



RESEARCH ARTICLE

Problematic Internet Use Among Adolescents In Saudi: Parenting Style And Parent-Adolescent Relationship

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ABSTRACT

The study consisted of two phases. In the first phase, the prevalence of internet use behaviors and problematic internet use (PIU) was examined. Then, the predictive role of gender and internet use behaviors (number of hours spent online during school days and non-school days), mother and father parenting styles (authoritative, authoritarian, and permissive), and parent-adolescent relationship on problematic internet use among Saudi adolescents was searched. A cross-sectional study was conducted, utilizing the Arabic version of several scales: Young's Internet Addiction Test Scale, the Parental Authority Questionnaire-short version, and the Quality of Parent-Child Relationship Questionnaire (PCRQ). The study included a total of 411 participants (272 Girls, 139 Boys) aged from 14 to 18 years, with a mean of 15.64 (SD=1.33 years) in Riyadh. Pearson correlation analysis and hierarchical regression analysis were employed as statistical methods in the analysis. Results indicated that 45.2% of adolescents met criteria for PIU. The Pearson correlation analysis revealed significant negative correlations between the parent-adolescent relationship and authoritative fathering style with PIU, while both mother and father authoritarian parenting styles showed significant positive correlations. Furthermore, the hierarchical regression analysis demonstrated that gender, number of hours spent online during school and non-school days, parent-adolescent relationship, and authoritarian fathering style significantly predicted adolescents' PIU. These findings emphasize the crucial role of the parent-adolescent relationship and parenting style in relation to PIU. To address PIU, this study offers evidence-based recommendations for parents, counselors, and digital literacy to mitigate PIU and promote healthy internet use among adolescents.

The internet has brought about significant changes in various aspects of individual's lives. While individuals benefit from its numerous advantages in education, communication, and entertainment, they also face the potential risk for developing problematic internet use (PIU). Beard and Wolf (2001) described PIU as the utilization of the internet that have unfavorable effects on an individual's psychological well-being, social life, and academic or professional performance. Adolescents, considered the most susceptible group to internet addiction (Chung, Lee, & Lee, 2019), have shown varying prevalence rates across countries: 20.8% in Iran (Ahmadi, 2014), 29.0% in Malaysia (Ying et al., 2020), 29.64% in Qatar (Chemnad et al., 2023), and 43.69% in Germany (Paulus et al., 2022). In Saudi, a nationally representative study indicated that approximately

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41.8% of intermediate and high school students exhibited PIU (Saqib et al., 2022), highlighting the urgency of investigating its underlying causes within this population.

Several theoretical frameworks provide valuable insights into the development of PIU among adolescents. Attachment Theory suggests that early interactions with caregivers shape internal working models, which, in turn, affect how individuals build relationships and manage stress (Bowlby, 1988). Adolescents with insecure attachment styles, particularly those characterized by anxiety, face a higher risk of developing PIU (Jia & Jia, 2016). In these instances, adolescents may turn to the internet for emotional validation and social connection, using it as a coping mechanism for stress. A systematic review of 25 studies by Asyriati (2020) further reinforced this link, identifying lack of parental attachment as one of the most significant factors contributing to PIU. These findings underscore the critical role of early parent-child relationships in shaping adolescent internet behaviors. Beyond attachment, self-regulation plays a crucial role in moderating adolescents' internet behaviors. Self-Regulation Theory explains how individuals manage their thoughts, emotions, and behaviors to achieve long-term goals (Vohs & Baumeister, 2016). Adolescents with poor self-regulation skills often struggle to control their internet use, increasing their risk of PIU. Research by Kwan and Leung (2017) found that parenting style is positively associated with attachment, which in turn correlates positively with self-regulation. Additionally, self-regulation was negatively related to smartphone addiction, suggesting that adolescents with stronger self-regulation skills are less likely to develop problematic internet behaviors. Similarly, Xiao, Li and Wang (2024) identified self-regulation as a key mediator between parenting and adolescents' problematic online behaviors, further reinforcing its protective role against PIU.

In addition to these theoretical perspectives, empirical studies have identified specific factors influencing PIU, including gender differences and internet usage patterns during school and non school days. A study conducted with the Korean adolescents aged from 12 to 18, found that boys had a PIU prevalence of 7.7%, while girls had 3.8% (Kim, Kim, Choi, Kim, & Kim, 2020). Similarly, Say and Batıgün (2016) yielded that Turkish male university students exhibited higher levels of PIU than females. However, Ciarrochi et al. (2015) revealed that Australian adolescents females had higher levels of PIU than males. These discrepancies suggest that gender-specific behavioural tendencies and cultural contexts may play a role in the internet use patterns. Regarding the number of hours spent online, Hawi (2012) reported that Lebanese adolescents, who classified as PIU, used the internet for an average of 3.38 hours during school days and 6.99 hours during non-school days. Mihara et al. (2016) reported that, in Japan, 31.2% of adolescents classified as PIU were using the internet for more than 5 hours on weekdays, while 44.9% exceeded 5 hours on weekends. In Saudi, 43.2% of adolescents were reported to use the internet for 3-5 hours per day (Nafee et al., 2018), and 33% of adolescents spent more than 6 hours per day in front of screens (Rajab et al., 2021). These findings emphasize the necessity of considering both individual and sociocultural factors when assessing PIU risk, as internet usage behaviours appear to vary significantly across different populations.

When it comes to adolescents' preferences for online services, existing literature highlights distinct differences between males and females. For instance, in Korea, Kim et al. (2020) found that while males predominantly preferred electronic games, females were more engaged in blogging and chatting. Similarly, a study on Japanese adolescents found that males favored gaming, while females preferred social networking, blogging, and email (Mihara et al., 2016). In Saudi, research has indicated that 64% of adolescents primarily use the internet for social media (Saqib et al., 2022), and 88.5% of Taibah University students use it for social networking (Kolaib et al., 2020). These finding suggest that PIU risk factors may be linked to specific online activities, necessitating further exploration of behavioral patterns within Saudi adolescents.

Adolescents who experience PIU face a wide range of harmful outcomes that affect various areas of life. Research links PIU to negative physical health effects (Taha, Shehzad, Alamro, & Wadi, 2019; Bener et al., 2019; Ying et al., 2020; Saquib et al., 2022; Hinojo-Lucena, Aznar-Díaz, Cáceres-Reche, Trujillo-Torres, & Romero-Rodríguez, 2019; Nafee et al., 2018; Barayan, Al Dabal, Abdelwahab, Shafey, & Al Omar, 2018), mental health (Bener & Bhugra, 2013; Dib et al., 2021; El-Khodary, Ayad, Kandil, & Hanafi, 2022; Hasan & Abu Jaber, 2020), academic performance (M.H.Taha et al., 2019; Tsitsika et al., 2011; Can & Zeren, 2019;

Sriati, Lukman, & Agustina, 2022; Kim et al., 2020; Barayan et al., 2018; Ciarrochi et al., 2015), and social interactions (Özaslan, Yıldırım, Güney, Güzel, & İşeri, 2022; Ledur, Schmitt, Nesi de Mello, & Andretta, 2022; Romero-López, Pichardo, De Hoces, & García-Berbén, 2021; Onyekachi, Egboluche, & Chukwuorji, 2022). Given these negative outcomes, understanding the role of protective and risk factors, particularly within the family context, is critical. Such inquiry not only deepens academic understanding of the issue but also supports the development of targeted, evidence-based measures to prevent and address PIU among young people.

