International Journal of Innovative Research and Scientific Studies, 8(6) 2025, pages: 3091-3098

IJIRSS
International Journal of Innovative Research & Scientific Studies

ISSN: 2617-6548

URL: www.ijirss.com

Risk factors and its relationship with problematic use of smartphone in Jordan adolescents

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Abstract

Adolescence is a life stage characterized by the adoption of new behavioral patterns, particularly concerning technology use. One notable outcome of this transition is the increased utilization of mobile communication devices, especially smartphones. This pilot study investigates problematic smartphone use among adolescents, emphasizing two primary psychological risk factors: Nomophobia (the fear of being disconnected from the internet) and FOMO (the fear of missing out on peer communication and experiences). The sample consisted of 201 participants, including adolescents aged 11 to 16, divided into two subgroups: 11–13 and 14–16. Data were collected via Google Forms during school hours with Jordanian students, with an average completion time of 15 minutes. The reliability indices of the adapted scales were found to be highly acceptable, confirming the effectiveness of the English-to-Arabic translation. Correlational analysis revealed a significant positive relationship between the FOMO and nomophobia scales. However, the correlations between problematic smartphone use and both nomophobia and FOMO were significant but negative. Furthermore, no significant age group differences were observed for FOMO, although differences were present for the other two variables.

Keywords: Adolescence, Mobile phone abuse, Risk factors, Smartphone.

DOI: 10.53894/ijirss.v8i6.10272
Funding: This study received no specific financial support.
History: Received: 28 July 2025 / **Revised:** 29 August 2025 / **Accepted:** 2 September 2025 / **Published:** 26 September 2025

Competing Interests: The authors declare that they have no competing interests.
Authors' Contributions: All authors contributed equally to the conception and design of the study. All authors have read and agreed to the published version of the manuscript.
Transparency: The authors confirm that the manuscript is an honest, accurate, and transparent account of the study; that no vital features of the study have been omitted; and that any discrepancies from the study as planned have been explained. This study followed all ethical practices during writing.
Publisher: Innovative Research Publishing

1. Introduction

Smartphones have become deeply embedded in daily life, occupying significant amounts of time across diverse environments, from urban areas to rural and remote regions. Rapid technological advancements have transformed these devices into essential tools that facilitate continuous connectivity [1]. The digital landscape now functions like a vast web that entangles users, with many experiencing distresses when disconnected, potentially undermining their autonomy. As key instruments for social interaction, entertainment, and information access, smartphone use among children and

adolescents has surged. This increase raises concerns among parents and experts about the negative impacts of prolonged use, including risks such as exposure to inappropriate content, addictive gaming, camera misuse, and social media exploitation, especially when supervision is lacking [2].

Research carried out [3] highlights that excessive smartphone use diminishes face-to-face interactions, impairing social skills like direct communication and empathy. Overuse is also linked to decreased academic performance, reduced homework completion, and poor emotional regulation, contributing to what some describe as a "zombie generation" [4]. The widespread adoption of smartphones among youth reflects broader social and technological shifts that have altered communication patterns and daily routines [5-7].

Today's smartphones combine traditional calling functions with computing capabilities, making them nearly inseparable from modern life [8]. When used excessively or without regulation, problematic patterns can emerge, often classified as a form of technological addiction that disrupts daily functioning. On average, children acquire their first smartphone around age 10. Ownership rates are notably high in countries such as Switzerland (97%), the UK (60%), and China, where 93.1% of minors accessed the internet via smartphones in 2019 [9, 10].

In Spain, studies report problematic internet use prevalence ranging from 3.7% to 9.9%, with adolescents being the most affected group. Regarding smartphone addiction specifically, rates vary from 2.8% to 26.1% among adolescent girls and 13% in boys [11, 12]. Globally, the average prevalence is approximately 25.7% [13]. In China, as the largest market, about 175 million young internet users were reported in 2021, with 21% engaging in excessive smartphone use [14]. Adolescents prone to overuse often exhibit psychological issues such as depression, loneliness, social anxiety, and emotional dependency.

