotional distress in problematic social media use among high school students

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Abstract: The regular use of social networks among adolescents can positively or negatively influence their mental health and level of physical activity. Although these platforms favor social interaction, their excessive use has been associated with sedentary lifestyles, anxiety and depression. This study analyzed the relationship between emotional distress, physical activity and social network addiction in 240 high school students in Medellín. Validated instruments were applied: DASS-21 (mental health), IPAQ (physical activity) and ARS (social network addiction).

The results showed a negative correlation between physical activity and emotional symptoms ($\rho = -.200$, $p = .002$), as well as with problematic network use ($\rho = -.207$, $p = .001$). It was observed that men reported greater physical activity and less psychological distress than women. The linear regression model indicated that physical activity negatively predicted social network addiction ($B = -4.932$, $p = .004$), whereas emotional distress predicted an increase in such addiction ($B = 0.338$, $p < .001$).

It is concluded that physical activity may function as a protective factor against excessive use of social networks. We recommend the design of school programs that integrate recreational physical activity as a strategy to improve emotional well-being and promote a healthy use of digital platforms..

Keywords: Physical activity, mental health, problematic social media use, high school students,

Introduction

Adolescent mental health is a priority area of study, given its critical influence on holistic development and long-term well-being. In the current context, factors such as physical activity levels and social media use are emerging as relevant variables that can positively or negatively impact the emotional stability of young people. This study focuses on a population of secondary school students, with the aim of characterizing their sociodemographic profile and analyzing the interrelationship between mental health (MH), physical activity (PA), and social media use (SM).

In recent years, cases of mental illness in adolescents have increased significantly. Global statistics report an additional 53.2 million cases of depressive disorder (27.6%) and 76.2 million additional cases of anxiety disorders (25.6%), with a higher incidence among young people (Santomauro et al., 2021). According to UNICEF (2019), more than 20% of adolescents worldwide experience some form of mental disorder, with suicide being the second leading cause of death among young people aged 15 to 19. Among the most frequent problems are anxiety, depression, and stress, conditions that affect social functioning and overall well-being (APA, 2018; WHO, 2024).

Various strategies have been proposed to address this situation, and among them regular physical activity stands out for its effectiveness in reducing symptoms related to mental disorders (Franco et al., 2024).

Chong et al. (2023) and Ostanin (2025) highlight its role as an effective and lasting tactic for optimizing metabolic syndrome in adolescents. Along these lines, the WHO (2020) recommends a minimum of 420 minutes of moderate- to vigorous-intensity physical activity per week as an essential self-care and prevention measure. Physical exercise influences neurotransmitter and neuroendocrine systems linked to mood regulation, and is therefore recognized as a protective factor against depression, anxiety, and stress (Katz and Koutsovitiss, 2021; Franco, 2024).

However, according to Espinel et al. (2021), today's student population is more exposed to social media in educational settings as a pedagogical strategy when implementing ICT in the classroom. When examining how social media use is associated with lifestyle in this population, Moreno et al. (2021) found that social media acts as a distraction, replacing physical activity and increasing sedentary behavior. Similarly, Sánchez et al. (2021) confirm that time spent on these platforms could replace essential physical activity, suggesting a reduction in sedentary practices related to the use of these new technologies. Therefore, the WHO (2020) recommends limiting screen time for adolescents. However, the relationship between social media and physical activity... The relationship between social media and mental health (MH) is complex. Some studies acknowledge benefits such as strengthening friendships and social life (Birjaer & Kaats, 2019), while others indicate that problematic use can negatively affect psychological well-being (Boer et al., 2020). This raises the need to consider whether the effects attributed to social media are based on an analysis of the context or on preconceived notions (Klimenko et al., 2024).

Therefore, considering that research suggests problematic social media use can contribute to the abandonment of physical activity (Moreno et al., 2021) and disrupt the mental well-being of students in academic communities, but that exercise-based interventions reduce symptoms of internet addiction and psychological distress (Yan et al., 2025), this study focused on evaluating these variables to analyze the relationship between mental well-being, physical activity, and social media use in secondary school students at a religious school in Medellín, Colombia.