Parenting style is widely acknowledged as a key family-related factor affecting PIU. According to Baumrind's (1966) model, parenting styles are classified into authoritative, authoritarian, and permissive. Authoritative parenting, characterized by a demanding yet responsive approach, involves parents establishing clear and consistent rules while providing emotional support, encouragement, and fostering independence in their children. This parenting style has been linked to lower PIU levels (Onyekachi et al., 2022; Lukavská, Vacek, & Gabhelík, 2020). In contrast, authoritarian parenting, marked by strict rules and low responsiveness, has been associated with increased PIU due to adolescents' potential reliance on online space for autonomy and emotional expression (Yaffe & Seroussi, 2019; Cheung, Yue, & Wong, 2015; Dogan, Bozgeyikli, & Bozdas, 2015; Li, Garland, & Howard, 2014; Lukavská et al., 2020; Setiawati et al., 2021). Similarly, permissive parenting, defined by responsiveness but a lack of structure, has also been linked to higher PIU levels (Onyekachi et al., 2022; Setiawati et al., 2021). Specifically, fathers' permissive parenting style was found to significantly predict PIU among adolescents (Setiawati et al., 2021).

Parenting in Saudi is deeply influenced by Islamic values, tribal traditions, and strong family ties (El-Haddad, 2003). While extended families were once prevalent, urbanization and economic growth have led to a shift toward nuclear families (Al Bassam, 2011). However, family remains the primary source of support, with extended relatives playing a key role in child-rearing (Almalki & Ganong, 2018). Research showed that strong family support was linked to better adolescent mental health (Alshehri, Yildirim, & Vostanis, 2020). Moreover, Saudi parents often use an authoritarian parenting style, emphasizing obedience and discipline (Shaikh et al., 2020). While some argue this approach is culturally accepted (Dwairy et al., 2006), a study claimed that authoritative parenting leads to better mental health outcomes (Shaikh et al., 2020). Additionally, the growing dependence on nannies in urban households has sparked concerns about weakened parent-child attachment and reduced oversight of children's internet use (El-Haddad, 2003).

In addition to parenting styles, the quality of parent-adolescent relationship plays a crucial role in adolescents internet use. Taha (2020) described this relationship as a series of reciprocal interactions between parents and adolescents, that shape the child's behavioural patterns and future development. This relationship is assessed based on key dimensions such as warmth, acceptance, closeness, involvement, and the use of supportive disciplinary methods (Taha, 2020). As children undergo developmental changes, the parent-child relationship transitions from a hierarchical structure to a more reciprocal dynamic (Larson, Richards, Moneta, Holmbeck, & Duckett, 1996). This developmental shift frequently brings about conflict, as teenagers strive for independence and challenge parental control (Steinberg & Silk, 2002). However, research by Laursen, Coy, and Collins (1998) suggests that such conflicts tend to diminish as adolescents progress into late adolescence. Despite these developmental shifts, the parent-child relationship continues to exert a lasting influence on adolescence development (Laursen & Collins, 2009; Antonucci, Akiyama, & Takahashi, 2004; Ahmadi, 2014). Numerous studies have demonstrated a strong association between poor parent-adolescent relationships and increased PIU (Özaslan et al., 2022; Ahmadi, 2014; Li et al., 2014; Verrocchio, Marchetti, Ciuluvica, Palumbo, & Fulcheri, 2012). Conversely, adolescents who maintain close and supportive relationships with their parents tend to exhibit lower levels of PIU over time (Choo, Sim, Liao, Gentile, & Khoo, 2015). These findings highlight the critical role of nurturing and communicative parent-adolescent relationship in mitigating the risk of PIU and fostering healthier internet use behaviors.

Despite several studies have examined individual and behavioral factors associated with problematic internet use among Saudi individuals, including religiosity, physical health, mental health, coping strategies (Saquib et al., 2022; Nafee et al., 2018; Barayan et al., 2018; M.H.Taha et al., 2019), and screen time habits including online time, types of devices used, and types of services utilized (Abdel-Salam et al., 2019; Nafee et al., 2018;

Saquist et al., 2022), research on family dynamics, specifically parenting styles and parent-adolescent relationships, remains limited. Additionally, most Saudi studies on PIU focus on university students rather than adolescents (Kolaib et al., 2020; M.H.Taha et al., 2019; Barayan et al., 2018; Hasan & Abu Jaber, 2020), despite adolescents being at greater risk of PIU due to their developmental stage.

Therefore, the current study includes two phases. First, the study examined the frequency of adolescents' internet use behaviors, including the number of hours spent online during school days and non-school days, as well as the rank order of commonly used internet services, in relation to PIU. Second, this study investigated the predictive role of gender and internet use behaviors (number of hours spending internet during school days and non-school days), mother and father parenting styles (authoritative, authoritarian, and permissive), and the quality of the parent-adolescent relationship in relation to PIU among Saudi adolescents. The following research questions was addressed:

1. What is the prevalence of internet use behaviors (number of hours spent online during school days and non-school days, and rank order of used internet services) among adolescents in Saudi?
2. What is the prevalence of PIU among adolescents in Saudi?
3. Is there a significant relationship among PIU, mother and father parenting style and parent-adolescent relationship?
4. To what extent does gender, internet use behaviors (number of hours spending internet during school days and non-school days), mother and father parenting styles (authoritative, authoritarian, and permissive), and parent-adolescent relationship predict PIU in Saudi adolescents?

By examining family-related factors within the Saudi cultural context, this study seeks to provide critical insights for parents, educators, and policymakers in addressing adolescent PIU.

Method

Research Design

The study adopted a quantitative, cross-sectional design within a non-experimental framework to examine the relationships between problematic internet use, parenting styles, and the quality of parent-child interactions. Because it enables data to be gathered at a single point in time that can be utilized to investigate the association between two or more variables without trying to influence them (Babbie, 2014).

Participants

The participant of the present study consists of 411 adolescents, 272 females (66.2%) and 139 males (33.8%) who lived in Riyadh-Saudi, aged between 14 and 18 years ($M = 15.64$, $SD = 1.33$ years). Socio-demographic features of the participants were displayed in Table 1.

Convenient and snowball sampling methods were employed to obtain the data for this study. Convenient sampling allowed for the inclusion of individuals between the ages of 14 and 18 who were available and willing to participate (Huck, 2012). In the snowball sampling method, participants were encouraged to assist in expanding the sample by suggesting additional potential participants such as friends, classmates, family members, or neighbors who might be interested in participating (Huck, 2012).

