

Is it Contagious? Does Parents' Internet Addiction Impact Their Adolescents' Internet Addiction?

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Abstract

Extensive research has shown various family factors such as low family cohesion, and limited parental supervision to be associated with adolescent Internet addiction (IA). There has been little discussion about the relationship between parental IA and adolescent IA. The purpose of this study was to determine whether parental IA and parental monitoring of digital technology use interpret IA in their adolescents. The current study was carried out with 168 parents of adolescents, predominantly female parents. They reported demographics and how often they monitored their adolescent's Internet usage and responded to the Internet Addiction Diagnostic Questionnaire (IADQ) and Parental Version of Young Diagnostic Questionnaire (PYDQ). The two scales, IADQ and PYDQ, comprise of eight binary questions, each representing a symptom of IA. Multiple regression and Chi-square were used for statistical analysis. The multiple regression model showed that parents' gender, employment status, frequency of monitoring of time spent on the Internet, and activities performed on the Internet by adolescents were not significant predictors of PYDQ. Parents' IADQ scores and the frequency of serious arguments with their adolescents about excessive Internet use were positive and significant predictors of PYDQ. Adolescents were more likely to be dependent Internet users when their parents were also dependent Internet users. Seven of the eight IA symptoms in parents were associated with the related symptoms in adolescents. These results suggest that family counseling programs shall not only focus on dealing with adolescents but help parents demonstrate constructive and balanced digital habits and become positive role models themselves. Serious arguments on excessive Internet use predicted IA in adolescents. In light of our results, it may be beneficial for parents to

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play a role model in technology use and have more productive discussions with their adolescents about it. The results also signify the need for better knowledge and literacy in communicating with adolescents about excessive Internet use.

Keywords

adolescent internet addiction, parental monitoring, parent internet addiction, problematic internet use

Introduction

Internet usage has become an integral part of the lives of adolescents, with 95% having access to a smartphone (Teens, *Social Media & Technology*, 2018). Nonetheless, Internet addiction (IA) has become an increasing problem among adolescents (Nakayama et al., 2017). Internet addiction in youth is worrying as it is associated with several adverse outcomes such as feelings of loneliness (Erdoğan, 2008), poor academic performance, depression (Wu et al., 2015), anxiety (Ho et al., 2014), and sleep disorders (Tan et al., 2016; Zhang et al., 2017). The COVID-19-fighting initiatives, in conjunction with limited face-to-face interaction and increased Internet-based activities, significantly increased Internet use and have placed adolescents at risk of developing Internet addiction (Duan et al., 2020; Kamasak et al., 2021; Lena et al., 2021; Siste et al., 2021). According to research conducted worldwide, Internet addiction is one of the most frequent problematic behaviors among adolescents, with a prevalence rate exceeding 5% in certain places (Bu et al., 2021; Malak et al., 2017). Bener and Bhugra (2013) found that the overall prevalence of Internet addiction was 17.6% among the Qatari youth.

Internet Addiction is generally described as excessive Internet use and the psychological difficulties that accompany it, such as preoccupation, withdrawal, tolerance, lack of control, continued excessive use of the Internet despite knowledge of adverse effects, and use of the internet to escape or relieve a dysphoric mood (Young, 2009). In the literature, there does not seem to be a consensus on the definition of Internet addiction, with terms such as Computer Addiction, Pathological Internet Use, Compulsive Internet Use, and Problematic Internet Use being utilized interchangeably (Spada, 2014; Young, 2009). Although general Internet Addiction has not yet been classified in the DSM or International Classification of Diseases, there is increasing evidence that it has shared features with other addictive behaviors such as tolerance and withdrawal (Young, 2017) and is increasingly recognized as a condition that may need professional therapy (Internet Addiction Treatment, n.d.; Pies, 2009).

WHO defines adolescence as the period between childhood and adulthood (10–19 years) during which they undergo tremendous physical, cognitive, and emotional development (Adolescent Health, n.d.). Adolescents are prone to IA because their developing brains are sensitive to excitement signals, making it difficult for them to manage their Internet use (Zhao et al., 2022), and behavioral addiction to smartphones may have adverse implications on their brain development (Hong et al., 2013).

