

Problematic internet use in adolescents and parents: a cross-generational comparison of independent samples

Shaima Moqbel , Ala Yankouskaya , Sameha Alshakhsi , Dena Al-Thani , Raian Ali & Diana Alsayed Hassan

To cite this article: Shaima Moqbel , Ala Yankouskaya , Sameha Alshakhsi , Dena Al-Thani , Raian Ali & Diana Alsayed Hassan (05 Aug 2026): Problematic internet use in adolescents and parents: a cross-generational comparison of independent samples, Behaviour & Information Technology, DOI: [10.1080/0144929X.2026.2711026](https://doi.org/10.1080/0144929X.2026.2711026)

To link to this article: <https://doi.org/10.1080/0144929X.2026.2711026>



© 2026 The Author(s). Published by Informa UK Limited, trading as Taylor & Francis Group



Published online: 05 Aug 2026.



Submit your article to this journal [↗](#)



Article views: 178



View related articles [↗](#)



View Crossmark data [↗](#)

Problematic internet use in adolescents and parents: a cross-generational comparison of independent samples

Shaima Moqbel^a, Ala Yankouskaya^b, Sameha Alshakhsi^a, Dena Al-Thani^a, Raian Ali^a and Diana Alsayed Hassan^c

^aCollege of Science and Engineering, Hamad Bin Khalifa University, Doha, Qatar; ^bSchool of Psychology, Bournemouth University, Poole, United Kingdom; ^cCollege of Public Policy, Hamad Bin Khalifa University, Doha, Qatar

ABSTRACT

The growing integration of digital technology into daily life has increased concerns about its impact on adolescents' and parents' well-being. This cross-sectional study used dual-informant data from 399 Arab parents and 220 Arab adolescents in the Gulf Cooperation Council (GCC) region to examine associations between parental PIU, family functioning, and adolescent PIU, and to assess differences in symptom patterns across parent and adolescent groups. Results revealed PIU prevalence, with adolescents self-classifying as dependent more frequently (45.9%) than parents (33.3%). At the symptom level, preoccupation with the internet, tolerance to internet use, and loss of control were the most consistently endorsed criteria across groups, although perspective-dependent differences emerged: adolescents reported higher withdrawal and loss of control, whereas parents emphasised preoccupation and perceived greater tolerance in their adolescents. Higher parental PIU and poorer family functioning were significantly associated with greater adolescent PIU, explaining 40.3% and 34.6% of the variance in adolescent- and parent-reported models, respectively. Consistent patterns of PIU were observed across parent and adolescent groups, highlighting the importance of prevention and intervention efforts to support digital well-being in collectivist Arab contexts.

ARTICLE HISTORY

Received 23 December 2025
Accepted 21 July 2026

KEYWORDS

Problematic internet use; family functioning; family environment; internet addiction; digital addiction

1. Introduction

Internet use has become an inseparable part of adolescent life, with approximately 95% of teenagers reporting access to a smartphone and nearly half describing themselves as being online 'almost constantly' marking an increase of 22 percentage points from a decade ago (Pew Research Center 2024). Among adolescents in particular, technology has become especially central to their recreational activities, educational engagement, and the development of social identity. Recent surveys indicate that almost all teenagers now own a smartphone and engage online multiple times each day (Howarth 2023; Rideout and Robb 2019). Recent evidence from the Middle East and North Africa (MENA) region shows similar high levels of screen exposure and sedentary behaviours among children and adolescents. A narrative review synthesising findings from seven MENA countries reported that the proportion of adolescents exceeding two hours of daily screen time ranged widely from 21.9% to 96.7% with Gulf Cooperative Countries (GCC) such as Qatar,

Saudi Arabia, and Kuwait showing particularly elevated levels. For example, in Qatar, 43–57% of adolescents exceeded two hours of screen time on weekdays and 50–62.5% on weekends, while studies from Saudi Arabia documented that over 84–91% of adolescents surpassed recommended limits (Alnaqbi et al. 2025). Alongside the benefits of technology, international organisations and experts have raised increasing concerns about the excessive or uncontrolled use of the Internet, especially among adolescents (Anderson, Steen, and Stavropoulos 2017; Kuss and Griffiths 2017; OECD 2021; UNICEF 2021; World Health Organization 2020).

Problematic Internet Use (PIU) is a broad concept encompassing a range of excessive or poorly controlled online behaviours that result in functional impairment, without necessarily implying a clinical diagnosis of addiction (Restrepo et al. 2020; Tiego et al. 2021). Consistent with Young's (1998) framework, PIU reflects difficulties such as preoccupation, loss of control, tolerance, withdrawal, and continued use despite negative consequences. Rather than framing Internet use as a pathological condition, PIU captures variations in self-regulation and

CONTACT Shaima Moqbel  shmo56828@hbku.edu.qa  College of Science and Engineering, Hamad Bin Khalifa University, Doha, Qatar; Diana Alsayed Hassan  dhassan@hbku.edu.qa  College of Public Policy, Hamad Bin Khalifa University, Doha, Qatar

© 2026 The Author(s). Published by Informa UK Limited, trading as Taylor & Francis Group

This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0/>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited. The terms on which this article has been published allow the posting of the Accepted Manuscript in a repository by the author(s) or with their consent.

functional impairment that may fluctuate across developmental stages and social contexts (Spada 2014). Previous research has shown that PIU is associated with several psychological and psychiatric disorders among adolescents (Ortuño-Sierra et al. 2024), including depression (H. C. Chen et al. 2020; Mita, Muthoni, and Kigamwa 2025), social anxiety (Ding, Cao, and Sun 2023), anxiety, and attention-deficit/hyperactivity disorder (ADHD) (Ko et al. 2012; Mita, Muthoni, and Kigamwa 2025), in addition to poor social and mental health outcomes such as sleep disturbances (Ko et al. 2012), low self-esteem, and poor family functioning (C. Y. Chen et al. 2021). Adolescence is a period marked by ongoing maturation of cognitive control, heightened sensitivity to social rewards, and active identity formation (Blakemore and Mills 2014). Individual differences in self-regulation, social motivation, and emotional coping may therefore shape how adolescents engage with online environments, increasing vulnerability to maladaptive use patterns when regulatory capacities are still emerging and social demands are heightened (Chemnad et al. 2025; Kardefelt-Winther 2014). Within this context, the boundary between normative and problematic engagement can easily blur, as online activities often serve important social and emotional functions while at the same time encouraging excessive or uncontrolled use (Kardefelt-Winther 2014; Spada 2014). Therefore, understanding PIU within a developmental framework is particularly important during adolescence.

Rather than viewing PIU as an individual behavioural problem, contemporary theoretical perspectives conceptualise PIU as a problematic outcome and as a culmination of the interactions between individual vulnerabilities and broader environmental contexts. Ecological frameworks suggest that adolescents and adults are embedded within shared socio-digital environments shaped by rapid digitalisation, constant connectedness, social norms, and family communication patterns. Consequently, within these environments, PIU may emerge naturally across generations and not only necessarily through direct within-family transmission, through exposure to similar digital ecosystems and patterns of technology use (Bronfenbrenner 1979; Kardefelt-Winther 2014; Livingstone and Helsper 2008).

One theoretical framework used to understand PIU in adolescence is the Interaction of Person–Affect–Cognition–Execution (I-PACE) model (Brand et al. 2016, 2019). The model proposes that PIU is developed through interactions between personal predispositions, affective responses, cognitive processes, executive functioning, and contextual factors associated with adolescents' online engagement. Similarly, the concept of technofence highlights how frequent engagement with digital devices during social and family interactions

is associated with poorer communication, reduced emotional availability, and lower relationship quality (McDaniel 2019). Furthermore, evidence suggests low family cohesion and poor communication are linked to higher rates of PIU in adolescents (Yu and Shek 2013; Zhang et al. 2025). Together, these perspectives suggest that PIU may reflect broader contextual and developmental processes operating across generations within increasingly digitalised societies.

Research examining PIU and family processes has been conducted across a wide range of cultural settings. However, the ways in which these mechanisms operate can vary across sociocultural contexts. In the Gulf Cooperative Council (GCC) region, where family cohesion is central to the collectivistic culture, digital technology has been rapidly integrated into the social, educational, and family daily life. The region reports some of the world's highest rates of smartphone ownership and social media engagement, with estimates of Internet addiction ranging from 4% to 82% and a pooled prevalence of 33% (Al-Khani et al. 2021). These figures reflect not only the rapid digital transformation of GCC societies but also the centrality of technology in social, educational, and family life. At the same time, broader cultural values emphasising close family relationships, parental involvement, and collective identity continue to shape adolescents' social experiences. Yet, as the region undergoes rapid modernisation and globalisation, traditional social values emphasising close family relationships and parental involvement continue to shape family structures.

Within this rapidly digitalising environment, differences in online engagement patterns between adolescents and adults may reflect broader developmental differences rather than direct parent–child transmission processes. Previous studies conducted in Arab and Gulf populations have reported associations between parental Internet use, family functioning, and adolescent PIU (Alshakhsi et al. 2025; Chemnad, Alshakhsi et al. 2023; Mousa et al. 2024). However, most of this literature relied on single-informant or family-based approaches that emphasise direct intergenerational influence within households, while fewer studies have examined similarities and differences in PIU patterns across independent adolescent and parent groups. Consequently, less is known about how PIU may manifest across generations at the broader population level within shared sociocultural digital environments.

For example, parents may view their involvement in Internet use monitoring as supportive, whereas adolescents may perceive it as excessive or unfair. Only a small number of studies globally have examined PIU using both parent and adolescent reports across

independent or matched parent–adolescent samples (Hiniker, Schoenebeck, and Kientz 2016; Lam and Wong 2015). It is important to note that the present study adopts a cross-generational approach, rather than examining within-family influences, using independent samples of adolescents and parents recruited from the same broader sociocultural context offering culturally relevant evidence for families in the GCC region. Using independent samples allows us to capture differences in perceptions while avoiding dependency between observations that commonly arises in dyadic designs due to shared environments and mutual influence. This design can also be considered a strength, as separating informants reduces shared-method bias and minimises dependency between observations.

Building on prior findings suggesting that adolescents are particularly vulnerable to problematic Internet use (Chemnad, Aziz et al. 2023), H1: we hypothesise that adolescents will report higher levels of PIU than parents. H2: We further hypothesise that adolescents' perceptions of parental PIU will differ from parents' self-reported PIU, reflecting differences in symptom patterns across groups. H3: Based on previous findings linking parental PIU with adolescent PIU (Alshakhsi et al. 2025; Chemnad, Alshakhsi et al. 2023; Yankouskaya et al. 2025), we hypothesize that parental PIU will be positively associated with adolescent PIU across independent samples. H4: Finally, given evidence showing associations between family functioning and adolescent PIU (Chemnad, Aziz et al. 2023; Mousa et al. 2024), we hypothesise that adolescents' perceptions of parental PIU will be positively associated with adolescents' own PIU, and that family functioning will be significantly associated with adolescents' own PIU.

The present study sets out to answer the following research questions:

RQ1. What are the levels of problematic Internet use (PIU) across our adolescent and parent samples?

