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Relationship between internet addiction and behavioural problems Among adolescents: A Cross-Sectional Study in selected Schools of Bengaluru, India

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ABSTRACT

Background

With the rapid development of digital technologies and the increasing access to the Internet, Internet addiction has become a serious public health problem among adolescents. Excessive internet use has been associated with a variety of psychological, emotional, behavioural and academic problems. Adolescent behavioural problems can have negative effects on social relationships, academic achievement and general well-being. Understanding the relationship between internet addiction and behavioural problems is essential for developing effective preventive and intervention strategies.

Aim

To assess the relationship between internet addiction and behavioural problems among adolescents in selected schools of Bengaluru.

Methods

A descriptive cross-sectional study was conducted among 300 adolescents studying in selected schools of Bengaluru using a non-probability convenience sampling technique. Data were collected using a structured sociodemographic questionnaire, Young's Internet Addiction Test (IAT), and the Strengths and Difficulties Questionnaire (SDQ). Descriptive statistics were used to summarize the data. Spearman's rank correlation coefficient was applied to determine the relationship between internet addiction and behavioural problems. Chi-square and Fisher's exact tests were used to assess the association between study variables and selected sociodemographic characteristics.

Results

Among the 300 participants, 33.7% had mild internet addiction, 32.3% had moderate internet addiction, 32.3% had normal internet use, and 1.7% had severe internet addiction. As for behavioural problems, 67.0% of the adolescents were in the normal range, 19.3% were at risk and 13.7% had clinically significant behavioural problems. There was a statistically significant weak positive correlation between internet addiction and behavioural problems (Spearman's rho = 0.22, p = 0.01). Significant association was found between internet addiction and variables like class, daily duration of internet use, academic performance and frequently used internet platform. Significant associations were found between class, daily use of internet, family income and frequently used internet platform with behavioural problems.

Conclusion

The study demonstrated a significant positive relationship between internet addiction and behavioural problems among adolescents. Although the association was weak, excessive internet use was linked with increased behavioural difficulties. School-based mental health interventions, early screening, parental guidance, and behavioural interventions may help reduce problematic internet use and improve adolescents' psychological well-being.

Keywords: Adolescents; Behavioural problems; Internet addiction; Mental health; School students.

INTRODUCTION

Adolescence is a pivotal period of physical, cognitive, emotional, and social development. During this stage, young people increasingly use the internet for education, communication, entertainment, and social networking. Although internet use offers numerous educational and social benefits, excessive and uncontrolled use has emerged as a significant public health concern because of its adverse effects on mental health, academic performance, behaviour, and interpersonal relationships. The World Health Organization (2019) has recognized problematic digital behaviours as an important area requiring greater attention to promote healthy technology use among young people.

Internet addiction, also referred to as problematic internet use, was first described by Young (1998) as excessive or poorly controlled internet use that results in impairment or distress. Adolescents are particularly vulnerable because of their developmental stage, emotional sensitivity, increased autonomy, and widespread access to smartphones and digital devices. Previous studies have shown that excessive internet use is associated with sleep disturbances, poor academic

performance, anxiety, depression, reduced physical activity, and impaired family and peer relationships (Kuss et al., 2013; Lam, 2014; Kuss & Lopez-Fernandez, 2016; Anderson et al., 2017; Rich et al., 2021; Wang et al., 2025).

Behavioural problems during adolescence, including emotional symptoms, conduct problems, hyperactivity, peer relationship difficulties, and reduced prosocial behaviour, can negatively affect academic achievement, social adjustment, and overall psychological well-being. Research suggests that excessive internet use may contribute to these behavioural difficulties by disrupting sleep patterns, reducing face-to-face social interaction, impairing emotional regulation, and increasing exposure to inappropriate online content. Conversely, adolescents experiencing emotional or behavioural problems may increasingly rely on the internet as a coping strategy, resulting in a bidirectional relationship between problematic internet use and behavioural problems (Restrepo et al., 2020; Wang et al., 2025).

Although several studies have reported an association between problematic internet use and behavioural or psychological problems among adolescents (Kuss et al., 2013; Anderson et al., 2017; Restrepo et al., 2020; Wang et al., 2025), relatively few studies have examined the relationship between internet addiction, behavioural problems, and selected sociodemographic characteristics among school-going adolescents in Bengaluru. Therefore, the present study was undertaken to assess the relationship between internet addiction and behavioural problems among adolescents in selected schools of Bengaluru. The findings may help psychiatric nurses, teachers, parents, psychologists, and other mental health professionals identify adolescents at risk and develop effective school-based prevention, counselling, and mental health promotion programmes.