Table 1. Socio Demographic Characteristics of the Participants

		Frequency	Percentage
Gender	Male	139	33.8 %
	Female	272	66.2 %
School	Public	52	12.7 %
	Private	278	67.6 %

Table 4 (*Continued*)

	International	79	19.2 %
Grade	8 th	84	20.4 %
	9 th	70	17.0 %
	10 th	80	19.5 %
	11 th	106	25.8 %
	12 th	69	16.8 %
With whom you live	Both parents	359	87.3 %
	Father	3	0.7 %
	Mother	12	2.9 %
	Extended Family (Parents & Relatives)	32	7.8 %
	Relatives	1	0.2 %
Parents marital status	Married	394	95.9 %
	Not divorced but separated	1	0.2 %
	Divorced	11	2.7 %
Parents	Both alive	398	96.8 %
	Mother passed away	3	0.7 %
	Father passed away	5	1.2 %
	Both parents passed away	1	0.2 %
Mothers' educational level	Below high school	10	2.4 %
	High school	59	14.4 %
	College	57	13.9 %
	University	221	53.8 %
	Graduate	43	10.5 %
Fathers' educational level	Below high school	4	1.0 %
	High school	18	4.4 %
	College	31	7.5 %
	University	217	52.8 %
	Graduate	124	30.2 %
Parents' income level	Low	3	0.7 %
	Low-Middle	12	2.9 %
	Middle	183	44.5 %
	High-Middle	160	38.9 %
	High	37	9.0 %

Fifty-two participants (12.7%) were studying in public school, 278 (67.6%) were in private school, while 79 (19.2%) were in international school. The participants were distributed across different grade levels as follows: 84 (20.4%) in 8th grade, 70 (17.0%) in 9th grade, 80 (19.5%) in 10th grade, 106 (25.8%) in 11th grade, and 69 (16.8%) in 12th grade. Participants include, 359 (87.3%) were living with both parents, 3 (0.7%) were living with the father, 12 (2.9%) were living with the mother, 32 (7.8%) were living with the extended family and 1 (0.2%) was living with relatives. 394 participants (95.9%) said that their parents were married, 11 participants (2.7%) said their parents are divorced, while 1 (0.2%) participant reported that parents are not divorced but separated. Based on the results, a total of 398 participants (96.8%) reported that both of their parents were alive, 3 participants (0.7%) stated that their mother had passed away, 5 participants (1.2%) reported their father had passed away, and 1 participant (0.2%) reported the loss of both parents.

Regarding the educational level of participants' mothers, 10 (2.4%) had an education level below high school, 59 (14.4%) had completed high school, 57 (13.9%) had attended college, 221 (53.8%) had a university degree, and 43 (10.5%) had a graduate degree. Participants reported their fathers' educational level as follows: 4 (1.0%) had an education level below high school, 18 (4.4%) had completed high school, 31 (7.5%) had attended college, 217 (52.8%) had a university degree, and 124 (30.2%) had a graduate degree. Regarding parents' income level, 3 (0.7%) participants reported a low-income level, 12 (2.9%) reported a low-middle income level, 183 (44.5%) reported a middle income, 160 (38.9%) reported a high-middle income, and 37 (9.0%) reported a high income.

Measures

Demographic Information Form

The study employed a demographic questionnaire that was designed by researcher, consisting of questions on age, gender, type of school, grade, living arrangements, number of siblings, and birth order. Additionally, the questionnaire included inquiries about the social, educational, and economic status of the participants' parents. Participants were also asked to report their internet usage, including the number of hours spent on the internet during school days and non-school days. They were also asked to rank the internet services they used, from the most frequently used to the least.

Young's Internet Addiction Test (YIAT)

Arabic version of the YIAT which was adopted by Hawi (2013), was utilized to assess the extent of an individual's excessive internet use and its effects on their lives. It contains 20 items rated from 0 (does not apply) to 5 (always). Total YIAT score range from 0 to 100. The lowest level, labeled as "no addiction", corresponded to scores below 20 points on YIAT. The second lowest level, designated for scores ranging from 20 to 39 points, was described as "average online user who has complete control over his/her usage". The third level, associated with scores ranging from 40 to 69 points, was characterized as "frequent problems due to Internet usage". The highest level, labeled as "the Internet is causing significant problems", was assigned to scores ranging from 70 to 100 points. The overall score on the scale, which ranges from 40 to 69, was used as a PIU indicator (Hawi, 2013). Hawi (2013) provided evidence of excellent internal consistency reliability ($\alpha = .921$) for the Arabic version, and validity for the one-factor solution using exploratory factor analysis approach. Consistent with his report, the instrument employed for the current study had a high internal-consistency reliability coefficient ($\alpha = .871$).

Parental Authority Questionnaire (PAQ) - Short Version

The original scale was created by Buri (1991) to assess adolescent perceptions of three parenting styles based on Baumrind's (1966) model. The questionnaire has separate versions for mothers and fathers, with 10 items for each parenting style. The short version of this scale contains 20 items rated from 1 (strongly disagree) to 5 (strongly agree). Where items (3, 5, 10, 15, 16, 18, 20) represent authoritative parenting style, items (1, 2, 6, 8, 11, 13, 17) represent authoritarian parenting style, and items (4, 7, 9, 12, 14, 19) for permissive parenting style. The mean score for each subscale is calculated, and then the prevailing pattern is known through the highest mean. Alkharusi, Aldhafri, Kazem, Alzubiadi, and Al-Bahrani (2011) examined psychometric properties for short Arabic version of the scale and provided reasonable internal consistency reliability, ($\alpha = .75$ for Authoritative; $\alpha = .72$ for Authoritarian; and $\alpha = .65$ for Permissive). In the current study the internal consistency coefficient for Father Parenting Style was ($\alpha = .816$ for Authoritative; $\alpha = .717$ for Authoritarian; and $\alpha = .529$ for Permissive), and the internal consistency coefficient for Mother Parenting Style was ($\alpha = .757$ for Authoritative; $\alpha = .695$ for Authoritarian; and $\alpha = .496$ for Permissive).

Quality of Parents-Child Relationship Questionnaire (PCRQ)

The original scale, developed by Furman and Giberson (1995), aimed to assess the quality of the parent-child relationship from the parent's perspective. Building upon this scale, researcher M.A. Taha (2020) created an Arabic version that measures relationship quality from the perspective of children. This scale is specifically designed for children aged 9 to 21 years. It consists of 38 items that measure five subscales as follow: possession (1, 2, 19, 20, 37, 38), warmth (3, 10, 11, 21, 28, 29), personal closeness (5, 6, 9, 13, 16, 23, 24, 27, 31, 34), disciplinary warmth (7, 15, 18, 25, 33, 36), power assertion (4, 8, 12, 14, 17, 22, 26, 30, 32, 35). Scores are graded on a five-point Likert scale: always (5), often (4), sometimes (3), rarely (2), never (1), the items of possessiveness and power assertion sub scales were reversed then scores add up and a high score indicates a good relationship. M.A. Taha (2020) has documented a satisfactory internal consistency reliability ($\alpha = .763$ for possessiveness, $\alpha = .894$ for warmth, $\alpha = .878$ for personal closeness, $\alpha = .800$ for disciplinary warmth, $\alpha = .814$ for power assertion), and validity for the five-factor structure using factor analysis. In this study the internal consistency reliability was ($\alpha = .672$ for possessiveness, $\alpha = .894$ for warmth, $\alpha = .891$ for personal closeness, $\alpha = .803$ for disciplinary warmth, $\alpha = .790$ for power assertion).

