Versión inglesa publicada del artículo (Published) / *English Published version of the article (Published)*

Título / *Title*

Versión española: Uso problemático del móvil en adolescentes: ¿influyen sus habilidades emocionales y su miedo a perderse algo?

English version: Problematic smartphone use in adolescents: Are their emotional abilities and fear of missing out influenced?

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Publicado en / *Published in*

Behavioral Psychology / Psicología Conductual

Fecha de asignación a volumen y número / *Date assigned to volume and issue:* 2025
Volumen / *Volume*: 33
Número / *Issue*: 1
Páginas / *Pages*: 42770
DOI: https://doi.org/10.31083/BP42770

Behavioral Psychology /Psicología Conductual

Behav. Psychol. **2025**; 33(1): 42770
https://doi.org/10.31083/BP42770

Original Research

Problematic Smartphone Use in Adolescents: Are Their Emotional Abilities and Fear of Missing out Influenced?

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Academic Editor: Vicente E. Caballo

Submitted: 6 July 2024 Revised: 23 October 2024 Accepted: 11 November 2024 Published: 30 May 2025

Abstract

Background: Adolescents are the most vulnerable population for problematic smartphone use (PSU). The scientific literature provides evidence that factors such as fear of missing out (FoMO) and emotional intelligence (EI) can be related to problematic internet behaviours, but few studies have been conducted on PSU in adolescents. This study aimed to examine how FoMO and EI might explain PSU in adolescents. **Methods**: The sample consisted of 537 students (12–17 years old) who completed scales assessing problematic smartphone use, fear of missing out, and emotional intelligence. **Results**: The results showed in both cases moderate, significant and positive correlations between PSU and FoMO, while significant and negative correlations between PSU and EI were observed. In addition, high FoMO and deficits in EI were found to explain part of the variance in PSU. **Conclusions**: The results are discussed based on the Theory of compensatory internet use. The need to address EI and FoMO in educational contexts is also justified.

Keywords: problematic smartphone use; fear of missing out; emotional intelligence; adolescents

Uso Problemático del Móvil en Adolescentes: ¿Influyen sus Habilidades Emocionales y su Miedo a Perderse Algo?

Resumen

Antecedentes: Los adolescentes constituyen la población más vulnerable en el uso problemático del teléfono móvil (PSU). La literatura científica evidencia que factores como el miedo a perderse algo (FoMO) y la inteligencia emocional (IE) pueden relacionarse con comportamientos problemáticos en internet, pero pocos estudios se han realizado con el PSU en adolescentes. Este estudio tuvo por objetivo examinar cómo el FoMO y la IE explicaban el PSU en adolescentes. **Métodos**: La muestra estaba compuesta por 537 estudiantes (12–17 años) que cumplimentaron escalas que evaluaban el uso problemático del teléfono móvil, el miedo a perderse algo y la inteligencia emocional. **Resultados**: Los resultados mostraron en ambos casos correlaciones moderadas, significativas y positivas entre PSU y FoMO, mientras que significativas y negativas entre PSU e IE. Además, se encontró que un elevado FoMO y déficits en IE explicaban parte de la varianza del PSU. **Conclusiones**: Se discuten los resultados con base en la teoría del uso compensatorio de internet. Asimismo, se justifica la necesidad del abordaje de la IE y del FoMO en contextos educativos.

Palabras Claves: uso problemático del teléfono móvil; miedo a perderse algo; inteligencia emocional; adolescentes

