

Article

Relationships Between Problematic Internet Use, Physical Activity, and Mental Health in University Students

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Abstract

This study examined associations between problematic Internet use, video game addiction, physical activity, perceived physical fitness, and psychological distress in pre-service teachers. A cross-sectional survey was completed by 404 education students from the University of La Laguna using validated measures (CERI, Vela Test, IPAQ-short, IFIS, GHQ-28). Descriptive, correlational, group-comparison, and binary logistic regression analyses were conducted. The prevalence of video game addiction was low (4%), and problematic Internet use was rare (1%), although 25.3% showed moderate-risk Internet use. Within the small group of students with video game addiction, male students showed relatively higher risk scores; however, this was not significantly associated with physical or emotional well-being. Problematic Internet use was positively associated with psychological distress ($r = 0.267$, $p < 0.001$) and poorer physical health indicators. Perceived physical fitness was inversely associated with distress ($r = -0.248$, $p < 0.001$) and, together with problematic Internet use, emerged as the strongest predictors with clinically relevant distress ($\text{GHQ} \geq 13$) in the logistic model. A focus group ($n = 4$) provided exploratory qualitative insights into participants' perceptions of digital behaviours, particularly regarding perceived loss of control and its potential associations with academic, physical, and emotional well-being.

Keywords: physical activity; problematic internet use; psychological distress; self-perception; teacher training; university students



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1. Introduction

Young university students spend much of their daily lives in digital environments, where technology shapes the way they communicate, learn, and interact (Backer & Awad, 2025; Grasso Imig, 2020; Marín-Díaz et al., 2019; Valerio & Serna, 2018). They are digital natives, highly tech-savvy and intensive users of social media and digital platforms. They particularly engage with short, highly reinforcing content, such as TikTok, Instagram Reels, and certain online video games, which have become central components of leisure, communication, and emotional regulation (Caro-Castaño, 2022; Da Silva, 2021; Del Moral Pérez et al., 2021; Fernández-García et al., 2025; Martínez-Murciano & Pérez-Jorge, 2025; Montero Corrales, 2025). Increased screen time has also been associated with addiction to digital content, particularly short-form videos. Their immersive and highly stimulating nature

may reinforce repetitive consumption patterns and contribute to psychological distress (Liu et al., 2025). Similarly, Backer and Awad (2025) found that extensive social media engagement among university students is associated with both high perceived gratifications and notable risks, including negative correlations with satisfaction and attention to broader issues.

These platforms are designed to maximise attention and time spent on them through cycles of immediate gratification (likes, comments, new stimuli) that encourage intensive use and make it difficult to disconnect. However, this does not necessarily reach the level of formal addiction (Yang et al., 2025; Wu et al., 2024; Zhou et al., 2023). Excessive use of platforms such as Facebook has been associated with significant negative consequences for the mental health of college students, including increased anxiety and procrastination. These effects can influence their academic performance and overall well-being (Backer & Awad, 2025; Liu et al., 2025; Mohamed et al., 2025). The participants reported that compulsive use of social media and short videos affects their concentration and study habits. These findings can be interpreted through the lens of Self-Determination Theory (Deci & Ryan, 1985), highlighting how disruptions in intrinsic motivation and behavioural regulation contribute to problematic technology use.

From the perspective of digital well-being, this is conceived as a dynamic balance between connection and disconnection influenced by personal and platform-related factors. When this balance is disrupted, stress, anxiety, exhaustion, and emotional dysregulation can arise (Hendrikse & Limniou, 2024; Vanden Abeele, 2021; Wu et al., 2024).

Problematic Internet use is now understood more as a continuum than as a dichotomy between addiction and healthy use, ranging from casual users to individuals whose patterns clearly interfere with their daily, social, and academic lives (Stangl et al., 2023; Zahra et al., 2020).

Although these constructs are related, it is important to distinguish between them conceptually. Problematic Internet use refers to a generalised pattern of dysregulated online behaviour that interferes with daily functioning, without necessarily meeting criteria for clinical addiction. In contrast, video game addiction represents a more specific behavioural pattern associated with gaming activities and is typically defined using more restrictive diagnostic criteria.

Social media use, while often included within problematic Internet use, refers to platform-specific engagement patterns that may have distinct psychological and behavioural implications. In this study, the concept of digital compulsivity is used as a broader interpretive framework to describe the subjective experience of loss of control or urgency in digital use, even in the absence of clinically significant addiction.

On this continuum, subjective compulsivity refers to the experience of urgency or lack of control when using digital platforms, even without meeting criteria for behavioural addiction. This can be observed in patterns of TikTok or Instagram Reels use, where the behaviour persists despite anxiety, worsening sleep, or fear of missing out (FoMO) (Gong et al., 2025; Y. Li & Liu, 2025; T. Li et al., 2025; Wu et al., 2024).

According to Flow Theory (Csikszentmihalyi, 1990), individuals can become fully absorbed in activities that match their skills and provide immediate feedback. This helps explain how short-form video flow experiences, together with FoMO, contribute to problematic use, highlighting the emotional and motivational mechanisms that sustain engagement (Türk-Kurtça, 2026).

In neuropsychological terms, interactions on social media activate dopaminergic reward systems (“social dopamine”), reinforcing behaviour and generating cycles of continuous search for immediate gratification (Hari, 2022; Lembke, 2021; T. Li et al., 2025).

Constant social comparison on social media and online video games also plays a key role in emotional regulation. Exposure to idealised lives has been linked to envy, anxiety, low self-esteem, and decreased well-being (Fernández-García et al., 2025; Lee, 2022; Y. Li & Liu, 2025; Vanden Abeele, 2021; Zhao, 2021). In this regard, Virós-Martín et al. (2025) observed that young female users of Instagram and TikTok perceived a more negative impact on their psychological well-being than boys, possibly due to more intense platform use, pressure related to personal image, and dependence on external validation. Hendrikse and Limniou (2024) found that TikTok use is associated with increased problematic use, depression, and lower self-esteem.

The overload of visual, auditory, and social stimuli leads to cognitive fatigue and attentional exhaustion (Hendrikse & Limniou, 2024). This saturation can interfere with concentration and academic performance (Gong et al., 2025) and contribute to digital fatigue (Martínez-Murciano & Pérez-Jorge, 2025; Shen, 2025; Vanden Abeele, 2021; Wu et al., 2024; Yang et al., 2025). Mark (2023) highlighted that this fatigue is related to temporal fragmentation, a phenomenon arising from constant exposure to brief stimuli, which generates a continuous cycle of distraction that impairs emotional well-being, productivity, and academic performance.

The use of video games and social media has both positive and negative effects. It can promote entertainment, socialization, and cognitive development when used in moderation (Zahra et al., 2020), but its abuse has been associated with sedentary lifestyles, sleep disturbances, emotional problems, and addiction (M. Griffiths, 2000; M. D. Griffiths, 2008).