RQ2. Do PIU symptom patterns differ across the adolescent and parent samples?

RQ3. Is there a cross-generational association between parental PIU and adolescent PIU in our samples?

RQ4. To what extent do parental PIU and family functioning, measured from adolescent- and parent-reported perspectives, predict adolescents' PIU across our samples?

2. Methods

2.1 Study design

This cross-sectional study utilised data from two independent groups, Arab adolescents and Arab parents,

recruited independently from different households. The parent and adolescent samples do not represent matched parent–adolescent dyads, as the study adopts a cross-generational comparative approach focused on differences in perceptions across groups rather than within-family relationships or causal influences between parents and their children, consistent with multi-informant research perspectives (De Los Reyes et al. 2013; De Los Reyes and Kazdin 2005).

2.2. Participants and procedure

2.2.1. Adolescent sample

A total of 256 adolescents aged 10–15 years were initially recruited from public, gender-segregated schools across Qatar using purposive and convenience sampling to ensure diverse student populations. After excluding 36 cases due to incomplete responses, failed attention checks, or ineligibility, the final adolescent sample consisted of 220 participants. Eligibility criteria included: (1) identifying as culturally Arab, (2) currently residing in Qatar, (3) being a regular internet user, and (4) providing both informed assent and parental consent. The survey was conducted online in a classroom environment under the guidance of trained research staff. Anonymity was ensured by assigning random identification numbers.

2.2.2. Parent sample

A total of 437 Arab parents were recruited through CINT, a global online research platform that provides access to verified and diverse participant panels. Following data quality checks, 38 responses were excluded, resulting in a final sample of 399 parents (218 males and 181 females). Participants were Arab parents residing in GCC countries, including Saudi Arabia ($n = 211$), the United Arab Emirates ($n = 119$), Kuwait ($n = 31$), Qatar ($n = 23$), Bahrain ($n = 11$), and Oman ($n = 4$). GCC countries share a broadly collectivist orientation and common cultural characteristics such as religion, language, customs, and social norms (At-Twajjri and Al-Muhaiza 1996). Eligibility criteria for parents included: (1) the primary caregiver of at least one adolescent aged 10–15 years, (2) identify as culturally Arab in terms of norms and traditions, (3) currently residing in one of the Arab GCC countries, and (4) be a regular internet user. To standardise responses when parents had multiple children in the target age range, the following instruction was included,

The following questions in this survey will focus on your adolescent who is between the ages of 10 and 15. If you have more than one adolescent in this age

range, please answer for the adolescent closest to 13 years old.

Parents completed an online survey reporting on their own internet use, their perceptions of their adolescent's internet use, and demographic details about the adolescent. Based on these reports, the adolescent group represented in the parent data included 125 males and 95 females.

2.2.3. Data collection and quality assurance

All data were collected using SurveyMonkey™, a secure and user-friendly web-based platform with full Arabic-language compatibility. The complete survey was administered in Arabic to ensure accessibility for GCC participants. Quality-assurance procedures were applied across both groups, including attention-check items to detect inattentive responses, exclusion of surveys completed in less than half the median completion time, and removal of uniform or patterned response sets. Only participants meeting all inclusion and quality criteria were retained for analysis.

2.2.4. Ethical considerations

The study was reviewed and approved by the Institutional Review Board (IRB) at Hamad Bin Khalifa University (HBKU) under two separate approvals, HBKU-IRB-2025-81 for the adolescent dataset and HBKU-IRB-2025-77 for the parent dataset, granted on January 30, 2025. Ethical procedures were applied consistently to both participant groups. Adolescent participants received a study information sheet written in simple Arabic and provided written assent, while their parents provided written informed consent through the participating schools before their children completed the survey. Parent participants recruited independently through CINT provided digital informed consent before accessing the online questionnaire. All participants were informed of their rights, including the voluntary nature of participation and their ability to withdraw at any time without penalty. No identifying information was collected to ensure full anonymity. Data collection for both groups occurred between early February and late March 2025. In the analysis and results sections, findings from the adolescent-reported dataset are referred to as adolescent-reported data, while findings from the parent-reported dataset are referred to as parent-reported data.

2.3. Measures

A validated Arabic version was used for the FAD-GF measure (Assaf et al. 2025). The IADQ and the parental

version of the Young Diagnostic Questionnaire (PYDQ) (Wartberg et al. 2016) were translated into Arabic using a forward-backward translation method (Brislin 1970), following established guidelines for the cross-cultural translation of self-report measures (Beaton et al. 2000; Sousa and Rojjanasrirat 2011). The English items were first translated into Arabic by bilingual translators and then independently back-translated into English. The source, forward, and back-translated versions were compared to identify and resolve discrepancies and to establish conceptual equivalence, with particular attention to preserving the behavioural symptoms each instrument assesses. Before full data collection, the Arabic translations underwent cognitive pretesting in a pilot study with twelve participants (six Arab parents and six Arab adolescents aged 10–15), who shared similar cultural and educational backgrounds with the target sample. The pilot evaluated the clarity, cultural appropriateness, and comprehension of the translated items. Based on participant feedback, several items were revised, simplifying the Arabic phrasing for age-appropriateness and refining the instructions, to ensure that the intended meaning of the original items, and the symptoms they assess, were accurately conveyed in the Arabic translation. A committee of bilingual experts, including specialists in adolescent digital behavioural addiction and PIU, reviewed the forward and back-translated versions to resolve discrepancies and confirm semantic, idiomatic, experiential, and conceptual equivalence before the Arabic version was finalised. The adolescent-reported perceived parental PIU measure was adapted from the original PYDQ. The adapted version was then pilot tested and evaluated using item descriptive statistics, internal consistency reliability, item discrimination, tetrachoric inter-item structure, and confirmatory factor analysis (CFA). Further psychometric details are provided in the Supplementary Materials.

Adolescents were instructed to respond based on the parent they interact with most frequently (i.e. mother or father).

2.3.1. Demographic information

Adolescents were asked to report their age (in years; continuous variable), gender (male = 1, female = 0), grade level (categorical: Grades 5–9), and school name.

Parents were asked to provide their age (in years; continuous variable), gender (male = 1, female = 0), nationality, country of residence, level of education (categorical: no formal education, secondary education, high school, pursuing or completed vocational or technical education, pursuing or completed undergraduate degree [bachelor's], or pursuing or completed

postgraduate degree [master's/PhD]) and employment status (categorical: employed full-time, employed part-time, running own business, unemployed, or prefer not to say). They also reported the age and gender of one of their adolescents aged 10–15, on whom their answers were centred.

2.3.2. Problematic internet use (PIU)

Problematic Internet Use (PIU) refers to a maladaptive pattern of Internet engagement characterised by excessive preoccupation, loss of control, withdrawal, tolerance, Risking or losing relationships and opportunities and continued use despite negative consequences. It was assessed in this study using two closely related and widely validated instruments: the Internet Addiction Diagnostic Questionnaire (IADQ) and the Parental Version of the Young Diagnostic Questionnaire (PYDQ; Wartberg et al. 2016). The instruments' criteria are the very foundation on which current digital-addiction instruments are built. Young's (1998) eight criteria were adapted from the DSM-IV diagnostic criteria for pathological gambling, and the same core symptoms, preoccupation/salience, tolerance, withdrawal, loss of control, mood modification (escape), deception, and negative consequences, were subsequently used to define Internet Gaming Disorder in the DSM-5 (2013) and are codified in Griffiths (2005) components model of addiction, which applies across behavioural addictions. Both tools capture the same eight core symptoms of PIU that mirror behavioural-addiction criteria such as deception, tolerance, withdrawal, and unsuccessful attempts to control usage. The IADQ and PYDQ were selected because they provide parallel parent and adolescent versions that assess the same eight core symptoms of problematic Internet use. This multi-informant, symptom-level design enabled consistent comparisons across the two independent informant groups and maintained comparability with previous studies in Arab populations using Young-based measures.

Parents completed the IADQ to evaluate their own Internet use, while adolescents completed an adapted version of the same instrument to assess their perception of their parents' use. In this adaptation, adolescents' responses were not intended to provide objective assessments of their parents' actual behaviour, but rather to capture adolescents' perceptions of their parents' Internet use. Accordingly, this construct is conceptualised as perceived parental PIU, reflecting adolescents' interpretations and subjective experiences of parental digital behaviour. Parents completed the PYDQ about their adolescents, and adolescents completed an adapted version of the PYDQ concerning their perceptions of their parents' Internet use behaviour. Each instrument

included eight binary (Yes, No) items indicating the presence or absence of each symptom. Total scores ranged from 0 to 8, with higher scores denoting greater levels of problematic use. Internal consistency ranged from acceptable to good in the current study (Cronbach's $\alpha = 0.702$, McDonald's $\omega = 0.707$ for parents, 95% CI [0.798–0.849]; $\alpha = 0.845$, $\omega = 0.845$ for adolescents, 95% CI [0.860–0.908]; see Supplementary Materials for details).

In the present study, the PYDQ (Wartberg et al. 2016) was adapted to allow adolescents to report on their perceptions of their parents' internet use. Specifically, all items were minimally reworded from a child-referential format (e.g. 'Do your child stays online longer than intended?') to a parent-referential format (e.g. 'Does your parent stay online longer than intended?'). The adapted version retained the same items and response format as the original PYDQ, with only the referent changed from the child to the parent. Therefore, linguistic and conceptual equivalence with the original instrument was expected. Nevertheless, the adapted version was psychometrically evaluated in the present sample using item descriptive statistics, internal consistency, item discrimination, tetrachoric inter-item structure, and confirmatory factor analysis (CFA). Further psychometric details are provided in the Supplementary Materials.

2.3.3. Family functioning

Family functioning was assessed using the General Functioning Subscale of the McMaster Family Assessment Device (FAD-GF), reported from both adolescent and parent perspectives. The FAD-GF consists of 12 items designed to evaluate overall family functioning, with a balanced mix of positively and negatively worded statements (e.g. 'We are able to make decisions about how to solve problems' vs. 'We don't get along well together'). Responses are rated on a 4-point Likert scale ranging from 1 (strongly disagree) to 4 (strongly agree). Total scores were computed by summing the item responses, resulting in possible scores ranging from 12 to 48, where higher scores reflect greater family dysfunction and lower scores indicate better functioning.

The FAD-GF has been validated in both clinical and research contexts (Miller et al. 1985) and applied in diverse cultural settings, including Arab populations, with good reliability (Al-krenawi, Graham, and Slonim-nevo 2002; Mousa et al. 2024). The scale was also recently validated in Arab populations (Assaf et al. 2025). In the present dataset, internal consistency analysis showed acceptable to good reliability, with Cronbach's alpha and McDonald's omega coefficients of α

= .762, $\omega = .802$ for adolescent reports, and $\alpha = .871$, $\omega = .875$ for parent reports. These results align with prior validation studies, supporting the use of the Arabic version of the FAD-GF in this sample (Assaf et al. 2025).

2.4. Data analysis

To address the research questions, a series of analyses were conducted.