Although the literature offers relevant clues, the magnitude of the impact and the forms of interaction between social media, physical activity, and social networks are not yet fully understood, especially during secondary school, a key period for consolidating healthy habits. Thus, with an integrative perspective, this study seeks to contribute to the understanding of these dynamics, as a basis for designing effective intervention strategies in increasingly digitally mediated school contexts.

Social [media](#) has become a widely used tool among adolescents (Moreno et al., 2021), particularly high school students, who spend long hours on platforms such as Instagram, Facebook, TikTok, and others (Espinel, Hernández, & Prada, 2021). These platforms can have both positive and negative effects on young people's daily lives. On the one hand, social media use can foster social connection, access to information, and the development of digital skills (López & Sánchez, 2019). On the other hand, several studies have also identified that its excessive use is associated with adverse effects such as sedentary behavior and decreased physical activity (Ajila, 2025; Moral et al., 2023), as well as metabolic disorders such as anxiety and depression (Moreira et al., 2021).

This phenomenon can have implications for various aspects of adolescents' overall well-being, especially regarding physical activity habits and metabolic syndrome. While some studies suggest that excessive use of social media could contribute to sedentary behavior, limiting the time available for physical exercise (Moreno et al., 2021), others have indicated that constant exposure to digital content can affect adolescents' metabolic syndrome, promoting symptoms of anxiety, depression, or stress (Linares, 2023; Barón et al., 2021).

Although the relationship between social media use and metabolic syndrome (MS), as well as the effects of sedentary behavior on young people and social media use, has been extensively studied, a gap exists in the literature regarding how these three variables (social media use, physical activity, and MS) interact, especially in a specific school context. It is crucial to analyze how social media use can influence students' physical activity and MS, both positively and negatively, and to assess whether physical activity is negatively impacting overexposure to social media, that is, whether it leads to a decrease in its use. This study aims to explore the relationship between these variables to determine if the level of physical activity and emotional distress have an impact on problematic social media use. The research seeks to offer a comprehensive view of the factors that affect the health and behavior of adolescents in the digital technology environment. In this context, the guiding research question is: To what extent do emotional distress and physical activity contribute to predicting problematic social media use among secondary school students?

Adolescent mental health

Mental health is defined by the Colombian Ministry of Health and Social Protection (2024) as an essential component of integral well-being; relating to contextual, social and cultural factors that enable human development and the realization of life projects both individual and collective.

Currently, mental health among adolescents represents a significant challenge globally. According to UNICEF (2019), more than 20% of adolescents worldwide suffer from some form of mental disorder, and suicide is the second leading cause of death among young people aged 15 to 19.

Among the most common disorders is anxiety, which is defined as an anticipatory response to undefined threats and is considered pathological when its presence is persistent (American Psychological Association). Association, 2018). According to data from the World Health Organization (2024), approximately 4.4% of adolescents between 10 and 14 years of age, and 5.5% of those between 15 and 19 years of age, suffer from an anxiety disorder. In the United States, the lifetime prevalence of this type of disorder reaches approximately 29% (Kessler et al., 2005).

Depression is another highly relevant problem. This diverse condition manifests itself through different combinations of symptoms, levels of severity, and trajectories (Herrman et al., 2022).

It affects social functioning, causes profound suffering, and is linked to physical illness and an increased risk of suicide. According to the WHO (2024), 1.4% of adolescents aged 10 to 14 and 3.2% of those aged 15 to 19 suffer from depression.

Another factor affecting mental health is stress. UNICEF (2023) defines it as a feeling of pressure or overload in response to difficult situations, which can be positive in small doses, but in excess can negatively affect physical and mental well-being. In adolescents, the main sources of stress are related to academic demands and emotional issues (OECD, 2017; Barcelata- Eguiarte and Gómez-Maqueo, 2012). Based on the empirical findings reviewed, it is necessary to delve deeper into the conceptual frameworks that explain the relationship between mental health, physical activity, and social media use in adolescents.

Behavioral activation theory

This theory suggests that physical activity acts as a natural mood regulator, reducing depressive and anxious symptoms by increasing positive experiences and motivation in daily life (Lewinsohn , 1974). From this perspective, physical movement is understood not only as a practice for physical well-being but also as a therapeutic strategy for promoting mental health (Urco et al., 2025; López López , 2024; Tello et al., 2025).