As advocated by the Problem Behavior Theory, there are three basic systems: personality, environment, and behavior in the conceptual framework of problematic behaviors in adolescents (Jessor, 1987). The balance of risk and protective factors among the three systems determines whether a person engages in addictive activities (Jessor, 1987). Various environmental, behavioral, and personal variables have contributed to Internet addiction in adolescents. Personal factors include poor academic performance (Dhir et al., 2016; Siddiqi & Memon, 2016), familial dissatisfaction (Tsitsika et al., 2011), and other negative behaviors (Milani et al., 2009). Individuals

who are depressed, lonely, or unsatisfied are more likely to develop Internet addiction (Tang et al., 2014). Several research studies have investigated the relationship between environmental and behavioral variables of adolescents, such as family income (Leung & Lee, 2012), family structures or interactions, and Internet addiction. Low family cohesion (Chung et al., 2019; Xiuqin et al., 2010), family conflict (Ko et al., 2015; Park et al., 2008), parental depression (Mun & Lee, 2021) and limited parental supervision (Bleakley et al., 2016; Durkee et al., 2012) were deemed risk factors for adolescent Internet addiction. According to a study by Livingstone et al. (2011), the widespread use of technology in the family home has impacted how parents and children work, play, and communicate. Previous research has demonstrated that parents influence their children's behavior regarding drinking, diet, exercise, smoking, and even wearing seat belts (Lau et al., 1990; Leonardi-Bee et al., 2011; Tilson et al., 2004). However, research on the relationship between parent IA and adolescents' IA is limited. According to Problem Behavior Theory, parental behavior may affect adolescent behavior, yet, there is limited research examining the influence of parental IA on adolescent IA. Parents' actual Internet use behavior is more influential on adolescents than the rules they put concerning Internet use. If parents restrict their adolescents' access to the Internet but use it excessively themselves, adolescents tend to adopt the same behavior patterns (Liu et al., 2012). However, the study by Liu et al. (2012) relied on the information adolescents provided and did not consider parental IA.

There have been differences in studies documenting the relationship between parental monitoring and adolescent IA. Bleakley et al. (2016) reported a decline in IA with increased monitoring, while Lee and Ogbolu (2018) reported an increase in IA with increased monitoring. It has been shown that negative parental control, such as using stringent methods to combat IA, causes IA in adolescents to increase (Li et al., 2014). IA among adolescents is directly linked to strong parental disapproval (Xu et al., 2014). In prior research that looked at perceived parental monitoring of undesirable conduct, children tended to conceal rather than change their behavior as parental monitoring increased (Stattin & Kerr, 2000). There is also evidence in the literature to suggest that parents' gender and employment status affect adolescent IA. Xu et al. (2014) discovered that mother-child relationships were more strongly associated with adolescent IA than father-child relationships. Lam (2020) found that the gender of the parent and kid might play a role in behavioral modeling. Gao et al. (2010) reported that adolescents who had one or both parents working were more likely to develop Internet addiction.

Most research on Internet addiction focuses on adolescents' internal and individual characteristics, such as personality traits (Sergi et al., 2016; Xiuqin et al., 2010; Zamani et al., 2011). While most of these studies had large samples recruited using reasonable methods and sampling methodologies, parental information was acquired from adolescents rather than parents. When information is collected from adolescents, there may be biases in text comprehension or social desirability (Waldo, 2014), which can reduce the reliability of the data. Denial is also a symptom of behavioral addiction and is likely to be more in adolescents than adults (Gerrard et al., 1996; Stein et al., 2018). Denial could also be the normalization of technology overuse amongst their age group (Young & Abreu, 2010). Hence, gauging IA in adolescents by asking their parents can be a more reliable measure. Our design allowed us to measure IA in both parents and their adolescents, while most studies focused on either parental IA or adolescent IA.

In our study, the parents reported the Internet addiction behavior of both themselves and their adolescents, the frequency of monitoring their adolescents' Internet time and activities, and the frequency of having serious arguments about it. Most studies look at adolescent Internet addiction without considering parental Internet addiction. Parents play an important role in adolescent development (Bronfenbrenner, 1977). According to social learning theory, children learn from watching the behavior of those around them, especially their parents (Bandura, 1977). However, many behaviors that adolescents observe, remember, and emulate are ones parents engage in but

want to avoid, including smoking and drinking. We hypothesize that parents' Internet addiction influenced their adolescent's Internet addiction. Existing digital parenting programs focused on observing and limiting activities and time on the Internet. However, there is limited evidence of the success of these programs, which raises the question of whether they need to be revised to address the parents' behavior and inform and train them on better ways for the dialogue they have with their adolescents. Given the ubiquity of technology and the Internet, parents may need support to manage it within a family setting and create an environment where balanced use is possible. Very few studies examine parental IA in parallel with adolescent IA, despite the considerable body of research demonstrating the connection between home environment and adolescents' IA (Ko et al., 2015; Yen et al., 2007; Zamani et al., 2011). The purpose of this study was to investigate the relationship between parental IA and their adolescents' IA and further investigate adolescents' IA taking into account parameters related to parenting about excessive Internet usage and the parents' gender and their employment status. The IA symptoms were looked at individually between parents and children to help better understand the association of IA symptoms in both of them, which may help policymakers, and experts devise more effective intervention strategies (Kuss et al., 2014). This paper aims to explore the following research questions:

- (RQ1): Which among the following variables predict adolescents' IA score: Parents' IA score, frequency of parental monitoring of activities and time spent on the Internet, frequency of serious arguments on excessive Internet use, parent's gender, and employment status?
- (RQ2): Is there an association between parental and adolescent IA?
- (RQ3): Are adolescents most likely to depict individual IA symptoms if their parents exhibit the corresponding IA symptoms?