2.4.1. Descriptive statistics

Descriptive analyses were conducted to summarise the sociodemographic characteristics and the main study variables, including parental PIU, adolescent PIU, and family functioning. Frequencies and percentages were used to describe the distribution of PIU categories. Differences in prevalence between parents and adolescents were then examined using chi-square tests. These analyses provided an overview of the sample characteristics and established the context for subsequent inferential analyses.

2.4.2. Symptom-Level analyses

To investigate similarities and differences in the endorsement of PIU symptoms between parents and adolescents, Generalized Linear Mixed Models (GLMMs) were employed. This approach allowed the inclusion of correlated repeated observations and unbalanced group sizes. The dependent variable represented the presence or absence of each PIU symptom. Fixed effects included role (parent vs. adolescent) and symptom type (eight criteria), as well as their interaction (Role $\times$ Symptom). A random intercept for participant ID was included to account for individual differences and the non-independence of repeated observations. Likelihood ratio tests were used to assess model fit, and post-hoc pairwise comparisons were adjusted using the Bonferroni correction to control for multiple testing. The model was assessed for normality, homoscedasticity, and absence of overdispersion to ensure the reliability of estimates.

2.4.3. Predictors of adolescent PIU

To examine the predictive role of parental PIU and family functioning on adolescent PIU, multiple regression analyses were performed. Separate models were built using parent-reported and adolescent-reported data to examine the predictors within each informant group. In each model, adolescent PIU served as the dependent variable, while parental PIU and family functioning were included as independent

variables. In addition, the interaction between Parental PIU $\times$ Family Functioning was explored to test whether the association between parental and adolescent PIU varied across levels of family functioning. All continuous variables were mean centred prior to inclusion in the models to facilitate the interpretation of interaction terms. Assumptions of normality, linearity, homoscedasticity, multicollinearity, and independence of residuals were verified using standard diagnostic plots and statistics, including Q-Q plots, residuals versus predicted values, Variance Inflation Factor (VIF), and the Durbin-Watson test.

All inferential analyses were conducted using a significance level of $p < .05$. Mixed models were estimated using restricted maximum likelihood (REML). For fixed effects, Type III Wald F-tests with Satterthwaite's approximation were applied, and effect sizes were reported using partial η^2 and odds ratios, depending on model type. Sensitivity analyses were conducted to confirm the robustness of findings. Results were interpreted considering both statistical significance and theoretical relevance to cross-generational patterns of Internet use.

2.4.4. Sensitivity analysis

Sensitivity analyses were conducted to evaluate what is the smallest overall model effect that could be reliably detected given the sample sizes in the present study. Sensitivity was assessed separately for the adolescent and parent-report samples using G*Power 3.1 (Faul et al. 2007, 2009), based on the omnibus test of explained variance in a fixed linear multiple regression model (R^2 deviation from zero). The analyses assumed two predictors, a significance level of $\alpha = .05$, and a target power of .80.

For the adolescent-report sample ($N = 220$), the sensitivity analysis indicated that the regression model could detect a minimum overall effect corresponding to approximately 4.4% of explained variance in adolescent PIU ($R^2 = .044$). For the parent-report sample ($N = 399$), the corresponding minimum detectable effect was approximately 2.4% of explained variance ($R^2 = .024$). These values represent the sensitivity thresholds for the two samples, that is, the smallest proportions of variance that could be reliably detected given the sample sizes and error rates.

The observed proportions of explained variance in the primary regression analyses substantially exceeded these sensitivity thresholds in both samples, indicating that the study was sensitive to detect the reported associations between parental PIU, family functioning, and adolescent PIU.

3. Results

3.1. Participant demographics

Descriptive statistics of the participants are presented in Table 1. Adolescents were between 10 and 15 years old, and parents were in their late thirties on average. The sample included both male and female participants across adolescents and parents. Reported ages of adolescents from both self- and parent-reports were consistent. Gender distribution was also recorded for both groups. Details about parents' educational attainment and employment status are presented in Table 2.

Table 3 summarises self- and other-reported problematic Internet use (PIU) scores across parent and adolescent perspectives. Across both instruments, adolescents tended to report more symptoms of PIU than their parents. This pattern was observed in parent evaluations of their adolescents' behaviour, which were slightly higher than parents' self-reports of their own use. Across both perspectives, adolescents consistently reported higher PIU scores than parents across groups, indicating similar patterns across informant groups

Table 1. Demographic characteristics of adolescents and parents participants.

Variables	Adolescent		Parents	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Adolescent age	12.12	1.66	13.19	1.21
Parent age	—	—	39.06	7.24
	<i>N</i>	%	<i>N</i>	%
Female	95	43.2%	181	45.4%
Male	125	56.8%	218	54.6%

Table 2. Educational level and employment status of parent participants.

Education_ Level	<i>N</i>	%
Pursuing or completed graduate degree (Master/PhD)	73	18.3%
Pursuing or completed undergraduate degree (bachelor's)	270	67.7%
Pursuing or completed vocational or technical education	24	6.0%
high school	30	7.5%
Secondary education	2	0.5%
No formal education	0	0%
Employment Status	<i>N</i>	%
Employed full-time	300	75.2
Employed part-time	41	10.3
I run my own business	35	8.8
I do not have a job	21	5.3
Prefer not to say	2	0.5

Table 3. Descriptive statistics of problematic internet use scores.

Variables	Adolescent perspective		Parents perspective	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Parents _PIU	3.32	2.55	3.54	2.06
Adolescents _PIU	4.11	2.74	3.64	2.22
Family functioning	33.60	6.34	40.97	5.50

regarding adolescents' greater engagement with online activities.

3.2. Psychometric properties of the adolescent-reported perceived parental PIU measure

Item endorsement proportions ranged from 28.6% to 58.2%, showing adequate variability across all eight items and no evidence of extreme floor or ceiling effects. Internal consistency of the 8-item adolescent-reported adapted questionnaire was good. Cronbach's alpha/KR-20 was .812, and McDonald's omega was .821, indicating satisfactory consistency among the binary items. All items showed acceptable to strong corrected item-total correlations, ranging from .434 to .632. All corrected item-total correlations exceeded the conventional minimum criterion of .30, indicating that each item contributed meaningfully to the total score. The tetrachoric correlation matrix showed consistently positive inter-item associations, ranging from .245 to .740. The overall KMO was .80, and Bartlett's test of sphericity was significant, $\chi^2(28) = 1111.23$, $p < .001$, confirming that the inter-item association structure was appropriate for latent variable modelling. A one-factor CFA for binary items was estimated using WLSMV. The hypothesised model showed good fit, $\chi^2(20) = 21.398$, $p = .374$, CFI = .999, TLI = .998, RMSEA = .018, 90% CI [.000, .062], SRMR = .069. All standardised factor loadings were statistically significant and ranged from .620 to .868. Further psychometric details are provided in the Supplementary Materials.

3.3. Prevalence of problematic internet use

We examined prevalence rates of PIU across parents and adolescents using the IADQ classification criteria (Young 1998). Adolescents classified themselves as dependent more frequently (45.9%) than parents classified themselves (33.3%). Parents also identified a substantial proportion of adolescents as dependent (38.6%), consistent with adolescent self-reports. Additionally, adolescents reported a notable proportion of perceived parental PIU (30.5%), further illustrating comparable prevalence patterns across groups.

Chi-square tests indicated no statistically significant differences in prevalence rates across perspectives (all p -values $> .05$). Nonetheless, descriptive patterns suggest that adolescents are more willing to acknowledge their own dependency, while parents are both aware of their children's struggles and comparatively less likely to classify themselves as problematic users. Detailed prevalence distributions and cross-tabulations are available in the Supplementary Materials.

Overall, these findings indicate that PIU is highly prevalent among adolescents and also present among parents, highlighting that problematic use is not limited to adolescents but is also observed among adult groups.

3.4. Symptom-Level descriptives

To examine patterns of problematic internet use in more depth, we analysed endorsement rates for each of the eight core symptoms across both parent and adolescent perspectives. This allowed us to identify which symptoms were most salient and whether differences emerged between parent and adolescent groups.

The results showed that preoccupation, tolerance, and loss of control were the most frequently endorsed symptoms across perspectives, whereas deception and loss of relationships or opportunities were least reported. When comparing self-reports, adolescents endorsed higher withdrawal but lower loss of control than parents. In cross-ratings, parents perceived adolescents as showing more withdrawal and tolerance (and slightly more deception and relationship loss) but fewer unsuccessful-control and escape symptoms than themselves.

Overall, these findings suggest that compulsive engagement symptoms are consistently more visible than relational or concealment-related symptoms. Adolescents appear more likely to acknowledge difficulties with withdrawal, while parents highlight their children's stronger tolerance and withdrawal but downplay problems of unsuccessful control and escape compared to themselves.

3.5. Generalised linear mixed model of PIU symptom endorsement from the adolescent perspective

We performed a generalised mixed model (GLMM) to test differences in PIU symptom endorsement from the adolescent perspective. The GLMM used a binomial distribution with a logit link and included two fixed effects: Role (parent vs adolescent) and Symptom (eight PIU symptoms) together with their Role $\times$ Symptom interaction. To account for the repeated nature of the data, subject ID was included as a random effect. By testing this model, we aimed to answer three questions: (i) whether endorsement differs between parents and adolescents overall when averaging across symptoms (main effect of Role), (ii) whether symptoms differ in overall prevalence when averaging across roles (main effect of Symptom), and (iii) whether the difference between parents and adolescents depends on which symptom is considered (Role $\times$ Symptom interaction). The interaction was tested by comparing

a model with the interaction to one without it, using a likelihood-ratio χ^2 test. To explore the interaction, we compared parents and adolescents on each symptom separately. *P*-values were adjusted for multiple testing using the Bonferroni method. Results are reported as Wald *z* statistics with adjusted *p*-values. Predicted probabilities with 95% confidence intervals are shown in Figure 1. and the full set of post hoc comparisons is presented in Table 4.

The model including symptom, role, and their interaction provided a good fit to the data. Likelihood ratio tests confirmed that both the full conditional model, χ^2 (16) = 1014.54, $p < .001$, and the marginal fixed-effects model, χ^2 (15) = 206.20, $p < .001$, explained significantly more variance than their respective null models.

Omnibus tests for the fixed effects showed strong evidence of differences across symptoms, χ^2 (7) = 136.30, $p < .001$, and a significant overall effect of role, χ^2 (1) = 54.00, $p < .001$, indicating that parents and adolescents differed in their reports of symptom endorsement when averaged across all symptoms. Importantly, the Symptom $\times$ Role interaction was also significant, χ^2 (7) = 16.20, $p = .024$.

A post hoc contrast of the main effect of role showed that, on average across symptoms, adolescents reported significantly more PIU symptoms for themselves than they did for their parents. The odds of endorsement were 1.86 times higher when adolescents rated themselves compared to when they rated their parents, OR = 1.86, SE = 0.16, Wald z = 7.35, $p < .001$.