Physical activity in adolescents

The World Health Organization (2024) describes physical activity (PA) as any bodily movement that expends energy. Globally, most adolescents do not get enough physical activity, and this trend is more pronounced among girls. In Latin America, the situation is even more concerning, with nearly nine out of ten adolescents not meeting the minimum recommended levels of physical activity (United Nations, 2019).

Use of social media and teenagers

Regarding the time that adolescents spend online, Villanueva (2018) states that around 32% of adolescents show a high frequency of internet connection (more than five hours a day); and another percentage does so during the night (81.6% between 9 pm and midnight, and 40% from midnight onwards).

The Integrative Model

This model It offers a comprehensive framework for analyzing how health-related behaviors, both physical and psychological, are influenced by a combination of individual, social, and environmental factors (Glanz et al., 2008). In adolescents, it allows for the examination of the interaction between mental health, physical activity, and social media use. From this model, an adolescent facing emotional problems may find in physical activity a way to regulate their mood, while social media use negatively affects self-esteem. This approach highlights the complex interaction between context, emotions, and daily habits, which act as risk or protective factors.

Methodology

This research employs a quantitative approach, using a cross-sectional correlational and explanatory design. Its objective is to analyze the relationship between mental health, physical activity, and social media use among secondary school students in Medellín. The sample was selected non-probabilistically, by convenience sampling, and consisted of 240 students from grades 7 through 11 at

the Icolven Adventist Educational Institution in Medellín, Colombia. Only participants enrolled in secondary school who voluntarily participated and had internet access, either through their mobile devices or the school's computer lab, were included. Students with severe cognitive disabilities or those who did not fully complete the survey were excluded.

Tools

To collect data, a Google Forms questionnaire was used that integrated three validated instruments: the DASS-21, the short version of the IPAQ, and the ARS questionnaire. The DASS-21 assesses symptoms of depression, anxiety, and stress and has been validated in Colombia with high reliability ($\alpha = 0.92\text{--}0.95$) (Ruiz et al., 2017). The IPAQ measures levels of physical activity and was validated in Colombia by Arango et al. (2020), showing acceptable reliability (ICC = 0.655). The ARS questionnaire, which assesses behavioral addiction to social media, was validated by Rosero et al. (2022) and has a Cronbach's alpha of 0.95.

The IPAQ classifies physical activity into three levels: low, moderate, and high, based on the calculation of METs and considering the time spent walking and performing moderate or intense activities.

The DASS-21 consists of 21 items distributed across three subscales: depression, anxiety, and stress. The ARS, on the other hand, assesses three dimensions: obsession, lack of control, and excessive use of social media, using 24 items organized by factor.

In addition, the form included sociodemographic questions (sex, age, grade level, family structure, access to electronic devices) and questions related to sports practice (type of activity, frequency, and duration). Before its final implementation, a pilot test was conducted to verify the instrument's functionality and make any necessary adjustments.

Procedure

Before starting the study, the required institutional permissions were obtained, including the approval of the ethics committee of the Adventist University Corporation in minutes 05-2024. The parents and students signed the informed consents, after having been duly informed about the objectives and conditions of the study.

The data collection took place during the school day thanks to the support of the teaching staff. The questionnaires were administered during class time in an organized and smooth manner. Most students accessed the form through their mobile devices. For those without personal access, especially in grades 7 and 8, the computer lab was made available.

During the study, mental health professionals provided support, creating an ethical, confidential, and respectful environment. Confidentiality of responses and compliance with the ethical principles established by Law 1090 of 2006 and the Habeas Data Law were ensured at all times. The overall objective of the study was to explore the connection between social media, physical activity, and mental health in high school students.

To do this, their habits were characterized, statistical relationship analyses were performed, and different behavioral patterns were compared.

Data analysis

A quantitative analysis was conducted using SPSS-30 software, encompassing a descriptive analysis of sociodemographic variables and key variables such as mental health, physical activity, and

social networks. The necessary statistical assumptions for bivariate and regression analyses were verified, and comparative tests (Student's t-test and ANOVA) were performed to differentiate by sex at birth. The regression model used was the Enter method.