1. Introduction

Digital platforms have brought numerous advantages in accessing information and communication, saving users time and effort (Castellacci and Tveito, 2018). However, prolonged use of these technologies carries various risks (Barrios et al, 2017). According to the Internet Architecture Board (IAB Spain; 2024), in Spain, mobile phones are the primary device for internet access (98% of cases) due to their ease of accessibility and the increasing features and functionalities they offer (Elhai et al, 2017). As a result, lack of contact with a mobile phone can generate symptoms in people similar to those described in substance addictions (e.g., behavioural salience, tolerance, use to modify mood, relapse, withdrawal symptoms in the absence of use, and impact on functioning) (Cheng et al, 2022). Consequently, excessive smartphone use has occasionally been labelled a "behavioural addiction" (Elhai et al, 2017). Nevertheless, Billieux et al (2015) found that employing the addiction model to describe excessive behaviours (e.g., mobile phone use) constitutes an oversimplification of the individual's psychological functioning, offering limited clinical relevance. Indeed, the so-called "mobile phone addiction" is not included in the latest version of the Diagnostic and statistical manual of mental disorders (DSM-5; American Psychiatric Association (APA), 2013), as it is not a universally recognized concept. For many authors, it represents a pathologization of ordinary behaviour (Dam et al, 2023).

For these reasons, the most up-to-date studies on the use and misuse of technologies have adopted the concept of problematic smartphone use (PSU) (Lee et al, 2018). PSU is characterized by an excessive frequency of smartphone use combined with difficulty regulating the excessive use, which eventually leads to negative consequences in daily life, including impacts on productivity, social relationships, physical health, and emotional well-being (Elhai et al, 2017; Long et al, 2016; Sohn et al, 2019).

According to a study by Rivero (2019), young people under 24 years old spend the most time using mobile phones, averaging about 4 hours per day. Specifically, a study by the United Nations International Children's Emergency Fund (UNICEF; Andrade et al, 2021) found that 33% of the adolescent population in Spain (aged 11–18 years) exhibited PSU. Adolescents constitute the most vulnerable group due to their heightened need for belonging, self-affirmation, and social support, coupled with a reduced inhibitory capacity to control compulsive use, which often results in complete digital immersion (Álvarez and Moral, 2020; Coskun and Karayagız Muslu, 2019). This vulnerability is further compounded by their stage of emotional maturation (Berman, 2018). Intensive smartphones use negatively affects their academic performance (Seo et al, 2016) and overall health, such as reducing sleep quality (Menglong and Liya, 2017), and is associated with symptoms of depression and anxiety (Elhai et al, 2020).

In the scientific literature, several risk factors for excessive smartphone use have been identified, including emotion dysregulation and narcissistic personality profiles (Hussain et al, 2021), negative emotions (Bernal-Ruiz et al, 2021), life satisfaction (Sahin, 2017), loneliness (Menglong and Liya, 2017), social anxiety (Wolniewicz et al, 2018), and the fear of missing out (FoMO) (Chotpitayasunondh and Douglas, 2016; Coskun and Karayagız Muslu, 2019; Elhai et al, 2018; Przybylski et al, 2013).

FoMO is defined as the anxiety of missing out on interesting events, which are often shared on social media (Tanhan et al, 2022). It has proliferated with the rise of social media applications, which encourage users to follow and share content instantly, especially exciting events, leading to constant anxious comparisons and the experience of unpleasant emotions when perceiving oneself as less happy (Kacker and Saurav, 2020). This phenomenon can be attributed to several motivations presented as personal characteristics that may act as predictors of PSU. These characteristics include individuals' natural curiosity, the desire to belong to a group, the tendency to compare and show off, changes in communication patterns, the desire to experience emotions unattainable in real life, and a sense of personal dissatisfaction (Tanhan et al, 2022).

In discussing the aetiology of this phenomenon, one should consider Deci and Ryan's Self-determination Theory (1985). These authors argued that individuals' psychological well-being depends on the satisfaction of three basic needs: autonomy, competence, and relatedness. In this context, FoMO can be understood as arising from a negative emotional state resulting from the unmet satisfaction of these fundamental needs (García-Jiménez et al, 2020). Furthermore, Compensatory Internet Use Theory (CIUT; Kardefelt-Winther, 2014) suggests that digital platforms serve as substitutes to address needs that cannot be immediately fulfilled. According to this perspective, individuals unable to satisfy their basic psychological needs at a given moment may turn to their mobile devices as a compensatory strategy. However, rather than alleviating negative emotions, the excessive use of social media driven by FoMO exacerbates anxiety and perpetuates negative emotional states.