Several factors contribute to problematic smartphone use, with a notable focus on the psychological concept of the fear of being disconnected, termed Nomophobia. Fear, broadly defined as an emotional response to perceived threats, becomes particularly relevant in the context of social experiences—referred to as "Fear of Missing Out" (FoMO). FoMO captures anxiety over missing rewarding experiences shared by peers on social networks, leading to feelings of exclusion and loss of social or experiential opportunities. The time spent on social media, driven by the exposure to idealized images and lifestyles, fosters a social anxiety that others are enjoying more fulfilling experiences without oneself, reinforcing dependence on digital connectivity [15].

Different fears related to problematic mobile use include Social Fear (fear of exclusion), Fear of Regret (missing important opportunities), Comparative Fear (worrying about others' better experiences), and Fear of Disconnection (anxiety about being unreachable, linked to nomophobia). According to DSM-5, phobias are persistent, irrational fears that lead to avoidance and distress, with nomophobia defined as the fear of being without or unable to use one's mobile phone—overlapping with FoMO but specifically related to separation anxiety. Symptoms include panic when disconnected, obsessive checking, and avoidance of restricted-use situations, often culminating in dependence and psychological issues such as anxiety and social withdrawal among adolescents.

This study exploratively examines whether there is a relationship between risk factors (FoMO and Nomophobia) and abusive mobile phone use. It also seeks to investigate whether higher scores in risk factors are related to increased scores in problematic mobile phone use, and if differences exist in the values found according to the age group.

2. Aims and Scope

The objectives were: (a) to identify the psychological and social risk factors (e.g., FoMO, nomophobia, low self-control, emotional dysregulation) associated with problematic smartphone use among adolescents. (b) to examine the extent to which specific individual factors (such as fear of missing out and nomophobia) predict smartphone abuse in adolescents.

As described in the introduction, Nomophobia, FoMO, and smartphone addictions are all parts of the same process of problematic phone use. There is no doubt since people rely on their phones to catch up with the latest information (and to lower the anxiety of falling behind), thereby leading them to become obsessed with using them. Surely any correlational study can be presented as a single process captured with theoretically independent measures. However, because of this, correlational studies set a substantive nomological network that eliminates alternative explanations and links those concepts with behaviors that appear independent but can only be combined using the model.

To achieve these goals a Jordan's convenience sample was used.

From this exploratory study the hypotheses to be confirmed were:

$H_{1:}$ There is a positive correlation between FOMO (Fear of Missing Out) and smartphone abuse among adolescents.

$H_{2:}$ There is a positive correlation between nomophobia and smartphone abuse among adolescents.

$H_{3:}$ FOMO and nomophobia will jointly predict a significant proportion of variance in smartphone abuse scores.

3. Materials and Methods

3.1. Participants and Procedures

The final sample consisted of 201 Jordanian adolescents aged 11 to 16, divided into two age groups: 11–13 and 14–16. As it is shown in Table 1.

This sample represented 18.14% of the student population under the Directorate of Education in Wadi Al-Seer and Marj Al-Hammam (Amman Fifth District). A cross-sectional convenience sample was used, with official approval obtained from the regional education authorities. The mean participant age was 14.16 years (SD = 1.47), and 52.74% were female. Adolescents were randomly selected from more than three public and private schools in Amman. Data collection was conducted during the 2024–2025 academic year over a three-month period, resulting in 201 completed questionnaires administered in school classrooms time.

Table 1.
Descriptive data by age and gender PSU.

	Age 11–13	Age 14–16	Total
Gender			
Male	40	55	95
Female	31	75	106
Total	71	130	201

This sample represented 18.14% of the student population under the Directorate of Education in Wadi Al-Seer and Marj Al-Hammam (Amman Fifth District). A cross-sectional convenience sample was used, with official approval obtained from the regional education authorities. The mean participant age was 14.16 years (SD = 1.47), and 52.74% were female. Adolescents were randomly selected from more than three public and private schools in Amman. Data collection was conducted during the 2024–2025 academic year over a three-month period, resulting in 201 completed questionnaires administered in school classrooms time.

All scales were translated into Arabic under the supervision of two psychology Ph.D. holders from a public university in Jordan and a private university in Amman. Language modifications ensured suitability for adolescents aged 11 to 16. Students required 25 to 33 minutes to complete the instruments.

Permission was obtained from schools to distribute the questionnaires both on paper and electronically via Google Forms. The primary outcome was smartphone uses behavior. The study examined the influence of risk factors, including Nomophobia and FoMO. Informed consent was acquired through a question indicating agreement to participate.