Results

The sociodemographic characteristics of the students participating in the research are presented below.

Table 1.

Sociodemographic data

Variable	Category / Value	Frequency (n)	% Valid	% Cumulative
Middle Ages)	14.5 years	—	—	—
High school level (middle school)	8.91	—	—	—
Age distribution (years)	12	18	7.50%	7.50%
	13	66	27.50%	35.00%
	14	41	17.10%	52.10%
	15	40	16.70%	68.80%
	16	47	19.60%	88.30%
	17	26	10.80%	99.20%
	18	1	0.40%	99.60%
	19	1	0.40%	100.00%
Sex at birth	Man	115	47.90%	47.90%
	Women	125	52.10%	100.00%
Current grade level	Seventh	56	23.30%	23.30%
	Eighth	53	22.10%	45.40%

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			10%	
	Ninth	39	16. 30%	61.70%
	Tenth	43	17. 90%	79.60%
	Eleven	49	20. 40%	100.00%
Family nucleus	Lives with mom and dad	150	62. 50%	62.50%
	Just with Mom	66	27. 50%	90.00%
	Just with Dad	14	5.8 0%	95.80%
	He does not live with his parents	10	4.2 0%	100.00%
Religion	None	22	9.2 0%	9.20%
	Adventist	80	33. 30%	42.50%
	Catholic	49	20. 40%	62.90%
	Evangelical	23	9.6 0%	72.50%
	Other	66	27. 50%	100.00%
Spiritual practice	No	50	20. 80%	20.80%
	Yeah	190	79. 20%	100.00%
Perception of physical activity	Sedentary	8	3.3 0%	3.30%
	Quiet	39	16. 30%	19.60%
	Moderately active	82	34. 20%	53.80%
	Very active	111	46. 30%	100.00%
Preferred	Instagram	120	50.	50.00%

social network			00%	
	TikTok	67	27.90%	77.90%
	X (Twitter)	4	1.70%	79.60%
	Online games	27	11.30%	90.80%
	WhatsApp	22	9.20%	100.00%

Table 2 shows the distribution of students according to their level of physical activity, classified according to the IPAQ criteria as low, moderate, and high.

Table 2.

Distribution of Physical Activity Levels according to the criteria established by the IPAQ

Category	AF level	Frequency	% valid	% cumulative
Category 1	Low level*	31	12.9	12.9
Category 2	Moderate level**	77	32.1	45
Category 3	High level***	132	55	100
	Total	240	100	

* Less than 5 days of moderate activity or walking, with less than 30 min/day. Walking: <495 METs/week. Or <600 METs/week in moderate and/or vigorous activity. ** 3 days of vigorous activity for 25 minutes. 5 or more days of moderate activity and/or walking with at least 30 min/day or a total of 600 METs/week.

*** Vigorous activity with at least 1500 METs/week, or combined with walking and moderate or vigorous activity, reaching at least 3000 METs/week.

The following tables detail the average time (in minutes) and weekly frequency (number of days) that students spend on different sports activities.

Table 3

Trends in student time spent on sports activities

Sports	tennis	swimming	soccer	Basketball	volleyball	gymnastics	table tennis	cycling	gymnastics	karate	table tennis	tennis	quash
average			.01	.51	.32	.2	.09	.4	.93	.24	.21	.2	.05

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e														
s	.16	.58	.18	.61	.70	.46	.98	.37	.8	.72	.6	.38		
	40	40	40	40	40	40	40	40	40	40	40	40	40	40

Header: Time spent on this activity/sport in minutes / **SD**: Standard deviation.

Table 4.

Trend of students by number of days dedicated to sports activities

port s	un	wim min g	oc cer	aske tball	oll ey ball	ym	all et	ycli ng	ym	kat ing	able tenni s	en nis	qua sh
vera ge	.52	.29	.07	.48	.51	.19	.13	.33	.23	.04	.17	.21	.12
s	.83	.71	.75	.20	.81	.78	.64	.90	.84	.68	.67	.81	.66
	40	40	40	40	40	40	40	40	40	40	40	40	40

Header: Days spent on this activity/sport / **SD** : Standard deviation.