Post hoc tests comparing symptoms averaged across roles showed marked differences in endorsement. Pre-occupation and Loss of Control were endorsed more frequently than several other symptoms, with odds ratios often exceeding 2.0 (all $p < .001$). By contrast, Deception and Loss of Relationships and Opportunities were consistently less likely to be endorsed, with odds ratios below 0.50 relative to other criteria (all $p < .001$). Other symptoms, such as Withdrawal, Tolerance, Escape, and Unsuccessful Efforts to Control, generally occupied an intermediate position, with fewer reliable differences once Bonferroni correction was applied. Full details of all pairwise contrasts are reported in Supplementary Material (GLMM_Results_Child_PIU_Symptoms).

Post hoc comparisons for the interaction term indicated that the interaction was driven by three symptoms for which adolescents' self-ratings were higher than their ratings of their parents. Specifically, adolescents were more likely to report Deception for themselves than for their parents (OR = 2.43, SE = 0.60, Wald z = 3.60, $p = .038$), as well as Loss of Control (OR = 3.12, SE = 0.73, Wald z = 4.82, $p < .001$) and Withdrawal

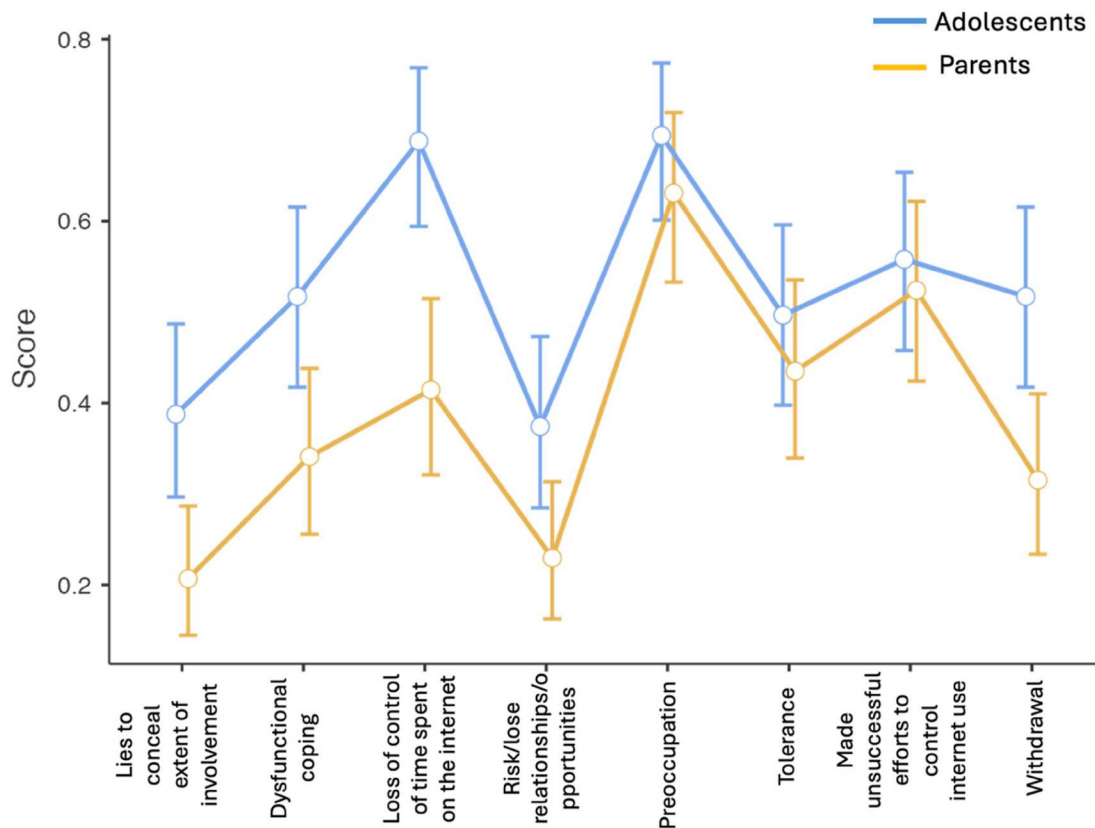


Figure 1. Mean ratings of PIU symptoms for parents and adolescents from adolescents' perspectives. Error bars represent the 95% CI: Adolescents' Perspectives.

Table 4. Symptom-level endorsement of problematic internet use (PIU) reported by parents and adolescents.

Symptom	Adolescent Perspective		Parents Perspective	
	Parents (%)	Adolescents (%)	Parents (%)	Adolescents (%)
Loss of relationships and opportunities	30.5	40.9	10.8	12.5
Lies to conceal	28.6	41.8	16.0	24.3
Withdrawal	36.8	50.5	34.8	52.6
Unsuccessful efforts to control	50.9	53.2	48.6	41.6
Dysfunctional coping	38.6	50.5	51.6	29.6
Tolerance	45.0	49.1	53.9	70.7
Preoccupation	58.2	62.7	68.9	67.2
Loss of control	43.6	62.3	69.2	65.2

(OR = 2.33, SE = 0.55, Wald $z = 3.58$, $p = .040$). For the other symptoms (Dysfunctional coping, Loss of Relationships and Opportunities, Preoccupation, Tolerance, and Unsuccessful Efforts to Control) no significant role differences were observed after Bonferroni adjustment (all adjusted $p > .05$) (see Supplementary Material GLMM_Results_Child_PIU_Symptoms for detail) (Table 5).

Adolescents rated themselves higher on deception, withdrawal, and loss of control compared to their parents. Relational consequences such as loss of

Table 5. Post hoc comparisons of PIU symptom ratings between parents and adolescents (Adolescents' Perspective).

Symptom	SE	z	Estimate (Mean)	CI		p _{bonf}
				Lower	Upper	
Lies to conceal	0.59	3.59	0.289	0.224	0.364	0.038
Dysfunctional copying	0.48	3.10	0.427	0.348	0.510	0.231
Loss of relationships and opportunities	0.48	2.85	0.297	0.231	0.373	0.519
Loss of control	0.734	4.82	0.555	0.472	0.636	<.001
Preoccupation	0.312	1.20	0.663	0.585	0.734	1.00
Tolerance	0.296	1.07	0.466	0.384	0.549	1.00
Unsuccessful efforts to control	0.264	0.59	0.541	0.458	0.622	1.00
Withdrawal	0.548	3.58	0.412	0.334	0.495	0.04

Note: Values represent predicted probabilities (0–1) derived from a generalised linear mixed model (binomial distribution, logit link).

relationships were less frequently endorsed. This suggests that adolescents experience PIU primarily as an internal struggle with control and compulsion.

3.6. Generalised linear mixed model of PIU symptom endorsement from the parent perspective

Based on the analysis following the adolescent view analysis, we also performed a generalised linear

mixed model (GLMM) based on parent-reported measures to investigate variation in PIU symptom endorsement between parents and adolescents. The GLMM specified a binomial distribution with logit link and included two fixed effects, namely, Role (parent vs. adolescent) and Symptom (eight PIU symptoms), along with their role $\times$ symptom interaction. Subject ID was specified as a random intercept to account for the repeated measure's structure. This enabled us to address three questions: (i) whether endorsement is different between parents and adolescents overall when averaging across symptoms (main effect of role), (ii) whether symptoms differ in occurrence when averaging across role (main effect of symptom), and (iii) whether variation between parents and adolescents depends on the symptom (role $\times$ symptom interaction). Interaction effects were tests performed formally using a likelihood-ratio χ^2 test. Post hoc contrasts of specific symptoms were carried out after Bonferroni adjustment, and results are presented as Wald z statistics with adjusted p -values.

Model including symptom, role, and their interaction provided a very strong fit to the data, likelihood-ratio tests affirming that both the full conditional model, $\chi^2(16) = 2124.48$, $p < .001$, and the marginal fixed-effects model, $\chi^2(15) = 1489.72$, $p < .001$, accounted significantly more variance than their null models. Omnibus tests on the fixed effects indicated strong differences between symptoms, $\chi^2(7) = 969.42$, $p < .001$. In contrast, the main effect of role was nonsignificant, $\chi^2(1) = 2.62$, $p = .105$, indicating no overall difference in endorsement averaging across symptoms. Of most importance, the interaction between Symptom $\times$ Role was significant, $\chi^2(7) = 136.49$, $p < .001$, indicating that the degree of parent-adolescent difference depended on the specific symptom.

Post hoc contrasts on the main effect of role indicated no overall difference between parents' and adolescents' averages on symptom endorsement (OR = 1.11, SE = 0.07, Wald $z = 1.62$, $p = .105$). Preoccupation, loss of control and Tolerance were most commonly endorsed, with odds ratios often above 1.0 (all $p < .001$). Conversely, loss of relationships and opportunities as well as deception were endorsed significantly less, with odds ratios less than 0.1 compared to other symptoms (all $p < .001$). Escape, unsuccessful efforts to control, and withdrawal fell into an intermediate category, with several significant differences observed after applying Bonferroni correction.

Post hoc comparisons for the interaction suggested that the parent-adolescent differences were focalised on specific symptoms. Adolescents significantly endorsed larger than parents Dysfunctional copying

(OR = 0.282, SE = 0.49, Wald $z = 7.33$, $p < .001$), Withdrawal (OR = 2.7, SE = 0.46, Wald $z = 5.90$, $p < .001$) and Tolerance (OR = 2.687, SE = 0.47, Wald $z = 5.70$, $p < .001$). On the other symptoms Deception, Loss of relationships and opportunities, Preoccupation, Loss of control, as well as Unsuccessful efforts to control there were no reliable parent-adolescent differences following Bonferroni adjustment (all $p > .05$) (Figure 2).

A graph with blue and orange lines and white text AI-generated content may be incorrect.

Parents and adolescents reported similar overall levels of PIU, but clear differences emerged at the symptom level. Across both perspectives, preoccupation, tolerance, and loss of control were the most salient symptoms, whereas deception and relational loss were least endorsed. Adolescents described themselves as struggling more with withdrawal but less with loss of control than parents did. In contrast, parents perceived their adolescents as showing more withdrawal and tolerance, as well as slightly more concealment and relational loss, but fewer problems with escape and unsuccessful control compared to their own reports.

Together, these results suggest that while both groups showed similar patterns in preoccupation, tolerance, and loss of control as central indicators of PIU, adolescents emphasise internal struggles such as withdrawal, whereas parents stress observable patterns like tolerance and escapism.