In terms of gender, men tend to use these platforms more than women for watching videos and playing video games, which is associated with adverse social effects and a less favourable assessment. Women, on the other hand, use social media primarily for communication, showing more positive perceptions than men, although no differences are observed in their academic performance or socio-emotional development (Victoria Maldonado et al., 2025). Among teacher trainees, spending more than five hours a day on social media and video games has been linked to lower concentration, poorer academic performance, and difficulties in social interaction (Victoria Maldonado et al., 2025).

Other studies show the relationship between excessive use of social media, poorer academic performance, and difficulties in time management (Grasso Imig, 2020) as well as learning strategies (Alhusban et al., 2022; Azizi et al., 2019; Mou et al., 2024; Pellegrino et al., 2022; Shen, 2025). Its association with anxiety, depression, low self-esteem, and fear of exclusion has also been described (García del Castillo et al., 2019; Mou et al., 2024; Valerio & Serna, 2018; Varchetta et al., 2020; Wu et al., 2024; Zhao, 2021; Zhou et al., 2023).

These findings highlight the importance of examining digital behaviours and the subjective experience of lack of control, even when the prevalence of clinical addiction is low. In addition, psychosocial resources may buffer these effects. For instance, Cai et al. (2026) found that social media addiction was associated with mental health problems among college students. Perceived social support and resilience acted as mediating factors. This is consistent with the theoretical frameworks of Cohen and Wills (1985) on the buffering effect of social support and Luthar et al. (2000) on resilience as a protective factor against psychological distress.

1.1. Mental Health, Physical Activity, and Lifestyles Among University Students

The literature points to a high prevalence of anxiety, academic stress, and depression among university students, intensified by the educational and social demands of this stage (Auerbach et al., 2018; Beroíza-Valenzuela, 2024; Martínez-Líbano et al., 2023; Silveira de Resende et al., 2025). There is strong evidence that physical activity and perceived physical fitness act as modest protective factors against psychological distress, improving

self-efficacy, physical well-being, and emotional stability (Brand et al., 2024; Byrne & Kim, 2019; Six et al., 2022).

A sedentary lifestyle, often associated with intensive use of social media and screen time, has been linked to poorer mental health, increased anxiety, and depressive symptoms (Fernández-García et al., 2025; Paul & Headley-Johnson, 2025). Prolonged screen time displaces physical activity and face-to-face interaction, increasing isolation. In contrast, students who comply with integrated recommendations for movement, sleep, and screen time (24-HGM) have fewer anxiety and depressive symptoms, underscoring the importance of promoting exercise, good sleep hygiene, and limits on screen use in the university context (Alhusban et al., 2022; Azizi et al., 2019; Luo et al., 2025; Martínez-Murciano & Pérez-Jorge, 2025; Vanden Abeele, 2021; WHO, 2022; Yáñez Martínez & Medina Gallego, 2021).

Intensive use of social media platforms such as Instagram and TikTok has been associated with increased stress, anxiety, body image concerns, poorer sleep quality, and reduced time for exercise (Hendrikse & Limniou, 2024; Virós-Martín et al., 2025). However, some technologies, such as exergames or active video games, show potential to transform some screen time into physical activity, helping to reduce depression, improve physical health, and enhance cognitive abilities when used in a regulated manner (Byrne & Kim, 2019; Lawrence et al., 2022; Pérez-Jorge et al., 2024; Six et al., 2022; Yáñez Martínez & Medina Gallego, 2021; Xu et al., 2021).

1.2. Digital and Physical Well-Being in Initial Teacher Training

In initial teacher training, digital and physical well-being takes on special relevance, as these students prepare to accompany future generations in their academic and personal development (Auerbach et al., 2018; Victoria Maldonado et al., 2025). Future teachers must not only protect their own social-emotional and educational well-being but also guide students in the balanced use of technology.

Teachers act as role models regarding information, digital, and lifestyle habits (Audiolís Formación, 2023; Casas-Puente & Gutiérrez-Leyton, 2025; Jomezai et al., 2021). Their patterns of digital consumption, emotional regulation, and physical activity influence the way they accompany students' use of technology and the culture of well-being they promote in the classroom (Fernández-García et al., 2025; Paul & Headley-Johnson, 2025).

Therefore, the digital literacy of future teachers must go beyond technical and pedagogical mastery of tools; it must include online time management, prevention of problematic uses, critical thinking about social media, and promotion of active and healthy lifestyles (Maisuroh et al., 2024). Despite the increase in studies on technology, mental health, and academic performance (Auerbach et al., 2018; Azizi et al., 2019; Paul & Headley-Johnson, 2025; Wu et al., 2024), there is still a lack of research that integrates digital well-being, physical activity, perceived physical condition, and psychological distress in education students. This integrative perspective justifies the present study, which focuses on jointly analyzing digital behaviours, physical health, and mental health in teacher trainees.

Although prior studies have examined problematic Internet use, physical activity, and mental health among university students, these factors have often been analysed in isolation or within limited combinations. Few studies have adopted an integrative approach that simultaneously considers digital behaviours, physical health indicators, and psychological distress within a single analytical framework.

Moreover, research specifically focused on pre-service teachers remains scarce, despite the relevance of this population. Future teachers not only experience the effects of digital environments on their own well-being but also play a key role in shaping students' digital habits, emotional regulation, and health-related behaviours.

In this context, the present study contributes to the literature in two main ways. First, it provides a comprehensive analysis of the interrelationships among several key variables, including problematic Internet use, video game addiction, physical activity, perceived physical fitness, and psychological distress. Second, by adopting a mixed-methods design, it integrates quantitative findings with qualitative insights into students' subjective experiences of digital use, offering a more nuanced understanding of digital dysregulation and its impact on well-being.

Given that future teachers explicitly and implicitly convey patterns of digital use, lifestyle habits, and strategies for emotional self-regulation, it is essential to examine their own well-being. Dysregulated behaviours, such as problematic Internet use, digital compulsivity, or low levels of physical activity, can affect their mental health. They may also become behavioural models that students tend to imitate. This study uses a mixed-methods approach to examine the prevalence and interrelationships of digital behaviours, physical activity, and perceived physical condition. It also analyses their predictive capacity regarding psychological distress.

Taken together, these theoretical perspectives provide an integrated framework for understanding how digital behaviours, motivational processes, and psychosocial factors interact to influence psychological well-being in university students.

This mixed-methods study analysed future teachers' perceptions of their digital technology use. The sample included students from Early Childhood Education, Primary Education, Pedagogy, and Physical Activity and Sports Sciences (CAFD) programs, all from similar populations. In addition, the relationship between these habits and students' physical activity was examined, as well as the impact of physical activity on psychological well-being.

