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Research Article

It Is Not Only the Child! Exploring the Nexus of Adolescents' Internet Addiction With Family Environment in Internet-Addicted Versus Nonaddicted Parents

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This study examines the nexus between internet addiction (IA) in parents and their adolescent children, with a particular focus on the influence of the family environment. While previous research has largely investigated IA in either adults or adolescents, relatively few studies have explored IA within a familial context. However, none has specifically addressed the distinction between internet-addicted and nonaddicted parents. To bridge this gap, we conducted an anonymous online survey of 404 UK parents, collecting demographic data alongside validated measures, including the Internet Addiction Diagnostic Questionnaire (IADQ), the Short Form of the Alabama Parenting Questionnaire (APQ-SF), the McMaster Family Assessment Device (FAD), the Parental version of the Young Diagnostic Questionnaire (PYDQ), and self-reported frequency of internet monitoring behaviours. Findings revealed that inconsistent discipline, as measured by a subscale of APQ-SF, significantly predicted adolescent IA among nonaddicted parents, whereas general family functioning played a more crucial role for addicted parents. Additionally, nonaddicted parents perceived their IA symptoms as less severe than those of their children's, whereas addicted parents rated their own symptoms as more severe. Loss of control, marked by excessive online time, emerged as the most prevalent IA symptom in both parents and adolescents. These findings highlight the intergenerational transmission of IA and underscore the need for targeted family-based interventions and digital parenting programs to foster healthier online behaviours among adolescents.

Keywords: adolescent internet addiction; family functioning; inconsistent discipline; loss of control; parent internet addiction

1. Introduction

The proliferation of internet usage has catalysed transformation in the way children and parents interact, integrating into various aspects of daily life such as accessing services, entertainment, work, and socialising [1]. However, alongside these many benefits, concerns arise when internet usage evolves into addictive behaviour [2]. The term internet addiction (IA) refers to prolonged online engagement exceeding intended durations, despite awareness of its negative consequences. IA manifests through preoccupation, tolerance, diminished control, withdrawal symptoms (i.e., anxiety, depression, or agitation upon internet deprivation), and use of internet to escape or alleviate dysphoric mood states [3]. Although IA's definition and classification remains controversial, prevailing definitions and assessment tools emphasise individuals' emotional, attitudinal, and behavioural reliance on the internet, while also delineating its detrimental impact on various domains of life and daily functioning [4]. Despite its omission from latest versions of diagnostic manuals such as the Diagnostic and Statistical Manual of Mental Disorders (DSM) or the International Classification of Diseases (ICD), IA shares discernible parallels with established addictive behaviours, such as tolerance and withdrawal [4, 5], thereby warranting professional attention and intervention [6].

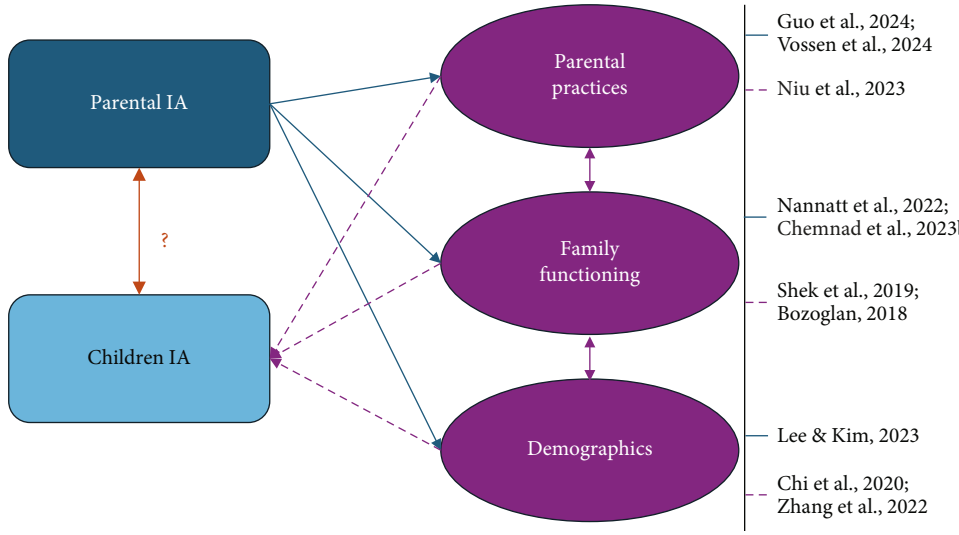

FIGURE 1: Current research linking family environment and children's IA. *Note*. The small colour-coded lines on the right indicate the corresponding links. The question mark denotes the less researched link.

A decade ago, research predominantly concentrated on children's IA [7]. However, recent investigations have widened their scope to examine IA among both parents and children, recognising the equal susceptibility of both groups [8, 9]. Notably, a recent systematic review and meta-analysis, incorporating data from 2,123,762 adults across 64 countries, unveiled global pooled prevalence rates for various digital addictions. The findings indicated rates of 14.22% for IA, 26.99% for smartphone addiction, 17.42% for social media addiction, and 8.23% for cybersex addiction [10]. These adult cohorts include not only current parents but also prospective parents and individuals with potential future parental responsibilities. Therefore, investigating how IA in parents influences IA in their offspring, and to what extent the patterns of IA symptoms in adolescents reflect the same symptoms reported by their parents, is crucial for understanding the intergenerational transmission of addictive behaviours. Such understanding is essential for developing effective prevention and intervention strategies that address family dynamics and parenting practices.

1.1. Family Influences on IA. According to Bronfenbrenner's ecological model of human development [11], the family microsystem represents one of the most proximal environments exerting a direct influence on children's developmental trajectories. Within this theoretical framework, parenting practices and family functioning have gained considerable research interest in the realm of IA. For instance, factors such as permissive parenting [12], poor parental control (i.e., [13]), diminished family cohesion [14], and family functioning [15], along with an imbalance between warmth and protection [16], low family expressiveness, and high levels of family conflict [17], have been identified as contributors to adolescent IA risk.

Moreover, recent systematic reviews have identified direct links between parental IA and various factors, including parental practices, family functioning, and sociodemographic characteristics and highlighted how poor parental practices, a dysfunctional family environment, and low socioeconomic status contribute to problematic internet use among children (Figure 1).

However, most research investigating the relationship between the family environment and IA in offspring has overlooked an important factor: whether parents exhibit IA symptoms. This omission is significant because emerging evidence indicates a significant correlation between parental IA and children's IA. For example, a study by Yen et al. [18] found that children of parents with IA are more likely to develop similar issues. Similarly, recent studies demonstrated that parental IA scores were predictive of corresponding scores in adolescents, implying the necessity of supporting parents in addressing their own IA symptoms [19]. Aziz et al. [20] provided further insights by examining the interplay between parental IA, adolescent IA, and family dynamics. Their study suggested that the relationship between parental and adolescent IA is not straightforward and that multiple factors, including parental conflict and internet parenting styles, contribute to this complex dynamic.

1.2. Theoretical Perspectives on IA Transmission. Several existing theoretical models contribute our understanding of the relationship between parental and children's IA. For example, social learning theory [21] posits that individuals learn behaviours by observing others, especially influential figures like parents, through processes such as imitation, and reinforcement. If parents frequently use the internet, children are likely to adopt similar habits. This enjoyment, or relaxation that parents derive from internet use, as observed by children, can encourage them to seek the same gratification. Moreover, according to normalisation theory [22], parents' attitudes and behaviours towards internet use may set norms for children; if parents engage in excessive internet use, children may perceive this behaviour as acceptable and desirable. Another theoretical model, attachment theory [23], implies that parents with IA may be less

emotionally available, leading to insecure (whether avoidant or ambivalent) attachment in children. These children might turn to the internet for emotional fulfilment, seeking comfort, coping with emotional neglect, or filling the void created by lack of parental engagement.