3.7. Testing the associations between problematic internet use (PIU) and family functioning from parent and adolescent perspectives

Regression analyses indicated that both parent PIU and family functioning were significantly associated with adolescents' PIU across adolescent- and parent-report-based models. We ran two specific regression models: one based on adolescent report of outcomes and the other based on parent report. On the adolescent report-based model, the predictors accounted for 40.3% of the variance ($R^2 = .401$, adjusted $R^2 = .396$), and on the parent report-based model, they accounted for 34.6% ($R^2 = .343$, adjusted $R^2 = .340$). These findings indicate that higher parental PIU levels and lower family functioning were associated with higher adolescent PIU across both models. Crucially, this relationship held regardless of whether report came from the parent or the adolescent, indicating consistent associations across models. Demographical, including age and gender, did not enter significantly, showing that the quality of the relationship within the family, including the behaviours

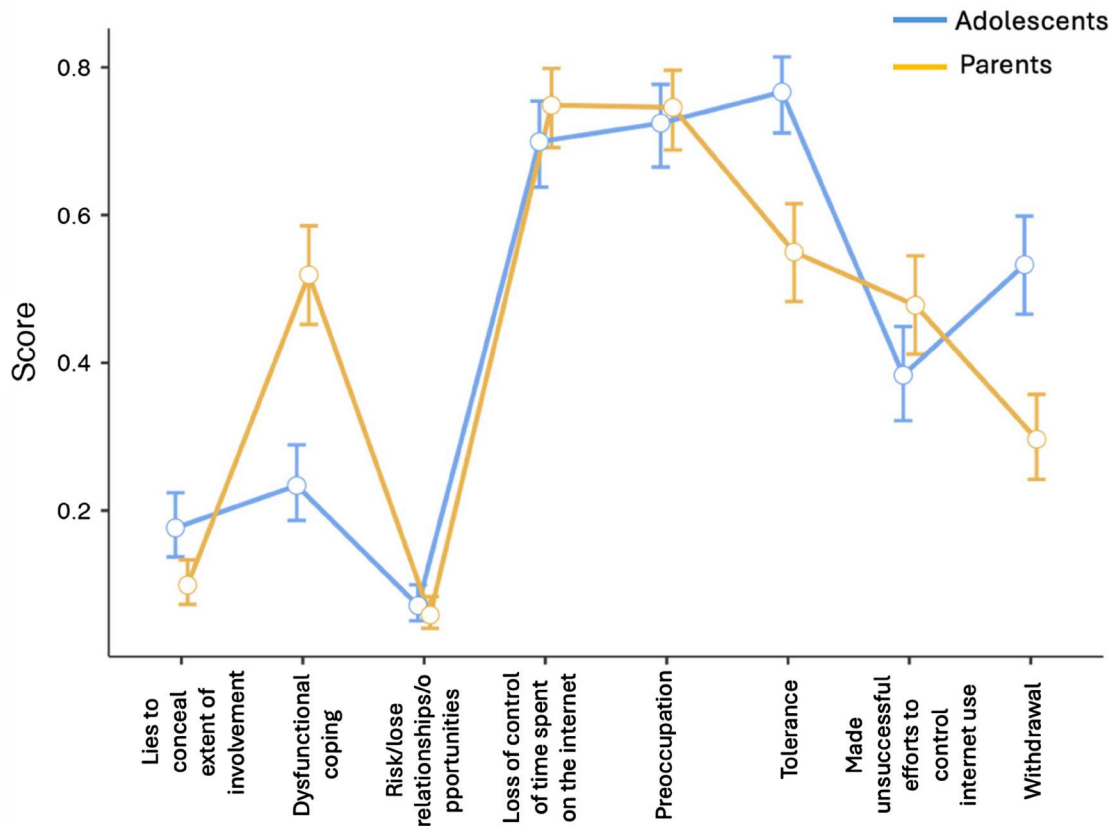


Figure 2. Mean ratings of PIU symptoms for parents and adolescents from parents' perspectives. Error bars represent the 95% CI: Parents' Perspectives.

Table 6. Post hoc comparisons of PIU symptom ratings between parents and adolescents (Parents' Perspective).

Symptom	SE	z	Estimate (Mean)	CI		P _{bonf}
				Lower	Upper	
Lies to conceal	0.40	3.30	0.1330	0.1069	0.1643	0.118
Dysfunctional copying	0.49	-7.33	0.3646	0.3153	0.4170	<.001
Loss of relationships and opportunities	0.30	0.85	0.0646	0.0492	0.0842	1.000
Loss of control	0.14	-1.42	0.7247	0.6780	0.7670	1.000
Preoccupation	0.16	-0.62	0.7352	0.6893	0.7765	1.000
Tolerance	0.47	5.70	0.6670	0.6162	0.7141	<.001
Unsuccessful efforts to control	0.11	-2.34	0.4300	0.3781	0.4834	1.000
Withdrawal	0.46	5.90	0.4094	0.3581	0.4628	<.001

Note: Values represent predicted probabilities (0–1) derived from a generalised linear mixed model (binomial distribution, logit link).

of the parents, rather than personal background descriptors, predominate in associated with adolescent PIU. (Table 7).

Parental PIU and poorer family functioning significantly predicted adolescent PIU in both adolescent-

and parent-reported models, explaining 40.3% and 34.6% of the variance respectively. Demographic factors were not significant. The interaction between parental PIU and family functioning was tested but was not statistically significant ($\beta = -0.016$, $p = .268$) and was

Table 7. Linear regression predicting adolescent problematic internet use.

Perspective	Predictor	β (Standardized)	Standard Error	t	p	95%CI	
						Lower	Upper
Adolescent's perspective	Parental PIU	.508	0.062	8.801	< .001	0.424	0.669
	Family Functioning	-.223	0.025	-3.874	< .001	-0.145	-0.047
Parent's perspective	Parental PIU	.539	0.045	12.870	< .001	0.492	0.670
	Family Functioning	-.138	0.017	-3.286	< .001	-0.089	-0.022

therefore not included in further interpretation. see Supplementary Table S2 for details.

4. Discussion

The prevalence levels of PIU observed in the current study are broadly consistent with prior research conducted in the GCC and broader Arab context. In the current study, 45.9% of adolescents and 33.3% of parents met the criteria for PIU. Previous research conducted among adolescents in Qatar also reported relatively high levels of PIU, with more than half of adolescents classified as dependent Internet users (Chemnad, Alshakhsi et al. 2023). Evidence from GCC countries further indicates that prevalence estimates among adolescents and young adults vary substantially across studies, with reported rates ranging from approximately 4% to 82.6%, reflecting differences in measurement instruments, cut-off criteria, and sample characteristics (Al-Khani et al. 2021). These findings highlight the importance of interpreting prevalence estimates in relation to measurement approaches and contextual factors, rather than as precise clinical rates (Chemnad, Aziz et al. 2023; Yankouskaya et al. 2025). In addition, contextual characteristics of the region may contribute to these elevated levels, as high accessibility to digital devices, combined with environmental conditions such as extreme heat that limit outdoor activities, can increase reliance on and engagement with online environments (Al-Khani et al. 2021). The current findings highlight comparable patterns of PIU observed across our independent parent and adolescent groups rather than suggesting an isolated individual-level behaviour. Both parents and adolescents reported elevated levels of problematic digital engagement, indicating comparable patterns of Internet use across the two groups. This supports the growing consensus that PIU is associated with both individual and contextual factors, rather than isolated personality traits (Anderson, Steen, and Stavropoulos 2017; Brand et al. 2016). These results are further supported by the I-PACE theoretical approach that views PIU as the result of interactions between personal characteristics, affective and cognitive processes, executive functioning, and environment. In turn, environmental factors, including family climate, communication, and digital environment, can play a role in PIU across different age groups. Importantly, because adolescents and parents were not recruited from the same family units, the findings should be interpreted as reflecting cross-generational similarities rather than direct intergenerational transmission processes.

In light of this interpretation, adolescents' digital behaviours may be understood in relation to broader

social and environmental contexts, including peer influences, online communities, and family environments (Karaer and Akdemir 2019). Within this context, parental modelling has been discussed in prior research as one contextual factor associated with adolescents' digital habits (Mousa et al. 2024). Within the I-PACE framework, contextual variables may represent important environmental associated with digital engagement patterns. A study conducted among 236 parents of adolescents aged 12–15 years from GCC countries found that supportive parenting and consistent boundaries have been associated with better self-regulation and emotional stability, whereas stress, criticism, or inconsistency are associated with greater vulnerability to excessive Internet engagement (Mousa et al. 2024). Patterns of PIU observed across parent and adolescent groups may reflect broader contextual influences related to shared digital environments and family interactions, such as similarities in online routines, technology use patterns, and communication dynamics reported across parent and adolescent, with prior studies reporting comparable behavioural patterns across groups (Alshakhsi et al. 2025; Lam and Wong 2015).

These findings are consistent with regional and international evidence indicating that PIU is associated with both individual factors, such as hyperactivity-impulsivity, depression, and anxiety (Mita, Muthoni, and Kigamwa 2025), and contextual factors including family conflict, reduced parental monitoring, and poorer parent–adolescent relationships, rather than solely an individual-level issue (Chung, Lee, and Lee 2019; Lam and Wong 2015; Wu et al. 2013). Chemnad, Aziz et al. (2023) reported associations between parents' excessive internet use and adolescents' internet addiction symptoms, consistent with prior research reporting associations between parental behaviours, including parental addictive behaviours and dysfunctional family environments, and adolescents' digital engagement patterns. Similarly, (Chemnad, Alshakhsi et al. 2023) observed that poor family functioning, inconsistent discipline, and frequent arguments have been associated with adolescents' dependence, corresponding to prior research linking family conflict and low cohesion to maladaptive coping (Bleakley, Ellithorpe, and Romer 2016; Chung, Lee, and Lee 2019; Ko et al. 2015). Moreover, Yankouskaya et al. (2025) reported that shared digital environments are associated with similarities in internet use behaviours across parent and adolescent groups.

While both groups exhibited high levels of PIU, differences in PIU patterns were observed. Adolescents reported stronger withdrawal and loss of control, indicating greater difficulties related to emotion regulation

and engagement, whereas parents emphasised observable behaviours such as tolerance and time mismanagement. These findings are consistent with previous work reporting that adolescents and adults differ in how PIU is experienced and interpreted (Gunuc and Dogan 2013; Kwon et al. 2011; Mousa et al. 2024).

From the perspective of the I-PACE model, these differences may reflect developmental variations in emotional regulation, cognitive responses, and coping skills across generations. Adolescents are more immersed in digital environments that serve developmental and social functions, particularly during a stage characterised by identity exploration and emotional engagement (Brand et al. 2019). Adolescents may also be more vulnerable to internally oriented experiences of PIU due to ongoing maturation of self-regulation, whereas adults may focus more on behavioural manifestations of excessive use. Furthermore, Adolescents in contexts characterised by inconsistency or stress have been reported to show higher levels of problematic engagement, whereas more supportive contexts are associated with more balanced patterns of use (van den Eijnden et al. 2010). Understanding these distinct perspectives highlights the importance of examining PIU across generational groups rather than assuming direct within-family transmission processes.

Adolescents reported higher levels of PIU compared to parents, though parents also acknowledged increased problematic use in their adolescents. This is consistent with a 'self-other' perception gap, reflecting differences in how each group interprets digital use. Adolescents have been reported to interpret overuse in relation to internal experiences such as emotion regulation, whereas parents tend to interpret it in terms of observable behavioural patterns (Nannatt et al. 2022). The tendency for parents to report lower levels of their own dependency and higher levels in their children has been discussed in relation to self-serving bias and attributional tendencies influenced by role expectations and cultural norms (De Los Reyes et al. 2013; De Los Reyes and Kazdin 2005). The tendency for parents to report lower levels of their own PIU, relative to adolescents' perceptions, may reflect differences in perspectives across informants (De Los Reyes et al. 2013). Recent studies indicate that families may perceive their online activity as necessary for work, education, or maintaining social connections, which may blur the boundary between functional and problematic use (Kimball et al. 2023; Nannatt et al. 2022).