3.2. Instruments

The first instrument used was the Nomophobia Questionnaire (NMP-Q) developed by Yildirim and Correia [16]. It comprises 20 items rated on a 7-point Likert scale (1 = strongly disagree to 7 = strongly agree). The NMP-Q assesses four core dimensions of nomophobia: (a) Inability to Communicate (Items 10–15), reflects the fear of being unable to communicate with others, resulting in feelings of disconnection or isolation. (b) Losing Connection (Items 16–20), captures anxiety about losing access to online social networks or feeling digitally disconnected. (c) Inaccessibility to Information (Items 1–4), indicates concern over not being able to access information, news, or answers to queries. (d) Loss of Convenience (Items 5–9), refers to the fear of losing the comfort and efficiency associated with smartphone use.

The original version demonstrated excellent internal consistency (Cronbach's α = .93). The Spanish adaptations by Gutiérrez-Puertas, et al. [17] and Olivencia-Carrión, et al. [18] preserved similarly high reliability scores.

The second instrument was the FoMO scale (Fear of Missing Out), developed by Przybylski, et al. [19]. This unidimensional scale includes 10 items rated on a 5-point Likert scale (1 = not at all true of me to 5 = extremely true of me). It measures individuals' apprehension that others may be experiencing rewarding events in their absence. The original version demonstrated good psychometric properties (Cronbach's α = .88), and the Spanish adaptation by Gil, et al. [6] confirmed its internal consistency and construct validity.

The questions reflect behaviors and feelings linked to FoMO, such as the worry that others are having experiences that are more rewarding or the desire to stay connected on social media to avoid missing out. Accordingly, interest in the use of smartphones and addiction to them among adolescents has increased, and it has been enhanced with the aim of increasing awareness among adolescents, making efforts, and performing an appropriate level of the anxiety.

The third instrument was the Smartphone Addiction Scale (SAS) developed by Kwon, et al. [20]. It includes 34 items rated on a 6-point Likert scale (1 = strongly disagree to 6 = strongly agree), covering six dimensions: Daily Life Disturbance (5 items); Positive Anticipation (8 items); Withdrawal (6 items); Cyberspace-Oriented Relationship (7 items); Overuse (4 items): Tolerance (4 items). The original version showed excellent internal consistency (Cronbach's α = .91), and the Spanish adaptation by Lopez-Fernandez [21] confirmed its reliability and validity among adolescents and university students. Scores on the SAS provide insights into the intensity and domains of smartphone addiction. Subscale scores reveal specific areas of concern, such as social isolation or neglect of obligations due to overuse. High overall scores suggest a significant impact on daily functioning and may warrant further psychological or behavioral interventions. Cultural factors are essential in interpretation, as societal norms regarding smartphone use can vary significantly.

3.3. Research Design and Data Analysis

Data were analyzed using IBM SPSS v.22 and JAMOVI Sánchez-Carbonell, et al. [22] and The JAMOVI project. Jamovi [23] software. A significance level of .05 was established for all analyses. Pearson correlations and Cronbach's alpha coefficients were calculated, a multivariate analysis was carried out also, beside a grouped data to know the level of implication in each variable. Demographic variables included age, gender, and age groups (11–13 and 14–16 years).

From the original sample of 209 adolescents, seven cases were excluded due to Mahalanobis distance outliers. Two additional cases were removed for missing data, yielding a final sample of 201 participants.

4. Results and Discussion

The first step of the analyses we carried out was focused on descriptive values of the instruments (Nomophobia, FoMo and SAS Addiction), mean, standard deviation and standard error (Table 2, 3 and 4) the second step was to calculate the effect size calculated through Cohen's d index, as it is shown in Table 5, the results presented it is assuming variance equality 1,77 *Cohen's d.*

Table 2.
Nomophobia Descriptive values.

	Group	Mean	SD	SE
Nomophobia	1	4.00	0.86	0.10
	2	4.40	1.20	0.10

Table 3.
FoMo Descriptive values.

	Group	Mean	SD	SE
FoMO	1	2.30	0.79	0.09
	2	2.50	0.78	0.06

Table 4.
SAS Descriptive values.