In line with these theories, family systems theory [24] views the family as an interconnected system where each member's behaviour affects the whole family dynamic. This theory posits that families strive for stability, and if a parent is addicted to the internet, children may also increase their internet use to maintain a semblance of balance or align with family norms. Therefore, considering the role that parental IA can play in the IA in children, it is essential for future research to include parental IA as a variable. This will provide a better understanding of the intricate relationship between family influences and children's internet use.

1.3. Methodological Approach and Hypotheses in the Present Study

1.3.1. Distinguishing Between Internet-Addicted and Noninternet-Addicted Parents. One limitation of studies supporting a direct relationship between parental and children's IA is the lack of differentiation between internet-addicted and noninternet-addicted parents. This distinction is important for several reasons. First, the mechanisms through which IA influences children may differ significantly between internet-addicted and noninternet-addicted parents. Internet-addicted parents might exhibit behaviours and establish household norms around internet use that are more permissive or even encouraging of excessive internet use [8]. These behaviours can serve as direct models for children to emulate, thereby increasing the likelihood of IA in the younger generation. Noninternet-addicted parents, on the other hand, may exhibit more controlled and balanced internet use, potentially promoting healthier internet habits in their children.

Additionally, the family dynamics and the overall environment may differ markedly between families with internet-addicted and noninternet-addicted parents. Internet-addicted parents may experience higher levels of stress [25], conflict, and dysfunction within the family [26] and may use internet as a coping mechanism. This environment can create additional risk factors for children, such as emotional instability, reduced parental supervision, and heightened family conflict, all of which are known to contribute to IA in adolescents [15, 17]. In contrast, noninternet-addicted parents are likely to maintain a more stable and supportive family environment, which can serve as a protective factor against IA in their children [27].

1.3.2. Implications for Prevention and Intervention. Crucially, understanding the differences between these two groups of parents can help in designing more effective intervention and prevention programs. Interventions for internet-addicted parents might need to focus more on managing their own IA and reducing the negative impact of their behaviours on their children [19, 28]. In contrast, interventions for noninternet-addicted parents might focus more on enhancing their existing protective strategies and further reinforcing healthy internet habits in their children. By differentiating between internet-addicted and noninternet-addicted parents, researchers can gain a more nuanced understanding of the specific pathways through which parental IA influences adolescent IA. This distinction will allow for more targeted and effective interventions, ultimately leading to better outcomes in preventing and addressing IA in both parents and their children [29]. To address this issue, the present study will focus on two groups of parents: those exhibiting IA symptoms and those who do not.

1.3.3. Cultural Considerations. The existing evidence on the relationship between parental IA and adolescents' IA primarily comes from Middle Eastern populations [19, 28]. Given the significant influence of cultural differences on parenting [30], these findings may not fully apply to British families. This study aims to fill this gap by providing insights relevant to the UK context, thereby informing the development of culturally appropriate measures to address IA among British adolescents. Moreover, a recent review highlights that parental monitoring behaviours vary across cultures, influenced by differing expectations regarding parental control over adolescents [31]. For instance, in some countries like Jordan and Kenya, high levels of behavioural control are associated with high levels of parental warmth. In contrast, in Western countries such as Sweden and the United States, high control often correlates with low warmth or an unrelated pattern [32]. Recognising that cultural aspects and family affective responsiveness impact parental monitoring of adolescents' internet use, this study measures the frequency of monitoring both the time spent online and the activities undertaken.

1.3.4. Hypothesis: Transmission of IA Symptoms. One important question yet to be addressed is whether the symptoms of problematic internet use observed in British parents are also evident in their children. A recent study on the Arab population reported very similar patterns of IA symptoms in both parents and adolescents [19]. Although these symptoms, measured by complementary scales, showed a close correspondence between parents and adolescents, it is reasonable to hypothesise that the different dynamics in families with internet-addicted versus nonaddicted parents can lead to variations in how symptoms of problematic internet use manifest in children. For example, internet-addicted parents may inadvertently model excessive and problematic internet use, normalising these behaviours for their children. As a result, children in these families might develop similar patterns of internet use and addiction, such as withdrawal effects, staying online longer than intended, or dysfunctional coping. In the present study, we addressed this question by systematically comparing perceived symptoms of IA in parent–adolescent dyads in internet-addicted and nonaddicted parents.

2. Method

2.1. Participants and Procedure. Data was anonymously collected from 404 parents and caregivers residing in the United Kingdom through an online survey. Eligible participants were those with children aged 12–15, including

biological parents, carers, foster parents, and stepparents. Both parents and caregivers had the opportunity to participate individually. In this study, parents were asked to provide their perspectives on themselves, their family, and their child. If parents had more than one child aged 12–15, they were asked to answer the survey based on the adolescent closest to the age of 12 years.

The participants were informed about the study's objectives, the voluntary and anonymous nature of their involvement, the confidentiality of their data, and their right to withdraw from the study. Informed consent was electronically obtained from all participants, and ethical approval was granted by the Ethics Committee at Bournemouth University (Ethics Approval ID: 45945). The survey was conducted via Qualtrics, and participants were recruited through Prolific (https://www.prolific.com), an online research platform. Upon completion of the survey, participants received a debrief form containing additional information about the study and details of organisations offering support to parents facing internet-related challenges. They were also compensated for their successful completion.

2.2. Measurements

2.2.1. Short Form of the Alabama Parenting Questionnaire (APQ-SF). The APQ-9 is a concise version of the original 42-item Alabama Parenting Questionnaire (APQ-42; [33–35]), which is designed to evaluate specific parenting behaviours linked child disruptive conduct [35]. This shortened form includes nine items aimed at facilitating a quicker assessment process [36]. Each item is rated on a 5-point Likert scale (1 = *never* to 5 = *always*), with higher scores indicating a more frequent occurrence of the parenting behaviours being measured. The APQ-9 assesses three domains of parenting practices: positive parenting, inconsistent discipline, and poor supervision.

Previous research validated the APQ-9 reported that factor loadings were 0.77, 0.76, and 0.79 for the positive parenting; 0.74, 0.63, and 0.74 for the inconsistent discipline; and 0.62, 0.75, and 0.65 for poor supervision [37]. A confirmatory factor analysis in the present study indicated 0.77, 0.94, and 0.68 for the positive parenting factor; 0.74, 0.70, and 0.64 for the inconsistent discipline factor; and 0.61, 0.72, and 0.52 for poor supervision indicating similar prespecified latent factor structure. Further analysis indicated a good fit of the three-factor structure to our data ($\chi^2 = 25.24$, df = 24, $p = 0.38$; the comparative fit index [CFI] = 0.99, the Tucker–Lewis index [TLI] = 0.98, and the root mean square error of approximation [RMSEA] = 0.01 together with the upper CI for RMSEA = 0.04). Cronbach alpha in our data was 0.72.

2.2.2. Internet Addiction Diagnostic Questionnaire (IADQ). The IADQ was used to measure the presence and severity of internet dependency among parents in our sample [38]. The IADQ, derived from diagnostic criteria for pathological gambling, consists of eight items administered with a binary response format (i.e., "no" or "yes"), resulting in a total score ranging from 0 to 8. Each item serves as an indicator for identifying symptoms associated with problematic internet use: preoccupation with the internet, tolerance, unsuccessful efforts to control internet use repeatedly, withdrawal, staying online longer than intended, risk/loss of relationships and opportunities because of internet use, and lies to conceal the extent of involvement and dysfunctional coping [3].

The classification of IA using the IADQ varies across the existing literature. According to Young [3], a total score of 5 or above indicates dependency on the internet, while a total score below 5 indicates a nondependent status. Another classification approach delineates three severity levels: "nondependent internet user" (endorsing 0–2 "yes" responses), "at risk of dependency" (endorsing 3–4 "yes" responses), and "dependent internet user" (endorsing 5 or more "yes" responses) [39, 40].