Research indicates that individuals aged 13 to 33 years are particularly prone to experiencing FoMO (Tanhan et al, 2022). Busch (2016) investigated the effects of FoMO on students, identifying the following outcomes: (1) a decline in concentration and delays in fulfilling responsibilities, as constant app-checking redirects attention from academic tasks and classroom activities; (2) a reduction in face-to-face communication, with screen absorption and prioritization of virtual interactions undermining the quality of real-life social exchanges; and (3) heightened stress levels, as the inability to access information or the compulsion to constantly monitor updates leads to feelings of frustration and impatience.

Several studies have established a relationship between FoMO and higher levels of PSU. Chotpitayasunondh and Douglas (2016) found that both internet addiction and FoMO were significant predictors of smartphone addiction in adults. Moreover, a study conducted with a sample of 4460 Turkish students revealed that FoMO was a strong predictor of PSU, accounting for 27.7% of its variance (Coskun and Karayagız Muslu, 2019). Przybylski et al (2013) reported that among young adults, higher levels of FoMO were correlated with greater engagement in social networks like Facebook. Additionally, research by Elhai et al (2018), while not directly addressing FoMO, demonstrated correlations between social anxiety, a construct closely associated with FoMO—and PSU. While some studies have used alternative terms like "smartphone addiction", "problematic internet use", or "social network engagement" instead of PSU, Chotpitayasunondh and Douglas (2016) argued that the primary predictors of such behaviours remain consistent, stemming from different theoretical perspectives (e.g., addiction model). FoMO has also been linked to diminished quality of life and an increase in depressive symptoms among adolescents (Trong et al, 2023). Based on the evidence presented, there is a need to study FoMO as a risk factor that potentially contributes to the development of PSU in adolescents.

The scientific community, in its efforts to elucidate the factors influencing PSU, has not only focused on risk factors such as FoMO but has also sought to analyse protective factors that may prevent its onset during adolescence. In this regard, emotional intelligence (EI) is proposed as a positive resource to address the challenges associated with digital immersion. According to Mayer and Salovey's (1997) ability model, EI refers to the capacity to manage emotional information through the ability to perceive, facilitate, understand, and regulate one's own emotions, as well as those of others.

According to Gracia Granados et al (2020), adolescents engage in an inappropriate use of social networks when they lack effective emotion regulation strategies. In line with CIUT, adolescents with lower levels of EI tend to exhibit excessive use of digital platforms as a means of avoiding unpleasant emotions experienced in real life, which they neither understand nor effectively regulate (Arrivillaga et al, 2020; Méndez et al, 2020). Several Spanish studies have demonstrated correlations between low EI and problematic behaviours related to smartphone use in adolescents. For example, Arrivillaga et al (2020) found that low EI levels, alongside other indicators of maladjustment, significantly predicted a high risk of PSU. Similarly, Díaz and Extremera (2020) demonstrated that deficits in two specific dimensions of EI — interpersonal perception and emotion utilisation — were predictive of higher levels of nomophobia (i.e., anxiety and distress resulting from the inability to use a mobile phone). Moreover, Satorre (2022) presented findings highlighting correlations between PSU and low EI, poor academic performance, and increased stress levels.

The relationship between low EI and high levels of PSU suggests that high EI in adolescents can provide significant benefits in managing technology use. In this regard, Valdés (2019) found that, among more than 5000 11–19-year-old adolescents from public and private educational institutions across various autonomous communities in Spain, higher EI scores were associated with lower levels of internet addiction. Specifically, variables such as the ability to manage one's own emotions, calm responses to stressful events, and interpersonal abilities for recognizing the emotions of others were the most effective predictors of reduced abusive use. Furthermore, a systematic review by Resurrección et al (2014), which examined studies conducted in populations from various countries, reported that high EI in adolescents was linked to better psychological adjustment, lower prevalence of risk behaviours (e.g., PSU), and improved social coping strategies. These findings suggest that EI plays an explanatory role in PSU, acting as a protective factor against its emergence.