The analysis of symptom endorsement provides insights into how PIU is experienced across parent and adolescent groups. Across both groups, preoccupation, tolerance, and loss of control emerged as the most

salient symptoms, while deception and relational loss were the least endorsed. This can be interpreted in light of cognitive-behavioural frameworks, which conceptualise PIU in relation to self-regulation and cognitive processes (Spada 2014). Adolescents' stronger emphasis on withdrawal and emotional dependence has been associated with more internally oriented experiences of PIU, consistent with the idea that online engagement has been discussed as a coping behaviour (Kardefelt-Winther 2014). By contrast, parents have been reported to emphasise observable symptoms such as time management difficulties and behavioural disruption. This divergence has been documented in prior research comparing parent and adolescent reports of media use, where adolescents have been reported to describe more internally oriented experiences (Bleakley, Ellithorpe, and Romer 2016) while parents focus on observable outcomes (Nannatt et al. 2022). For example, (Bleakley, Ellithorpe, and Romer 2016) reported that higher online engagement among adolescents is associated with indicators of PIU, particularly where discrepancies exist between adolescent reports and parental awareness. Similarly, Nannatt et al. (2022) reported that parents tend to interpret problematic use through observable indicators such as academic or behavioural changes, whereas adolescents' reports more often reflect internal experiences. Despite these perceptual differences, both parents and adolescents reported similar core symptoms indicating comparable patterns of PIU. Within the I-PACE framework, these overlapping symptoms may reflect common underlying mechanisms related to reward processing, self-regulation difficulties, and repeated reinforcement of online engagement across different age groups.

Recent regional evidence reports associations between parental and adolescent digital behaviours, indicating similarities in patterns of use across the two samples (Mousa et al. 2024). In contexts where technology use is more prominent, reduced face-to-face interaction has been associated with lower levels of communication and engagement (Hiniker, Schoenebeck, and Kientz 2016; McDaniel 2019). Regression analyses indicated that both parental PIU and lower family functioning were significantly associated with adolescent PIU, together explaining over one-third of the variance. This finding suggests that the emotional climate of the household is relevant to understanding digital overuse. Previous research has consistently shown that family cohesion, communication quality, and consistent discipline are protective factors against adolescent risk behaviours, including PIU (Marengo et al. 2020). Furthermore, parents' own problematic use has been linked to reduced emotional availability and attention, a

phenomenon captured by the concept of technoference (Wang et al. 2024). As parents become preoccupied with their devices, their reduced responsiveness has been associated with lower parental responsiveness and fewer verbal interactions with children (McDaniel 2019). Overall, these patterns highlight the role of contextual factors in understanding PIU.

Within Bronfenbrenner's ecological systems theory (Bronfenbrenner 1979), the family microsystem is the most immediate context shaping adolescents' developmental outcomes. The current findings suggest that disruptions at this level whether through conflict, inconsistent communication, or emotional withdrawal are associated with maladaptive digital behaviours. In collectivist Arab cultures, family cohesion is an important contextual factor that can serve as a protective buffer, but when combined with poor emotional awareness or excessive control, it may be associated with higher dependency. Prior work on family dynamics in collectivist societies suggests that parental authority is valued as a form of care (Alsheikh and Elhoweris *n.d.*; Harb 2016; Tamis-LeMonda et al. 2008). Yet, when authority is exercised without empathy or flexibility, adolescents may conceal behaviours. This cultural duality may help explain why family functioning emerged as a stronger predictor of adolescent PIU than structural factors such as age or gender. In Arab family contexts, where interdependence is culturally embedded, balancing closeness with autonomy is important, and adolescents may require both guidance and space to develop self-regulation. The current results are consistent with the idea that processes may operate not only through behavioural monitoring but also through emotional understanding and responsiveness. Rather than viewing technology as an external threat, it can be understood as a medium through which relational dynamics are expressed. When families maintain open communication and consistent boundaries, digital engagement may serve adaptive functions such as learning and connection. However, when emotional needs are unmet or boundaries are inconsistent, online activity may become a substitute for intimacy and regulation. Consistent with the I-PACE framework, these findings suggest that emotional and contextual processes may shape how individuals across generations engage with digital environments.

Although age was not a significant predictor of adolescent PIU in the regression models, this finding is theoretically meaningful. It suggests that PIU is not simply driven by chronological age but is more strongly shaped by relational and environmental factors, particularly parental behaviour and family functioning at the group level. Within this context, adolescence represents

a critical developmental stage characterised by ongoing maturation of self-regulation and heightened sensitivity to social and emotional influences. This helps explain why adolescents reported stronger withdrawal and loss of control, reflecting internal regulatory difficulties, whereas parents emphasised more observable patterns such as tolerance and behavioural overuse. These generational differences therefore reflect distinct experiential perspectives rather than age alone, consistent with prior work showing that discrepancies between parent and adolescent reports reflect differences in perspective rather than measurement error (De Los Reyes et al. 2013; De Los Reyes and Kazdin 2005).

4.1. Limitations

Several limitations should be considered when interpreting the findings. The study relied on self-reports and parent-reports rather than behavioural measures. While the dual-informant design reduces single-source bias, responses may still be affected by recall errors or social desirability. Within each regression model, parental PIU, family functioning, and adolescent PIU were reported by the same informant, which may have contributed to the magnitude of the observed R^2 values. These values should therefore be interpreted as upper-bound estimates of the true associations. Prior mental health history was not directly assessed; however, as the study was conducted in non-clinical populations and focuses on behavioural patterns rather than clinical diagnosis, this limitation is unlikely to substantially affect the interpretation of the findings. The reported prevalence rates should be interpreted with caution, as the IADQ 5/8 cut-off may overestimate prevalence rates, particularly in non-clinical samples. Future research could address this limitation by incorporating digital usage logs or ecological momentary assessments. Finally, the sample focused exclusively on Arab parents and adolescents residing in GCC countries. Although this provides culturally grounded insights, it may limit the generalizability of the findings to non-Arab or non-collectivist contexts. Comparative cross-cultural studies are needed to examine whether these patterns and associations are consistent across diverse populations and cultural settings.

4.2. Implications

Culturally sensitive interventions in the GCC context can build on collectivist family values of guidance and mutual responsibility. Initiatives emphasising 'shared regulation' and 'guided autonomy' are likely to resonate more deeply than approaches imported from Western,

individualistic models. In this respect, family counselling, school-based workshops, and national awareness campaigns should integrate content and exercises on co-use, reflective discussion, and joint goal setting to normalise open communication about digital challenges.

From a policy and design perspective, the implications extend beyond the household. Many commercial parental control applications still rely on surveillance-based mechanisms that risk undermining trust and autonomy (Stoilova, Bulger, and Livingstone 2024; Wisniewski et al. 2017). Findings from this study suggest a need to reorient digital well-being tools toward collaborative functionality shared dashboards, transparent feedback on family-wide digital habits, and prompts for discussion rather than restriction. Aligning with Mousa et al. (2024), persuasive design in parental control technology should foster empathy, co-learning, and mutual accountability. Policymakers in the GCC could also support the creation of community-based ‘digital well-being hubs’, where families access resources tailored to cultural norms around authority and interdependence. Similar models already exist internationally, such as UNICEF- and OECD-supported community digital-literacy hubs and parent–child learning centres, which provide families with training on balanced technology use, online safety, and communication skills (OECD 2021; UNICEF 2021). Recognising PIU as a family-system issue rather than a youth concern can reframe policy discourse from control to connection an essential step toward sustainable digital resilience. Shifting from control to connection emphasises open dialogue, shared decision-making, and collaborative rule-setting rather than unilateral parental restriction. Successful examples of this approach appear in digital parenting programmes such as the EU Kids Online ‘co-engagement’ model and UNICEF family digital literacy initiatives, which demonstrate that parent–child communication and joint online activities strengthen trust and reduce conflict around technology use (UNICEF 2021).

From an educational perspective, the findings suggest that PIU should be addressed through preventive digital well-being programmes that target both adolescents and parents rather than focusing solely on individual screen-time reduction. The prominence of withdrawal, tolerance, and loss of control across both groups indicates that interventions may need to prioritise the development of self-regulation, emotional coping, and reflective technology-use skills within everyday family and school contexts. Recent evidence further supports the importance of self-regulation and psychosocial interventions, with approaches such as cognitive behavioural therapy,

self-control training, and group counselling showing reductions in IA symptoms and related emotional difficulties, although the overall evidence remains methodologically heterogeneous (Lu et al. 2025). Prevention research has also emphasised the importance of family involvement, school environments, and role modelling in PIU prevention programmes (Romero Saletti et al. 2021). In educational settings, this may include structured digital well-being curricula that teach adolescents how to recognise compulsive patterns of online engagement, manage emotional triggers associated with excessive use, and develop healthier offline coping and social interaction strategies. Given that adolescents in the current study reported stronger withdrawal and loss-of-control symptoms, schools may also play an important role in promoting emotional regulation, impulse-control skills, and awareness of maladaptive coping behaviours associated with technology use. At the family level, the significant association between family functioning and adolescent PIU highlights the importance of involving parents in intervention efforts through programmes that strengthen supportive communication, collaborative rule-setting, and positive parental modelling of technology use. This is particularly important in collectivist family contexts, where parental behaviours and family interactions strongly shape adolescents’ everyday routines and emotional environments. Prior literature similarly suggests that problematic Internet use is closely associated with emotional distress, maladaptive coping, family communication patterns, and parental digital behaviours (Kardefelt-Winther 2014; Mousa et al. 2024; Restrepo et al. 2020). Accordingly, interventions that combine digital literacy education with family-based communication and self-regulation training may be more effective than approaches that rely primarily on restrictive monitoring or surveillance-based control strategies (Stoilova, Bulger, and Livingstone 2024).

5. Conclusion

The findings indicate that PIU among adolescents is best understood as cross generational and contextual issue rather than an isolated individual behaviour. The overlap in core symptoms between parents and adolescents particularly preoccupation, tolerance, and loss of control reflect shared behavioural patterns shaped through everyday family interactions. Importantly, family functioning emerged as more strongly associated with adolescent PIU than demographic characteristics, highlighting the role of relational and contextual influences in maladaptive digital engagement. Within the Arab cultural context, where interdependence and

parental authority remain central, these findings support the importance of family-centred approaches that promote communication, balanced guidance, and healthy digital routines to foster digital well-being among adolescents.

Author contributions

CRedit: **Shaima Moqbel**: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Validation, Visualization, Writing – original draft; **Ala Yankouskaya**: Conceptualization, Formal analysis, Supervision, Writing – review & editing; **Sameha Alshakhsi**: Investigation, Methodology, Writing – review & editing; **Dena Al-Thani**: Conceptualization, Supervision, Writing – review & editing; **Raian Ali**: Conceptualization, Funding acquisition, Investigation, Methodology, Project administration, Supervision, Writing – review & editing; **Diana Alsayed Hassan**: Conceptualization, Methodology, Supervision, Validation, Writing – review & editing.