	Group	Mean	SD	SE
Addiction	1	4.63	0.20	0.02
SAS	2	3.30	0.92	0.08

Table 5.
Independent samples t-test.

							95% CI	
		Statistic	*df*	*p*	Effect Size		Lower	Upper
Addiction	Student's *t*	12.0[a]	199	< 0.001	Cohen's *d*	1.77	1.36	2.18
SAS	Mann-Whitney *U*	1112		< 0.001	Rank biserial corr.	0.759		

Note: H_a μ 1 $\neq$ μ 2.

The levels of internal consistency of the scales, since they had been translated into Arabic from the original English version, so it was necessary to know the level of understanding by the participants. Table 6 shows internal consistency coefficients for the Arabic versions of the scales. Estimate the Composite Reliability (CR) and the Average Variance Extracted (AVE), that it is to say AVE is a measure of the amount of variance that is captured by a construct in relation to the amount of variance due to measurement error. It is shown that AVE coefficients should be around .0.50 being a little bit low in these scales.

4.1. Reliability Analysis

Table 6.
Internal consistency of scales.

Scales	Cronbach's α	McDonald's ω	CR	AVE	Items
Nomophobia	0.907	0.907	0.96	0,43	20
FoMO	0.837	0.838	0.85	0.35	10
Smartphone Addiction	0.966	0.966	0.87	0.39	34

The following analysis aimed to examine the relationship between the psychological risk factors and problematic smartphone use. To this end, a Pearson correlation analysis was conducted, and the results are presented in Table 7.

Table 7.
Pearson's Correlation Matrix.

	SAS Scale	Nomophobia Scale (NOMO)	FOMO Scale
Nomophobia Scale	-0.186**	—	
df	199	—	
p-value	0.008	—	
FoMO Scale	-0.206**	0.363***	—
df	199	199	—
p-value	0.003	< .001	—

Note. *p < .05, **p < .01, ***p < .001
SAS = Smartphone Addiction; Nomo = Nomophobia; FoMO = Fear of Missing Out.

We also wanted to know the level of correlation between the factors on the SAS scale. Table 8 shows the high level of correlation, so we could consider treating them as a single factor since they are so highly correlated.

Table 8.
SAS Addiction Correlation Matrix.

	DailyDistu		PositiveAnti		Withdra		Cyberspac		Overuse
PositiveAnticip	0.60	***	—						
Withdrawl	0.67	***	0.85	***	—				
Cyberspace	0.71	***	0.80	***	0.82	***	—		
Overuse	0.60	***	0.82	***	0.86	***	0.78	***	
Tolerance	0.59	***	0.65	***	0.79	***	0.71	***	0.76***

Note: * p < 0.05, ** p < 0.01, *** p < 0.001

The third analysis presents grouped data to describe the distribution of scores among participants. As shown in Figure 1, in the case of nomophobia, 14.93% of adolescents experience a very high level of fear of being disconnected, while 26.37% report a high level of fear related to losing access to the internet or social networks.

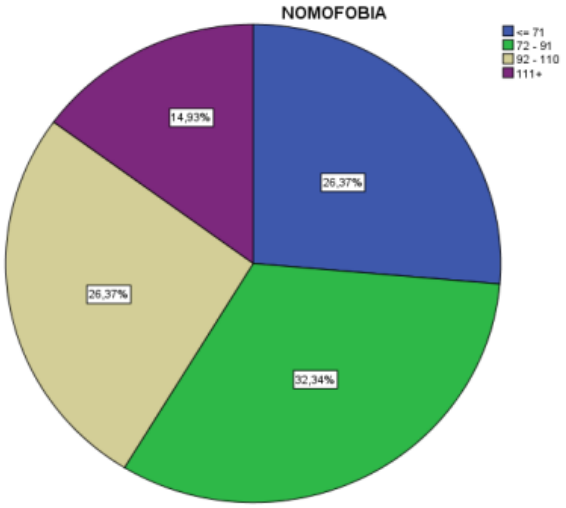

Figure 1.
Nomophobia Scale (Colored areas show the percentage in the variable).

Figure 2 illustrates the levels of fear related to being left out of one's close social circle on platforms such as WhatsApp, Instagram, or TikTok. This fear reflects concerns about missing social experiences or interactions occurring within these digital environments.