Research Method

Participants

A cross-sectional quantitative survey was conducted on a sample of parents with adolescents aged 10 to 19 living in Qatar. The period of data collection was from May 2021 to September 2021, when partial restrictions on social gathering were in place, and students attended classes through blended learning at 30% capacity of their schools where they went to school 2–3 days a week or were on summer vacation (Preventative Measures, n.d.). The participants in this study were recruited through online administered questionnaires on SurveyMonkey. The link to the questionnaire was shared via the social media sites of the participating institutes as well as their mailing lists. The institutes have various social media accounts, mainly on Twitter, Facebook, and Instagram. The mailing lists include employees at the institutes and attendants and subscribers to events they organized. The first author's Institutional Review Board approved the study.

After excluding participants who did not provide completed answers, completed the survey quickly, and provided disqualifying answers, for example, age of their adolescent is above 19 or below nine years, 168 of the 216 parents were included in the analytical sample of this study. The parents who participated in the study answered based on their own perspectives and not that of their spouses. At the time of data collection, participants were informed of the study's aim, that participation is optional, and that they are free to refrain from answering any of the questions or withdraw from the survey at any time. 115 mothers (68.45%) and 53 fathers were in the sample (31.55%). The average age of adolescents was 12.97 ($SD = 1.91$, range: 10–18), of which 97.61% were between 10 to 16. The average age of parents was 43.87 ($SD = 6.76$, range: 26–65). The parents were explicitly asked about the age of their adolescents. If parents had more than one

adolescent, they were asked to answer the survey based on the adolescent closest in age to 12 years. The adolescent gender was not included as there was no difference in IA between adolescent males and females. A similar finding has also been reported in a study by [Lee and Ogbolu \(2018\)](#), who reported no difference in IA based on gender in adolescents. [Table 1](#) summarizes the descriptive statistics of the sample of this study.

Measures

The survey consisted of 28 questions and was divided into two sections—the first section aimed at gathering information about the parent’s demographics and level of IA. The second section dealt with the adolescent’s online activities, perceived IA, and frequency of serious arguments. In the introduction of the second question and the introductory text of the survey, parents were made aware that the survey is on how they deal with problematic behavior and conflict with their adolescents.

Internet Addiction Diagnostic Questionnaire. The IADQ, adopted from pathological gambling, is an eight-items questionnaire (binary response format: no, yes), each of which represents a symptom for detecting problematic Internet use ([Young, 2009](#)). IADQ total score (range: 0–8) is produced by adding the values of all eight binary questions. The criteria for being addicted to the Internet varies amongst different literature. According to Young, participants who answered “yes” to five or more criteria in each case were categorized as addicted to the Internet (Dependent Internet users), while the others were categorized as Non-Dependent Internet users. Another scoring technique differentiating three severity subcategories: “non-dependent Internet user” (answered 0–2 “yes”), “at risk of dependency” (answered 3–4 “yes”), and “dependent Internet user” (answered 5 or more “yes”) has also been used in research studying IADQ ([Bakken et al., 2009](#);

Table 1. Descriptive Statistics of Demographic Variables.

Are both parents employed?	<i>n</i>	%
Yes	90	53.57
No	78	46.43
Frequency of parents observing the amount of time their adolescent spends on the internet	<i>n</i>	%
Never	3	1.79
Seldom	17	10.12
Sometimes	51	30.36
Often	57	33.93
Very often	40	23.8
Frequency of parental observation of the activities of their adolescent on the internet	<i>n</i>	%
Never	9	5.36
Seldom	25	14.88
Sometimes	48	28.57
Often	59	35.12
Very often	27	16.07
Frequency of parents’ serious arguments with their adolescents about excessive internet use	<i>n</i>	%
Never	2	1.19
Seldom	19	11.31
Sometimes	60	35.71
Often	49	29.17
Very often	38	22.62

Durkee et al., 2012). Our study utilizes the total score itself and both of the assessment techniques. IADQ was used to measure parents' IA.

Parental Version of Young Diagnostic Questionnaire. The PYDQ is a modified version of the IADQ that assesses internet addiction in adolescents from the perspective of their parents (Wartberg et al., 2016). The PYDQ comprises eight questions (binary response format: no, yes), each of which represents a symptom for detecting IA. A PYDQ total score (range: 0–8) was produced by adding the values of all eight questions, with a greater sum indicating higher risk levels of adolescent problematic Internet usage. There are no modifications to the IADQ instrument's content in PYDQ. All eight items of the original IADQ (Young, 2009) were reworded to collect an external rather than a self-report rating. The questions in IADQ (Young, 2009) and PYDQ are similar. While in IADQ, if the question is framed to receive a self-report rating ("Have you repeatedly made unsuccessful efforts to control, cut back, or stop Internet use?"). The related question in PYDQ would be framed to receive an external rating ("Has your child repeatedly made failed efforts to control, reduce, or eliminate Internet use?").