1.3. Objectives

The purpose of this study was to comprehensively analyse the interaction between various digital behaviours, in particular, video game addiction and problematic Internet use, levels of physical activity, perceived physical condition, and psychological distress among university students enrolled in education degrees at the University of La Laguna. The methodological design combined descriptive, correlational, comparative, and predictive analyses, enabling us to examine the magnitude of each variable and its relationships in the context of initial teacher training.

1.3.1. General Objective

To jointly examine how risky digital behaviours, physical activity habits, and self-perception of physical condition are related to the mental health of future teachers, and to identify the factors that contribute to psychological distress in the university context.

1.3.2. Specific Objectives

1. To describe the prevalence of problematic Internet use, video game addiction, physical activity levels, perceived physical fitness, and psychological distress among pre-service teachers.
2. To examine the relationships between digital behaviours (problematic Internet use and video game addiction) and psychological distress, as well as their associations with indicators of physical health (physical activity and perceived physical fitness).
3. To analyse the protective role of physical activity and perceived physical fitness in relation to psychological distress.
4. To explore differences in digital behaviours, physical health, and mental health according to gender and academic program.

5. To estimate an explanatory model using logistic regression to identify which variables are most strongly associated with the likelihood of clinically relevant psychological distress.

2. Materials and Methods

The study adopted a predominantly quantitative, cross-sectional design complemented by an exploratory qualitative component. The quantitative phase constituted the core of the study, while the qualitative phase was included to provide contextual and interpretive insights into students' experiences.

The quantitative component followed a non-experimental, correlational design, suitable for estimating the prevalence of the variables analysed and examining relationships between digital behaviours, physical activity, perceived physical condition, and psychological distress, without establishing causal relationships.

Given the small size of the qualitative sample, this component was designed as exploratory and should be interpreted as complementary to the quantitative findings rather than as a fully developed qualitative analysis. To delve deeper into the patterns identified, an exploratory focus group was incorporated into the quantitative phase, allowing exploration of students' experiences and perceptions of technology use and their well-being, providing useful contextual information for interpreting the quantitative findings.

This mixed approach provides a more comprehensive and integrative understanding of the phenomenon under study, combining the descriptive and analytical strengths of quantitative analysis with the interpretive richness of qualitative data.

2.1. Sample

The quantitative sample consisted of 404 students enrolled in education degrees at the University of La Laguna: 315 women (78%) and 89 men (22%), with a mean age of 20.76 years ($SD = 3.16$; range: 18–49). By degree program, 39.4% were studying Early Childhood Education ($n = 159$), 31.2% were studying Primary Education ($n = 126$), 21.8% were studying Pedagogy ($n = 88$), and 7.7% were studying CAFD ($n = 31$), which constituted diverse educational profiles among the trainee teachers. The questionnaire was administered to all students who voluntarily agreed to participate during class time.

For the qualitative phase, a focus group was held with four students, one from each degree program: a preschool education student with high exposure to social media; a primary education student who is a frequent video game user; a pedagogy student interested in the educational use of technology; and a CAFD student with an active lifestyle. This intentional composition allowed complementary insights into digital use, healthy habits, and well-being and represented different profiles of teacher trainees, consistent with the study's objectives.

2.2. Instruments

Data collection was conducted using a structured questionnaire that included sociodemographic variables (age, gender, and educational qualifications) and validated psychometric scales to assess risky digital behaviours, physical activity, perceived physical condition, and mental health.

Video game addiction was measured using the Vela Test (2020), consisting of nine items that assess compulsion, withdrawal, gaming priority, and negative consequences. The score ranges from 0 to 20, and a value ≥ 12 is considered indicative of addiction.

Problematic use of the Internet and social media was assessed using the Internet-Related Experiences Questionnaire (CERI), consisting of 10 items on a Likert scale. It allows participants to be classified as non-problematic users (≤ 20 points), at moderate

risk (21–29), or with problematic use (≥ 30), a classification used in correlational and comparative analyses.

Although the IPAQ distinguishes among three levels of physical activity (low, moderate, high), in this study it was recoded into two categories (low vs. moderate/high) following WHO recommendations to identify whether participants meet minimum health-related activity levels. This recoding facilitates interpretation from a public health perspective by distinguishing between students who meet versus do not meet recommended activity thresholds.

However, this approach may reduce variability and limit the sensitivity of the analyses, particularly in detecting differences between moderate and high levels of activity. This decision was considered appropriate given the study's focus on identifying risk and protective profiles in relation to psychological distress, although the findings related to physical activity should be interpreted with this limitation in mind.

Perceived physical fitness was assessed using the International Fitness Scale (IFIS), comprising 5 items that measure perceptions of overall physical fitness and specific abilities (strength, endurance, speed, and flexibility). The score corresponding to the lowest quartile (≤ 16) was used as an indicator of low physical fitness.

Mental health was measured using the Goldberg General Health Questionnaire-28 (GHQ-28), which assesses psychological distress using 28 items scored on a 0-0-1-1 scale. The total score (0–28) enabled identification of cases with possible clinically relevant distress using a cutoff of ≥ 13 . Learning strategies were assessed through a self-reported measure included in the questionnaire, focusing on students' perceived organization, planning, and study management. This variable was not derived from a standardised or validated scale but was used as an exploratory indicator of self-regulation in academic contexts. Responses were analysed to examine potential associations with digital behaviours, physical activity, and psychological distress.

These instruments assess related but conceptually distinct digital behaviours. Problematic Internet use captures generalised patterns of dysregulated online engagement, while video game addiction focuses on a specific behavioural domain. Social media use is considered as part of broader Internet use but is interpreted separately in the discussion due to its unique characteristics. The concept of digital compulsivity is not directly measured but is used as an interpretive construct to describe participants' subjective experiences of loss of control.

In addition, a single focus group was incorporated as a qualitative component of the design. The session was conducted with volunteer students, audio recorded with informed consent, and transcribed verbatim for thematic analysis. This phase enabled in-depth exploration of experiences, perceptions, and meanings regarding the use of digital technologies and their impact on physical and psychological well-being, thereby complementing the quantitative data.

Together, standardised scales and qualitative techniques provided a comprehensive characterization of the participating students, including their behaviours, physical and mental health, and subjective perceptions of digital use.

Internal consistency was assessed for the scales used in this study. Cronbach's alpha coefficients were as follows: CERI ($\alpha \approx 0.82$), Vela Test ($\alpha \approx 0.78$), IFIS ($\alpha \approx 0.80$), and GHQ-28 ($\alpha \approx 0.90$), indicating acceptable to good reliability in this sample.

2.3. Procedure

The study was approved by the Ethics Committee of the University of La Laguna and complied with the principles of confidentiality, voluntariness, and data protection in accordance with current regulations on research involving human subjects. Following

authorization, the questionnaire was administered in digital format via a link distributed in classrooms and on institutional platforms aimed at participating students. Teachers collaborated in its distribution during academic hours, which contributed to a high response rate. Completion was voluntary, anonymous, and unpaid, with an estimated duration of 15–20 min and was carried out after reading and accepting an informed consent form detailing the objectives of the study, confidentiality guarantees, and the exclusive academic use of the data.