The originally proposed criteria of the cutoff of 5 to differentiate nonindependent from dependent internet use were tested against internet usage and psychological dysfunction in a large sample of young adults across Europe [41]. It was found that individuals scoring 3 and 4 showed an undistinguishable pattern of internet use compared to those scoring 5 and suggested that the endorsement of 3 or 4 criteria might be adequate for categorising internet dependence. Based on these findings and the median of the IADQ in our sample (median = 2), we will use this new cutoff point for the present study where scores above 2 will be considered internet dependency.

Previous studies reported Cronbach's alpha values ranged between 0.60 and 0.72 [38]. In the present study, Cronbach's alpha was 0.74. In addition, we tested agreement between the total score of IADQ and the perceived degree of problems associated with the use of the internet within respondents' households. A correlation analysis showed a medium effect size in this positive association ($r = 0.41$, 95% CI [0.32, 0.49], $p < 0.001$) with the Bayesian factor providing strong support for the association ($BF_{10} > 100$).

2.2.3. McMaster Family Assessment Device (FAD). We used the McMaster FAD [42, 43] to assess perceptions of family functioning. The FAD is a 60-item multidimensional self-report measure of seven subscales including problem solving, communication, roles, affective responsiveness, affective involvement, behaviour control, and general functioning. For the present study, we used only two subscales: affective responsiveness (six items), which assesses the degree to which family members can experience, respond to, and express different emotions in an appropriate way and general functioning (12 items) which measures the overall health or dysfunction within the family unit.

In this study, we selected the affective responsiveness and general functioning subscales of the McMaster FAD to maximise both theoretical relevance and methodological efficiency in assessing family functioning in relation to adolescent IA. Affective responsiveness has been widely highlighted in addiction research due to its strong association with emotional dysregulation and compulsive behaviours, factors that are directly linked to problematic internet use [44]. Additionally, studies have shown that affective responsiveness has the highest correlation with the total FAD score,

reinforcing its importance in capturing family emotional dynamics [45]. The general functioning subscale, frequently used as a proxy for overall family health and dysfunction, provides a comprehensive measure of family dynamics without the need for administering all seven FAD subscales [46, 47]. Given that several FAD subscales overlap conceptually—such as communication, affective involvement, and problem solving—general functioning has been demonstrated to effectively capture these dimensions in a holistic manner [48]. Furthermore, structural family dynamics assessed by the roles and behaviour control subscales have shown weaker empirical ties to IA compared to emotional and global family function [49]. Finally, to minimise participant fatigue and enhance response accuracy, we prioritized the most relevant and nonredundant subscales, ensuring methodological efficiency while maintaining a robust assessment of family influences on adolescent IA [47].

Participants are asked to rate how well each item represents their family on a 4-point Likert scale (1 = *strongly agree* to 4 = *strongly disagree*). The subscales are calculated by averaging the items for each subscale. Lower scores reflect better family functioning. Numerous studies have reported the strong internal consistency of the 60-item FAD scales across diverse cultures (i.e., [50, 51]) and various family types, including nonclinical, psychiatric, and medical populations [52]. In the present study, Cronbach's alpha was 0.84 for the affective responsiveness subscale and 0.89 for the general functioning subscale.

2.2.4. Parental Version of the Young Diagnostic Questionnaire (PYDQ). The PYDQ is an adaptation of the IADQ, and it was developed to evaluate parents' perspectives on their children's problematic internet use. This adaptation modifies all eight items of the original IADQ to gather external assessments rather than self-report ratings (i.e., using "your child" instead of "you"). Like the IADQ, the PYDQ comprises eight items derived from the criteria for pathological gambling outlined in the fourth edition of the DSM [53], with binary (no/yes) response options. The close alignment between the IADQ and PYDQ enables the evaluation of perceived IA symptoms in both parents and their children. The total PYDQ score is calculated by summing the values of the eight items, where a higher score reflects a greater risk l of IA among young individuals. In the current study, the reliability of the PYDQ, as indicated by Cronbach's alpha, was 0.74.

2.2.5. Frequency of Monitoring Activities and the Amount of Time on the Internet. Respondents were asked to indicate how often they monitor the amount of time their child spends on the internet, choosing from the following options: never, very rarely, rarely, occasionally, frequently, and very frequently. This study focuses on the general tendency of parents to monitor rather than conducting a detailed analysis. Therefore, we grouped these six options into two categories: rarely (never, very rarely, and rarely) and frequently (occasionally, frequently, and very frequently). Additionally, respondents were asked to indicate the frequency of their monitoring activities on the internet using the same six-item scale. For the analysis, we aggregated these responses into the same two categories: rarely and frequently.

2.3. Data Analysis

2.3.1. Descriptive Statistics. We provided a sample overview separately for the entire sample, as well as for the two groups (internet addicted and internet nonaddicted), to facilitate a more comprehensive comparison. We also reported the prevalence of all descriptive measurements to enable comparison across studies. Additional demographics (i.e., with whom the child lives, financial status of parents, parents' employment status, and education) are reported in the Supporting Information (Section 1: Figures S1 and S2).

2.3.2. Multiple Regression. We conducted a multiple regression analysis to identify factors predicting total PYDQ scores. The factors tested included parenting style, parents' gender, family functioning, and monitoring of time and activities on the internet. Before conducting the analysis, we ensured that the assumptions were met. Cook's distance values were relatively small (mean = 0.16, SD = 0.09), indicating no multivariate outliers. A Kolmogorov–Smirnov test confirmed the normality of data distribution ($D = 0.07$, $p = 0.06$). Additionally, assumptions of heteroscedasticity ($\gamma = 0.84$, $p = 0.89$) and multicollinearity (all variance inflation factor (VIF) < 1.9) were met. We used semipartial correlations to calculate the effect size for each predictor. The semipartial correlation measures the correlation between the outcome and the unique aspects of the predictor, distinct from all other predictors. The unique aspects of a predictor were obtained by saving the unstandardized residuals from a regression of all other predictors predicting the predictor of interest as a new variable [54, 55]. It must be noted that when two predictor variables are highly correlated, neither variable may add much unique predictive power beyond the other. Therefore, the semipartial correlations will be small in this case. However, providing these effect sizes helps determine the extent to which the predictors, singly and in combinations share variance with the dependent variable [56].

Two additional statistics were calculated to obtain the evidence and test for robustness of the regression model. First, we employed Bayesian inclusion criteria to enhance the reliability and interpretability of our multiple regression analyses. Unlike traditional stepwise methods, which rely on arbitrary significance thresholds, Bayesian inclusion criteria provide probabilistic evidence for the inclusion of each predictor, allowing for a more nuanced and data-driven approach to model selection. This method accounts for model uncertainty, reduces the risk of overfitting, and ensures that only variables with substantial evidence are retained [57]. Second, we converted the observed p value for predictors into the false-positive risk (FPR), which represents the probability that the observed result is actually a false positive [58]. FPR corrects this limitation of traditional p value by incorporating prior probabilities and showing the actual risk of a false-positive result. Even when a p value is below the typical significance threshold (e.g., $p < 0.05$), the actual probability that the finding is a false positive can still be much higher than 5% if the prior likelihood of a real effect is low [59].