Use of social media

Table 5 presents the distribution of students according to their total level of addiction to social networks, calculated from the sum of the three factors evaluated by the ARS instrument.

Table 5.

Distribution of students by level of addiction to social networks in the total sum of the ARS categories.

ARS Category	Frequen cy	% valid	% cumulative
Low	91	37.9	37.9
Moderate	102	42.5	80.4
High	40	16.7	97.1
Very high	7	2.9	100
Total	240	100	

ARS: Social Media Addiction

The levels obtained in each of the three factors of the ARS questionnaire are detailed below:

obsession, lack of control, and excessive use.

Table 6.

Factors of Social Media Addiction (SMA)

Category	Obsession (f1)	% f1	Lack control (f2)	% f2	Use excessive (f3)	% f3
Low	63	26.30%	60	25.00%	22	9.20%
Moderate	65	27.10%	69	28.80%	31	12.90%
High	48	20.00%	58	24.20%	42	17.50%
Very high	64	26.70%	53	22.10%	145	60.40%
Total	240	100%	240	100%	240	100%

Note: F1: Factor 1, F2: Factor 2, F3: Factor 3 of the Social Media Addiction questionnaire.

Behaviors related to social networks

This research found that the majority of students access social media from their cell phones (87.2%) and from home (61.2%). Access from school (7.4%) and internet cafes (3.7%) is minimal. In contrast, 92.6% do not use internet cafes and 96.3% do not access social media from school. Among the motivations for using social networks, it was found that the majority of students use social networks mainly for entertainment (52.1%) and to socialize (17.4%).

Other motivations such as getting informed or educating oneself are very underrepresented. The Students connect between 7 and 12 times a day, and 10.8% remain connected almost all the time, indicating a pattern of intensive and constant use (see Figure 1)

Figure 1 – Daily frequency of use

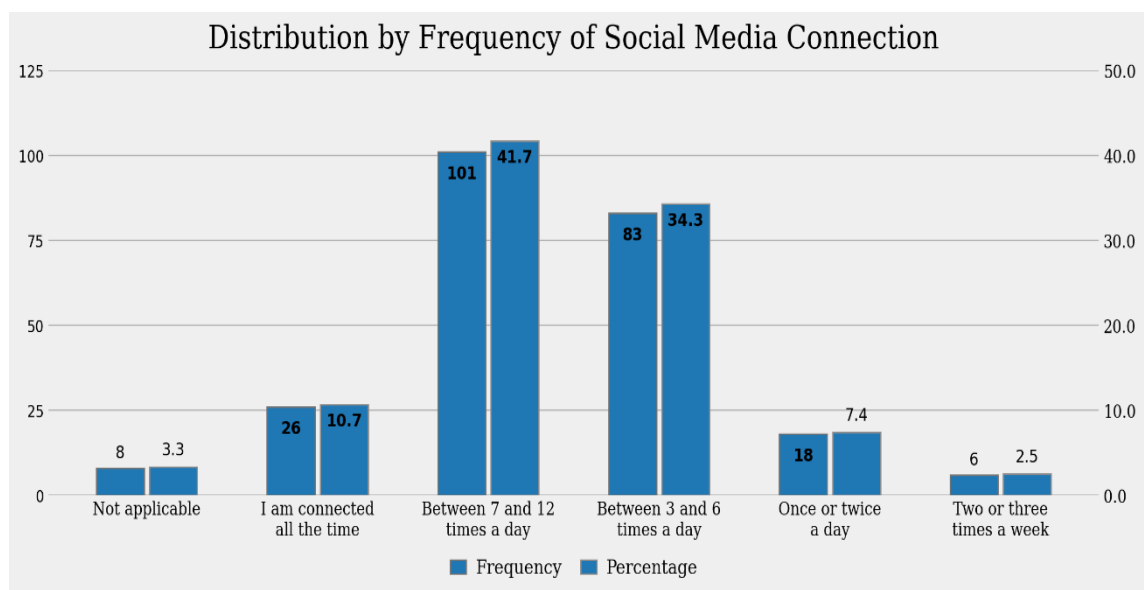


Table 7 shows the levels of anxiety, depression, and stress in the participating population sample.