Once the quantitative phase was complete, a focus group was held as the qualitative phase of the mixed design to explore the students' experiences and perceptions of the dimensions evaluated: use of video games and the Internet, physical activity, perceived physical condition, and psychological well-being. To ensure academic representation, one student was selected from each participating degree program. This strategy allowed us to collect and compare different perspectives on the digital and healthy habits of future teachers.

The focus group was conducted in a single session, facilitated by the research team, using a thematic guide of open-ended and semi-structured questions aligned with the questionnaire variables. The open-ended questions, which grew progressively more in-depth, encouraged interaction and spontaneous expression. The session was audio-recorded with prior informed consent, then transcribed verbatim, anonymised, and prepared for thematic analysis.

Given the small size of the qualitative sample, the analysis was designed to be exploratory and illustrative, focusing on identifying recurrent themes that support and contextualise the quantitative findings rather than providing an in-depth qualitative exploration.

2.4. Statistical Analysis

Quantitative data were analysed using descriptive and inferential statistics. Descriptive statistics (means, standard deviations, and frequencies) were calculated to summarise the characteristics of the sample and the main study variables.

Bivariate relationships between continuous variables were examined using correlation analysis. Associations between categorical variables were analysed using chi-square (χ^2) tests, and effect sizes were estimated using the contingency coefficient (C) or epsilon squared (ϵ^2) when appropriate. Differences between groups were assessed using the Mann–Whitney U test when comparing two independent groups, with the rank-biserial correlation (Rrb) reported as an effect size.

To identify factors associated with psychological distress ($\text{GHQ-28} \geq 13$), a binary logistic regression analysis was conducted including video game addiction, problematic Internet use (CERI), perceived physical condition (IFIS), and physical activity level (IPAQ) as predictors. Model fit was evaluated using the likelihood ratio chi-square test and Nagelkerke's R^2 , and classification accuracy, sensitivity, and specificity were also examined.

Prior to conducting the analyses, the assumptions underlying each statistical test were assessed, including normality, independence, and homogeneity of variance where appropriate, to ensure the validity of the results. The level of statistical significance was set at $p < 0.05$. All statistical analyses were performed using IBM SPSS Statistics version 31. (IBM Corp., Armonk, NY, USA)

3. Results

The following section presents the results, organised both quantitatively and qualitatively, to facilitate their interpretation and readability.

3.1. Quantitative Results

The results are presented in the order of the study's specific objectives. First, the prevalence of digital behaviours, physical activity, and psychological distress (SO1) is described. Next, the relationships between digital behaviours and mental health (SO2) are analysed, followed by the associations between physical activity, perceived physical condition, and psychological distress (SO3). Finally, the relationships between digital behaviours and physical health indicators are examined (SO4).

Each section includes descriptive analyses, contrast tests, and, where appropriate, effect sizes, all based solely on data from the original document.

3.1.1. Prevalence of Digital Behaviours, Physical Activity, and Mental Health (OE1)

The prevalence of digital behaviours and physical and mental health indicators showed clearly differentiated patterns. Regarding video game addiction, scores ranged from 0 to 15.5 ($M = 5.20$; $SD = 3.42$), with only 4% of students exceeding the cutoff of ≥ 12 , indicating that this behaviour pattern is rare.

Problematic Internet use (CERI) ranged from 10 to 33 points ($M = 18.12$; $SD = 4.47$). Seventy-three-point seven percent showed non-problematic use, 25.3% showed moderate risk, and only 1% showed scores compatible with addiction, reflecting a low prevalence, although with a segment of students in a vulnerable situation.

Regarding physical activity, 20.3% of students reported low levels, and 79.7% reported moderate or high levels, indicating that the majority meet the minimum recommendations for healthy practice.

GHQ-28 scores ranged from 3 to 26 points ($M = 11.43$; $SD = 4.56$), with 35.9% of students exceeding the cut-off of ≥ 13 , an indicator of probable psychological distress.

Finally, perceived physical fitness (IFIS) had an average of 18.76 ($SD = 3.99$), with 25% of students in the lowest quartile (≤ 16), indicating poor physical self-perception.

3.1.2. Relationships Between Digital Behaviours and Mental Health (OE2)

Regarding the link between digital behaviours and psychological distress, video game addiction did not show a significant relationship with the GHQ-28 ($r = 0.036$, $p = 0.468$). In contrast, problematic Internet use was associated with greater psychological distress ($r = 0.267$, $p < 0.001$).

The contingency test between the risk of video game addiction and the level of Internet use was significant ($\chi^2(2) = 8.387$, $p = 0.015$; $C = 0.145$), indicating that the risk of video game addiction is higher among students with moderate Internet use. See Table 1.

Table 1. Digital behaviours and mental health.

Variable	Statistic	<i>p</i> -Value	Effect Size
Video game addiction and GHQ	$r = 0.036$	0.468	Null
Problematic Internet use (CERI) and GHQ	$r = 0.267$	<0.001	Small
Video game addiction and Internet use	$\chi^2(2) = 8.387$	0.015	$C = 0.145$

3.1.3. Physical Activity, Perceived Physical Fitness, and Mental Health (OE3)

The analyses indicated that physical activity and perceived physical fitness are linked to psychological distress. Students with low physical activity levels reported greater psychological distress ($M = 12.29$, $SD = 4.50$) than those who engaged in moderate or high levels of activity ($M = 11.16$, $SD = 4.52$), with a significant difference (Mann–Whitney U; $U = 13,133$, $p = 0.035$; $Rrb = 0.156$).

Perceived physical fitness correlated negatively with the GHQ ($r = -0.248$, $p < 0.001$), confirming that a better perception of one's physical fitness acts as modest protective factors against emotional distress. See Table 2.

Table 2. Physical health and psychological distress.

Variable	Statistic	<i>p</i> -Value	Effect Size
Physical activity (low vs. moderate/high) and GHQ	$U = 13,133$	0.035	$Rrb = 0.156$ (small)
Perceived physical fitness (IFIS) and GHQ	$r = -0.248$	<0.001	Small

3.1.4. Relationships Between Digital Behaviours and Physical Health (OE4)

Video game addiction showed no significant relationship with physical activity ($U = 10,097.5$, $p = 0.132$) or perceived physical fitness ($p = 0.600$). However, problematic Internet use was linked to poorer physical health indicators: students with low activity scores had higher CERI scores ($M = 19.16$; $SD = 4.42$) than those with moderate/high activity ($M = 17.87$; $SD = 4.49$), a significant difference ($U = 13,505$, $p = 0.009$; $Rrb = 0.193$).