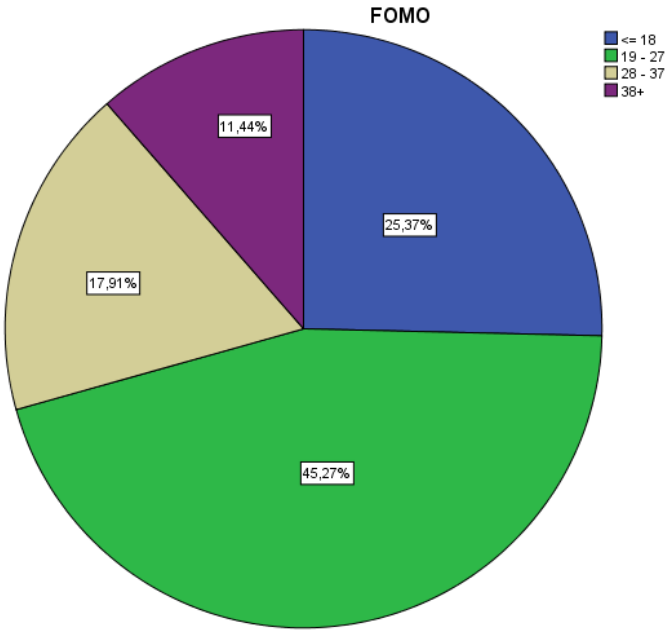

Figure 2.
FoMO (Fear of Missing Out) Scale (Colored areas show the percentage in the variable).

In this case, 11.44% of the sample exhibited *very high* levels of fear of missing out, while 17.91% reported *high* levels of this fear. Figure 3 presents the distribution of problematic smartphone use. The data reveal that 47.26% of adolescents

demonstrate *very high* levels of systematic mobile phone abuse, while an additional 9.95% fall within the *high abuse* category.

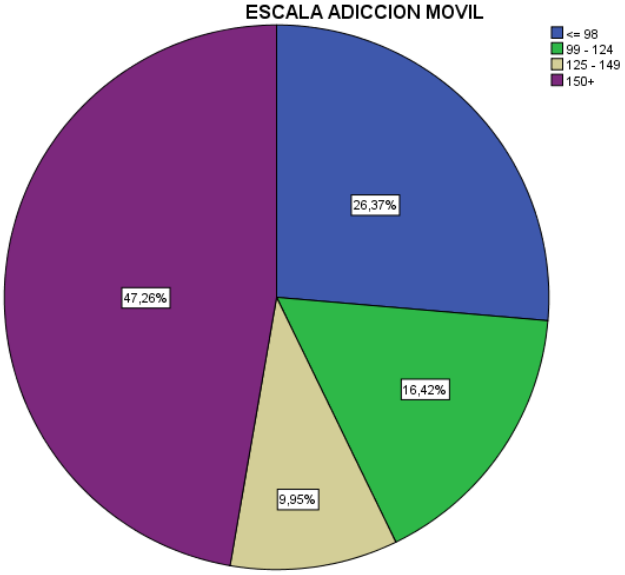

Figure 3.
Problematic Smartphone Use Scale (Colored areas show the percentage in the variable).

4.2. Multivariate Analysis

In addition to the previous analyses, we aimed to explore whether there were statistically significant differences based on age group in the three main variables: fear of disconnection (nomophobia), fear of missing out (FoMO), and problematic smartphone use. Finally, to assess the combined behavior of these variables, a multivariate analysis of variance (MANOVA) was conducted.

As shown in Table 9, significant differences were found between age groups for nomophobia and problematic smartphone use, but no significant difference emerged for FoMO. In other words, both age groups 11–13 and 14–16 years reported similar levels of fear of missing out, while differences were evident in the other two variables.

Table 9.
Multivariate Analysis.