Procedure

The data collected both in person and online. In person process, the informed consent and questionnaires used in the study distributed in various locations, including youth sports clubs, educational centers, book clubs, residential compounds. For online process, the research link which was built in googledocs distributed through online platforms such as Facebook, WhatsApp, and Instagram. The informed consent form provided a concise overview of the research and assured participants that their involvement was voluntary, with a guarantee of confidentiality for their responses. If a parent granted permission for their adolescent to take part in the study, they could scan the barcode in the informed consent form, which would provide access to a Google Form. Participants were required to submit the parental informed consent and provide their own voluntary consent before proceeding to complete the questionnaire. In this way only 44 online responses were obtained. Therefore, the complete questionnaire was printed with parents' and adolescents' consent form and distributed in the aforementioned places, and the participants were asked to fill it out and return it. Several friends of the first researcher were engaged in the distribution and collection process. 810 questionnaires were distributed and 430 were returned, the return rate was 53.1%. The completed forms were examined, and the legitimate responses were converted into SPSS for analysis. 63 questionnaires were excluded due to non-completion or no signature of informed consent. The number of valid paper questionnaires became 367, and with the responses collected online, the total number of participants in this research was 411. The data were collected from March 2023 to June 2023. The estimate time to complete the questionnaire was around 25 minutes.

Data Analysis

Statistical analysis was conducted by the Statistical Package for the Social Sciences (SPSS)-Version 29. The analysis proceeded as follows: First, the normality assumption of continuous variables was assessed through skewness, and kurtosis. Second, descriptive statistics were computed for continuous variables, including measures such as mean, standard deviation (SD). Third, the percentages and prevalence were calculated through frequency analysis. Fourth, Pearson correlation analysis and a hierarchical regression analysis was conducted to examine the factors associated with PIU. Before normal distribution analysis, data were converted to standard z scores and outlier analysis was performed. According to Tabachnick and Fidell (2013), values converted to standard z scores that are less than -3.29 and greater than +3.29 are considered extreme values. Seven values outside this range were removed from the data set. The fact that skewness values are between -0.62 and 0.62 and kurtosis values are between -0.19 and .089 indicated that the normality assumption is met for all variables of the study. Outliers were identified using Cook's Distance. According to Cook and Weisberg (1982), Cook's Distance should not exceed a value of 1. The study found that all Cook's Distance values were below 1. Hence, no outliers were found in the data. Additionally, multicollinearity was tested by examining the Variance Inflation Factor (VIF) and Tolerance values. Field (2009) recommended that VIF values be less than 10 and tolerance values be greater than 0.2. All VIF values were below 3, and tolerance values exceeded 0.3. The results showed that the variables were not multicollinear. Thus, all predictors were included in the regression analysis. The Durbin-Watson value was utilized to assess autocorrelation among the error terms. A Durbin-Watson value within the range of 1.5-2.5 indicates no autocorrelation problem (Kalaycı, 2006). Since the Durbin-Watson value in the current study was 2.17, no autocorrelation issue was detected.

Results

Internet Use Behavior of Participants

Participants in the study were examined regarding their internet usage patterns, including the number of hours spent online during school days and non-school days. They were also asked to rank the internet services they used from most to least frequently. As presented in Table 2, a total of 113 participants (27.5%) reported spending more than five hours online during school days. Additionally, 129 participants (31.4%) indicated using the internet for 3-5 hours, while 108 participants (26.3%) reported spending 2-3 hours in internet. Furthermore, 45 participants (10.9%) stated that they spent 1-2 hours, while only 12 participants (2.9%) reported using the internet for less than one hour during school days. On non-school days, the participants' internet usage hours were distributed as follows: the majority, 207 participants (50.4%), reported spending

more than five hours in internet, 126 participants (30.7%) spent 3-5 hours, 60 participants (14.6%) spent 2-3 hours, 12 participants (2.9%) spent 1-2 hours, and 3 participants (0.7%) reported spending less than an hour.

Regarding the ranking of internet services used, the majority of participants (224, 54.5%) selected social networking sites as their most frequently used service. Conversely, 185 participants (45%) indicated that email services were their least utilized service.

Table 2. Internet Use Behavior of the Participants.

		Frequency	Percentage
How long do you spend time on the internet during school days (include using smart phone, personal computer, gaming console)?			
	Less than 1 h	12	2.9 %
	1-2 h	45	10.9 %
	2-3 h	108	26.3 %
	3-5 h	129	31.4 %
	More than 5 h	113	27.5 %
How long do you spend time on the internet during non-school days?			
	Less than 1 h	3	0.7 %
	1-2 h	12	2.9 %
	2-3 h	60	14.6 %
	3-5 h	126	30.7 %
	More than 5 h	207	50.4 %
What kind of services have you used? Rank from 1 to 5 where 1 is the most used service.			
Education & Search for information	Most used service	65	15.8 %
	2 nd choice	102	24.8 %
	3 rd choice	107	26.0 %
	4 th choice	86	20.9 %
	Least used service	32	7.8 %
Social media	Most used service	224	54.5 %
	2 nd choice	87	21.2 %
	3 rd choice	40	9.7 %
	4 th choice	19	4.6 %
	Least used service	24	5.8 %
Email	Most used service	22	5.4 %
	2 nd choice	22	5.4 %
	3 rd choice	46	11.2 %
	4 th choice	112	27.3 %
	Least used service	185	45.0 %
Online Gaming	Most used service	58	14.1 %
	2 nd choice	72	17.5 %
	3 rd choice	96	23.4 %
	4 th choice	86	20.9 %
	Least used service	78	19.0 %
Downloading or streaming (movies and series)	Most used service	48	11.7 %
	2 nd choice	107	26.0 %
	3 rd choice	102	24.8 %
	4 th choice	76	18.5 %
	Least used service	60	14.6 %

Frequency of Problematic Internet Use (PIU)

Regarding PIU and based on the cut-off scores of the YIAT scale, a total of 173 participants (42.7%) were classified as average internet users. Additionally, 183 participants (45.2%) fell into the problematic internet use group, while 10 participants (2.5%) were identified as experiencing significant problems due to internet use. Furthermore, 39 participants (9.6%) were categorized as belonging to the no addiction group as shown in Table 3.

Table 3. Frequency of Problematic Internet Use.

PIU	Frequency	Percentage
No addiction	39	9.6 %
Average internet use	173	42.7 %
Problematic internet use	183	45.2 %
Internet is causing significant problems	10	2.5 %

Predictors of Problematic Internet Use

First of all, Pearson correlation coefficient analysis was performed to investigate the associations among study variables. Then hierarchical regression analysis was employed to examine the predictors of problematic internet use. The findings of Pearson correlation analysis were displayed in Table 4.

Two significant moderate correlations were observed with PIU; one with internet usage hours during school days ($r = .297$) and the other with internet usage hours during non-school days ($r = .247$). Findings revealed a significant negative correlation between scores on PIU and both the parent-adolescent relationship ($r = -.346$) and authoritative fathering style ($r = -.141$). While a negative correlation was also found between PIU and authoritative mothering style ($r = -.077$), it did not reach statistical significance. Conversely, statistically significant positive correlations were yielded between PIU scores and both authoritarian fathering style ($r = .197$) and authoritarian mothering style ($r = .103$). Furthermore, although not statistically significant, a positive correlation was found between PIU and both permissive mothering style ($r = .093$) and permissive fathering style ($r = .011$).