Significant differences were also observed in IFIS scores according to level of Internet use ($\chi^2(2) = 12.135$, $p = 0.002$; $\varepsilon^2 = 0.030$). Students with moderate risk had poorer physical condition than those without problematic use ($p_{Holm} = 0.002$). See Table 3.

Table 3. Digital behaviours and physical health.

Variable	Statistic	<i>p</i> -Value	Effect Size
Video game addiction and IPAQ	$U = 10,097.5$	0.132	$Rrb = 0.077$
Problematic Internet use (CERI) and IPAQ	$U = 13,505$	0.009	$Rrb = 0.193$ (small)
Video game addiction and IFIS	$U = 10,850$	0.600	$Rrb = 0.077$
Problematic Internet use (CERI) and IFIS	$\chi^2(2) = 12.135$	0.002	$\varepsilon^2 = 0.030$ (small)

3.1.5. Gender Differences (OE5)

The gender analysis revealed significant differences in video game addiction, with men presenting a higher risk than women ($\chi^2 = 9.403$, $p = 0.009$; $C = 0.153$).

Regarding perceived physical condition, the difference was significant and of moderate effect size ($\chi^2 = 32.276$, $p < 0.001$; $\varepsilon^2 = 0.067$), with men reporting better perceptions.

In terms of mental health, women showed a higher prevalence of psychological distress ($\chi^2 = 7.787$, $p = 0.020$; $C = 0.138$).

No gender differences were found in problematic Internet use ($p = 0.838$) or physical activity ($p = 0.141$). See Table 4.

Table 4. Gender differences in digital behaviours, physical health, and mental health.

Variable	Men (%)	Women (%)	Other (%)	Statistic	<i>p</i> -Value	Effect Size
Video game addiction (≥ 12)	8.3	2.4	13.3	$\chi^2 = 9.403$	0.009	$C = 0.153$
Problematic Internet use	25.3	26.1	24.6	$\chi^2 = 1.434$	0.838	$C = 0.060$
Low physical activity	13.5	22.8	14.3	$\chi^2 = 3.920$	0.141	$C = 0.102$
Poor physical condition	12.0	22.6	6.7	$\chi^2 = 32.276$	<0.001	$C = 0.067$
Psychological distress ($GHQ \geq 13$)	23.9	39.1	46.7	$\chi^2 = 7.787$	0.020	$C = 0.138$

3.1.6. Relationships with Learning Strategies (OE7)

Learning strategies did not show significant associations with digital behaviours (video game addiction, CERI), physical condition, physical activity, or mental health ($p > 0.20$ in all cases). This pattern suggests that it is appropriate to interpret this variable as an indicator of self-efficacy and study organization, rather than as a direct measure of academic performance.

3.1.7. Predictive Analysis of Psychological Distress (OE8)

To identify factors associated with the likelihood of psychological distress ($\text{GHQ-28} \geq 13$), a binary logistic regression model was estimated to incorporate video game addiction, problematic Internet use (CERI), perceived physical condition (IFIS), and physical activity level (IPAQ) as predictors. The final model was significant ($\chi^2 = 42.97$, $p < 0.001$) and explained 14.9% of the variance (R^2 Nagelkerke = 0.149), indicating an acceptable overall fit. The summary of the model fit is presented in Table 5.

Table 5. Model fit statistics for the logistic regression predicting psychological distress.

Model	Deviation	AIC	BIC	gl	$\Delta\chi^2$	p -Value	R^2 Nagelkerke
M0 (null)	488.02	490.02	493.94	373	—	—	—
M1 (final)	445.04	455.04	474.66	369	42.97	<0.001	0.149

Regarding individual coefficients, two variables showed significant explanatory value. First, problematic Internet use (CERI) was positively associated with psychological distress ($B = 0.093$, $p < 0.001$), such that higher scores increased the likelihood of exceeding the clinical cutoff on the GHQ-28. Second, perceived physical condition (IFIS) was inversely associated with psychological distress ($B = -0.142$, $p < 0.001$): a better self-perception of physical condition is associated with a lower probability of psychological distress.

Neither video game addiction ($p = 0.595$) nor self-reported physical activity (IPAQ) ($p = 0.276$) was a significant predictor. The complete set of model coefficients is shown in Table 6.

Table 6. Predictors of clinically relevant psychological distress: logistic regression results.

Predictor	B	SE	Wald	p -Value	Interpretation
Constant	−0.021	0.805	0.001	0.979	—
Video game addiction	0.018	0.034	0.283	0.595	Is not significant
Problematic Internet use (CERI)	0.093	0.027	11.869	<0.001	↑ CERI → ↑ Associated with higher odds of distress
Perceived physical condition (IFIS)	−0.142	0.032	19.421	<0.001	↑ IFIS → ↓ Associated with lower odds of distress
Physical activity (IPAQ)	0.324	0.297	1.184	0.276	Is not significant

Note: Arrows indicate the direction of the association. ↑ = positive association; ↓ = negative association.

To evaluate the model's performance, the classification matrix was analysed. The model correctly classified 70.0% of cases, with high specificity (90%) and sensitivity (34.3%), indicating that it adequately identifies students who do not present psychological distress but is less effective at detecting those who do. Table 7 summarises this information.

Table 7. Classification accuracy, sensitivity, and specificity of the logistic regression model.

Observed	Predicted: No Discomfort	Predicted: With Discomfort	% Correct
No discomfort (GHQ < 13)	216	24	90.0
With discomfort (GHQ ≥ 13)	88	46	34.3
Overall ranking	—	—	70.0

Overall, the results show that, although problematic digital behaviours have a low prevalence, problematic Internet use is a significant factor associated with both psychological distress and poorer physical health indicators among students. Video game addiction, on the other hand, showed no significant relationship with mental health or physical activity. Perceived physical condition and, to a lesser extent, physical activity acted as modest protective factors for emotional and psychological well-being. Gender differences showed greater psychological vulnerability among women, while, by degree, better levels of physical condition were noted among CAFD students and greater psychological distress among Early Childhood Education students. Learning strategies were not significantly linked to any of the variables analysed. Finally, the logistic model identified problematic Internet use and perceived physical condition as the variables most strongly associated with psychological distress, underscoring the importance of addressing both in preventive interventions for university students, particularly teacher trainees.

3.2. Qualitative Results

The qualitative analysis was based on a focus group conducted on 25 February 2025, with four students (one from each academic program), and lasted approximately one hour. This component aimed to explore students' perceptions and experiences related to digital behaviours, physical activity, and psychological well-being. The transcripts were manually coded using both thematic and content analysis approaches to identify patterns, categories, and the types of content discussed by participants.

Four main themes emerged from the thematic analysis, aligned with the quantitative objectives of the study: (1) perceptions of digital behaviours; (2) the relationship between digital use and mental health; (3) links between physical activity, perceived physical condition, and well-being; and (4) the impact of digital use on academic and daily life.