Previous studies have linked constructs like FoMO and EI to problematic internet behaviours. However, not all studies have focused specifically on adolescent samples — a group particularly vulnerable to excessive internet and smartphone use (e.g., Chotpitayasunondh and Douglas, 2016). Similarly, many studies have not employed the term "problematic smartphone use" (e.g., Cheng et al, 2022), a concept that avoids the pathologizing limitations of addiction models. Moreover, no comprehensive model has yet been proposed to explain how both dimensions (FoMO and EI) predict (and to what extent) the risk of PSU in adolescents. Thus, the present study aimed to achieve two objectives: first, to analyse the relationships among FoMO, EI, and PSU; and second, to examine whether FoMO and EI are factors that explain adolescents' inclusion in the PSU group. The following hypotheses were proposed: (1) FoMO and PSU will be positively correlated (H1a), whereas EI and PSU will show a negative correlation (H1b); (2) Higher levels of FoMO will be associated with a greater likelihood of adolescents being part of the PSU group (H2); and (3) Higher levels of EI will be associated with a lower likelihood of adolescents being part of the PSU group (H3).

2. Method

2.1 Participants

In this study, the sample was obtained by non-probabilistic convenience sampling and comprised 537 adolescents (49.7% boys, 50.3% girls) (12–17 years old, mean (M) = 13.85, standard deviation (SD) = 1.31) who were students in three high school centres from the province of Malaga; 27.2% of the sample were in their first year of compulsory secondary education, 24.4% in their second year, 27.7% in year 3, and 20.7% in year 4 (U.S. equivalency to grades 7–10); 92.6% were Spanish, and 7.4% were of another nationality.

2.2 Instruments

(a) *Fear of Missing Out Scale* (FoMO; Przybylski et al, 2013); Spanish validation developed by Gil et al (2015). The FoMO was used to assess the level of FoMO, which Gil et al (2015) defined as the discomfort of knowing that other people are doing enjoyable activities and that one is not a part of it. The scale has 10 items (e.g., "Sometimes, I wonder if I spend too much time keeping up with what is going on") assessed with a 5-point Likert scale, where 1= not at all true of me and 5 = extremely true of me. Participants respond to each item considering their general day-to-day experience. Higher scores indicate a higher level of FoMO. The scale has good psychometric properties (the Cronbach's alpha coefficient was 0.85) (Gil et al, 2015). In the present study, Cronbach's alpha was 0.82.

(b) *Wong and Law Emotional Intelligence Scale* (WLEIS; Wong and Law, 2002); Spanish validation developed by Extremera et al (2019). The WLEIS was used to measure EI based on Mayer and Salovey's (1997) theoretical framework. It is a scale with 16 items and four subscales (self-emotion appraisal, others' emotion appraisal, regulation of emotion, and use of emotion). Each item is answered on a 7-point Likert scale, where 1 = completely disagree and 7 = completely agree. Each participant is asked to indicate the response that most closely reflects their preference for each item. Due to the interest and purpose of this study, the total EI score was used in the analyses (the scores of each subscale were not used separately). An example item is "I have a good understanding of my own emotions". Higher scores indicate a higher level of EI. The WLEIS has proven to be a reliable scale in its Spanish version (the Cronbach's alpha coefficient of the total scale was 0.91) (Extremera et al, 2019). In the present study, Cronbach's alpha was 0.89.

(c) *Smartphone Addiction Scale-Short Version* (SAS-SV; Kwon et al, 2013); Spanish validation developed by Lopez-Fernandez (2017). The SAS-SV was used to measure PSU. According to Lopez-Fernandez (2017) a maladaptive smartphone use can lead to dependence with negative consequences for the individual (e.g., not being able to maintain attention on a task or in an interpersonal relationship). The scale consists of 10 items (e.g., "Missing planned work due to smartphone use") assessed on a Likert scale that ranges from 1 = strongly disagree to 6 = strongly agree. On this scale, participants are asked to indicate their degree of agreement or disagreement with each of the items in relation to their smartphone use. Higher scores indicate a higher risk of PSU. Following the criteria of Lopez-Fernandez (2017), if in the sample there are no significant differences in the SAS-SV scores between boys and girls, the cut-off point will be 32 points. Thus, adolescents (both boys and girls) who have obtained a score equal to or higher than 32 points in the SAS-SV will belong to the PSU group. The Spanish validation of this scale obtained good psychometric properties (the Cronbach's alpha coefficient = 0.88) (Lopez-Fernandez, 2017). In the present study, Cronbach's alpha was 0.87.