Disclosure statement

No potential conflict of interest was reported by the author(s).

Funding

Open Access funding provided by the Qatar National Library. This publication was supported by NPRP 14 Cluster grant # NPRP 14C-0916-210015 from the Qatar National Research Fund (a member of Qatar Foundation). The findings herein reflect the authors.

Data availability statement and supplementary materials

The dataset and supplementary materials used for this paper can be found at the Open Science Framework: https://osf.io/rc8s6/overview?view_only=55b117120e9f474cb35da87b5633aaf9.

References

- Al-Khani, A. M., J. Saquib, A. M. Rajab, M. A. Khalifa, A. Almazrou, and N. Saquib. 2021. "Internet Addiction in Gulf Countries: A Systematic Review and Meta-Analysis." *Journal of Behavioral Addictions* 10 (3): 601–610. <https://doi.org/10.1556/2006.2021.00057>.
- Al-krenawi, A., J. R. Graham, and V. Slonim-nevo. 2002. "Mental Health Aspects of Arab-Israeli Adolescents from Polygamous Versus Monogamous Families." *The Journal of Social Psychology* 142 (4): 446–460. <https://doi.org/10.1080/00224540209603911>.
- Alnaqbi, S. E., R. Sohail, H. M. Radwan, M. N. Mohamad, F. Zeb, H. Hasan, M. Hashim, et al. 2025. "Physical Activity, Screen Time, Dietary Habits, and Health Outcomes among Children and Adolescents in the Middle East and North Africa Region: A Narrative Review." *Frontiers in Public Health* 13: 1628904. <https://doi.org/10.3389/fpubh.2025.1628904>.
- Alshakhsi, S., K. Chemnad, C. Panourgia, D. A. Hassan, A. Yankouskaya, and R. Ali. 2025. "From Parents to their Adolescent Children: Reexamining the Link between Parental and Adolescent Internet Addiction." *Behaviour and Information Technology* 44 (18): 4599–4615. <https://doi.org/10.1080/0144929X.2025.2484395>.
- Alsheikh, N. O., and H. Elhoweris. n.d. "Parenting Style, Self-Esteem and Student Performance in the United Arab Emirates." <https://www.researchgate.net/publication/266353142>.
- Anderson, E. L., E. Steen, and V. Stavropoulos. 2017. "Internet use and Problematic Internet Use: A Systematic Review of Longitudinal Research Trends in Adolescence and Emergent Adulthood." *International Journal of Adolescence and Youth* 22 (4): 430–454. <https://doi.org/10.1080/02673843.2016.1227716>.
- Assaf, M., R. Hallit, D. Malaeb, F. Sakr, M. Dabbous, F. Fekih-Romdhane, S. Obeid, and S. Hallit. 2025. "Psychometric Properties of the Arabic Version of the McMaster Family Assessment Device-General Functioning Subscale (FAD-GF) among a Sample of Lebanese Adults." *Cogent Psychology* 12 (1): 1–15. <https://doi.org/10.1080/23311908.2025.2540065>.
- At-Twajiri, M. I., and I. A. Al-Muhaiza. 1996. "Hofstede's Cultural Dimensions in the GCC Countries: An Empirical Investigation." *International Journal of Value-Based Management* 9:121–131.
- Beaton, Dorcas E., Claire Bombardier, Francis Guillemin, and Marcos Bosi Ferraz. 2000. "Guidelines for the Process of Cross-Cultural Adaptation of Self-Report Measures." *Spine* 25 (24): 3186–3191. <https://doi.org/10.1097/00007632-200012150-00014>.
- Blakemore, S. J., and K. L. Mills. 2014. *Annual Review of Psychology*. Vol. 65, 187–207. Annual Reviews Inc. <https://doi.org/10.1146/annurev-psych-010213-115202>.
- Bleakley, A., M. Ellithorpe, and D. Romer. 2016. "The Role of Parents in Problematic Internet Use among us Adolescents." *Media and Communication* 4 (3): 24–34. <https://doi.org/10.17645/mac.v4i3.523>.
- Brand, M., E. Wegmann, R. Stark, A. Müller, K. Wölfling, T. W. Robbins, and M. N. Potenza. 2019. "The Interaction of Person-Affect-Cognition-Execution (I-PACE) Model for Addictive Behaviors: Update, Generalization to Addictive Behaviors Beyond Internet-Use Disorders, and Specification of the Process Character of Addictive Behaviors." *Neuroscience & Biobehavioral Reviews* 104:1–10. <https://doi.org/10.1016/j.neubiorev.2019.06.032>.
- Brand, M., K. S. Young, C. Laier, K. Wölfling, and M. N. Potenza. 2016. "Integrating Psychological and Neurobiological Considerations regarding the Development and Maintenance of Specific Internet-use Disorders: An Interaction of Person-Affect-Cognition-Execution (I-PACE) Model." *Neuroscience & Biobehavioral Reviews* 71:252–266. <https://doi.org/10.1016/j.neubiorev.2016.08.033>.
- Brislin, R. W. 1970. "Back-Translation for Cross-Cultural Research." *Journal of Cross-Cultural Psychology* 1 (3): 185–216. <https://doi.org/10.1177/135910457000100301>.
- Bronfenbrenner, U. 1979. *The Ecology of Human Development: Experiments by Nature and Design*. Cambridge, MA: Harvard University Press.

- Chemnad, K., S. Alshakhsi, S. Al-Harashsheh, A. O. Abdelmoneium, M. S. Al-Khalaf, A. Baghdady, and R. Ali. 2023. "Is It Contagious? Does Parents' Internet Addiction Impact their Adolescents' Internet Addiction?" *Social Science Computer Review* 41 (5): 1691–1711. <https://doi.org/10.1177/08944393221117408>.
- Chemnad, K., M. Aziz, A. O. Abdelmoneium, S. Al-Harashsheh, A. Baghdady, F. Y. Al Motawaa, D. Alsayed Hassan, and R. Ali. 2023. "Adolescents' Internet Addiction: Does it All Begin with their Environment?." *Child and Adolescent Psychiatry and Mental Health* 17 (1): 1–14. <https://doi.org/10.1186/s13034-023-00626-7>.
- Chemnad, K., M. Aziz, S. Al-Harashsheh, A. Abdelmoneium, A. Baghdady, D. Alsayed Hassan, and R. Ali. 2025. "Assessing the Relationship between the Type of Internet use and Internet Addiction in Early and Middle Adolescents: Cross-Sectional Study from Qatar." *JMIR Human Factors* 12:e62955. <https://doi.org/10.2196/62955>.
- Chen, C. Y., I. H. Chen, A. H. Pakpour, C. Y. Lin, and M. D. Griffiths. 2021. "Internet-Related Behaviors and Psychological Distress among Schoolchildren during the COVID-19 School Hiatus." *Cyberpsychology, Behavior, and Social Networking* 24 (10): 654–663. <https://doi.org/10.1089/cyber.2020.0497>.
- Chen, H. C., J. Y. Wang, Y. L. Lin, and S. Y. Yang. 2020. "Association of Internet Addiction with Family Functionality, Depression, Self-Efficacy and Self-Esteem among Early Adolescents." *International Journal of Environmental Research and Public Health* 17 (23): 8820. <https://doi.org/10.3390/ijerph17238820>.
- Chung, S., J. Lee, and H. K. Lee. 2019. "Personal Factors, Internet Characteristics, and Environmental Factors Contributing to Adolescent Internet Addiction: A Public Health Perspective." *International Journal of Environmental Research and Public Health* 16 (23): 4635. <https://doi.org/10.3390/ijerph16234635>.
- De Los Reyes, A., and A. E. Kazdin. 2005. "Informant Discrepancies in the Assessment of Childhood Psychopathology: A Critical Review, Theoretical Framework, and Recommendations for Further Study." *Psychological Bulletin* 131 (4): 483–509. <https://doi.org/10.1037/0033-2909.131.4.483>.
- De Los Reyes, A., S. A. Thomas, K. L. Goodman, and S. M. Kunder. 2013. "Principles Underlying the use of Multiple Informants' Reports." *Annual Review of Clinical Psychology* 9 (1): 123–149. <https://doi.org/10.1146/annurev-clinpsy-050212-185617>.
- Ding, H., B. Cao, and Q. Sun. 2023. "The Association between Problematic Internet Use and Social Anxiety within Adolescents and Young Adults: A Systematic Review and Meta-analysis." *Frontiers in Public Health* 11:1275723. <https://doi.org/10.3389/fpubh.2023.1275723>.
- Faul, F., E. Erdfelder, A. Buchner, and A.-G. Lang. 2009. "Statistical Power Analyses Using G*Power 3.1: Tests for Correlation and Regression Analyses." *Behavior Research Methods* 41 (4): 1149–1160. <https://doi.org/10.3758/BRM.41.4.1149>.
- Faul, F., E. Erdfelder, A.-G. Lang, and A. Buchner. 2007. "G*Power 3: A Flexible Statistical Power Analysis Program for the Social, Behavioral, and Biomedical Sciences." *Behavior Research Methods* 39 (2): 175–191. <https://doi.org/10.3758/BF03193146>.
- Griffiths, M. 2005. "A 'Components' Model of Addiction within a Biopsychosocial Framework." *Journal of Substance Use* 10 (4): 191–197. <https://doi.org/10.1080/14659890500114359>.
- Gunuc, S., and A. Dogan. 2013. "The Relationships between Turkish Adolescents' Internet Addiction, Their Perceived Social Support and Family Activities." *Computers in Human Behavior* 29 (6): 2197–2207. <https://doi.org/10.1016/j.chb.2013.04.011>.
- Harb, C.. 2016. "The Arab Region: Cultures, Values, and Identities." In *Handbook of Arab American Psychology*, 3–18. London: Routledge.
- Hiniker, A., S. Y. Schoenebeck, and J. A. Kientz. 2016. "Not at the Dinner Table: Parents' and Children's Perspectives on Family Technology Rules." *Proceedings of the ACM Conference on Computer Supported Cooperative Work, CSCW* 27: 1376–1389. <https://doi.org/10.1145/2818048.2819940>.
- Howarth. 2023. *EXPLODING-TOPICS-Alarmig-Average-Screen-Time-Statistics-2024*.
- Karaer, Y., and D. Akdemir. 2019. "Parenting Styles, Perceived Social Support and Emotion Regulation in Adolescents with Internet Addiction." *Comprehensive Psychiatry* 92: 22–27. <https://doi.org/10.1016/j.comppsy.2019.03.003>.
- Kardefelt-Winther, D. 2014. "A Conceptual and Methodological Critique of Internet Addiction Research: Towards a Model of Compensatory Internet use." *Computers in Human Behavior* 31 (1): 351–354. <https://doi.org/10.1016/j.chb.2013.10.059>.
- Kimball, H. G., F. Fernandez, K. A. Moskowitz, M. Kang, L. M. Alexander, K. P. Conway, K. R. Merikangas, G. A. Salum, and M. P. Milham. 2023. "Parent-Perceived Benefits and Harms Associated with Internet Use by Adolescent Offspring." *JAMA Network Open* 6 (10): e2339851. <https://doi.org/10.1001/jamanetworkopen.2023.39851>.
- Ko, C. H., P. W. Wang, T. L. Liu, C. F. Yen, C. S. Chen, and J. Y. Yen. 2015. "Bidirectional Associations between Family Factors and Internet Addiction among Adolescents in a Prospective Investigation." *Psychiatry and Clinical Neurosciences* 69 (4): 192–200. <https://doi.org/10.1111/pcn.12204>.
- Ko, C. H., J. Y. Yen, C. F. Yen, C. S. Chen, and C. C. Chen. 2012. "The Association between Internet Addiction and Psychiatric Disorder: A Review of the Literature." *European Psychiatry* 27 (1): 1–8. <https://doi.org/10.1016/j.eurpsy.2010.04.011>.
- Kuss, D. J., and M. D. Griffiths. 2017. "Social Networking Sites and Addiction: Ten Lessons Learned." *International Journal of Environmental Research and Public Health* 14 (3): 1–17. <https://doi.org/10.3390/ijerph14030311>.
- Kwon, J. H., C. S. Chung, and J. Lee. 2011. "The Effects of Escape from Self and Interpersonal Relationship on the Pathological Use of Internet Games." *Community Mental Health Journal* 47 (1): 113–121. <https://doi.org/10.1007/s10597-009-9236-1>.
- Lam, L. T., and E. M. Wong. 2015. "Stress Moderates the Relationship between Problematic Internet use by Parents and Problematic Internet use by Adolescents." *Journal of Adolescent Health* 56 (3): 300–306. <https://doi.org/10.1016/j.jadohealth.2014.10.263>.