Table 4. Pearson Correlations Among Study Variables

	1	2	3	4	5	6	7	8	9	10
1. PIU	1									
2. IHD_SD	.297**	1								
3. IHD_NSD	.247**	.457**	1							
4. P-A Relationship	-.346**	-.036	-.002	1						
5. Authoritative F	-.141**	-.055	.043	.560**	1					
6. Authoritarian F	.197**	-.107*	-.096	-.433**	-.330**	1				
7. Permissive F	.011	-.025	-.006	.025	.053	-.019	1			
8. Authoritative M	-.077	.001	.056	.490**	.630**	-.141**	-.036	1		
9. Authoritarian M	.103*	-.101*	-.045	-.291**	-.097	.603**	.187**	-.179**	1	
10. Permissive M	.093	-.015	-.025	-.065	.016	.127*	.769**	-.029	.112*	1

IHD_SD = Internet hours during school days, IHD_NSD = Internet hours during non-school days,

*P-A=Parent-Adolescent, F = Father, M = Mother, ** $p < 0.01$, * $p < 0.05$*

To explore the predictive role of gender, internet use behavior and parental factors on PIU, a hierarchical regression analysis was conducted, with PIU as the dependent variable. In the first block, gender was included as a predictor (0 = male, 1 = female). The second block consisted of internet hours during school days and non-school days (0= less than three hours, 1= three hours or more). In the third block, the father parenting style

(authoritative, authoritarian, and permissive) were included. The fourth block included mother parenting style (authoritative, authoritarian, and permissive) variables. Finally, the fifth block incorporated the parent-adolescent relationship variable. The effect size was calculated using Cohen's f^2 , which resulted in $f^2 = 0.376$, suggesting a large effect size (Cohen, 1988), highlighting the substantial contribution of the predictors to PIU variance. The 95% confidence intervals (95% CI) were computed using 1,000 samples, ensuring robust and reliable parameter estimates. The results were shown in Table 5.

The initial model was statistically significant, $[F(1, 390) = 19.83, p < .001, R^2 = .048]$, suggesting that gender alone accounts for 4.8% of the variation in PIU. Gender was a significant predictor of PIU ($\beta = .22, t(390) = 4.45, p < .001, 95\% \text{ CI } [4.286, 10.085]$).

The second model, including gender ($\beta = .19, t(388) = 3.86, p < .001, 95\% \text{ CI } [3.141, 8.923]$), internet usage during school days ($\beta = .20, t(388) = 3.68, p < .001, 95\% \text{ CI } [2.924, 9.534]$), and internet usage during non-school days ($\beta = .14, t(388) = 2.72, p = .007, 95\% \text{ CI } [1.733, 9.188]$), showed an improvement from the first model ($R^2\text{change} = .084$). The overall model was statistically significant $[F(3, 388) = 19.73, p < .001, R^2 = .132]$, explaining 13.2% of the variance when gender and internet usage variables were included.

The third model, which incorporated father's parenting style variables, was also found to be statistically significant $[F(6, 385) = 16.51, p < .001, R^2 = .205]$. Gender ($\beta = .22, t(385) = 4.71, p < .001, 95\% \text{ CI } [4.253, 10.485]$) and internet usage hours during school and non-school days remained significant predictors ($\beta = .21, t(385) = 4.08, p < .001, 95\% \text{ CI } [3.569, 9.710]$, and $\beta = .16, t(385) = 3.15, p = .002, 95\% \text{ CI } [2.626, 9.610]$, respectively). The authoritarian fathering style was a significant and positive predictor ($\beta = .26, t(385) = 5.32, p < .001, 95\% \text{ CI } [3.481, 7.847]$), while authoritative and permissive fathering styles did not significantly predict PIU ($\beta = -.02, t(385) = -0.47, p = .64, 95\% \text{ CI } [-2.567, 1.711]$, and $\beta = .04, t(385) = 0.80, p = .43, 95\% \text{ CI } [-1.235, 3.148]$, respectively). In this case, authoritative fathering style showed a negative association, while permissive fathering style revealed a positive association with PIU. The R^2 change value of .072 for this regression model indicated that the addition of father's parenting style variables, along with previous variables, accounts for 20.5% of the variance in PIU.

Table 5. Hierarchical Regression Analysis for the Predictors of PIU

<i>Variables</i>	β	<i>t</i>	<i>p.</i>	R^2	R^2_{chg}	<i>F</i>
Step 1				.048	.048	19.83**
Gender	.220	4.453	<.001			
Step 2				.132	.084	19.73**
Gender	.185	3.858	<.001			
Internet hours during school	.197	3.681	<.001			
Internet hours during non-school	.144	2.717	<.001			
Step 3				.205	.072	16.51**
Gender	.223	4.713	<.001			
Internet hours during school	.211	4.076	<.001			
Internet hours during non-school	.161	3.151	.002			
Authoritative Father	-.023	-.472	.638			
Authoritarian Father	.263	5.322	<.001			
Permissive Father	.036	.796	.427			
Step 4				.210	.006	11.31**
Gender	.222	4.683	<.001			
Internet hours during school	.209	4.022	<.001			
Internet hours during non-school	.164	3.20	.001			
Authoritative father	-.020	-.310	.757			
Authoritarian father	.239	3.533	<.001			
Permissive father	-.061	-.797	.426			
Authoritative mother	-.011	-.184	.854			
Authoritarian mother	.008	.132	.895			
Permissive mother	.124	1.646	.101			

Table 5. (Continued)

Step 5				.273	.063	14.32**
Gender	.201	4.402	<.001			
Internet hours during school	.202	4.044	<.001			
Internet hours during non-school	.148	3.012	.003			
Authoritative father	.083	1.271	.204			
Authoritarian father	.158	2.376	.018			
Permissive father	-.031	-.412	.681			
Authoritative mother	.068	1.120	.263			
Authoritarian mother	-.025	-.407	.684			
Permissive mother	.096	1.333	.183			
Parent-adolescents relationship	-.333	-5.735	<.001			

* $p < 0.05$; ** $p < 0.01$.

The results of the fourth block which included mother's parenting style variables, revealed a statistically significant model [$F(9, 382) = 11.31, p < .001, R^2 = .210$]. However, the R^2 change value of .006 indicated that the addition of mother's parenting style variables did not considerably contribute to explaining PIU. Gender ($\beta = .22, t(382) = 4.68, p < .001, 95\% \text{ CI } [4.206, 10.431]$), internet usage hours during school and non-school days ($\beta = .21, t(382) = 4.02, p < .001, 95\% \text{ CI } [3.555, 9.551]$), and $\beta = .16, t(382) = 3.20, p = .001, 95\% \text{ CI } [2.798, 9.908]$, respectively), and authoritarian father ($\beta = .24, t(382) = 3.53, p < .001, 95\% \text{ CI } [2.126, 8.088]$) were found to be significant predictors of PIU. However, authoritative ($\beta = -.02, t(382) = -0.31, p = .757, 95\% \text{ CI } [-2.960, 2.123]$) and permissive fathering style ($\beta = -.06, t(382) = -.80, p = .426, 95\% \text{ CI } [-5.430, 3.259]$) were not significant predictors. Notably, permissive fathering style was negatively associated with PIU. While authoritarian and permissive mothering styles indicated a positive association with PIU ($\beta = .01, t(382) = .13, p = .895, 95\% \text{ CI } [-2.454, 3.080]$), and $\beta = .12, t(382) = 1.65, p = .101, 95\% \text{ CI } [-1.089, 6.619]$, respectively), on the other hand, the authoritative mothering style demonstrated a negative association ($\beta = -0.01, t(382) = -.18, p = .854, 95\% \text{ CI } [-2.722, 2.383]$). However, none of mother's parenting style variables were significant predictors.