The questions in IADQ and PYDQ assess the following criteria of problematic Internet use: "preoccupation" (Q1), "tolerance" (Q2), "unsuccessful efforts to limit or stop internet usage" (Q3), "withdrawal" (Q4), "loss of control of time spent on the Internet" (Q5), "risk/lose relationships/opportunities" (Q6), "lies to conceal extent of involvement" (Q7), and "dysfunctional coping" (Q8) (Strittmatter et al., 2014).

Parental Monitoring of Digital Technology Use. Parents were asked to answer questions on the frequency of monitoring their adolescent's time on the Internet. Similarly, they were asked about the frequency of monitoring the activities of adolescents on the Internet and the frequency of serious arguments they had with their adolescents about excessive Internet use. The question on serious arguments was framed as "How often do you have a serious argument with your child about excessive internet use?" All three questions were answered on a 5-point Likert scale; 1: never, 2: seldom, 3: sometimes, 4: often, 5: very often.

Employment Status of Both Parents. Parents were asked to answer questions on their employment status and that of their spouse. Their responses were combined, coded as "Yes" if both parents were employed and "No" if only one of the parents was employed.

Statistical Analysis

A multiple linear regression analysis was utilized to identify the role of parental demographic variables of gender and employment status of both parents, parental IADQ score, and parental monitoring factors in predicting adolescent Internet addiction (Total PYDQ). The total PYDQ score was considered as the outcome variable. A chi-square test (χ^2) was performed to verify the relationship between parental and adolescent Internet addiction. We use the same test to study the relationship between the different symptoms of Internet Addiction between parents and adolescents. For regression, only the total Internet Addiction score was used. The Chi-square analysis used the categorization of being dependent and non-dependent based on the techniques of Young (2009) and Bakken et al. (2009). The significance level was set at 0.05. All statistical analyses were performed using JASP version 0.16 (JASP - A Fresh Way to Do Statistics, n.d.).

Results

Participant Demographics

Descriptive Statistics of our participants are described in Table 1. Of the 168 participants in our study, 83.33% were from Arab and Eastern countries, mainly India, Pakistan, and 16.67% were from Western countries, mainly the USA, UK, Canada, and Australia. All the participants in our sample were residents of Qatar.

Internet Addiction Test Scoring

Table 2 describes the average score of IADQ and PYDQ. Tables 3 and 4 show IA prevalence in adolescents and parents based on two different scoring criteria. Table 5 shows the distribution of each IA symptom in parents and children.

(RQ1) Predicting PYDQ Through IADQ, Demographics, Monitoring, and Argument Frequencies

Multiple regression analysis was used to determine what factors in the current study predicted the total PYDQ score. The data were screened for outliers, and no outliers were found. Pearson’s correlation was also performed and showed that none of the independent variables had correlations greater than 0.8, indicating no multicollinearity among variables (Young, 2018), as shown in Table 6. All assumptions of linearity, normality, homoscedasticity, and multicollinearity were met. As shown in Table 7, the model included total IADQ score, parents’ gender, employment status of both parents, frequency of serious arguments on excessive Internet use, frequency of observation of the time spent on the Internet by adolescents, and frequency of the parents observing the activities of the adolescent on the Internet as explanatory variables and total PYDQ score as the response variable. The regression model was significant ($F(6, 161) = 18.38, p < .001, R^2 = 0.41, \text{adjusted } R^2 = 0.38$). Within the model, parents’ total IADQ score ($\beta = 0.34, p < .001$)

Table 2. Descriptive Statistics of Internet Addiction Diagnostic Questionnaire and Parental Version of Young Diagnostic Questionnaire.

Psychometric Tests	M	SD
Internet addiction diagnostic questionnaire	2.82	1.97
Parental version of young diagnostic questionnaire	4.64	2.07

Table 3. Prevalence of Internet Addiction in Adolescents and Parents Based on Young’s (2009) Internet Addiction Diagnostic Questionnaire Two Levels Scoring.

IA in Adolescents	n	%
Non-dependent internet users	78	46.43
Dependent internet users	90	53.57
IA in parents	n	%
Non-dependent internet users	132	78.57
Dependent internet users	36	21.43

IA = Internet addiction.

and serious argument frequency on excessive Internet use ($\beta = 0.48, p < .001$) were the only significant predictors.