2.3.3. Generalized Linear Mixed Model (GLMM). Both the IADQ and PYDQ use binary response scales to indicate the presence or absence of corresponding symptoms. This study aims to investigate how parents' perceptions of their adolescents' symptoms of IA vary as a function of their own IA. The main advantage of using GLMM is that the data is hierarchically clustered by parents' assessment with two ratings (own and their adolescent) being nested within parents. GLMM allows us to account for the nested structure of the data by including and estimating a random variance of each subject in the model. Moreover, as observations from the same subject are *usually* more like each other than observations from different subjects, we cannot use statistical methods on these data to assume independence, because estimates of variance, and therefore p values, will be incorrect. GLMMs allow us to account for the nonindependence in the data and provide us an estimate of that correlation. Specifically, we estimated the proportion of the total variance in the symptoms of IA that is accounted for by the clustering by computing the ratio of the between-cluster variance to the total variance (intraclass correlation, ICC). The ICC will provide us with the correlation among observations within the same cluster.

We estimated the model parameters assuming that the responses were drawn from a binomial distribution using logit as a link function. The inference in GLMMs is based on the likelihood. To get probabilities out of our model, we used the inverse logit. We used *simple* coding scheme, which is centred to zero and compares each mean with the reference category mean. The reference category is the first appearing in the variable levels; therefore, the interpretation of the results was adjusted accordingly. In the PYDQ data, some items had missing values for two respondents. The mean and standard deviation of each item with missing values were used to scale the scores which are computed with the available data of the variable, independently of possible missing values in other variables. The relationship between a binary outcome and categorical predictors was expressed in odds ratio (OR) which compares the odds of the event occurring for each category of the predictor relative to the reference category, given that all other variables remain constant. All post hoc tests were performed using Bonferroni corrections for multiple comparisons. To compute standard errors and confidence intervals, we used profile likelihood–based confidence interval, in which the bounds are chosen based on the percentiles of the chi-square distribution around the maximum likelihood estimate.

3. Results

3.1. Sample Overview. Table 1 summarises the descriptive statistics for the entire sample of this study ($N = 404$) as well as for subgroups based on the level of IA among parents, based on the IADQ assessment, where Group 1 and Group 2 represent internet nonaddicted parents and internet-addicted parents, respectively.

3.2. Predicting IA in Adolescents in Internet-Addicted and Internet-Nonaddicted Parents. We analysed two multiple regression models. The first model tested whether parents' gender, general family functioning, parents' affective responsiveness, parenting style, and monitoring behaviour could predict problematic internet use in the group of internet nonaddicted parents. The second model examined these predictors in parents who showed IA. For each model, we also added two parental behavioural control variables (monitoring time and activities on the internet) that may have implications on parental impacts on adolescent IA [13, 60]. We excluded the school performance variable from these regression analyses because parents' evaluations of their adolescents' school performance did not differ significantly between the two parent groups ($X^2(2) = 2.78$, $p = 0.25$).

To increase the precision of parameter estimation and the power of statistical testing of the parameters, all continuous variables for regression analyses were mean-centred [61]. For all regressions conducted, the VIF values were below 3.0. Given that multicollinearity is generally considered a significant concern when VIF exceeds 5.0, the findings suggest that multicollinearity was not an issue in this study.

In the nonaddicted group of parents, the predictors explained 21% of the variance in adolescents' problematic internet use, representing a significant proportion of variance explained, $R^2\,\text{adj} = 0.21$, $F(8, 215) = 3.32$, $p = 0.001$. The results for each predictor within the regression model are shown in Table 2. Only parental inconsistent discipline could predict problematic internet use in adolescents. No other predictors added a significant unique contribution to the model.

It must be noted that the effect size for parental inconsistent discipline on problematic internet use in children is very small. We conducted two additional analyses to test this effect. First, we performed the same regression using the Bayesian framework and used Bayesian model averaging to obtain the posterior probability of the inconsistent discipline predictor after considering all the candidate models (i.e., the number of models that were constructed given all predictors in this regression). Assuming that all models are equally likely a priory [62], we estimated the posterior summaries of coefficients and the inclusion Bayes factor (BFinc) which quantifies how much the observed data are more probable under models that include a particular predictor relative to the models that do not contain that particular predictor. For the parental inconsistent discipline predictor, BFinc was 608.64 indicating that the model containing this predictor is about 608 times more likely than the model without it when we consider all candidate models. In contrast, all other predictors had a very small BFinc ranging between 0.23 and 1.0 (see details in the Supporting Information, Section 2: Table S1). Second, we calculated an additional parameter by converting the observed p value for the inconsistent discipline predictor to the FPR which corresponds to the probability that the results occurred by chance only [58]. This analysis revealed that the likelihood of the existence of a real effect of inconsistent discipline on problematic internet use in children given the effect size (as multiple of standard deviation) and p value was 106.89 times (vs. the existence of no effect) corresponding to the power of 84% (alpha = 0.05) and FPR of 1% (0.009).

TABLE 1: Descriptive statistics and prevalence of the variables in the present study.

		Whole sample[a]	Prevalence (sample)	Group 1[b]	Prevalence (Group 1)	Group 2	Prevalence (Group 2)
Parent gender	Males	202	0.50	125	0.56	77	0.43
	Females	200	0.50	97	0.43	103	0.57
Adolescent gender	Males	227	0.56	114	0.51	113	0.63
	Females	176	0.44	110	0.49	66	0.37
Parent age	Mean (*SD*)	44.91 (8.10)		45.31 (8.16)		44.40 (8.02)	
Adolescent age	Mean (*SD*)	13.3 (1.31)		13.37 (1.13)		13.21 (1.50)	
Parent groups (based on the IADQ assessment)	Group 1	224	0.55				
	Group 2	180	0.45				
IADQ	Mean (*SD*)	2.6 (2.0)		1.2 (0.8)		4.5 (1.4)	
PYDQ	Mean (*SD*)	2.6 (2.0)		1.8 (1.7)		3.6 (2.0)	
Frequency of monitoring the amount of time[c]	Frequently	291	0.72	161	0.71	130	0.72
	Rarely	112	0.27	63	0.28	49	0.27
Frequency of monitoring activities[c]	Frequently	310	0.76	170	0.75	140	0.78
	Rarely	93	0.23	54	0.24	39	0.21
The extent that the internet use within the household is perceived as problematic[c]	Disagree	234	0.58	162	0.72	72	0.40
	Agree	169	0.41	62	0.28	107	0.60
Parenting practices (APQ-9)	Positive parenting	13.2 (2.3)		13.2 (1.6)		13.1 (1.7)	
	Inconsistent discipline	7.4 (2.4)		7.0 (2.3)		8.0 (2.2)	
	Poor supervision	5.3 (2.0)		5.1 (1.9)		5.5 (2.1)	
Family functioning (McMaster)	General family functioning	20.5 (5.3)		19.8 (4.9)		21.3 (5.6)	
	Affective responsiveness	11.2 (3.3)		10.8 (3.1)		11.7 (3.4)	

Note. Group 1 ($N = 224$) and Group 2 ($N = 180$) were defined based on the IADQ scores as parents showing no interned addiction and internet addiction symptoms, respectively.
[a]Two parents preferred not to disclose their gender, and one parent did not disclose the gender of their child.
[b]In this group, two parents did not disclose their gender.
[c]Data from one parent was missing in those questions.

TABLE 2: Multiple regression results for the prediction of adolescents' IA in the group of internet-nonaddicted parents.

	β[a]	95% CI for β		B	p	$r^2a(b,c)$[b]
		Lower	Upper			
Positive parenting	−0.01	−0.16	0.15	−0.01	0.95	−0.0001
Inconsistent discipline	0.28	0.10	0.30	0.20	< 0.001	0.09
Poor supervision	0.10	−0.03	0.21	0.09	0.12	0.01
FAD-GL	0.02	−0.05	0.06	0.01	0.84	0.004
Affective responsiveness	−0.01	−0.10	0.09	−0.01	0.90	−0.004
Monitoring time on internet	0.06	−0.15	0.32	0.08	0.49	0.001
Monitoring activities on internet	−0.09	−0.38	0.13	−0.13	0.33	−0.05
Parent gender	0.13	−0.25	0.67	0.21	0.37	0.06

[a]β represents standardised regression coefficients, and B represents unstandardised regression coefficient.
[b]Semipartial correlation (effect size).