Multivariate Test						
Effect	**Test**	**Value**	***F***	***df*1**	***df*2**	***p***
Age (11–16)	Wilks' Lambda	0.563	51.00	3	197	< .001
	Hotelling's Trace	0.776	51.00	3	197	< .001
Univariate Test						
Dependent Variable	**Sum of Squares**	***df***	**Mean Square**	***F***	***p***	
SAS (Addiction)	81.50	1	81.500	144.63	< .001	
Nomophobia	16.04	1	16.044	11.14	<.001	
FoMO	1.65	1	1.651	2.65	<.105	
Residuals						
Variable	**Sum of Squares**		***df***	**Mean Square**		
SAS (Addiction)	112.14		199	0.564		
Nomophobia	286.70		199	1.441		
FoMO	123.99		199	0.623		

The purpose of this exploratory study was to evaluate the potential overuse of mobile phones among a sample of adolescents, as well as to assess differences across three variables: nomophobia (the fear of being disconnected from social networks), FoMO (fear of being left out of reference social groups and digital interactions), and problematic smartphone use which includes both general problematic behaviors and signs of addiction. Knowing that Nomophobia, FoMO are parts of the same cognitive process of problematic phone use, the authors wanted to know if these cognitive processes were enough strong to determine the negative consequences of using the cellular phone. To achieve that goal, first, we conducted a reliability analysis to evaluate the internal consistency of the scales used. Once they were translated into Arabic language. The results revealed high internal consistency for all instruments, indicating that the translation into the participants' native language was effective and that the adolescents correctly understood the items.

Second, we explored the correlations between the variables. The data revealed a significant positive correlation between the two fear-based scales (r = .363***), suggesting a strong link between nomophobia and FoMO. However, problematic smartphone use correlated negatively with both nomophobia (r = –.186**) and FoMO (r = –.206**). These

negative correlations may reflect a tendency among adolescents to deny that their fears of disconnection or exclusion are driving their problematic smartphone behaviors. This resistance to acknowledgment appeared stronger for FoMO than for nomophobia.

Next, we analyzed the distribution of scores across the scales, using grouped percentiles to visually interpret the data. This yielded some concerning findings: over 41% of adolescents exhibited high or very high levels of nomophobia, while 28% scored similarly high in FoMO. The most alarming result, however, was that 58% of participants fell into the high or very high range of problematic smartphone use, prompting important questions about what interventions might reduce this rate of mobile phone overuse among adolescents.

Finally, we assessed whether age influenced the three variables. The multivariate analysis showed significant differences between age groups (11–13 and 14–16 years) in both nomophobia and problematic smartphone use, but no significant difference in FoMO. This suggests that both age groups perceive fear of missing out similarly. Importantly, the assumption of homogeneity of variance was met for the nomophobia and addiction scales, so parametric tests were used. However, for the FoMO scale, the Mann–Whitney U test for independent samples was employed, and no significant differences emerged. Thus, we conclude that FoMO is perceived consistently across age groups.

5. Conclusion

We have argued that exists an ongoing debate, there remains a cautious stance toward classifying mobile phone addiction as a new diagnostic entity. Current perspectives suggest that abuse, excessive use, or problematic use may not reach the same level of dependency as technological addictions such as internet addiction [22] even though they may present with similar symptoms to those of substance dependence.

Further research is needed to better understand the potential consequences of internet overuse, with the recognition that mobile phones are merely tools that facilitate access to digital content. In the context of adolescence, a period that marks the integration of technology into everyday life this study highlights the need to promote awareness and education on the beneficial uses of smartphones, while also addressing the harmful effects that may arise from unsupervised or excessive use.

The theoretical and practical meaning assigned to the age category was perfectly explained, since age in psychology is essentially a temporal, sequential, and developmental trajectory of a mind, that is the reason to split the sample into two categories because our main intention was to know if age determined categorizing it into stages knowing that literature demonstrate a strong quantitative understanding that an justify the operation. The back-translation procedure concerned mainly to reflect precisely the sense and meaning of the authors in more detail, and described how the authors assessed its quality as a psychological instrument to be incorporated in Jordan country.

The risk factors examined in this study underscore emerging mental health concerns, such as anxiety, social fears, and the fear of exclusion from digital social networks. These issues warrant closer attention from educators, psychologists, and families alike.

This exploratory study does have limitations, including the use of self-report paper-and-pencil measures and the restriction of the sample to Jordanian adolescents. Future research should replicate this study with European or cross-cultural populations to determine whether cultural differences influence the prevalence and perception of problematic smartphone use and associated psychological risk factors. Second phase is in progress with more than a thousand adolescents and for the future it should be matched both groups of data to acquire more information about problematic smartphone use and its consequences.

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