The final model was found to be statistically significant [$F(10, 381) = 14.32, p < .001, R^2 = .273$], indicating that the model explains a meaningful portion of the variance in PIU scores. The R^2 change value of .063 associated with this regression model revealed that when parent-adolescent relationship was included, the variables explained 27.3% of the variance in PIU. The parent-adolescent relationship was found to be significantly and negatively associated with PIU ($\beta = -.33, t(381) = -5.74, p < .001, 95\% \text{ CI } [-0.423, -0.217]$). The significant predictors of this model were gender ($\beta = .20, t(381) = 4.40, p < .001, 95\% \text{ CI } [3.596, 9.674]$), internet usage hours during school and non-school days ($\beta = .20, t(381) = 4.04, p < .001, 95\% \text{ CI } [3.394, 9.170]$), and $\beta = .15, t(381) = 3.01, p = .003, 95\% \text{ CI } [2.374, 9.317]$, respectively, and authoritarian fathering style ($\beta = .16, t(381) = 2.38, p = .018, 95\% \text{ CI } [0.258, 6.196]$). However, authoritative ($\beta = .08, t(381) = 1.27, p = .204, 95\% \text{ CI } [-1.107, 4.122]$) and permissive ($\beta = -.031, t(381) = -.412, p = .681, 95\% \text{ CI } [-5.032, 4.357]$) fathering style, as well as authoritative ($\beta = .07, t(381) = 1.12, p = .263, 95\% \text{ CI } [-1.119, 4.038]$), authoritarian ($\beta = -.03, t(381) = -.407, p = .684, 95\% \text{ CI } [-3.260, 2.109]$), and permissive ($\beta = .10, t(381) = 1.33, p = .183, 95\% \text{ CI } [-1.640, 5.900]$) mothering styles, were found to be non-significant predictors.

To conclude, the findings suggest that gender, internet usage, and authoritarian fathering style are significant predictors of PIU, while authoritative and permissive parenting styles, particularly from mothers, do not. Parent-adolescent relationship emerged as a strong protective factor, significantly reducing PIU risk.

Discussion

Discussion of the Findings of Internet Use Behaviors

The duration of participants' internet usage during school days and non-school days, as well as their reported utilization of internet services based on their usage patterns were investigated in the current study. Participants reported their internet usage as follows: 31.4% used the internet for 3-5 hours during school days, while 27.5% reported using it for more than 5 hours. During non-school days, 50.4% reported using the internet for more than 5 hours, while 30.7% reported using it for 3-5 hours. These findings exhibit a moderate level of similarity to the numerical findings reported by Nafee et al. (2018), who reported that 43.2% of Saudi adolescents use

the internet daily for 3 to more than 5 hours. Additionally, Rajab et al. (2021) found that 33% of adolescents in Saudi spend more than 6 hours a day in front of screens. These statistics are concerning, as Hawi (2012) found in his study that problematic internet users had an average usage of 3.38 hours during weekdays and 6.99 hours during holidays. These comparisons demonstrate the possible problematic nature of the reported patterns of internet usage, indicating that a significant number of participants might be classified as problematic users of the internet because of their excessive use.

Regarding the most frequently utilized service on the internet, the majority of participants in this study (54.5%) selected social networking sites as their top choice. Conversely, 45% of participants regarded email as the least used service. These findings indicate the popularity of social networking sites among Saudi adolescents, as found in the research conducted by Saquib et al. (2022), where 64.8% of participants identified it as their most used service. Kolaib et al. (2020) similarly reported that 88.5% of participants in their study primarily used the internet for social networking purposes. However, the findings of this research contrast with those of Kim et al. (2020), who reported that video games were the most popular service among 35.0% of their study participants. This disparity may be attributed to the fact that 66.2% of the current research sample consists of females, who are more inclined to use social networking sites, as indicated by Kim et al. (2020) and Mihara et al. (2016). Alternatively, the growing interest of adolescents in social networking sites, regardless of gender, could also contribute to this difference.

Social networking sites are the most widely used service among our sample, this can be explained in two ways. Firstly, according to Vogels and Gelles-Watnick (2023), these sites bring various benefits to adolescents, including maintaining contact with friends, meeting new friends who share similar interests, having their voice heard, feeling accepted, and showcasing their creative side. Secondly, as mentioned in the documentary film by Orlowski (2020), these platforms are designed in a way that keeps users engaged. Features like instant notifications and endless scrolling make it challenging to stop browsing, thus spending more time using these sites. On the other hand, email is the least used service on the internet which is understandable due to the age group of the present study considering that the need for this service becomes more apparent during later stages of life, such as pursuing higher education or entering the professional world.

In conclusion, the findings regarding the duration of internet use and preferred services among adolescents provide valuable insights into the substantial role that the internet plays in their daily lives. The statistics revealing prolonged usage and the reported utilization of various internet services raise concerns about the potential consequences, particularly with the prominent use of social media platforms in their internet activities.

Discussion of the Findings of Problematic Internet Use

The prevalence of problematic internet users in this study was 45.2%, with 42.7% classified as average online users, and 2.5% considered internet addicts. The result of this study is similar to the prevalence reported by Nafee et al. (2018), which found a prevalence of 45.3% for PIU and 0.9% for internet addicts among Saudi adolescents. It is important to note that the previous study employed a different definition of PIU, using a cutoff score of YIAT 50-79, and a cutoff score of YIAT >80 for internet addicts. Additionally, the finding is closely aligned with the prevalence reported by Paulus et al. (2022) in Germany, where the prevalence of PIU among individuals aged 12 to 17 was 43.69%.

On the other hand, this finding is higher compared to the prevalence reported by Saquib et al. (2022) in their study on a representative sample of Saudi adolescents, where the reported PIU prevalence was 41.8%, while internet addiction was 3.7%. It is important to note that both studies utilized the same scale and cutoff score for PIU (YIAT score 40-69), and for internet addiction (YIAT >70). The results were also considerably higher than the prevalence reported in recent research among adolescents globally. For instance, Chemnad et al. (2023) reported a prevalence of 29.64% in Qatar, Ying et al. (2020) reported 29.0% in Malaysia, and Liu et al. (2023) cited a prevalence of 19.5% in China. The variation in prevalence rates may be attributed to the use of different scales to determine PIU. Similarly, a study by Kim et al. (2020) reported a notably low prevalence of 5.2% in Korea. However, it is important to note that the data used in that study were obtained from the years

2008 to 2010, which may explain the lower prevalence compared to other results. As internet access was relatively limited during that time period. According to Statista (2023), the internet usage rate in Korea increased from 76.5% in 2008 to 93% in 2022. This finding also indicates the rapid spread of the PIU phenomenon over time, especially with high internet access and increased exposure to internet-enabled devices such as smartphones.