2.3 Procedure

In the present study, a favourable certificate was requested and obtained from the Ethics Committee of the University of Malaga (170-2023-H). Also, the procedures and guidelines of the Helsinki Declaration (World Medical Association, 2013) were followed. Subsequently, an initial phase of contact was made with the educational centres. In this phase, collaboration was requested from the head teachers of several centres, who were informed of the characteristics of the study by means of a face-to-face appointment or phone call. Finally, three centres agreed to participate and were asked to sign an informed consent form, completed by the head teacher. In addition, given that the participants were underage, authorisation was required from their family or legal tutors to participate in the study. In one of the centres, the consent obtained was active (i.e., families gave their consent by signing a physical-format document; the students handed this signed document to their teacher). In the remaining two centres, the obtained consent was passive (i.e., families were informed of the data collection through the centre's own internal platforms). Only students whose families gave their authorisation completed the questionnaire. Also, each pupil completed the questionnaires voluntarily and anonymously. The application of the questionnaires was then scheduled with each centre. Data collection was carried out during teaching hours chosen by the centres themselves between December 2023 and May 2024. Adolescents were informed of the anonymity and confidentiality of the questionnaires after they heard an explanation about how to fill in the questionnaires, which were completed individually within the class group. A researcher was present to describe the anonymity and confidentiality of the process. In addition, the researcher gave instructions on how to fill in the questionnaires correctly. At all times, she offered personalised attention to each student, ensuring that they completed the questionnaires correctly, and answered any queries they had.

2.4 Data Analysis

Statistical analyses were performed with the IBM SPSS statistical package v. 25.0 (SPSS Inc., Armonk, NY, USA). First, descriptive statistics and internal consistency analyses of the variables were carried out. Then, a Pearson's bivariate correlation analysis was conducted to examine the relationships between PSU and the FoMO and EI variables. A Student's *t*-analysis was then performed to check that there were no significant differences between boys and girls. In this way, the cut-off of 32 points could be used to indicate a PSU profile. This criterion was established by the Spanish version of the Lopez-Fernandez (2017) scale. Two profiles were thus established: a PSU group (i.e., adolescents who scored 32 points or more on the

Table 1. Pearson's bivariate correlations between study variables, reliability, and descriptive statistics.

Variables	Problematic smartphone use	α	Mean	SD	Min	Max
Emotional intelligence	–0.186***	0.88	4.779	1.020	1.44	7
Fear of missing out	0.293***	0.82	2.383	0.785	1	5
Problematic smartphone use	-	0.87	25.18	10.553	10	60

Note: ***$p < 0.001$.

SD, standard deviation; Min, minimum; Max, maximum.

Table 2. Binary logistic regression analysis to explain problematic smartphone use.

Variables	Beta	Standard error	Wald	p	OR
Age	0.295	0.081	13.314	<0.001	1.343
Emotional intelligence	–0.275	0.104	6.991	0.008	0.760
Fear of missing out	0.732	0.134	29.943	<0.001	2.080

Note: $\chi^2_{(4)} = 59.728$, R^2 Cox & Snell = 0.105, R^2 Nagelkerke = 0.154.

OR, odds ratio.

SAS-SV) and a non-PSU group (those who scored less than 32 points). Finally, to see the joint contribution of a vulnerability factor (i.e., FoMO) and a protective factor (i.e., EI) on belonging to the group of adolescents with PSU, a binary logistic regression analysis was performed.

3. Results

Descriptive statistics, minimum and maximum scores, and reliability indices for each variable are shown in Table 1. Also, Pearson's correlations between EI and FoMO and PSU variables can be observed. A significant and positive correlation was found between FoMO and PSU (r = 0.293, $p < 0.001$), while a significant and negative correlation was found between EI and PSU (r = –0.186, $p < 0.001$).