TABLE 3: Multiple regression results for the prediction of adolescents' IA in the group of internet-addicted parents.

	β	95% CI for β		B	p	$r^2a(b,c)$
		Lower	Upper			
Positive parenting	−0.03	−0.20	0.15	−0.03	0.77	−0.0004
Inconsistent discipline	0.10	−0.05	0.24	0.09	0.20	0.008
Poor supervision	0.15	−0.01	0.32	0.14	0.07	0.02
FAD-GL	0.32	0.11	0.53	0.11	0.003	0.05
Affective responsiveness	−0.15	−0.36	0.06	−0.09	0.16	−0.005
Monitoring time on internet	0.10	−0.09	0.28	0.16	0.30	0.001
Monitoring activities on internet	−0.16	−0.34	0.02	−0.27	0.09	−0.01
Parent gender	0.36	0.05	0.67	0.71	0.03	0.03

Among the internet-addicted group of parents, the predictors explained 10 of the variance in adolescents' IA, representing a significant proportion of variance explained, adj $R^2 = 0.10$, $F(8, 171) = 3.61$, $p < 0.001$. The results for each predictor within the regression model are shown in Table 3. General family functioning and parent's gender could predict problematic internet use in adolescents. No other predictors added a significant unique contribution to the model.

Using Bayesian regression analysis, we also estimated the posterior summaries of coefficients for the general family functioning and parents' gender. For the general family functioning, BFinc was 20.18 indicating that the model containing this predictor is about 20 times more likely than the model without it when we consider all candidate models. In contrast, our data does not provide evidence for the effect of this predictor on problematic internet use in children (BFinc = 2.21). All other predictors showed small BFinc ranging between 0.33 and 1.21 (see details in the Supporting Information, Section 2: Table S2). In addition, we calculated the FPR for the FAD-GL and parent gender predictors. This analysis revealed that the likelihood of the existence of a real effect of general family functioning on problematic internet use in children given the effect size (as multiple of standard deviation) and p value was 41.39 times (vs. the existence of no effect). This corresponds to the power of 83.91% (alpha = 0.05) and FDR of 2.3%. However, the likelihood that parents' gender exerts an influence on problematic internet use in their adolescents was small (2.76) with an FDR of 26.62%.

3.3. Parents' Perceived Own Symptoms of IA Versus Those of Their Adolescents in Internet-Addicted and Nonaddicted Parents. A GLMM was used with a binary response variable ("0" or "1") as the dependent variable. Three fixed-effect factors were included: assessment type (IADQ: parents evaluated their IA symptoms and PYDQ: parents evaluated their adolescents' IA symptoms), parent groups (internet addicted and internet nonaddicted), and items (subscales measuring preoccupation with the internet, tolerance, loss of control [cutting back], loss of control [time], withdrawal, risk of losing relationships or opportunities, and lies to conceal internet use and dysfunctional coping). The respondents' ID was used as a clustering variable.

The GLMM revealed three main effects that provided insight into how parents estimate their own symptoms of IA and those of their adolescents. Specifically, fixed-effect omnibus tests indicated a significant effect of assessment type ($X^2(1) = 7.37$, $p = 0.007$), showing that parents generally perceived their own IA symptoms as lower than those of their children (OR = 0.76, SE = 0.08, $z = -2.72$, $p = 0.007$). There was also a significant effect of parent groups ($X(1) = 285.93$, $p < 0.001$), suggesting that the overall rating of IA symptoms was lower in the internet-nonaddicted group compared to the internet-addicted group (OR = 0.09, SE = 0.01, $z = -16.93$, $p < 0.001$). Furthermore, a fixed effect of items ($X^2(7) = 722.86$, $p < 0.001$) indicated high variability in the symptoms, with "staying on the internet longer than intended" receiving the highest rating, while "lying" and "risk of loss of relationships or opportunities" received the lowest ratings (see details in the Supporting Information, Section 3: Tables S3 and S4). An intraclass correlation analysis suggested that correlations among responses within clusters contributed only 20% of the variance in the dependent variable. This analysis also revealed interactions between assessment type and parent groups ($X^2(1) = 82.60$, $p < 0.001$), assessment type and items ($X^2(7) = 120.01$, $p < 0.001$), and parent groups and items ($X^2(7) = 27.62$, $p < 0.001$). However, the interaction between assessment type, items, and parent groups was not significant ($X^2(7) = 8.52$, $p = 0.29$).

Our primary objective in this analysis was to examine the relationship between perceived symptoms of IA in parents and adolescents within each parent group. Consequently, two interactions reported above were of particular interest—between assessment type and parent groups and parent groups and items. We investigated these interactions in detail by conducting post hoc comparisons employing the Bonferroni adjustment to account for multiple comparisons.

The interaction between assessment type and parent group revealed an interesting finding. In the internet nonaddicted group, parents perceived their own symptoms as lower on average compared to those of their adolescents (OR = 0.30, 95% CI [0.19, 0.40], SE = 0.05, $z = -6.86$, $p_{bonf} < 0.001$). Conversely, in the internet-addicted group, parents perceived their own symptoms as higher on average than those of their adolescents (OR = 1.93, 95% CI [1.53, 2.32], SE = 0.05, $z = 6.28$, $p_{bonf} < 0.001 < 0.001$). Additionally,