(RQ2) Relationship Between IA Levels in Parents and Their Adolescents

We have studied this relationship in two ways depending on the classification used to judge IA level. In the first, we followed [Young's \(2009\)](#) scoring criteria in which participants who indicated "yes" to five or more of the criteria in either the IADQ or PYDQ were classified as dependent Internet users, while the other participants were classified as Non-Dependent Internet users. A Chi-square test of independence was performed to examine the relationship of parents' Internet Addiction with the adolescent's Internet Addiction. A significant interaction was found $\chi^2(1, N=168)=13.41, p < .001$. Adolescents were more likely to be dependent Internet users when their parents were dependent Internet users.

Table 4. Prevalence of Internet Addiction in Adolescents and Parents Based on [Bakken et al. \(2009\)](#) and [Durkee et al. \(2012\)](#) Three Levels of Scoring.

IA in Adolescents	<i>n</i>	%
Non-dependent internet users	26	15.48
At risk of dependency	52	30.95
Dependent internet users	90	53.57
IA in parents	<i>n</i>	%
Non-dependent internet users	76	45.24
At risk of dependency	56	33.33
Dependent internet users	36	21.43

Table 5. Prevalence of Internet Addiction Symptoms in Parents and Adolescents.

Symptoms of Internet Addiction	<i>n</i> (%)			
	Parent		Adolescent	
	Yes	No	Yes	No
Preoccupation	97 (57.74)	71 (42.26)	129 (76.79)	39 (23.21)
Tolerance	63 (37.50)	105 (62.50)	126 (75)	42 (25%)
Made unsuccessful efforts to control internet use repeatedly	75 (44.64)	93 (55.36)	69 (41.07)	99 (58.93)
Withdrawal	40 (23.81)	128 (76.19)	116 (69.05)	52 (30.95)
Staying online longer than intended	113 (67.26)	55 (32.74)	150 (89.29)	18 (10.71)
Risk/lose relationships/opportunities because of the internet	13 (7.74)	155 (92.26)	50 (29.76)	118 (70.24)
Lies to conceal extent of involvement	11 (6.55)	157 (93.45)	77 (45.83)	91 (54.17)
Dysfunctional coping	62 (36.90)	106 (63.10)	62 (36.90)	106 (63.10)

Table 6. Correlation Between Parental Version of Young Diagnostic Questionnaire, Internet Addiction Diagnostic Questionnaire, Parental Monitoring of Digital Technology Use Variables.

Variables	Pearson's r				
	1	2	3	4	5
1. Adolescents' parental version of young diagnostic questionnaire score	—				
2. Parents' Internet addiction diagnostic questionnaire score	0.42***	—			
3. Frequency of parents observing the amount of time adolescents spends on the internet	0.10	0.05	—		
4. Frequency of parents observing the activities of the adolescents on the internet	−0.06	−0.10	0.58***	—	
5. Frequency of serious arguments on excessive internet use	0.52***	0.16*	0.17*	0.09	—

* $p < .05$, ** $p < .01$, *** $p < .001$.

Table 7. Multiple Linear Regression Analysis for RQ1.

Predictors	R ²	Adjusted R ²	F (df)
	0.41	0.38	18.38 (6.161)
	Standardized β	T	p
Constant		−0.28	.78
Parents' IADQ score	0.34	5.41	<.001*
Parents' gender (father: 1, mother: 2)	−0.10	−1.41	.16
Both parents' employed (no: 0, yes: 1)	0.08	1.34	.18
Frequency of parents observing the amount of time adolescents spends on the internet	0.08	1.07	.28
Frequency of the parents observing the activities of the adolescents on the internet	−0.08	−0.99	.33
Frequency of serious arguments with adolescents about excessive internet use	0.48	7.51	<.001*

* $p < .05$.

In the second, we relied on the classification proposed by [Bakken et al. \(2009\)](#) and [Durkee et al. \(2012\)](#), in which participants who answered “yes” to 0–2 criteria were classified as Non-Dependent Internet users, “yes” to 3–4 criteria were classified “at risk of dependency” and five or more “yes” were classified as “Dependent Internet user.” A Chi-square test of independence was performed to examine the relationship of parents’ Internet Addiction with the adolescent’s Internet Addiction. A significant interaction was found $\chi^2(4, N=168)=29.46, p<.001$. Adolescents were more likely to be at risk of dependency or dependent Internet users when their parents were at risk of dependency or dependent Internet users, respectively.