The increase in PIU rates among Saudi adolescents may be attributed to the following key factors. First, over the past decade, internet access in Saudi has expanded significantly, reaching more than 90% of the population (Saqib, 2020). This rapid growth has made the internet an essential part of everyday life. Additionally, Saudi Arabia's severe weather conditions, particularly the excessive heat during summer, are expected to further increase digital media use, as people are often compelled to stay indoors during the day (Saqib, 2020). Moreover, the studies mentioned collected their data prior to the COVID-19 pandemic. During the pandemic period, there was significant reliance on the internet in various domains, including education, online shopping, electronic government services, communication, and entertainment. Even though the pandemic has ended, these digital services have remained central. For instance, the Saudi e-learning platform "Madrasati" continues to play a crucial role in education, facilitating tasks like assignment submissions and providing electronic educational resources. Additionally, many tests and assessments are conducted on the platform. At present, numerous projects and assignments are expected to be completed in digital formats, such as presentations, digital documents, and video clips. These aspects, encompassing education, online shopping, and others, have resulted in increased internet usage and its integration as an essential part of daily life. This may be a contributing factor to the rise in rates of PIU.

In conclusion, this study emphasizes the high prevalence of PIU among Saudi adolescents, driven by increased digital adoption and diffusion, particularly post-COVID-19, as well as environmental factors such as extreme weather conditions. The findings align with regional studies but exceed global averages, likely due to assessment differences and rapid technological advancements.

Discussion of the Predictors of Problematic Internet Use

Problematic internet use, which has been shown to have harmful effects on adolescents, represents a real challenge for parents. The current study considers gender, internet-related factors, parenting style (mother/father) and the parent-adolescent relationship as influential factors within the perceived environment that contribute to this problematic behavior.

Gender and PIU were found to have a significant weak relationship, and gender had a predictive role for PIU which suggests that females had higher levels of PIU than males (coded as 0). This result can be understood within the social and cultural norms of Saudi society, as suggested by Saqib (2020). Limited outdoor and extracurricular activities for females may lead to increased time spent indoors, potentially encouraging greater online engagement. This finding was consistent with a study by Saqib et al. (2022), which also reported a significantly higher prevalence of PIU among female students in Saudi. The findings also align with Ciarrochi et al. (2015), who found higher levels of PIU among females compared to males in Australian adolescents. Similarly, Mihara et al. (2016) reported differing rates of PIU between genders in Japanese adolescents, with girls exhibiting a higher prevalence. The authors explained this difference by noting that girls in high school tend to be more aware of their behaviors and consequences, leading to more accurate reporting on PIU. However, the finding of this study contradicts the results of Kim et al. (2020), where boys had a higher prevalence of PIU compared to girls among Korean adolescents. This finding also conflicts with Say and Batıgün (2016), who reported higher levels of PIU among males compared to females in Turkish university students. The researchers in last study explained this difference by highlighting factors such as males' greater interest in technological improvements and frequent visits to places like internet cafes, which may contribute to higher levels of PIU among males. In conclusion, these findings highlight the complex interplay between gender and PIU. The higher prevalence of PIU among females observed in this study aligns with cultural and societal norms in Saudi.

The duration of participants' internet usage, both on school days and non-school days, was found to have a moderate and statistically significant association with PIU, as revealed by the findings of the current study.

This finding was further supported by hierarchical regression analysis, which indicated that these two variables significantly predicted PIU. Similar findings were reported in a previous study conducted by Bener et al. (2019), which revealed that university students with PIU spent significantly more hours using the internet compared to students without PIU. Additionally, research conducted by Bleakley, Ellithorpe, and Romer (2016) found that adolescents who frequently used computers for a long time were more likely to experience PIU. Furthermore, a study by Alhantoushi and Alabdullateef (2014) indicated that students who spent more than five hours a day on the internet had higher scores on the internet addiction test compared to other participants. Additionally, the study conducted by Saquib et al. (2022) demonstrated a noticeable increase in the odds of experiencing PIU as screen time increased.

The results of the Pearson correlation analysis demonstrated a significant positive association between authoritarian mothering/fathering style and adolescents' PIU. This finding aligns with Self-Regulation Theory (Vohs & Baumeister, 2016), which suggests that rigid parental control may hinder adolescents' ability to develop self-discipline, increasing their reliance on external coping mechanisms like excessive internet use. However, only authoritarian fathering style predicted PIU. A previous study conducted by Setiawati et al. (2021), similarly found a significant positive association at the bivariate level between authoritarian parenting and PIU, regardless of whether it was exhibited by the father or mother. One possible explanation is that adolescents raised in authoritarian households may be more likely to rebel against strict rules and seek autonomy through internet use (Darling & Steinberg, 1993). However, in Saudi, parenting is influenced by cultural and societal factors that may shape its impact on adolescent behaviors. Collective socialization, where children are expected to conform to societal norms and values, may reinforce authoritarian parenting approaches, potentially intensifying PIU behaviors. Alternatively, authoritarian parenting may function as a reaction rather than a cause—parents may tighten control over adolescents as a response to excessive internet use (Yaffe & Seroussi, 2019). However, the causal direction of this relationship remains unclear, necessitating further longitudinal research.

Findings regarding authoritarian parenting and PIU have been mixed in the literature. For instance, Lukavská et al. (2020) found no significant association between authoritarian fathering style and PIU, but they did observe a relationship between authoritarian mothering and PIU. The authors suggested that strictness without emotional responsiveness may have a more detrimental effect when exhibited by mothers compared to fathers. The present study's finding that only authoritarian fathering predicted PIU aligns with Bronte-Tinkew, Moore, and Carrano (2006), who reported that father's parenting style tend to have a stronger influence on adolescent risk behaviors compared to mother's parenting style.

Contrary to expectation, permissive parenting styles (both fathering and mothering) were not associated with PIU and didn't predict PIU. This contradicts previous studies, such as Setiawati et al. (2021), who found that permissive fathering significantly predicted PIU, as well as Onyekachi et al. (2022) and Cheung et al. (2015), who reported a positive association between permissive parenting and PIU. A possible explanation for this discrepancy is the low representation of permissive parents in current sample (3.2% fathers, 4.7% mothers), which may have limited the ability to detect statistically significant effect.

Although the authoritative fathering style was negatively associated with PIU, neither authoritative fathering nor mothering styles were significant predictors of PIU. This aligns Lukavská et al. (2020), who found that authoritative fathering style was negatively correlated with PIU, and with Onyekachi et al. (2022), who reported that authoritative parenting predicted lower levels of PIU among Nigerian undergraduate students. Similarly, a meta-analysis by Lukavská, Hrabec, Lukavský, Demetrovics, and Király (2022) identified a slight inverse relationship between PIU and authoritative parenting, suggesting that authoritative parenting may mitigate PIU risk.