The qualitative analysis followed a structured, multi-stage process. First, three experts independently reviewed the transcript and performed initial open coding of the transcript. In the second stage, codes were grouped into broader categories through iterative comparison. For instance,

- Statements referring to frequent checking of mobile devices were initially coded as frequent digital engagement and later grouped under the broader theme “perceptions of digital behaviours” (“Every time I was studying, I would uninstall it. . . but when I was studying, I would remove it, then reinstall it for five minutes.”)
- Statements reflecting motivation for physical activity due to social media were initially coded as social-media-driven motivation for exercise and later grouped under the broader theme “links between physical activity, perceived physical condition, and well-being” (“Because of TikTok, I want to be strong, I want changes. . .”)
- Statements reflecting participants' perceptions of emotional distress and difficulties in managing frustration associated with digital use among their university peers were initially coded as perceived emotional responses to digital engagement and later grouped under the broader theme “the relationship between digital use and mental

health" ("In the end, students get frustrated, lose in a class game, and it's as if their world is falling apart. . .")

- Statements describing loss of concentration and rapid disengagement from tasks due to social media use were initially coded as attentional disruption and later grouped under the broader theme "the impact of digital use on academic and daily life" ("I'm watching something I like, and after 20 s I have to skip it because it tires me out. . . it literally scares me.")

Finally, these categories were refined into overarching themes aligned with the study objectives.

The coding process was iterative, moving from initial codes to broader themes through discussion and consensus among the three researchers. To enhance reliability and validity, discrepancies in coding were resolved through consensus, and an audit trail of analytic decisions was maintained to enhance transparency and credibility. This approach enabled a systematic and transparent thematic analysis of the qualitative data.

Given the small size of the qualitative sample, the analysis was designed to be exploratory and illustrative. Although thematic saturation was not the primary aim given the exploratory nature and small sample size, recurring patterns were identified across participants.

The qualitative findings are therefore intended to complement and contextualise the quantitative results, rather than to provide a comprehensive or fully generalizable qualitative account. These insights offer an additional perspective on students' experiences of digital behaviours, physical activity, and psychological well-being and help to contextualise and better interpret the quantitative findings of the study.

The following subsections describe the main themes identified through the analysis.

3.2.1. Perceptions of Digital Behaviours

Participants reported frequent use of social media, especially TikTok, and a subjective sense of loss of control, even though they did not identify as regular video game players. The perception of addiction was particularly linked to the continuous consumption of short, auto-scrolling content:

"TikTok is something I'm literally hooked on. . . you're just endlessly scrolling".
(Participants 2 and 4)

"Anything to do with my phone is addictive for me". (Participant 1)

In addition to their own experiences, participants reported cases of extreme social media use among their friends and family, with significant emotional repercussions:

"He spent 18 h watching TikTok. . . it caused him immense depression".
(Participant 3)

These narratives show how the subjective experience of addiction is associated both with the compulsion for continuous consumption and with the perception of loss of control and emotional deterioration.

3.2.2. Digital Use and Mental Health

The students described various emotional effects resulting from intensive use of video games and, in particular, social media. They mentioned emotional tension, anxiety, frustration, and disproportionate reactions to situations of failure or competition:

"They can't tolerate frustration at all. . . they break the PlayStation, the TV".
(Participant 1)

"Not winning makes them feel suffocated. . . they take it to extremes".

(Participants 2 and 4)

“It makes them feel angry and powerless. . . you end up losing control”.

(Participant 4)

In the case of social media, narratives emerged that focused mainly on social comparison, aesthetic pressure, and deterioration of self-esteem, linked to the constant consumption of idealised images and content:

“Everything you see is fake, you compare yourself and feel inferior”.

(Participants 2 and 4)

“That makes everything wrong. . . because you feel bad about yourself.”

(Participant 1)

Likewise, prolonged use of social media was associated with mental noise, rumination, and difficulty disconnecting, generating a persistent feeling of restlessness and cognitive agitation:

“After TikTok, I can’t concentrate. . . my head won’t shut up”.

(Participant 2)

“You get hooked and feel the addiction”. (Participant 4)

However, positive experiences linked to the use of emotional or motivational content were also identified:

“I follow emotional psychologists and podcasts. . . they have a positive side”.

(Participant 3)

These perceptions show a heterogeneous emotional landscape, in which adverse effects dominate but coexist with intentional uses aimed at psychological well-being.

3.2.3. Physical Activity, Perceived Physical Fitness, and Well-Being

Participants pointed out that excessive use of video games and social media can lead to a reduction in regular physical activity and encourage sedentary habits:

“The time you don’t spend exercising, you spend playing. . . it leads to a sedentary lifestyle”. (Participant 1)

However, they also described the potential of specific social media platforms to motivate people to participate in sports, primarily through aspirational content, role models, or tracking exercise routines:

“I joined the gym because of TikTok. . . it motivated me a lot”. (Participant 2)

“It can be motivating. . . but you get bored and give up quickly”. (Participant 4)

The perception of physical and emotional improvement associated with physical activity also emerged clearly in the group’s discourse:

“When I’m exercising, I feel better about myself, as if everything else affects me less”. (Participant 3)

These contributions reflect an ambivalent relationship between digital use and physical activity habits, in which social media can both stimulate and hinder physical well-being.

3.2.4. Impact of Digital Use on Academic Performance and Daily Life

One of the most notable dimensions of the qualitative analysis was the perceived interference of digital device use on concentration, academic performance, and time management. Participants described patterns of constant distraction, difficulty maintaining attention, and a tendency to procrastinate and fragment study tasks:

“I watch 10 s of a video, and then I need to move on to the next one.” (Participant 1)

“After using TikTok, I can’t study; my head won’t shut up.” (Participant 2)

They also pointed out that the use of video games can repeatedly replace or postpone academic obligations:

“I’ve been told I’m not going to do anything today because I’m playing”.

(Participant 4)

Faced with these difficulties, students mentioned various self-regulation strategies that they use spontaneously to try to control their digital use:

“When I have to study, I put my phone away... it’s the only way”. (Participant 3)

These experiences highlight the perception of significant interference from digital use in daily and academic life, as well as the need for personal strategies to regain attentional control.

3.3. Comparative Summary

The integration of quantitative and qualitative results shows a convergent pattern: although video game addiction and problematic Internet use are not very common, students often report subjective feelings of a lack of control, mainly linked to the intensive use of social networks such as TikTok and the continuous consumption of short-form content. This phenomenon helps to understand why, even without reaching pathological levels, a significant proportion of students experience significant psychological distress, quantifiable in more than a third of the sample.

The data also indicate that problematic Internet use is associated with negative emotions, difficulties with disconnecting, and experiences of social comparison, aspects that the participants in the focus group widely described and are consistent with the patterns observed in the quantitative analyses. In contrast, video game addiction appears to be less relevant in terms of perceived impact and physical and mental health indicators.