(RQ3) Relationship Between Parents and Adolescents in Each of the Individual Symptoms of IA

Chi-square tests of independence were performed to test the relationship between parents and adolescents in the different symptoms of IA. Concerning the symptom of preoccupation, the relationship was significant $\chi^2(1, N = 168) = 4.17, p = .04$. Adolescents were more likely to be preoccupied with the Internet when their parents were preoccupied with it. Concerning the symptom of tolerance $\chi^2(1, N = 168) = 10.37, p = .001$. Adolescents were more likely to use the Internet with increasing time to achieve satisfaction when their parents behaved in the same manner. Concerning the symptom of unsuccessful efforts to control, cut back, or stop Internet use repeatedly, the results of a chi-square test of independence showed a significant relationship $\chi^2(1, N = 168) = 6.69, p = .009$ between parents and adolescents. Adolescents were more likely to have unsuccessful efforts to control Internet use when their parents had unsuccessful attempts to control it. Concerning the symptom of withdrawal, the chi-square test results of independence showed a significant relationship $\chi^2(1, N = 168) = 13.51, p < .001$ between parents and adolescents. Adolescents were more likely to feel restless, moody, depressed, or irritable when trying to cut down or stop Internet use when their parents felt the same way. Concerning the symptom of loss of control of time spent on the Internet, a chi-square test of independence was performed to examine the relationship between parents and adolescents. The results showed a significant relationship $\chi^2(1, N = 168) = 7.37, p = .006$. Adolescents were more likely to stay online longer than intended when their parents behaved similarly. Considering the symptom of jeopardizing or risking opportunities or relationships because of the Internet, the results of a chi-square test of independence showed a significant relationship $\chi^2(1, N = 168) = 6.81, p = .009$ between parents and adolescents. Adolescents were more likely to jeopardize or risk opportunities or relationships because of the Internet when their parents behaved similarly. Concerning the symptom of dysfunctional coping, no statistically significant relationship was found. Concerning the symptom of using the Internet to escape problems or relieve a dysphoric mood, the chi-square test results showed a significant relationship $\chi^2(1, N = 168) = 21.88, p < .001$ between parents and adolescents. Adolescents were more likely to use the Internet to escape from problems when their parents behaved in the same manner.

Discussion

The current study adds to prior research on adolescent Internet addiction by examining the association between parental IA and adolescent IA. In literature, minimal research has been done examining the relationship between the IA in parents and their adolescents. Our study is one of the first to examine the relationship between each symptom of IA between parents and adolescents. The descriptive analysis showed that more than one-fourth of the parents were Dependent Internet users, and more than half of the adolescents were Dependent Internet users. Another interesting finding from the descriptive statistics was the similarity in the prevalence of exhibiting the IA symptom of dysfunctional coping in both parents and adolescents. The findings from the multiple regression model suggested that only parents' total IA score and frequency of serious arguments with adolescents regarding excessive digital technology predicted the total score of IA in their adolescents. Parents' gender, employment status of both parents, and frequency of observing the adolescents' activities and time spent on the Internet were not significant predictors of adolescents' total IA score. The Chi-square results (RQ2) indicated that adolescents were more likely to be Dependent Internet users when their parents were Dependent Internet users. Additionally, results from Chi-square (RQ3) indicated that adolescents were most likely to exhibit Internet addiction symptoms when their parents exhibited similar symptoms.

Regression analysis demonstrated that parents' Internet addiction is a significant predictor of adolescents' Internet addiction. These results further support the findings of [Lam and Wong \(2015\)](#), who suggested that problematic Internet use in parents could interpret problematic Internet use in adolescents. [Lam and Wong \(2015\)](#) followed a dyad study design and measured parental IA and adolescent IA using the 20-item Internet Addiction Test (IAT) ([Young, 1998](#)) reported by parents and adolescents, respectively. Similar parent-adolescent addictive behaviors have been reported in other addiction domains, such as substance use ([Keeley et al., 2015](#)). These findings suggest that, like other addictive behaviors, parents are likely to influence adolescents in Internet addiction. Family-based intervention methods are an effective treatment approach for adolescent addictions, with substantial data demonstrating their effectiveness ([Liddle, 2004](#)). These further suggest that preventative initiatives to address IA may have to involve parents and adolescents in their creation and implementation. Participatory learning involving parents and adolescents may be a practical parental mediation approach since it indicates that both learn together to combat digital addiction ([Clark, 2011](#)). The participatory learning approach encourages parents to be active listeners and collaborators with their adolescents on the Internet and seek to learn from and alongside their adolescents. Family-based group intervention is another mediation approach that may minimize IA. It focuses on the whole family as a unit rather than individual family members and can help improve family functioning and promote a better family environment for adolescents ([Zhong et al., 2011](#)). According to [Lo et al. \(2021\)](#), family involvement in treating IA is known to bring positive results.

The regression analysis showed that parents' employment status was not a significant predictor of Internet addiction. It has been demonstrated in a study by [Orsal et al. \(2013\)](#) that adolescents who had both parents working were more likely to develop Internet addiction. This does not appear to be the case with our results. This difference in our findings could be attributed to our survey being done during COVID-19 when employed parents worked from home for an extended period. Our regression results also showed that the gender of parents was not a significant predictor of Internet addiction in their adolescents. [Lam \(2020\)](#) reported that parent-and-child gender matches contributed to IA in adolescents and might play a role in behavioral modeling. This may mean that, as part of their normal psychological development throughout their stage of development, adolescents often accept the parent of their same sex as a role model.