MATERIALS AND METHODS

Study Design

A descriptive cross-sectional study was conducted to assess the relationship between internet addiction and behavioural problems among adolescents studying in selected schools of Bengaluru, Karnataka.

Study Setting

The study was conducted in two selected schools in Bengaluru, Karnataka: Jai Gopal Garodia Rasthotthana Vidya Kendra and ITI Central School. These schools were selected based on feasibility and administrative permission.

Study Population

The study population comprised adolescents aged 13–17 years studying in classes VIII, IX, and X in the selected schools during the study period.

Sample Size and Sampling Technique

A total of 300 adolescents participated in the study. Participants were selected using a non-probability convenience sampling technique. A pilot study was conducted among 30 adolescents to assess the feasibility of the study and the reliability of the research instruments.

Eligibility Criteria

Inclusion Criteria

- Adolescents aged 13–17 years.
- Students studying in classes VIII, IX, and X.
- Students present during data collection.
- Students who provided assent and whose parents/guardians provided written informed consent.

Exclusion Criteria

- Adolescents with known psychiatric disorders or cognitive impairment that could interfere with questionnaire completion.
- Students who were absent during data collection.
- Students who declined to participate.

STUDY INSTRUMENTS

Sociodemographic Questionnaire

A structured questionnaire was used to collect information regarding age, gender, class, family type, parental education, family income, duration of daily internet use, purpose of internet use, frequently used internet platform, academic performance, and other relevant characteristics.

Internet Addiction Test (IAT)
Internet addiction was measured by Young's Internet Addiction Test (IAT) . It is a standardised self-report questionnaire of 20 items. Each item is rated on a Likert scale, with higher scores indicating greater severity of internet addiction. The internet addiction was classified as normal, mild, moderate and severe based on the total score.
Strengths and Difficulties Questionnaire (SDQ)
Behavioural problems were assessed using the Strengths and Difficulties Questionnaire (SDQ) comprising 25 items covering five domains: emotional symptoms, conduct problems, hyperactivity/inattention, peer relationship problems and prosocial behaviour. A total difficulties score was derived using standard scoring guidelines and participants were classified as normal, borderline (at risk) or abnormal (clinically significant).

Validity and Reliability
The content validity of the study instruments was established by a panel of experts which included faculty members of psychiatric nursing and psychiatrists. In the pilot study, the reliability test was performed using the split-half method. The reliability coefficient was 0.87 for the Internet Addiction Test and 0.82 for the Strengths and Difficulties Questionnaire, indicating good internal consistency.

Data Collection Procedure
Administrative permission was obtained from the school authorities prior to the start of the study. Informed written consent was obtained from the parents or guardians of the participating adolescents and assent was obtained from the adolescents the participants were informed about the study's purpose, the voluntary nature of participations, the confidentially of information, and their right to withdrawn from the study at any time without any academic repercussions. The questionnaires were administered in classroom settings with the investigator present. Participants completed the questionnaires independently and clarification was provided
The average time taken to complete the questionnaires was approximately 20–30 minutes.

Ethical Considerations
Ethical approval for the study was obtained from the Institutional Ethics Committee of Ramaiah Institute of Nursing Education and Research, Bengaluru, before data collection. Administrative permission was obtained from the respective school authorities. Confidentiality and anonymity of participants were maintained throughout the study. All procedures were conducted in accordance with the ethical principles outlined in the Declaration of Helsinki.

Statistical Analysis
Data were entered into Microsoft Excel and analysed using IBM SPSS Statistics software. Descriptive statistics, including frequency, percentage, mean, and standard deviation, were used to summarize participant characteristics and study variables. The normality of the data was assessed using the Kolmogorov–Smirnov and Shapiro–Wilk tests. As the data were not normally distributed, Spearman's rank correlation coefficient was used to determine the relationship between internet addiction and behavioural problems. Associations between study variables and selected sociodemographic characteristics were analysed using the Chi-square test or Fisher's exact test, as appropriate. A p-value of <0.05 was considered statistically significant.

RESULTS
Participant Characteristics
A total of 300 adolescents were included in the study. Most participants were 14 years of age (34.0%), followed by those aged 15 years (29.7%), 16 years (22.7%), 13 years (10.0%), and 17 years (3.6%). Female participants comprised a slightly larger proportion of the sample (53.3%; $n = 160$) than males (46.7%; $n = 140$). Regarding educational level, the highest proportion of adolescents were studying in Class IX (41.0%), followed by Class X (37.0%) and Class VIII (22.0%). The majority of participants belonged to nuclear families (74.0%), and smartphones were the most commonly used device for accessing the internet (86.7%).