The results of the Student's t-analysis indicated no significant differences between boys (M = 24.81, SD = 10.45) and girls (M = 25.54, SD = 10.67), $t_{(535)} = -0.807$, p = 0.420, in PSU. This means that, according to the classification criteria of Lopez-Fernandez (2017), those adolescents (both boys and girls) who scored 32 points or more in the SAS-SV were part of the PSU group. Therefore, in the sample of this study, 141 adolescents (26.3%) had PSU, while 396 adolescents (73.7%) did not have PSU.

The results of binary logistic regression, in which explanatory factors of PSU in adolescents were estimated, can be observed in Table 2. In the first step, using the enter method, age was included as a covariate. In the second step, the EI and FoMO variables were included. A significant model was obtained, $\chi^2_{(4)} = 59.728$, $p < 0.001$, which explained between 10.5% and 15.4% of the variance (R^2 Cox & Snell = 0.105, R^2 Nagelkerke = 0.154). According to the Wald statistic and its associated significance, it was observed that older age, a higher level of FoMO, and a lower level of EI increased the likelihood that the adolescent would be included in the PSU group. In addition, FoMO was found to be the strongest explanatory factor (odds ratio (OR) = 2.080), followed by age (OR = 1.343) and EI (OR = 0.760).

4. Discussion

Considering the increasing use of smartphones by adolescents, as well as the negative health consequences of PSU, this study aimed to contribute to a deeper understanding of the phenomenon of PSU in adolescents. Specifically, our aim was to analyse the influence of a risk factor (i.e., FoMO) and a protective factor (i.e., EI) to explain the greater or lesser likelihood of adolescents developing PSU or not, adding evidence to previous studies with other populations.

In this study, positive associations between FoMO and PSU in adolescents were found (confirming H1a). Both variables were positively and significantly correlated, so that adolescents with higher FoMO were those who showed higher PSU. Our findings on FoMO are in line with the results of Chotpitayasunondh and Douglas (2016), who assessed a sample of adults regarding internet addiction. They are also consistent with the findings of Przybylski et al (2013), who used a sample of university students to study social media participation.

Regarding EI, negative associations between EI and PSU were found in this study (confirming H1b). This suggests that those adolescents with a low EI score were those with higher PSU levels, while those with better skills in perceiving, facilitating, understanding, and regulating their own and others' emotions showed lower PSU. The finding that low EI was significantly associated with a higher risk of PSU is in line with previous studies relating EI to PSU with Spanish adolescents (Arrivillaga et al, 2020; Satorre, 2022) and EI to nomophobia (i.e., nervousness and anxiety about not using a mobile phone) (Díaz and Extremera, 2020).

Finally, on the one hand, we found that higher levels of FoMO explained belonging to the group of adolescents with PSU (confirming H2). In fact, FoMO was the strongest explanatory factor for PSU (explaining 20.80%). Conversely, lower levels of EI were found to explain belonging to the group of adolescents with PSU (confirming H3). The consideration of EI as a protective factor against smartphone-

related behaviours is in line with the cross-cultural review by Resurrección et al (2014) (EI was a protective factor against risky behaviours in adolescents) and with the research by Valdés (2019) on EI and internet addiction in adolescents.

PSU is a complex phenomenon influenced by various psychological, social, educational, and familial factors (e.g., Sánchez-Fernández and Borda-Mas, 2023; Zhang et al, 2023). Therefore, the fact of including in the same model a vulnerability factor, such as FoMO, and a protective factor, such as EI, allows us to understand their joint and separate influence, contributing to a much more comprehensive explanation of the phenomenon of PSU in adolescence. Although our results did not reflect a very high explanatory percentage, given the complexity of this phenomenon, they provide evidence of a higher risk of developing PSU among adolescents with low levels of EI and high levels of FoMO. Furthermore, according to CIUT (Kardefelt-Winther, 2014), these findings suggest that adolescents who do not show a good EI development and have high levels of FoMO may use less adaptive regulation strategies (e.g., PSU) to try to alleviate their distress.