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Student mental health

Level	A nxiety	% anxiety	D epressi on	% depressio n	tress	% stress
No symptoms	8 3	34 .60%	9 6	40. 00%	02	4 2.50%
Mild	3 2	13 .30%	2 8	11. 70%	5	1 0.40%
Moderate	3 1	12 .90%	5 1	21. 30%	0	2 0.80%
Severe	2 9	12 .10%	3 1	12. 90%	6	1 9.20%
Extremely severe	6 5	27 .10%	3 4	14. 20%	7	7 .10%
Total	2 40	10 0%	2 40	10 0%	40	1 00%

The following presents the correlation matrix between the main variables of the study, evaluated using the scores obtained in the ARS (social media addiction), IPAQ (physical activity) and DASS-21 (mental health) questionnaires.

Table 8

Correlation between variables through questionnaire scores.

Variables	Rho	P
Ars – ipaq	-,207**	,001
Ars – ipaq walk	-,139*	,031
Moderate IPAQ – DASS	-,200**	,002
Ipaq moderate anxiety	-,158*	,014
Moderate IPAQ – Depression	,150*	,020
Moderate IPAQ – Stress	,146*	,023
Dass – ars t	,284**	,000
Anxiety – factor 1 ars	,215**	,001
Anxiety – factor 3 ars	,252**	,000
Anxiety – factor 2 ars	,173**	,007
Depression – factor 1 ars	,276**	,000
Depression – factor 3 ars	,313**	,000
Depression – factor 2 ars	,238**	,000
Stress – factor 1 ars	,203**	,002
Stress – factor 3 ars	,238**	,000
Stress – factor 2 ars	,147*	,023

Note: Rho = Spearman's correlation coefficient. P = significance level. Only significant values are reported, $p < .05$ (*); $p < .01$ (**).

In Table 8, it is interesting to note that physical activity (PA) is negatively correlated with social media use (SMU) ($\rho = -0.207$, $p = 0.001$). This suggests that as the level of physical activity increases, the tendency toward digital addiction decreases. More specifically, time spent walking is also associated with a slight reduction in social media use ($\rho = -0.139$, $p = 0.031$).

On the other hand, higher scores on social media addiction factors, such as obsession, excessive use, and lack of control, are significantly associated with higher levels of anxiety, depression, and stress. For example, depression is correlated with all three ARS factors: obsession ($\rho = .276$), excessive use ($\rho = .313$), and lack of control ($\rho = .238$), all with $p < .001$.

Stress also shows significant relationships with all three addiction factors, although these are somewhat weaker. Taken together, these correlations suggest that emotional distress could be a risk factor for problematic social media use, while physical activity could act as a protective factor.

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Table 9

t-tests (group comparison)

Variable	Men (<i>m</i> ± <i>de</i>)	Women (<i>m</i> ± <i>de</i>)	<i>T</i> (<i>gl</i>)	<i>P</i>	<i>D</i> ifference of stocki ngs	<i>Ic</i> 9 5% of the differen ce
DAS (depression, anxiety, and stress)	17.97 ± 12.66	26.88 ± 15.15	- 4.93 (23 8)	< , 001	- 8.91	[- 12,48, - 5.35]
Depress ion	7.25 ± 5.88	6.96 ± 5.36	0.4 0 (238)	, 689	0 .29	[- 1.14, 1.72]
Anxiety	6.66 ± 5.27	6.32 ± 5.07	0.5 0 (23 8)	, 619	0 .33	[- 0.98, 1. 65]
Stress	9.04 ± 5.17	8.63 ± 5.49	0.6 0 (238)	, 549	0 .41	[- 0.94, 1.77]
ARS total	31.38 ± 19.09	34.88 ± 17.92	- 1.47 (23 8)	, 144	- 3.50	[- 8,21, 1. 21]
Factor 1: obsession	10.38 ± 7.77	11.44 ± 8.59	- 1.00 (238)	, 320	- 1.06	[- 3.14, 1.03]
Factor 2: lack of control	9.01 ± 5.21	8.42 ± 5.40	0.8 6 (23 8)	, 391	0 .59	[- 0.76,000]. 1, 94]
Factor 3: excessive use	14.01 ± 6.71	13.44 ± 7.30	0.6 3 (238)	, 528	0 .57	[- 1.21, 2.36]
IPAQ: to walk	1230.81 ±	768.31 ± 842.57	3.5 4	< ,	4 62.50	[2 05.02,