Internet Addiction Among Adolescents
Based on Young's Internet Addiction Test (IAT), 97 (32.3%) adolescents had normal internet use, 101 (33.7%) had mild internet addiction, 97 (32.3%) had moderate internet addiction, and 5 (1.7%) had severe internet addiction (Table 1). Mild internet addiction was the most common category observed among the participants.

Table 1. Distribution of participants according to the level of internet addiction (N = 300)

Internet addiction level	Frequency (n)	Percentage (%)
Normal	97	32.3
Mild	101	33.7
Moderate	97	32.3
Severe	5	1.7

Behavioural Problems Among Adolescents

Assessment using the Strengths and Difficulties Questionnaire (SDQ) revealed that 201 (67.0%) adolescents were within the normal range, 58 (19.3%) were classified as borderline (at risk), and 41 (13.7%) were classified as having clinically significant behavioural problems (Table 2).

Table 2. Distribution of participants according to behavioural problems (N = 300)

Behavioural problems	Frequency (n)	Percentage (%)
Normal	201	67.0
Borderline (At risk)	58	19.3
Clinically significant	41	13.7

The mean scores for the SDQ subscales were as follows: emotional symptoms (3.62 ± 2.33), conduct problems (2.92 ± 1.89), hyperactivity/inattention (3.03 ± 1.70), and peer relationship problems (3.75 ± 2.05).

Relationship Between Internet Addiction and Behavioural Problems

Spearman's rank correlation analysis demonstrated a statistically significant weak positive correlation between internet addiction and behavioural problems (Spearman's rho = 0.22, $p = 0.01$). The findings indicate that higher levels of internet addiction were associated with increased behavioural problems among adolescents.

Table 3. Correlation between internet addiction and behavioural problems

Variables	Spearman's rho	*p* value
Internet addiction and behavioural problems	0.22	0.01*

Statistically significant at $p < 0.05$.

Association Between Internet Addiction and Selected Sociodemographic Variables

Internet addiction showed statistically significant associations with class of study ($p < 0.001$), daily duration of internet use ($p = 0.005$), academic performance ($p < 0.001$), and frequently used internet platform ($p = 0.001$). No statistically significant association was observed between internet addiction and gender.

Association Between Behavioural Problems and Selected Sociodemographic Variables

Behavioural problems were significantly associated with class of study ($p < 0.001$), daily duration of internet use ($p = 0.002$), monthly family income ($p = 0.029$), and frequently used internet platform ($p < 0.001$). Other sociodemographic variables did not demonstrate statistically significant associations.

Overall, the findings suggest that excessive internet use is associated with behavioural difficulties among adolescents and that several demographic and internet-use characteristics influence these outcomes.

DISCUSSION

The present study assessed the relationship between internet addiction and behavioural problems among adolescents in selected schools of Bengaluru. The findings indicate that problematic internet use is common among adolescents and is significantly associated with behavioural problems, highlighting the need for early identification and intervention.

The present study found that **33.7% of adolescents had mild internet addiction, 32.3% had moderate internet addiction, and 1.7% had severe internet addiction**. Although severe internet addiction was relatively uncommon, a considerable proportion of adolescents experienced mild to moderate levels of problematic internet use. These findings are consistent with those reported by **Restrepo et al. (2020)**, who found that problematic internet use was prevalent among children and adolescents and was associated with functional impairment and psychiatric symptoms. Similarly, **Rich et al. (2021)** reported that increasing smartphone ownership and unrestricted internet accessibility have contributed to rising levels of problematic internet use among adolescents. Furthermore, **Wang et al. (2025)**, in a systematic review and meta-analysis, concluded that problematic internet use has become a growing public health concern among adolescents worldwide.

Regarding behavioural problems, **67.0% of participants were within the normal range, 19.3% were at risk, and 13.7% had clinically significant behavioural problems**. Although the majority of adolescents did not exhibit significant behavioural difficulties, nearly one-third experienced emotional or behavioural problems that could adversely affect their academic performance, interpersonal relationships, and psychological well-being. Similar findings were reported by **Restrepo et al. (2020)**, who demonstrated that problematic internet use was associated with emotional, behavioural, and psychiatric difficulties among adolescents. Likewise, **Anderson et al. (2017)** observed that excessive internet use during adolescence was associated with poorer psychosocial adjustment and increased behavioural problems.