Likewise, both approaches highlight the central role of physical activity and a positive self-perception of physical condition as modest protective factors for psychological well-being. At the same time, excessive digital use can displace study time, reduce physical activity, and generate cognitive and emotional interference in academic life.

Overall, the quantitative and qualitative results converge in identifying intensive, unregulated social media use as an important, though not exclusive, contributing factor to psychological distress and active lifestyles as a relevant protective factor for the emotional and functional health of teacher trainees.

4. Discussion

The results of this study show a low prevalence of addictive behaviours but a high frequency of perceived digital lack of control. Addiction to video games and social networks negatively impacts academic performance, mental, and physical health (Martínez-Murciano & Pérez-Jorge, 2025). The prevalence of video game addiction is low (4%), which is consistent with the previous literature reporting higher prevalence rates in adolescents than in university students. However, the students’ responses in the focus group reveal a strong sense of digital dysregulation, especially regarding TikTok and Instagram Reels.

The findings suggest that intensive use of short-form video platforms such as TikTok and Instagram Reels is associated with feelings of urgency and reduced perceived control. This pattern is consistent with recent research highlighting the role of flow experiences and fear of missing out (FoMO) in explaining the link between anxiety and problematic engagement with this type of content (Gong et al., 2025; Liu et al., 2025; Türk-Kurtça, 2026).

From the perspective of Self-Determination Theory, these patterns may reflect attempts to satisfy psychological needs through digital engagement, albeit in a potentially maladaptive way. Overall, the findings can be most coherently interpreted through the lens of this theory, which provides a unifying framework for understanding the motivational and psychological mechanisms underlying students' digital behaviours. These dynamics may reinforce repetitive consumption cycles, contribute to increased stress and anxiety, and be associated with difficulties in daily functioning and interpersonal relationships.

The quantitative findings suggest that the impact of high-frequency digital use on students' daily functioning is shaped by complex interactions. These include behavioural patterns, psychological processes, and contextual factors. In particular, this relationship can be understood through a combination of motivational, cognitive, and social pathways, consistent with Self-Determination Theory (Deci & Ryan, 1985).

Additionally, reduced perceived social support and lower resilience can exacerbate the psychological effects of intensive use. This pattern reflects increased stress, anxiety, and interference with academic and social responsibilities (Cai et al., 2026; Cohen & Wills, 1985; Luthar et al., 2000), consistent with the Social Support Buffering Hypothesis (Cohen & Wills, 1985) and Resilience Theory (Luthar et al., 2000).

Gender and individual differences in self-regulation, time management, and emotional coping further moderate these effects (Devadharshini et al., 2026; T. Li et al., 2025), suggesting that high-frequency digital use does not necessarily disrupt students' daily functioning in isolation but rather interacts with personal and psychosocial vulnerabilities, helping to explain why some students experience significant difficulties while others maintain balanced usage.

This apparent discrepancy between quantitative and qualitative findings suggests that the perception of "addiction" in young people is more closely associated with a subjective sense of loss of control than with clinical criteria. Consequently, this points to the idea that discomfort does not usually stem from fully established clinical addictions. These patterns involve dopaminergic reinforcement mechanisms and a persistent urge to remain connected (Del Moral Pérez et al., 2021; Hari, 2022; Lembke, 2021; T. Li et al., 2025; Yang et al., 2025). This pattern may contribute to a subjective perception of "addiction" among students, even in the absence of clinically defined criteria.

One of the main contributions of this study is that the gap between low quantitative prevalence and intense subjective experience suggests that the current challenge lies not in formal addiction but in intensive and unregulated use that interferes with the daily lives of university students.

The study also shows a notable finding: although only 1% of students have full-blown problematic Internet use, around 25% at moderate risk report greater psychological distress. Combined interventions, such as psychological support and structured guidance, may reduce the negative effects of intensive digital use (Martínez-Murciano & Pérez-Jorge, 2025).

According to Gao et al. (2022), moderate risk may be functionally more relevant than formal addiction, which usually has more obvious and severe consequences, because it potentially affects more people in subtle but significant ways in their daily lives.

Recognizing early signs of risky digital behaviour may be important to prevent its potential progression toward more problematic patterns. In this context, prevention and early intervention could improve students' health and well-being. In our predictive model, problematic Internet use emerged as a significant predictor of clinically relevant psychological distress, although the overall effect size was modest. This suggests that students' mental health is influenced by multiple interacting factors.

These findings are consistent with studies showing that social media addiction is positively associated with mental health problems among university students. Moreover,

research suggests that this relationship may be explained by psychosocial mechanisms such as social support and resilience. For instance, recent evidence indicates that social media addiction can indirectly affect mental health through reduced perceived social support and lower resilience.

Gender may moderate some of these relationships, with stronger effects observed among female students, a pattern consistent with the Social Support Buffering Hypothesis (Cohen & Wills, 1985) and Resilience Theory (Luthar et al., 2000).

It is essential to raise awareness about the risks, both at the moderate and addictive levels, to minimize long-term negative effects. Research links intensive social media use to social comparison and low self-esteem (Y. Li & Liu, 2025; Zhao, 2021), FoMO (Mou et al., 2024), aesthetic pressure (Caro-Castaño, 2022; Lee, 2022), and symptoms of anxiety and depression (Backer & Awad, 2025; García del Castillo et al., 2019; Mou et al., 2024; Y. Li & Liu, 2025; Zhao, 2021). In this context, Liu et al. (2025) demonstrated that increased screen time is linked to addiction to digital content, particularly short videos. This increase exposes young people to these media more frequently. Furthermore, increased screen use may be associated with mental health issues such as anxiety and depression.

In turn, these issues may lead to greater use of this content as a form of escapism. Finally, this pattern may be associated with difficulties in daily activities and interpersonal relationships, reflecting a cycle that may be difficult to break.

Among the contributions of the focus group, students described experiences of “mental noise” (Vanden Abeele, 2021), cognitive overload (Wu et al., 2024), attentional exhaustion (Yang et al., 2025), sleep difficulties (Virós-Martín et al., 2025), and frustration/loss of control (García del Castillo et al., 2019; Mou et al., 2024).

Taken together, these findings suggest that the “university digital problem” is not clinical addiction, but rather the emotionally disruptive use of social media, with problematic Internet use an important, though not exclusive, contributor to psychological vulnerability.

The results also show that physical activity and perceived physical fitness are inversely related to psychological distress. Both operate as modest protective factors, buffering the effects of stressors or adverse situations and reducing the likelihood of anxiety, depression, or other emotional symptoms. Furthermore, IFIS emerges as an independent predictor, even stronger than objective physical activity.

Perceived physical fitness often reflects self-efficacy, bodily well-being, and a positive assessment of one’s own body, all of which are associated with less distress (Brand et al., 2024; Byrne & Kim, 2019; Six et al., 2022). Exercise acts as an emotional regulator, as explicitly stated by the focus group participants.