	1146.64		(21 0.34)	.001		7 19.98]
<i>IPAQ: moderate</i>	966.72 ± 1139.72	562.58 ± 932.50	3.0 0 (222.54)	, 003	4 04.14	[1 38.21, 670.08]
<i>IPAQ: vigorous</i>	2611.03 ± 2709.52	1426.45 ± 1670.47	4.0 4 (18 8.98)	< , 001	1 184.58	[6 06.80, 1 762.36]
<i>IPAQ</i>	4808.57 ± 3839.98	2757.35 ± 2594.68	4.8 2 (200.09)	< ,001	2 051.23	[1 211.36, 2891.10]

As shown in Table 9, an independent samples t-test was performed comparing the groups of women and men. Regarding emotional distress, a statistically significant difference was found between men and women in the emotional distress variable. No significant differences were found between men and women for the individual dimensions of depression, anxiety, and stress. No significant differences were found for the Social Media Addiction scores, either in the total score or in the individual factors.

For the physical activity variable, significant differences were found between the two groups, where men obtained higher scores for physical activity in the walking, moderate and high physical activity dimensions and in the total scores.

Linear regression

A simple linear regression was performed to predict social media addiction (SMA) from mental health symptoms (DASS) and weekly physical activity level (IPAQ Total), using the Enter method. Both predictors were significant, especially DASS ($p < .001$).

The six assumptions of the model were verified: the errors were independent (Durbin-Watson = 2.016), there was homoscedasticity, and no anomalous patterns were observed in the residual dispersion. Although the Kolmogorov-Smirnov test showed significant deviations from normality, the QQ plots and the histogram revealed an acceptable residual distribution.

The relationship between ARS and IPAQ was linear, while with DASS it was not clearly observed in the graphs, although its inclusion significantly improved the model's R^2 . Furthermore, multicollinearity issues were ruled out (VIF = 1.005; Tolerance = .995).

Two outliers ($ZRESID > \pm 3$) were identified, which, although they had a low influence (Cook's distance $< .05$), were excluded due to their effect on the model fit. After their removal, the model showed an increase in its explanatory power.

The multiple linear regression model was significant ($F(2, 237) = 14.707, p < .001$), explaining 11% of the variance in the dependent variable (ARS). The model showed a stable fit (adjusted $R^2 = 0.103$). Although the percentage of variance explained is modest, the DASS and IPAQ predictors provide significant information to explain the outcome variable. The coefficient of determination was $R^2 = 0.110$, which means that the model explains 11% of the variance in total ARS. While this is a modest value, it

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is statistically significant, justifying the inclusion of both predictors in the model (see Table 10).

Table 10

Ipaq and DASS model predicting ARS .

R	R square	R adjusted square	Mistake standard of estimation	Sign. Change in f
,332	,110	,103	17,560	0.000

In the linear regression model, both predictors proved to be statistically significant in explaining social media addiction. Physical activity, measured using the IPAQ, showed a significant negative association ($B = -4.932$, $p = .004$). This means that for every point increase in physical activity, the addiction score decreases by approximately 4.93 units, taking into account the effect of psychological distress. On the other hand, the DASS showed a significant positive relationship ($B = 0.338$, $p < .001$), suggesting that greater emotional distress is associated with a higher social media addiction score. These findings reinforce the idea that physical activity acts as a protective factor, while psychological distress acts as a risk factor (see Table 11).

Table 11.

Model explanatory coefficients

Model	Coefficients non-standardized	Coefficients standardized	t	Sig.	Statistics of collinearity	
					Tolerance	VIF
(constant)	4,7580	4,714	,973	.000		
Ipaq	-4,932	-0,180	-2,926	.004	0,995	1,005
Dass	0,338	0,267	3,355	.000	0,995	1,005

Note: Dependent variable: Social media addiction (ARS).