Results from the multiple regression further showed that monitoring the time the adolescent spent on the Internet and monitoring the activities of the adolescent on the Internet were not significant predictors of the adolescent's Internet addiction. However, the findings of this study do not support previous research by [Lin et al. \(2009\)](#), who reported that parental monitoring is an inhibitor of Internet Addiction. On the other hand, having serious arguments on excessive digital technology use was a significant predictor of adolescent Internet addiction, indicating this approach as ineffective in combating Internet addiction. This finding can be explained by evidence demonstrating conflicts between parents and children as a risk factor for behavioral difficulties in children ([Streit et al., 2021](#)). Parental mediation styles that largely match aggressive parenting styles seem ineffective in reducing adolescents' IA ([Kalmus et al., 2015](#)). Adolescent problem behaviors such as substance abuse, dysfunctional hazardous behavior, and Internet addiction have been linked to ineffective parenting practices ([Park et al., 2008](#); [Yen et al., 2007](#)). It has been shown that parents equipped with open communication about IA decrease the probability of IA in adolescents ([Yu & Shek, 2013](#)). Researchers have stressed the critical role of family settings in developing adolescents' self-regulation skills, and conflict may hamper the development of these abilities ([Morris et al., 2007](#)). Many parents are less digitally adept than their adolescents ([Clark, 2009](#)), which may explain why parents often fail to express clear and consistent norms about proper media usage to their adolescents ([Blackwell et al., 2016](#)) and hence end up with an aggressive argument with their adolescents about it. According to [Hirschi's \(2002\)](#) social control

theory, dysfunctional behaviors could be minimized through the guidance of role models (e.g., parents). Positive family interactions (e.g., high-quality communication) benefit adolescents because they provide a firm emotional basis that encourages desired behavior and reduces Internet addiction (Floros & Siomos, 2013; van den Eijnden et al., 2010). Our results reflect those of Solecki (2021), who also found that adolescents will demonstrate less problematic behavior concerning Internet use if their parents act as positive role models.

The chi-square (RQ3) results showed a significant association between parents and adolescents in seven of the eight Internet addiction symptoms. Research before COVID-19 has reported that adolescents value peer influence more than parental influence, resulting in a rise in problem behaviors (Karaman, 2013). Even though most adolescents had been physically separated from their friends, family time increased under COVID-19 stay-at-home mandates (Ellis et al., 2020). This further implies the importance of paying attention to parental behavior. Another possible explanation for the results from (RQ3) is that adolescents learn to imitate their parents' habits at a young age (Bandura, 1977). Neglect in everyday life has been reported as a symptom of IA (Kuss et al., 2014), which extends to negative parenting. When parents are addicted to the Internet, their compulsive digital habits can negatively impact their children's nurturing and affect their well-being throughout their developing years (Hefner et al., 2019). Chi-square results on the relation between parents and adolescents on the symptom of lying to family members, therapists, or others to conceal the extent of involvement with the Internet showed no significant relationship. This could be because the parents themselves answered both the questionnaires.

Findings from this study have implications for the management of Internet addiction in adolescents and their families. In terms of prevention strategies, identifying risk factors for Internet addiction allows for targeted interventions. In line with findings from Wu et al. (2016), our results demonstrated that Internet addiction is not a unique issue for adolescents but rather a family issue. Thus, implemented solutions may need to consider and address family and parental components. The frequency of serious arguments about excessive digital technology use being a significant predictor of Internet addiction (RQ1) further suggested that the approach is ineffective in handling excessive Internet use, and perhaps there is a need to educate the parents on how to effectively communicate with their adolescent to manage their Internet use better. According to (Bandura 1977), parents' risky behaviors may have a significant modeling impact on their children. This also seems to be the case for IA, suggesting that parents may have to be informed and educated that their Internet use can play a role in minimizing their adolescents' IA. Using digital wellness applications (those that track time spent on various apps) may assist parents to raise awareness about their own behavior and help with self-regulation. It is advised that parents get help for their Internet usage difficulties if needed as part of a complete strategy to manage Internet addiction in adolescents (Király et al., 2020).

Group counseling programs as IA intervention techniques are starting to be studied more in the literature. A recent study has reported that exercise may help reduce Internet addiction by managing the neurobiology of the central and autonomic nervous systems (Li et al., 2020). Sports are being used in IA interventions and have been seen to positively impact treating all the symptoms of IA (Liu et al., 2017). Some adolescents turn to the Internet as a substitute for real-life connections to escape the stress and can use the connections on the Internet to escape their poor real-life personal relationships (Liu & Kuo, 2007). The disengagement from other activities linked to IA may be possible as this was increasingly seen during the pandemic when school and leisure activities were low, adolescents started replacing it with screen time (Zhu et al., 2021) and reported higher IA (Dong et al., 2020). More research is needed to determine if this was actually due to the lack of activities or more of a coping mechanism to the stress during the pandemic and the new normal.