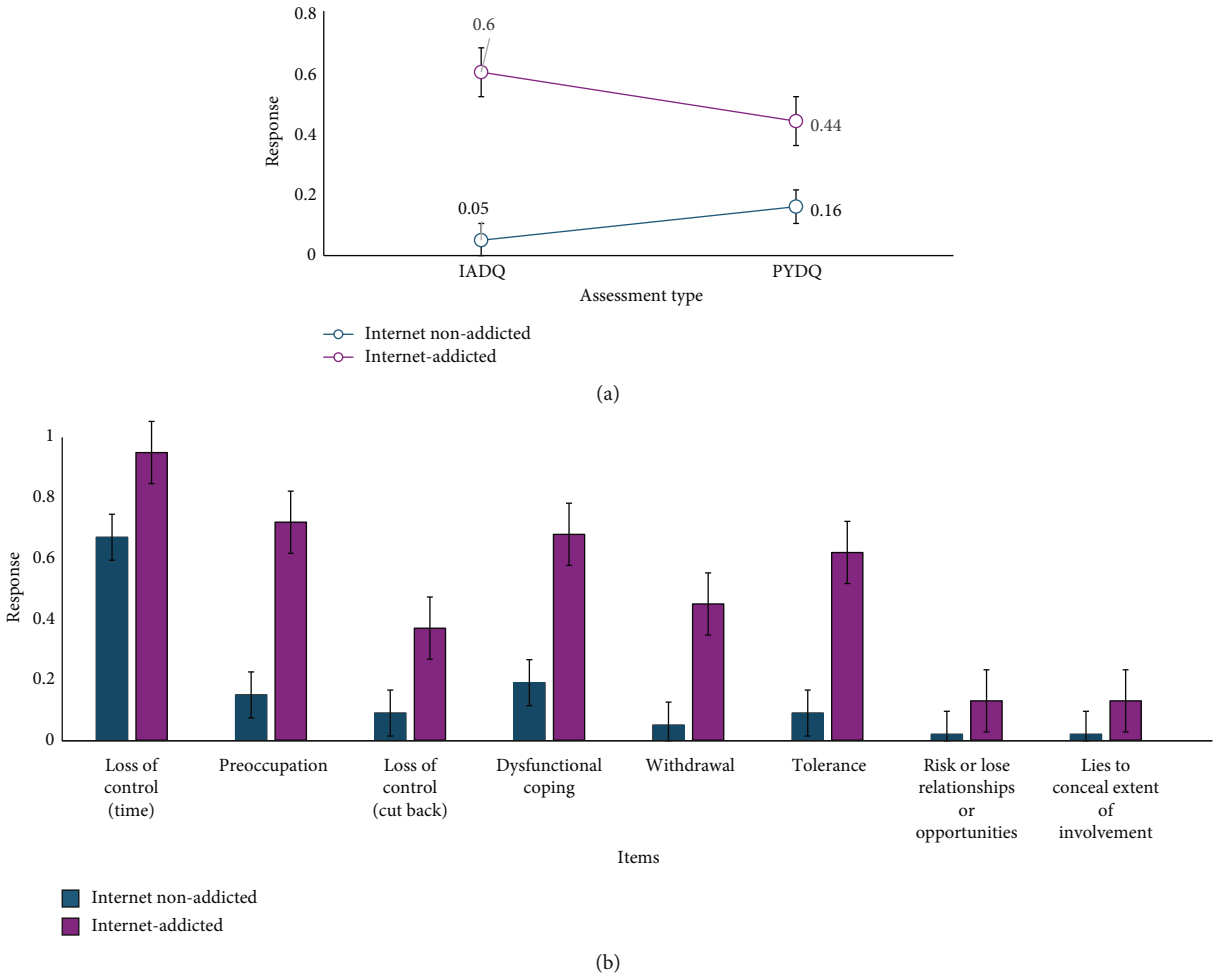

FIGURE 2: Interaction between (a) assessment type and parent group and (b) parent groups and items. *Note*. Error bars represent 95% confidence interval of mean.

internet nonaddicted parents reported fewer symptoms of IA compared to internet-addicted parents (OR = 0.04, 95% CI [0.02, 0.05], SE = 0.01, $z = -16.18$, $p_{bonf} < 0.001$). They also reported fewer symptoms of IA in their adolescents compared to internet-addicted parents (OR = 0.24, 95% CI [0.18, 0.30], SE = 0.03, $z = -10.44$, $p_{bonf} < 0.001$) (Figure 2a). Details are reported in the Supporting Information (Section 3: Table S5).

The interaction between parent groups and items revealed that the internet nonaddicted group consistently reported only one symptom of IA: spending more time on the internet. In contrast, addicted parents reported several other symptoms, including dysfunctional coping, preoccupation with the internet, the need to spend more time online to achieve the same satisfaction, and some withdrawal symptoms (Figure 2b) (detailed pairwise comparisons are reported in the Supporting Information, Section 3: Table S6).

It should be noted that the interaction between parent groups and items provides an averaged assessment (IADQ and PYDQ). To further investigate these effects, we plotted and analysed symptoms for parents and adolescents in each group (Figure 3). In the internet nonaddicted group, parents reported that their adolescents experienced more symptoms of being preoccupied with the internet, needing to spend more time on the internet to achieve satisfaction, and feeling anxious about reducing their internet use compared to their symptoms (OR = 0.19, 95% CI [0.16, 0.21], $SE = 0.05$, $z = -5.81$, $p_{bonf} < 0.001$; OR = 0.14, 95% CI [0.12, 0.17], $SE = 0.05$, $z = -5.20$, $p_{bonf} < 0.001$; OR = 0.08, 95% CI [0.05, 0.1], $SE = 0.04$, $z = 4.64$, $p_{bonf} < 0.001$, respectively). In contrast, in the internet-addicted group, parents reported more problems with cutting down on internet use (OR = 5.97, 95% CI [0.16, 0.21], $SE = 1.51$, $z = 7.08$, $p_{bonf} < 0.001$) and dysfunctional coping (OR = 6.68, $SE = 1.74$, $z = 7.31$, $p_{bonf} < 0.001$) compared to their children.

4. Discussion

The present study examined the role of parental practices, family functioning, and monitoring behaviours on adolescents' IA in two groups of parents: those exhibiting IA symptoms and those without. In addition, we directly assessed the associations between symptoms of IA in parents and adolescents in those two groups of parents. Our findings indicate that the prediction of IA in adolescents

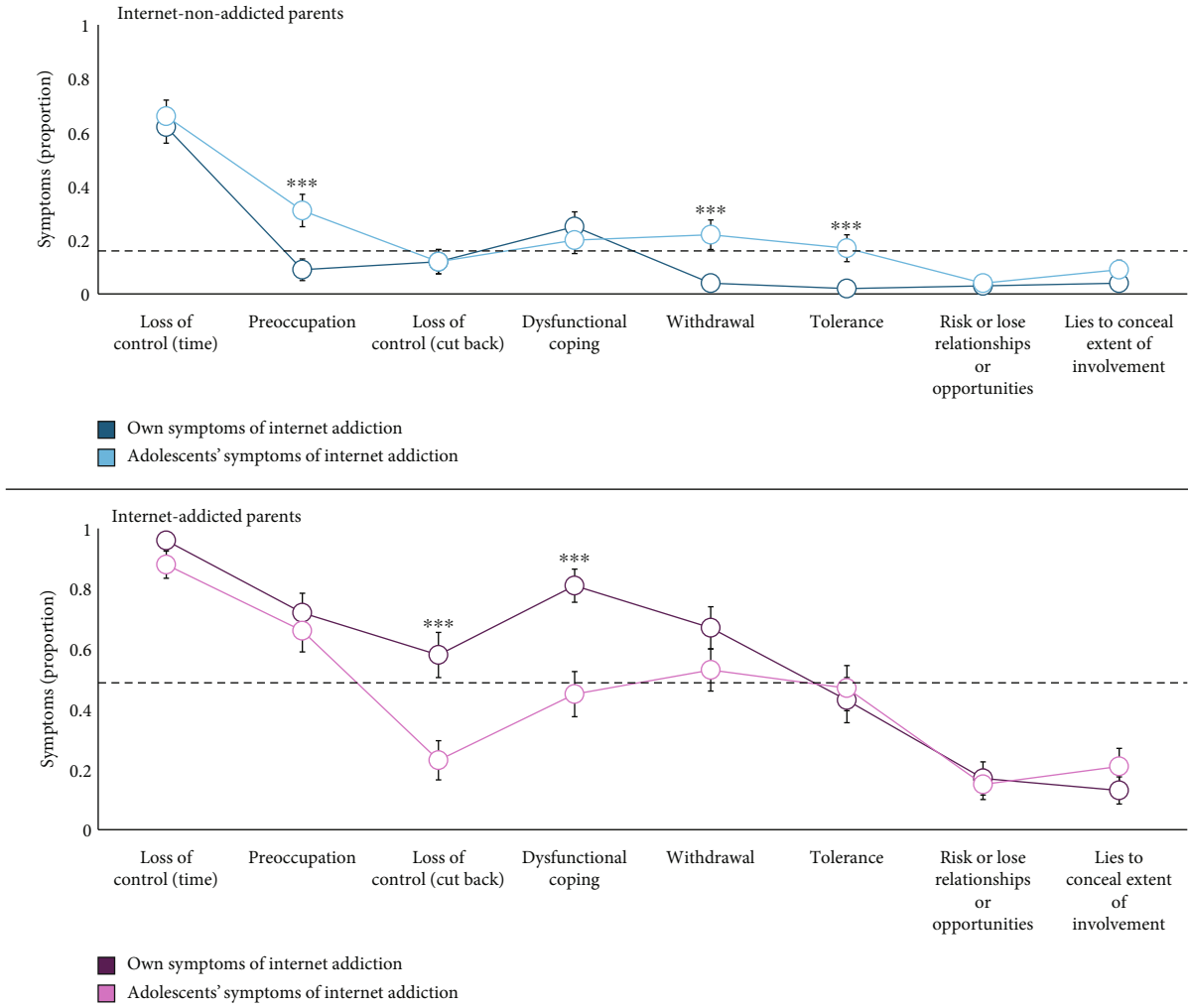

FIGURE 3: Symptoms of IA among the internet-nonaddicted and internet-addicted groups of parents and their adolescents. *Note*. Dashed black lines in each plot indicate the mean level of symptoms of problematic internet use. Asterisks denote significant differences between the symptoms in parents and their adolescents in each group ($p < 0.001$).

varies according to the IA status of their parents. Specifically, among parents who are not internet addicted, inconsistent parenting emerges as the primary predictor of IA in adolescents, while internet-addicted parents exert their influence through general family functioning. Moreover, we observed distinct patterns of perceived IA symptoms in parents. Parents who are not internet addicted perceived their symptoms as less severe compared to their adolescents. In contrast, parents who are internet addicted perceived their symptoms as more severe than those of their adolescents. Interestingly, in both groups, the most commonly perceived symptom of internet addiction—reported by parents for both themselves and their adolescents—was loss of control, primarily defined as spending more time online than intended. However, this may inaccurately imply that adolescents' own perceptions of their symptoms were measured.