The present study demonstrated a **statistically significant weak positive correlation between internet addiction and behavioural problems (Spearman's rho = 0.22, p = 0.01)**, indicating that behavioural difficulties tend to increase with increasing levels of internet addiction. This finding is consistent with the systematic review by **Kuss and Lopez-Fernandez (2016)**, which concluded that excessive internet use is associated with emotional symptoms, conduct problems, hyperactivity, and peer relationship difficulties. Similarly, **Wang et al. (2025)** reported a significant association between problematic internet use and poor mental health outcomes among adolescents, including behavioural and emotional problems. The relatively weak correlation observed in the present study may be explained by the influence of other factors such as parental supervision, family environment, coping skills, and individual personality characteristics, which were not examined in the present study.

The present study also found significant associations between internet addiction and **class of study, duration of daily internet use, academic performance, and frequently used internet platform**. Behavioural problems were significantly associated with **class of study, daily duration of internet use, monthly family income, and frequently used internet platform**, whereas no significant association was observed between gender and internet addiction. These findings are comparable with those of **Lam (2014)**, who identified duration of internet use and environmental factors as important predictors of problematic internet use among adolescents. Likewise, **Kuss et al. (2013)** reported that prolonged internet use and easy accessibility to digital devices significantly increased the risk of internet addiction among adolescents.

Overall, the findings of the present study emphasise the importance of school-based mental health programmes, routine screening for problematic internet use, psychoeducation, parental involvement, and counselling services. Early identification and timely intervention may help reduce problematic internet use, minimise behavioural problems, and promote healthy psychological development among adolescents.

Strengths and Limitation.

Strengths

The current study has several strengths. First, the sample size of 300 adolescents from two schools was fairly large and increased the reliability of findings. Second, internet addiction and behavioural problems were assessed using standardised and validated instruments, the internet addiction test(IAT) and the strengths and difficulties questionnarie9 SDQs). Third, ethical principles were strictly adhered to including informed consent, participant assent and confidentiality. Finally, the study examined not only the prevalence of internet addiction and behavioural problems but also their relationship and associations with selected sociodemographic variables, providing comprehensive evidence relevant to adolescent mental health.

LIMITATIONS

The study has certain limitations that should be considered while interpreting the findings. The cross-sectional design does not permit conclusions about the causal relationships between internet addiction and behavioural problems. The study was limited to only two selected schools in Bengaluru using a non -probability convenience sampling technique, which may limit the generalisability of findings to other adolescent populations. Data were collected using self-administered questionnaires, which may be subject to recall and social desirability biases. Moreover, the parental monitoring, personality traits, academic stress, family relationship and pre-existing psychological conditions were not studied and may have influenced the results of the study.

Implications for Clinical Practice and Future Research

The findings of this study have important implications for adolescent mental health. Routine screening for internet addiction and behavioural problems should be incorporated into school health programmes to enable early identification and timely intervention. School mental health professionals, psychiatric nurses, psychologists, teachers, and parents should work together to promote healthy digital habits, improve emotional well-being, and provide appropriate counselling for adolescents at risk.

Mental health education on responsible internet use, time management, stress management, and healthy coping strategies should be integrated into school curricula. Parents should also be encouraged to monitor internet use and support balanced academic, recreational, and social activities.

Future research should involve larger, multicentre, and longitudinal studies to better understand the long-term relationship between internet addiction and behavioural problems. Further studies evaluating school-based and family-centred interventions are recommended to identify effective strategies for preventing problematic internet use and promoting adolescent mental health.

CONCLUSION

The present study found that internet addiction is common among adolescents, with most participants demonstrating mild to moderate levels of problematic internet use. Although the majority of adolescents did not exhibit significant behavioural problems, a considerable proportion were identified as being at risk or having clinically significant behavioural difficulties. A statistically significant weak positive correlation was observed between internet addiction and behavioural problems, indicating that increasing levels of internet addiction are associated with greater behavioural difficulties.

The findings highlight the need for early identification, regular mental health screening, and preventive interventions within school settings. Collaborative efforts involving psychiatric nurses, school health professionals, psychologists, teachers, parents, and policymakers are essential to promote healthy internet use, improve psychological well-being, and reduce behavioural problems among adolescents. The study contributes to the growing evidence on adolescent digital health and provides valuable information for planning school-based mental health programmes and future research.

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