This study contrasts the effects of sedentarisation associated with device use with the protective role of physical movement. It aligns with comprehensive wellness models, such as the 24-HGM approach by Luo et al. (2025), which integrates physical activity, sleep, and screen time to promote balance.

In addition, combined interventions, including structured guidance and support, may further reduce the negative effects of intensive digital use (Martínez-Murciano & Pérez-Jorge, 2025). While our study focuses on university students, evidence from adolescents shows that gamified physical activity can improve mental health and promote healthy habits (Pérez-Jorge et al., 2024).

The same pattern is observed in other dimensions of well-being, such as academic performance (Alhusban et al., 2022; Backer & Awad, 2025; García del Castillo et al., 2019; Hendrikse & Limniou, 2024; Marín-Díaz et al., 2019) and self-regulation (Zimmerman, 2000), as part of broader self-regulatory processes described within Self-Determination Theory (Auerbach et al., 2018; Deci & Ryan, 1985; García del Castillo et al., 2019; Hendrikse & Limniou, 2024; Vanden Abeele, 2021).

Although learning strategies did not show significant correlations at the quantitative level, qualitative testimonies indicate notable difficulties in concentrating and managing attention. In particular, microdistractions, attention jumps (Mark, 2023), social media-induced procrastination (Lembke, 2021; Mohamed et al., 2025; Devadharshini et al., 2026), and impaired inhibitory control (Wu et al., 2024) were described.

In response, students reported compensatory strategies (e.g., putting away their cell phones, setting goals in advance). They noted that exercise helped them “feel better,” “balance themselves,” and “put their minds in order” as a mechanism for emotional and cognitive regulation.

These patterns align with studies explaining how digital use interferes with cognition and self-regulation, both in terms of cognitive load (Shen, 2025), temporal fragmentation (Mark, 2023), reward systems (Backer & Awad, 2025; Hari, 2022), and attentional exhaustion (Azizi et al., 2019; Vanden Abeele, 2021; Wu et al., 2024).

From the perspective of Self-Determination Theory, Deci and Ryan (1985), these disruptions may reflect difficulties in satisfying basic psychological needs for autonomy, competence, and relatedness. These qualitative findings provide a direct view of how future teachers perceive the impact of digital use on concentration and self-regulation. This perspective enriches understanding of the cognitive challenges in the digital university environment.

The implications transcend the individual level and are particularly relevant to teacher training. Given that teachers act as models of digital, emotional, and lifestyle habits (Audiolís Formación, 2023; Casas-Puente & Gutiérrez-Leyton, 2025; Jomezai et al., 2021), it is therefore important to consider how the patterns of digital dysregulation of teachers in training themselves can be transferred to educational practice, condition emotional management in the classroom, and indirectly influence the well-being and development of the students in their care.

Therefore, teachers’ digital literacy must go beyond the technical use of tools and include online time management (Gong et al., 2025; Zhao, 2021), emotional regulation (Grasso Imig, 2020), and prevention of problematic use of technologies (Alhusban et al., 2022; Backer & Awad, 2025; Pellegrino et al., 2022). Beroiza-Valenzuela (2024) also adds the critical analysis of networks.

Furthermore, promoting healthy habits such as adequate sleep and physical activity is also important, as well as developing a culture of digital well-being (Maisuroh et al., 2024; WHO, 2022).

Intervening in the digital well-being of future teachers can have a multiplier effect that benefits the health and development of their students, promoting more balanced and healthy educational environments in schools and universities.

Our findings align with recent evidence indicating that intensive social media use among university students is associated with both immediate gratifications and subtle negative outcomes. This highlights the importance of monitoring digital behaviour even when formal addiction criteria are not met (Backer & Awad, 2025; T. Li et al., 2025; Mohamed et al., 2025).

In summary, Self-Determination Theory helps explain students’ digital behaviours. The intensive use of social media challenges autonomy, competence, and relatedness. This can increase stress and reduce daily functioning. Physical activity and self-regulation help buffer these effects. Promoting digital literacy and well-being in teacher training can benefit both teachers and their students.

Limitations

The present study has several methodological limitations that should be considered when interpreting the findings. First, the sample was drawn from a single university and

focused exclusively on education students. This limits the generalizability of the results to other academic contexts or student populations.

Second, the sample shows a marked gender imbalance (78% women), which may influence the robustness of gender comparisons and should be taken into account when interpreting differences between male and female students.

Third, all variables were assessed through self-report measures, which may introduce potential biases such as social desirability, recall inaccuracies, or subjective interpretation of the items.

Additionally, the categorization of physical activity into low versus moderate/high groups, following WHO recommendations, may have reduced sensitivity to activity gradients and limited the explanatory power of our findings regarding physical activity.

Finally, the regression model explained a modest proportion of variance ($R^2 = 0.149$), suggesting that psychological distress is a multifactorial phenomenon likely influenced by additional variables not included in the present study. For instance, personality traits, coping strategies, or social and contextual factors.

These limitations do not invalidate the results but indicate that they should be interpreted with caution and highlight the need for future research using more diverse samples, multi-method approaches, and broader explanatory models.

Nevertheless, these limitations highlight the need for future research that integrates quantitative and qualitative data more systematically and uses larger, more diverse samples. Applying multi-method approaches and broader explanatory models could further enhance the robustness, generalisability, and methodological rigour of findings.

5. Conclusions

This study provides evidence that digital behaviours, physical activity, and perceived physical fitness are significantly associated with the emotional and academic well-being of university students, particularly teacher trainees. It underscores the potential value of comprehensive teacher training. Such training could help them to manage their digital use and teach their students to balance the advantages of the digital environment with adequate emotional and physical well-being.

Gender differences were observed in the patterns of digital use: women reported greater psychological distress associated with social networks such as Instagram and TikTok. At the same time, men showed a higher proportion of risk of video game addiction, although this was not significantly associated with physical or emotional well-being in this sample.

In addition, early childhood education students reported a stronger relationship between problematic Internet use and psychological distress. Primary education students tended to report somewhat better physical activity habits, although differences were modest.

Although no significant associations with learning strategies were found, students with more structured study methods tended to report fewer problems with Internet use and somewhat better mental health indicators. This highlights the importance of digital and academic time management as a key competency in initial teacher training.

These conclusions should be interpreted in light of methodological limitations. Nevertheless, they provide practical guidance for designing preventive actions and programs to promote digital and physical well-being in the university setting, with special attention to teachers-in-training.

Future work could address these limitations by using a longitudinal design and incorporating objective measures of digital use and mental health. In addition, it would be helpful to include a more diverse sample and to explore additional contextual factors,

such as socioeconomic background and access to emotional support resources. This would improve understanding of factors that moderate the impact of digital use on college students' health and well-being.

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Abbreviation

The following abbreviation is used in this manuscript:

CAFD Physical Activity and Sports Sciences

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