4.1. Factors Predicting Adolescents' IA in Internet-Addicted and Nonaddicted Parents. Consistent with our hypothesis that parenting practices and family functioning predict IA in adolescents, our results demonstrated that in the nonaddicted parent group, inconsistent discipline was the only significant predictor of adolescent IA, although it can be within a manageable level, but this should be explored further. This finding implies that parents who generally adopt inconsistent discipline practices may face greater challenges in adhering to rules and establishing an appropriate framework and guidance for their children. Consequently, they may struggle to foster healthy internet-related behaviours among their children. This result concurs with previous studies observing a positive association between inconsistent parenting and problematic internet use among adolescents [63]. Supporting this, Miltuze et al. [64] found that the consistent application of general and internet-specific rules is linked to a reduced risk of IA in children. Their study also revealed that the establishment of parental rules concerning the use of electronic screen devices, as reported by the child, functions as a protective measure against the development of IA. In contrast, the outright prohibition of internet use by parents did not seem to offer the same protective effect. Similarly, another study among Dutch adolescents showed that

the establishment of parental rules concerning the content accessed online can play a preventive role in regulating IA [65]. Although our study did not focus on internet-related discipline practices, it is plausible to draw a parallel with existing evidence suggesting that parents who struggle to consistently enforce general boundaries and rules may face similar challenges in establishing and maintaining rules about their children's internet use [66].

Several psychosocial mechanisms have been proposed to link inconsistent parental discipline with early adolescent behaviours [67]. One such mechanism highlights the negative impact of inconsistent parental discipline on the development of a positive self-concept in children [68]. This impact often results in reduced confidence in offline settings, leading adolescents to spend excessive time online seeking validation and affirmation [69, 70]. Additionally, previous studies suggest that adolescents with low self-concept are more susceptible to IA due to psychological vulnerabilities such as self-distrust and a sense of loss of control and failure [71, 72]. This aligns with the attachment perspective in the development of psychopathology, where dysfunctions in adult–child attachment intersect with attachment insecurities such as anxiety and avoidance [23]. Additionally, our findings contribute to attachment theory by demonstrating that IA is not solely a behavioural issue but also a relational–attachment issue. While traditional attachment research has mainly explored the relationship between different attachment styles and offline behaviours, such as excessive reassurance-seeking in social interactions (i.e., [73]), our findings extend this theoretical framework into digital contexts. Specifically, we propose that adolescents who experience inconsistent parental discipline may turn to excessive internet use as an alternative source of security, validation, and emotional regulation. That way, IA may serve as a compensatory mechanism for insecurely attached adolescents, further integrating digital behaviours into the attachment theory.

Our results also showed that among the internet-addicted parent group, general family functioning and parent gender were significant predictors of adolescent IA. In families where parents struggle with IA, research consistently demonstrates a pattern of low family functioning, which can elevate the risk of IA among adolescents. Prior studies have highlighted the adverse effects of IA on family functioning [74, 75]. Our findings align with this, revealing that families with parental addiction exhibit diminished family functioning, subsequently increasing the propensity for IA among adolescents as supported by various studies (i.e., [76, 77]).

The negative impact of family dysfunction on adolescent IA can be attributed to a complex family environment characterised by a deficiency in familial resources and inadequate collaborative decision-making and nurturing responsibilities among parents [78, 79]. In such environments, individuals often struggle to form and sustain warm, supportive relationships [80]. These families typically lack mutual support, guidance, and the quality time necessary for healthy interactions [78, 79]. This lack of emotional support and nurturing can drive adolescents to seek fulfilment, relational bonds, and a sense of belonging in the virtual world [81]. When their fundamental psychological needs are unmet by their families, adolescents may turn to the internet for escapism or emotional support, significantly increasing their vulnerability to IA [74, 82, 83].

Our regression analysis indicated that parents' gender was also a significant predictor of adolescents' IA among the internet-addicted parent group. However, additional analyses assessing the parent's gender as a predictor of adolescent IA on the internet-addicted group of parents provided very weak evidence for this effect. Previous research has reported mixed findings on the impact of parents' gender on adolescent IA. For example, some research has linked gender differences to variations in parenting style, internet use, and addiction [84, 85]. There is also evidence indicating significant discrepancies between male and female parents in judging child's behaviour [86]. For instance, male parents generally reported fewer internalising and externalising behaviours compared to female parents do; also, maternal care, but not paternal care, is negatively associated with IA in adolescents [25]. However, some studies argue that gender does not alter the relationship between parenting style and IA [27, 87, 88]. Previous research has highlighted the different responses of fathers and mothers to their adolescents' internet use. For example, studies have shown that mothers generally have a greater awareness of their children's online activities compared to fathers [89]. In contrast, fathers are often more proactive than mothers in engaging with their children's online activities [90]. These findings indicate that both fathers and mothers play crucial, yet distinct and independent roles in influencing adolescents' IA. Our study may not have identified gender as a strong predictor of adolescent IA because it did not account for these differing roles that mothers and fathers play in preventing IA. Additionally, the nonsignificant effect may be due to our omission of the quality of the perceived parent–adolescent relationship, which prior research has identified as a significant protective factor against adolescent IA in gender-specific associations [91].

4.2. The Links Between Perceived IA Symptoms in Parents and Adolescents. Our findings indicate generally similar patterns of IA symptoms between parents and their children in both internet-addicted and noninternet-addicted groups. This suggests a mutual dependency between parental and adolescent IA, underscoring the significant role parents play as behavioural models [21]. The findings further extend social learning theory by highlighting how observational learning occurs in digital environments, where both adaptive and maladaptive behaviours—such as excessive internet use—are modelled and reinforced within the family unit. However, parents addicted to the internet tend to view their children's internet use as less severe than their own, while noninternet-addicted parents perceive their children's internet use as more problematic than their own. This disparity can be understood through the lens of normalisation theory, which suggests that behaviours become perceived as more attractive and less problematic when they are widespread and socially accepted [22, 92]. In the context of our findings, it can be argued that internet-addicted parents have

normalised their excessive internet use, considering it standard and nonproblematic. Consequently, they may see their children's internet use as less severe, reflecting a higher tolerance and more permissive attitude towards such behaviours. This aligns with existing research linking parental tolerance and permissive parenting to IA among adolescents [84]. On the other hand, noninternet-addicted parents, who have not normalised excessive internet use, are more likely to set a lower threshold for what they deem problematic. This perspective likely leads them to view their children's internet use as more concerning. Our findings contribute to normalisation theory by demonstrating how parental perceptions of internet use shape their assessment of their children's behaviour, reinforcing the idea that the acceptability of a behaviour influences its perceived severity. Moreover, this study extends normalisation theory by demonstrating that the normalisation process applies beyond traditional risk behaviours (i.e., substance use) and occurs not only at a societal level but also within smaller social systems, such as families.