This study has several limitations: first, our study did not consider parent–adolescent communication and relationship. There is evidence that dysfunctional parent–adolescent communication is often related to increased adolescent risk behaviors (Wang et al., 2013). Our study is cross-sectional, and this makes it difficult to determine the causal relationship between variables. Longitudinal studies will be required further to establish the direction of causality between the variables. Based on the results, parental IA and adolescent IA depend on each other. This dependency could be because parents are answering both cases. In the ideal scenario, we needed to get the response from parents and adolescents separately on their Internet usage and IA.

Self-reported metrics, particularly IADQ and PYDQ, may impact possible recall and same-source bias. Yazdi et al. (2021) examined the parental assessment of their adolescent's Internet Gaming Disorder (IGD) compared to expert evaluations of IGD and the adolescent's view of their IGD compared to expert evaluations of IGD. According to their findings, parents overestimated their adolescents' online addiction, but adolescents' perceptions of their internet addiction were closer to professional assessments. However, adolescents can be in denial about their addictive behaviors (Stein et al., 2018). Hence, future research should use objective metrics (e.g., screen time data) to address these biases. When analyzing data and developing conclusions, it is important to note that adolescents' IA ratings represent parent' perceived risk of IA, not the actual risk. Parents' method of assessing adolescent IA needs further investigation. Other family factors or interactions, such as an overprotective parenting style, may influence parental response to PYDQ. Some PYDQ questions on observable behavior are simpler for parents to assess ("Has your child lied to family members, a therapist, or others to conceal the extent of involvement with the Internet?") than those about the adolescents' thoughts and feelings ("Does your child feel preoccupied with the Internet (think about previous online activity or anticipate next online session)?") (Wartberg et al., 2016). Due to lockdown measures, there may have been greater face-to-face engagement with adolescents, and parents may have watched their adolescents' Internet activities more closely than usual, which may have resulted in a difference in reporting compared to pre-pandemic research. Our study was carried out during COVID-19, where partial restrictions on social gatherings, including schools, were imposed, and adolescents followed blended learning where they had classes on campus 2–3 days a week and had to stay home on other days (Preventative Measures, n.d.). However, the effect of the pandemic on Internet use and addiction was not considered.

With this, future work in this area needs to look into the familial relationship between parent and adolescent and take into consideration the effect of the pandemic on parental monitoring and adolescent and parent Internet use when parent and adolescent are confined in the same space for an extended period. Previous research has shown that the adolescent Internet addiction prevalence rate differs from place to place (Bener & Bhugra, 2013; Bu et al., 2021). This difference suggests that nationality may be a possible variable that influences IA. Although studying the influence of the different nationalities on adolescent IA is not possible in our sample, a possible approach to consider in the future is to extend and divide the sample using the regional criteria based on the United Nations Department of Economic and Social Affairs, Statistics Division for use in the Sustainable Development Goals (SDG) indicators. A similar approach was adopted by Bruder et al. (2022) in their study on cross-cultural awareness and attitudes towards endangered species. Due to the limited sample size, we did not individually study the difference within the different age groups of adolescent IA and considered them a whole group. Literature shows a difference in adolescents' cognitive and psychological development and how they interact with their families and peers. Future work will study the relationship between parental IA for each stage of adolescence separately.

Conclusion

Adolescents are more susceptible to excessive Internet use than other age groups (van den Eijnden et al., 2008). The present study advanced our understanding of the relationship between IA in parents and adolescents. Additionally, our research found that frequent arguments about excessive digital technology usage were a strong predictor of an adolescent's Internet addiction. Recent research suggests that stress associated with COVID-19 may also rationalize new harmful behaviors (e.g., poorly managed Internet usage or excessive screen time) as necessary for coping, thus creating a longer-term risk (Chen et al., 2021). Further research is needed to understand whether Internet addiction in parents and adolescents is temporary for coping with the pandemic or a more persistent issue in the family. Results from our study have implications for counselors and policymakers working to establish preventative and therapeutic strategies for adolescents' Internet addiction. Based on our findings, intervention programs for Internet addiction may need to consider the family as a whole instead of adolescents alone. Family counseling programs addressing Internet addiction may need to be revised to integrate techniques based on holistically understanding excessive Internet use within the family. Digital programs designed to monitor and control children's Internet activities, for example, (Google Family Link, n.d.), may need to be revised to incorporate features to assess, monitor, and help parental Internet addiction and guide parents towards playing positive role models. Family psychologists could further assist parents in helping them learn how to communicate with their adolescents and minimize arguments about excessive Internet use.

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