The protective effect of authoritative parenting aligns with Self-Regulation Theory (Vohs & Baumeister, 2016), which posits that authoritative parenting fosters self-discipline and emotional warmth, setting clear expectations that promote responsible internet use while encouraging adolescents to develop self-regulation skills. These skills have been identified as a robust mediator between parenting and adolescents' PIU (Xiao et

al., 2024). However, the lack of predictive power of authoritative and permissive parenting styles on PIU may be attributed to several theoretical and contextual factors. Firstly, Social Cognitive Theory (Bandura, 1986), posits that behaviors are shaped by observational learning and reinforcement from one's social environment. Adolescents may develop PIU by modeling the behaviors they observe, particularly if peers or family members engage in excessive internet use. This suggests that external influences may override the direct impact of parenting styles on adolescent PIU. Supporting this perspective, Chung, Lee, and Lee (2019) found that factors such as peer relationships, individual characteristics, and digital accessibility may play a more significant role in adolescent PIU than direct parental influence. Secondly, developmental psychology research suggests that adolescence is a period of increasing autonomy, making parental influence less direct over time (Steinberg & Silk, 2002). As adolescents gain more independence, they experience less parental supervision, allowing them greater freedom in how they spend their time (Collins, Madsen, & Susman-Stillman, 2002). This shift may explain why authoritative parenting, which is effective in childhood, has a weaker influence on adolescent PIU behaviors. Moreover, the relationship between parenting styles and PIU is complex, and methodological variations may explain the inconsistent findings across studies. The specific sample or measurement tools used in this research may not have captured the full effects of authoritative or permissive parenting on PIU.

This study highlights a significant negative association between the parent-adolescent relationship and PIU, indicating that stronger parent-adolescent bonds are linked to lower levels of PIU. Moreover, the findings suggest that parent-adolescent relationship quality is a significant predictor of PIU, supporting prior research that has identified a positive parent-adolescent relationship as a protective factor against PIU (Özaslan et al., 2022; Koca & Saatçı, 2022). Conversely, a weak parent-adolescent relationship appear to increase PIU risk, as suggested by O'Reilly and Mohan (2023), Ahmadi (2014), Li et al. (2014), Verrocchio et al. (2012), and Koca & Saatçı (2022).

The negative association between the parent-adolescent relationship and PIU can be explained in two ways. First, Attachment Theory suggests that adolescents with weak emotional bonds with their parents may seek digital spaces for connection, increasing their risk of PIU (Bleakley et al., 2016; Özaslan et al., 2022). Alternatively, adolescents who experience family conflict may use PIU as a psychological escape mechanism to avoid emotional distress (Soh et al., 2014). Secondly, since the parent-adolescent relationship is reciprocal (Larson et al., 1996), PIU among adolescents can also negatively impact family relationships, leading to increased conflict between parents and children. This problematic behavior, especially when it disrupts adolescents' health, education, or social lives, can strain the overall quality of relationships within the family. Supporting this perspective, Ko et al. (2015) found that adolescents who developed internet addiction initially had poorer family function compared to those without addiction at baseline. A one-year follow-up revealed that the family function of adolescents with internet addiction continued to worsen overtime, further reinforcing the bidirectional relationship between PIU and family dynamics.

In conclusion, this study highlights the role of gender, internet use, parenting styles, and parent-adolescent relationships in PIU among Saudi adolescents. Authoritarian fathering predicted PIU, while strong parent-adolescent bonds reduced its risk.

Limitations

There are some limitations that should be acknowledged in the present study. First, the sample size was relatively small, and a non-random sampling method was used to collect data, which may limit the generalizability of the findings. As a result, the results may not be representative of the broader population of parents and adolescents experiencing PIU. Future research should incorporate larger and more diverse samples and employ random sampling methods to enhance the reliability and generalizability of the findings. Second, the data collection method in this study relied on self-report questionnaires, which may lead to underreporting or overreporting of PIU behaviors due to recall bias or social desirability bias. Some participants may have difficulty accurately recalling their internet use behaviors. To improve the accuracy of PIU measurement, future research should consider using advanced data collection tools, such as big data analytics and artificial intelligence, rather than relying solely on self-reported data. Moreover, participants may exhibit a reluctance to disclose negative aspects of their parents' parenting style or the nature of their parent-adolescent relationship. To mitigate this potential bias, researchers may adopt a multi-method approach, such as conducting interviews

or including parental assessments through self-report questionnaires. Comparing adolescent and parental perspectives may provide a more comprehensive and accurate assessment of parenting style dynamics and the parent-adolescent relationship. Third, the absence of the researcher during the data collection process may have limited participants' ability to seek clarification on unclear or ambiguous questions, potentially resulting in imprecise or invalid responses. Future research may benefit from the presence of a researcher during data collection to provide necessary clarifications. Additionally, the length of the questionnaire used in this study may have affected response quality. Some participants may have experienced survey fatigue, leading to incomplete or inattentive responses. Future research may consider using a shorter questionnaire or dividing the survey into smaller sections to reduce respondent fatigue and improve data quality. Finally, since this study was designed as a cross-sectional model, it cannot establish causal relationships between parenting styles, the parent-adolescent relationship, and PIU. To gain a comprehensive understanding of how parenting styles and the parent-adolescent relationship influence PIU over time, future research should employ a longitudinal design to track changes and assess the impact of interventions aimed at improving the parent-adolescent relationship and modifying the parenting styles.

Recommendations

Reducing PIU among adolescents requires collaborative efforts among policymakers, schools, and parents. Awareness campaigns, digital literacy education, and parental training programs on digital parenting are essential for fostering healthy internet habits. Since family plays a significant role in shaping adolescent behaviors in Saudi, parents should receive psychoeducation on effective parenting styles and digital supervision. Encouraging open communication, shared activities, and supportive parenting techniques can help to build emotional security and trust between parents and adolescents (Baumrind, 1991). Additionally, educating parents on the importance of warmth, responsiveness, and involvement is crucial in preventing PIU.

For adolescents struggling with PIU, family counseling programs can help to create a supportive home environment. Moreover, parents, particularly those with authoritarian tendencies, should receive training on positive reinforcement, autonomy-supportive discipline, and active mediation (Darling & Steinberg, 1993). Furthermore, instead of imposing restrictions, parents should present PIU as a shared concern and involve adolescents in problem-solving (Asyriati, 2020). Finally, structured internet use can be encouraged by setting daily screen time caps, digital curfews, and promoting screen-free family interactions.

Additionally, adolescents should be educated on time management and strategies to mitigate social media pressures. Techniques such as digital detox periods, guided goal-setting, and setting personal and academic milestones can enhance self-regulation, leading to healthier technology habits (Kwan & Leung, 2017). Difficulty in emotional regulation has also been linked to addictive behaviors, as leaving screens requires emotional competence. Therefore, counselors should prioritize developing emotional regulation strategies to help adolescents develop healthier coping mechanisms (Amendola, Spensieri, Guidetti, & Cerutti, 2019). Furthermore, digital literacy education should include critical thinking skills about excessive internet use and providing practical tools to manage digital habits. By combining parent education, structured digital engagement, emotional support, and self-regulation techniques, involved parties can work toward reducing PIU and fostering adolescent well-being.

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