Another notable finding was that the most commonly perceived IA symptom among both parents and adolescents was spending more time online than intended, indicating a loss of control over time. This symptom was prevalent in both internet-addicted and noninternet-addicted groups of parents, highlighting that time distortion while online is a widespread issue regardless of addiction status. This pattern can be attributed to several factors inherent in modern digital platforms, which are deliberately designed to maximise user engagement through a continuous stream of content and activities, creating an environment that encourages prolonged use [93]. The anticipation and excitement of unpredictable content trigger the brain's reward system, promoting extended online engagement beyond initial intentions [94]. Additionally, the effortless access to digital content further complicates time management, making it challenging for users to regulate their online activity effectively [95]. This ease of access often distorts users' sense of time, increasing the likelihood of prolonged usage and the potential for addictive behaviours [96]. The consistent reporting of this symptom among both internet-addicted and noninternet-addicted individuals underscores a broader challenge in managing digital consumption. It highlights that the pervasive nature of digital platforms affects all users, necessitating greater awareness and strategies to manage internet use effectively. This finding also emphasises the importance of advocating for more responsible design practices in digital platforms to mitigate the risks of excessive use.

In our study, both internet-addicted and nonaddicted parents, as well as their adolescents, exhibited low scores for the symptoms related to "risk or loss of relationships or opportunities" and "lying to family members, therapists, or others to conceal the extent of internet use." This result could be attributed to parents being the sole informants for both questionnaires, possibly finding these symptoms too embarrassing to acknowledge fully. Another plausible explanation is that the measure used to assess IA was adapted from pathological gambling criteria, which may not accurately capture the symptomatology specific to IA.

4.3. Advantages and Limitations of the Present Study. There are some limitations to consider. Firstly, while the cross-sectional design provides a snapshot of relationships between the studied variables, adopting longitudinal methodologies in future research could more clearly determine causality. Additionally, our sample was restricted to early and middle adolescents, which limits the generalisability of our findings across the entire adolescent age spectrum. Incorporating multiple data sources in future research could offer a more comprehensive view and potentially mitigate overestimations due to shared method variance. For instance, parents may exhibit biases when reporting their own internet use due to the common issue of denial associated with problematic behaviours [97]. Conversely, parents tend to overrate their adolescents' level of internet gaming disorder compared to expert assessments [98], while adolescents often underrate their own addictive behaviours [99]. To address these potential biases, future research could incorporate objective metrics, such as screen time data, to provide a more accurate assessment of internet use.

There is also evidence suggesting that parental attributions can affect perceived behaviours in children. For instance, parents experiencing higher levels of depression or anger may perceive their children as exhibiting more problematic behaviours [100, 101]. While these attribution biases may lead some studies to question the reliability of parental reports [102, 103], the attribution bias context model emphasises that each parent provides unique insights into a child's functioning. This model considers complex factors beyond simple attribution biases and accounts for the context in which an activity is observed [104]. Therefore, using parental assessments to evaluate a child's problematic internet use is valid, as these observations reflect real dynamics within different settings [105]. Nevertheless, the similarity of IA symptoms patterns between parents and children in our study may be influenced by the fact that parents provided responses for both themselves and their children. For a more accurate assessment, future research should ideally gather separate IA responses from both parents and adolescents.

Despite the above limitations, our findings carry significant practical implications for addressing adolescent IA. First, our research indicates that the prevention of IA in adolescents is fundamentally a family matter. Educating parents about their own internet habits and their influential role as models is crucial in fostering a more comprehensive approach to preventing IA among youths. Second, our results provide valuable insights for practitioners working with families of adolescents. Practitioners should evaluate the IA levels of parents when addressing adolescent IA. For parents not exhibiting IA symptoms, guidance on setting and maintaining clear, consistent boundaries is essential. Conversely, for parents who do experience IA symptoms, interventions should support them in cultivating a healthier family environment. This includes teaching skills for joint decision-making, fostering parental responsibilities, and promoting emotional support and quality family interactions. Third, the finding that losing track of time is the most prevalent symptom among both IA-addicted and nonaddicted parents, as well as their adolescents, underscores the need for interventions focusing on time management and digital literacy. Implementing strategies that address these

areas can mitigate excessive internet use and lower the risk of IA across all family members. One way forward to effectively tackle adolescent IA is implementing a holistic approach that involves the entire family, not just the adolescents. Digital programs should include features that evaluate and support parents' internet use, encouraging them to serve as positive role models. Furthermore, family counselling should incorporate methods that comprehensively address excessive internet use within the family unit. Adopting these strategies can foster healthier, more balanced family relationships and reduce the risk of IA for everyone involved.

4.4. Countermeasures. Our findings indicate that inconsistent discipline among nonaddicted parents is a key predictor of adolescent IA. To mitigate this, parents should establish clear and consistent digital boundaries, including defined screen time limits, guidelines for online activities, designated device-free zones (e.g., no phones during meals or bedtime), and appropriate online behaviour. However, beyond enforcing rules, it is important for parents to engage in open discussions with their children about the reasoning behind these boundaries and the potential consequences of excessive internet use. Encouraging collaborative decision-making can help adolescents develop self-regulation skills and a more responsible digital consumption. For parents struggling with IA themselves, seeking guidance or professional support can be beneficial in fostering healthier online habits. Modeling balanced digital behaviours and prioritising face-to-face interactions can reinforce positive family interactions and reduce the risk of IA among adolescents.

Schools can play a critical role in the prevention and early intervention of IA among adolescents. Actively integrating digital literacy education into existing curricula can equip adolescents with knowledge and skills to explore the digital world more responsibly. Schools can also extend their reach by offering workshops for parents, providing them knowledge to recognise early signs of IA and practical strategies for establishing digital rules and offline family engagement. Policymakers can further support these efforts by promoting family-centred interventions that empower parents and educators. Government-supported community programs on digital parental can help families develop effective digital strategies and encourage open discussions about healthy internet use. Additionally, public awareness campaigns—potentially in collaboration with schools and mental health organisations—can provide parents with accessible resources and tools to prevent and address IA.

These recommendations reflect a multisystemic understanding of human behaviour, highlighting the need for coordinated efforts across families, schools, and policymakers. By leveraging existing support networks and promoting digital well-being initiatives, we can foster healthier online habits among adolescents and their families.

Data Availability Statement

All anonymised raw data supporting the findings of this study are openly available via the Open Science Framework (OSF) at https://osf.io/u3fcn/ (doi:10.17605/OSF.IO/U3FCN).

Ethics Statement

The study was performed in line with the principles of the Declaration of Helsinki and in accordance with the BPS Ethics code of conduct. Approval was granted by the Ethics Committee of Bournemouth University. Electronic informed consent was obtained from all participants included in the study.

Disclosure

The funder played no role in the study design; in the collection, analysis, and interpretation of data; in the writing of the report; or in the decision to submit for publication. The findings herein reflect the work and are solely the responsibility of the authors.

Conflicts of Interest

The authors declare no conflicts of interest.

Author Contributions

Conceptualization and design: R.A. and C.P.; data collection: C.P.; data preparation: A.Y.; formal analysis and investigation: A.Y.; writing—original draft preparation: C.P. and A.Y.; writing—review and editing: C.P., A.Y., and R.A.; funding acquisition: C.P. and R.A.

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Supporting Information

Additional supporting information can be found online in the Supporting Information section. *(Supporting Information)* The following Supporting Information are provided and attached as a separate document to accompany the manuscript: Supporting Section 1: Detailed demographic data of the study participants. Supporting Section 2: Bayesian multiple Regression 1 and Bayesian multiple Regression 2. Supporting Section 3: Generalised linear mixed model. These materials are intended to provide additional context and support for the findings presented in the manuscript.

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