Discussion

The multiple linear regression model revealed that both physical activity (PA) and mood (MS) levels are key predictors of problematic social media use in adolescents. Specifically, it was observed that as reported PA levels increased, the social media distress score decreased ($B = -4.93$, $p = .004$). Conversely, higher levels of mood distress were associated with increased MS scores ($B = 0.34$, $p < .001$). Although the model explained only 11% of the variance ($R^2 = .110$), these findings are statistically significant ($p < .001$) and support the idea that physical activity may act as a protective factor, while emotional distress presents a risk factor in the face of digital hyperconnectivity (Yang et al., 2021).

When analyzing the relationship between social media use and physical activity, it was observed that students with a greater tendency to be physically active exhibited lower levels of dependence on or problematic use of social media ($r = -0.207$, $p = 0.001$). In fact, authors such as Moreno et al. (2021) state that social media is widely used by children and adolescents, but that continued use can contribute to excessive use, potentially influencing sedentary behavior, a significant public health problem. However, other studies have found that the use of these platforms increases the likelihood of meeting the WHO's recommended levels of physical activity (Morningstar et al., 2023), a phenomenon that may be due to "a positive feedback loop when sharing related news or images on social media" (Shimoga et al., 2019, p. 6). Therefore, it is necessary to investigate the motivations and influences of social media in future research. SS on the regular maintenance of physical activity.

This research examined the most popular social media platforms among the surveyed students, finding that Instagram was the most frequently used (50%), followed by TikTok (27.9%). Similarly, Marín and González (2024), in a study conducted with a similar sample, found a greater preference for TikTok (80.0%), followed by Instagram (60.0%) and Facebook (43.3%). Despite the discrepancies in usage percentages between the two studies, the results coincide on the general trend toward digital platforms focused on visual and easily consumed content, such as Instagram and TikTok.

In this context, rather than an equality in the intensity of use, the findings indicate a common trend in the direction of youth digital consumption in Latin American scenarios such as Colombia and Venezuela, revealing quite similar digital socialization processes, with differences attributable to contextual, cultural and temporal factors.

The results show a positive, albeit weak, correlation between moderate-intensity physical activity and higher levels of depression ($r = .150$; $p = 0.02$), which challenges the notion of physical activity as a homogeneous protective factor for mental health. This finding suggests that the psychological effects of physical activity may depend on the context and conditions in which it is performed, especially when associated with external demands or performance pressures. Along these lines, studies such as that by Poucher et al. (2021) have documented a high prevalence of depressive and anxious symptoms in athletes, supporting the need to consider the intensity and competitive nature of physical activity as potential psychological risk factors.

Significant differences were found in overall emotional distress (total DASS-21 score), with women scoring higher than men ($p < .001$), indicating higher levels of reported emotional distress in this group. This finding is consistent with international literature, which has documented a higher prevalence of emotional health problems in women, as well as lower levels of physical activity, which could constitute an additional risk factor (Biddle et al., 2019). However, when the dimensions of anxiety, depression, and stress were analyzed independently, no statistically significant differences were observed by sex.

On the other hand, men reported significantly higher levels of physical activity in all categories assessed by the IPAQ, which could be related to lower levels of general emotional distress, although this does not imply a direct causal relationship. Finally, no significant differences were found between men and women in problematic social media use (RSU), suggesting that both sexes may be experiencing a similar impact from these platforms (Marino et al., 2018), although potentially with different motivations and usage patterns.

Limitations:

The sample was non-probabilistic and based on convenience sampling, which limits the generalizability of the results. Furthermore, the use of self-report instruments as a data collection technique could introduce social desirability bias. It is recommended that future research include larger and more diverse samples, as well as longitudinal designs that allow for a more in-depth analysis of the variables studied.

Practical applications

This research provides a theoretical basis for justifying the implementation of educational programs that consider moderate physical exercise as a protective factor. Psychoeducational workshops on the importance of healthy lifestyle habits as regulators of digital misuse can also be implemented. This study also serves as a foundation for developing public policies in the educational field that integrate physical exercise, mental health programs, and the moderate use of technology.

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