Overall, these findings could help in constituting a useful approach for PSU prevention and intervention programmes during adolescence. Strengthening adolescents' emotional skills could increase their ability to manage their emotions and cope more adaptively with different daily situations. This would help them avoid PSU. These findings suggest the importance of implementing programmes that focus on improving or developing emotional competencies in adolescents to promote their well-being and good use of technologies.

The present study had limitations, however. First, the use of convenience sampling implied a selection of participants based on their availability, which may affect the representativeness of the sample with respect to the target population. In other words, the results obtained may not be generalisable to a wider population. Furthermore, the cross-sectional nature of this research did not allow us to establish causal relationships between the variables. Future studies could use probability sampling with longitudinal designs. These could provide more valid data on a possible causal relationship between EI and FoMO and PSU over time and increase the generalisability of the results. On the other hand, the self-report measures may have caused social desirability bias to interfere with the results. Moreover, due to their full digital immersion, adolescents may not be sufficiently aware of the problems associated with intensive smartphone use. Similarly, due to their lack of emotional maturation, they may have a distorted perception of their EI competencies. Future research could include external assessments and/or direct measures of the variables related to the use of digital platforms and emotional competencies. Also, it is suggested that the study be conducted with a larger and more heterogeneous sample to corroborate and generalise these results.

Despite the limitations described above, we believe this study represents a relevant contribution to the contemporary field of research on the use and abuse of digital devices. These findings underline the importance that FoMO and EI may have as relevant and explanatory factors of PSU in adolescents. The findings also suggest the usefulness of addressing these constructs in educational contexts.

Regarding educational environments and focusing on EI as a protective factor for the development of PSU, numerous studies have found that EI can be trained, being susceptible to developing in adolescents as a result of interventions (Rubiales et al, 2018; Ruíz and Berrios, 2023). Therefore, educational professionals who wish to reduce PSU might design and implement prevention and intervention programmes aimed at the development of EI in adolescents. The improvement of EI in adolescents might shield adolescents from PSU despite the existence of powerful risk factors like FoMO.

5. Conclusions

This study aimed to contribute to scientific knowledge for a deeper understanding of the phenomenon of PSU in adolescents, considering the combined influence of risk and protective factors, such as FoMO and EI. The findings particularly highlight that a deficit in emotional skills and the presence of high levels of FoMO may promote PSU as a dysfunctional emotional regulation strategy. These results not only encourage further exploration of the underlying mechanisms and variables (e.g., psychological, social, familial, or contextual) that influence adolescents' propensity to engage in PSU but also suggest the importance of designing interventions focused on strengthening emotional skills as a means to promote better management of everyday situations and emotions, foster healthier technology use, and ultimately enhance adolescent well-being.

Availability of Data and Materials

The data will be available in a public repository of the corresponding author's university.

Author Contributions

Conceptualization: LR and MTCN, MGC; Methodology & investigation: LR and MTCN; Formal analysis: LR and MTCN; Writing—original draft preparation: MGC; Writing—review & editing: MGC, MTCN and LR; Funding acquisition: LR; Supervision: LR and MTCN. All authors read and approved the final manuscript. All authors have participated sufficiently in the work and agreed to be accountable for all aspects of the work.

Ethics Approval and Consent to Participate

This study was approved by the Ethics Committee of University of Malaga (170-2023-H) and was performed in accordance with the principles of the Declaration of Helsinki. In one education center, an active consent was

obtained (i.e., families gave their consent by signing a physical-format document; the students handed this signed document to their teacher). In the remaining two centers, a passive consent was obtained (i.e., families were informed of the data collection through the center's own internal platforms).

Acknowledgment

The authors would like to thank the members of the participating education centers (principals, management team, educational counsellors, teachers, and adolescents) for their valuable contribution and cooperation in this study.

Funding

This study is part of the project R&D&I PID2020-117006RB-I00, funded by MCIN/AEI/10.13039/501100011033/, and the research group CTS-1048G-FEDER (Junta de Andalucia). The second author has received funding from the University of Malaga under a postdoctoral contract.

Conflict of Interest

The authors declare no conflict of interest.

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