- Livingstone, S., and E. J. Helsper. 2008. "Parental Mediation of Children's Internet Use." *Journal of Broadcasting and Electronic Media* 52 (4): 581–599. <https://doi.org/10.1080/08838150802437396>.
- Lu, Peng, Jiamin Qiu, Shiqi Huang, Xinman Wang, Shasha Han, Sui Zhu, Youjing Ning, Fang-fang Zeng, and Yuan. 2025. "Interventions for Digital Addiction: Umbrella Review of Meta-analyses." *Journal of Medical Internet Research* 27:e59656. <https://doi.org/10.2196/59656>.
- Marengo, D., C. Sindermann, D. Hackel, M. Settanni, J. D. Elhai, and C. Montag. 2020. "The Association between the big Five Personality Traits and Smartphone use Disorder: A Meta-analysis." *Journal of Behavioral Addictions* 9 (3): 534–550. <https://doi.org/10.1556/2006.2020.00069>.
- McDaniel, B. T. 2019. "Parent Distraction with Phones, Reasons for use, and Impacts on Parenting and Child Outcomes: A Review of the Emerging Research." *Human Behavior and Emerging Technologies* 1 (2): 72–80. <https://doi.org/10.1002/hbe2.139>.
- Miller, I. W., N. B. Epstein, D. S. Bishop, and G. I. Keitner. 1985. "The McMaster Family Assessment Device: Reliability and Validity." *Journal of Marital and Family Therapy* 11 (4): 345–356. <https://doi.org/10.1111/j.1752-0606.1985.tb00028.x>.
- Mita, S., M. Muthoni, and P. Kigamwa. 2025. "Relationship Between Problematic Internet Use and Depression, Anxiety, and Stress among University of Nairobi Students." *IRE Journals* 8 (11): 1404–1413.
- Mousa, O., S. Alshakhsi, A. Yankouskaya, C. Panourgia, and R. Ali. 2024. "Good Technology Requires a Good Environment: The Role of Parenting Practices in Adolescent Internet Addiction." *GoodIT 2024 - Proceedings of the 2024 International Conference on Information Technology for Social Good*: 143–150. <https://doi.org/10.1145/3677525.3678654>.
- Nannatt, A., N. M. Tariat, M. Gowda, and S. M. Devassy. 2022. "Family Factors Associated with Problematic Use of the Internet in Children: A Scoping Review." *Indian Journal of Psychological Medicine* 44 (4): 341–348. <https://doi.org/10.1177/02537176221090862>.
- OECD. 2021. *Children in the digital environment: Risks and opportunities*. Paris: OECD Publishing.
- Ortuño-Sierra, Javier, Julia Pérez-Sáenz, Oliver Mason, Alicia Pérez de Albeniz, and Eduardo Fonseca Pedrero. 2024. "Problematic Internet use among Adolescents: Spanish Validation of the Compulsive Internet Use Scale (CIUS)." *Adicciones* 36 (3): 247–256. <https://doi.org/10.20882/adicciones.1801>.
- Pew Research Center. 2024. *Teens, Social Media & Technology 2025*. Washington, DC. <https://www.pewresearch.org/internet/2024/12/12/teens-social-media-and-technology-2024/>.
- Restrepo, A., T. Scheininger, J. Clucas, L. Alexander, G. A. Salum, K. Georgiades, D. Paksarian, K. R. Merikangas, and M. P. Milham. 2020. "Problematic Internet use in Children and Adolescents: Associations with Psychiatric Disorders and Impairment." *BMC Psychiatry* 20 (1): 1–11. <https://doi.org/10.1186/s12888-020-02640-x>.
- Rideout, V., and M. B. Robb. 2019. *The Common Sense Census: Media use by Tweens and Teens, 2019*. San Francisco, CA: Common Sense Media.
- Romero Saletti, S. M., S. Van den Broucke, and C. Chau. 2021. "The Effectiveness of Prevention Programs for Problematic Internet use in Adolescents and Youths: A Systematic Review and Meta-Analysis." *Cyberpsychology: Journal of Psychosocial Research on Cyberspace* 15 (2): 10. <https://doi.org/10.5817/CP2021-2-10>.
- Sousa, V. D., and W. Rojjanasrirat. 2011. "Translation, Adaptation and Validation of Instruments or Scales for Use in Cross-Cultural Health Care Research: A Clear and User-Friendly Guideline." *Journal of Evaluation in Clinical Practice* 17 (2): 268–274. <https://doi.org/10.1111/j.1365-2753.2010.01434.x>.
- Spada, M. M. 2014. "An Overview of Problematic Internet Use." *Addictive Behaviors* 39 (1): 3–6. <https://doi.org/10.1016/j.addbeh.2013.09.007>.
- Stoilova, M., M. Bulger, and S. Livingstone. 2024. "Do Parental Control Tools Fulfil Family Expectations for Child Protection? A Rapid Evidence Review of the Contexts and Outcomes of use." *Journal of Children and Media* 18 (1): 29–49. <https://doi.org/10.1080/17482798.2023.2265512>.
- Tamis-LeMonda, C. S., N. Way, D. Hughes, H. Yoshikawa, R. K. Kalman, and E. Y. Niwa. 2008. "Parents' Goals for Children: The Dynamic Coexistence of Individualism and Collectivism in Cultures and Individuals." *Social Development* 17 (1): 183–209. <https://doi.org/10.1111/j.1467-9507.2007.00419.x>.
- Tiego, Jeggan, Christine Lochner, Konstantinos Ioannidis, Matthias Brand, Dan J. Stein, Murat Yücel, Jon E. Grant, and Samuel R Chamberlain. 2021. "Measurement of the Problematic Usage of the Internet Unidimensional Quasitrait Continuum with Item Response Theory." *Psychological Assessment* 33 (7): 652–671. <https://doi.org/10.1037/pas0000870>.
- UNICEF. 2021. *The State of the World's Children 2021: On My Mind - Promoting, Protecting and Caring for Children's Mental Health*. New York, NY. <https://www.unicef.org/reports/state-worlds-children-2021>.
- van den Eijnden, Regina J. J. M., Renske Spijkerman, Ad A. Vermulst, Tony J. van Rooij, and Rutger C. M. E Engels. 2010. "Compulsive Internet Use among Adolescents: Bidirectional Parent-Child Relationships." *Journal of Abnormal Child Psychology* 38 (1): 77–89. <https://doi.org/10.1007/s10802-009-9347-8>.
- Wang, Y., K. Zhou, Y. Wang, J. Zhang, Y. Xie, X. Wang, W. Yang, X. Zhang, J. Yang, and F. Wang. 2024. "Examining the Association of Family Environment and Children Emotional/Behavioral Difficulties in the Relationship between Parental Anxiety and Internet Addiction in Youth." *Frontiers in Psychiatry* 15: 1–14. <https://doi.org/10.3389/fpsy.2024.1341556>.
- Wartberg, L., L. Kriston, K. Kegel, and R. Thomasius. 2016. "Adaptation and Psychometric Evaluation of the Young Diagnostic Questionnaire (YDQ) for Parental Assessment of Adolescent Problematic Internet use." *Journal of Behavioral Addictions* 5 (2): 311–317. <https://doi.org/10.1556/2006.5.2016.049>.
- Wisniewski, P., A. K. Ghosh, H. Xu, M. B. Rosson, and J. M. Carroll. 2017. "Parental Control Vs. Teen Self-regulation: Is there a Middle Ground for Mobile Online Safety?" *Proceedings of the ACM Conference on Computer Supported Cooperative Work, CSCW*: 51–69. <https://doi.org/10.1145/2998181.2998352>.

- World Health Organization. 2020. *Adolescent Mental Health: Protecting and Promoting Mental Well-Being*. <https://www.who.int/news-room/fact-sheets/detail/adolescent-mental-health>.
- Wu, X., X. Chen, J. Han, H. Meng, J. Luo, L. Nydegger, and H. Wu. 2013. "Prevalence and Factors of Addictive Internet Use among Adolescents in Wuhan, China: Interactions of Parental Relationship with age and Hyperactivity-Impulsivity." *PLoS ONE* 8 (4): e61782. <https://doi.org/10.1371/journal.pone.0061782>.
- Yankouskaya, A., R. Ali, S. AlShakhsi, E. Delvecchio, N. Manesis, C. Mazzeschi, S. G. Turan, and C. Panourgia. 2025. "Emerging Impact of Parental Internet Addiction on Adolescent Internet Use: A Cross-Cultural Perspective." *New Directions for Child and Adolescent Development* 2025 (1): 1–20. <https://doi.org/10.1155/cad/4336597>.
- Young, K. S. 1998. "Internet Addiction: The Emergence of a New Clinical Disorder." *Cyberpsychology & Behavior* 1 (3): 237–244.
- Yu, L., and D. T. L. Shek. 2013. "Internet Addiction in Hong Kong Adolescents: A Three-Year Longitudinal Study." *Journal of Pediatric and Adolescent Gynecology* 26 (3): S10–S17. <https://doi.org/10.1016/j.jpog.2013.03.010>.
- Zhang, J., Q. Zhang, B. Xiao, Y. Cao, Y. Chen, and Y. Li. 2025. "Parental Technoference and Child Problematic Media Use: Meta-Analysis." *Journal of Medical Internet Research* 27:e57636. <https://doi.org/10.2196/57636>.