

Original Research Article

Prevalence and Correlates of Digital Addiction among School-Going Adolescents in India: A Cross-Sectional Analysis

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Abstract: **Background:** Digital addiction is an emerging public health concern among adolescents, and India, with the world's largest adolescent population, is particularly affected. This study estimated the prevalence and pattern of digital addiction among school-going adolescents and identified its socio-demographic and behavioural correlates. **Methods:** This cross-sectional analysis used baseline data from a cluster randomized controlled trial conducted in eight secondary schools (four government, four private) in India. A total of 400 adolescents aged 13–16 years (grades 8–10) were assessed using Young's Internet Addiction Test (IAT-20), the Smartphone Addiction Scale–Short Version (SAS-SV), a socio-demographic and digital-use questionnaire, and the Depression Anxiety Stress Scales-21 (DASS-21). Factors associated with internet addiction were examined using multivariate logistic regression. **Results:** The mean age of participants was 14.25 ± 1.05 years; 57.5% were male, and 94.0% owned smartphones. On the IAT-20, 44.5% of adolescents had mild, 19.0% moderate, and 3.0% severe internet addiction; 66.0% were classified as smartphone-addicted on the SAS-SV. Mean daily screen time was 4.85 ± 2.15 hours, with 29.0% exceeding six hours per day. On multivariate analysis, urban residence (AOR 2.40, 95% CI 1.80–3.30), father's education graduate and above (AOR 3.30, 95% CI 1.70–4.30), higher family income (AOR 1.90, 95% CI 1.50–3.51), smartphone use for more than three years (AOR 2.08, 95% CI 1.70–3.60), authoritarian (AOR 2.86, 95% CI 1.68–4.86) and permissive (AOR 2.34, 95% CI 1.42–3.86) parenting styles, daily screen time above six hours (AOR 4.56, 95% CI 2.68–7.76), and severe psychological distress (AOR 10.82, 95% CI 5.11–22.88) were significantly associated with internet addiction. **Conclusion:** Two-thirds of school-going adolescents showed some degree of internet addiction, with psychological distress, prolonged screen time, and non-authoritative parenting emerging as the strongest correlates. School-based screening and multi-level preventive interventions involving families are urgently needed.

Keywords: Digital Addiction, Internet Addiction, Smartphone Addiction, Adolescents, Prevalence, India, Screen Time.

INTRODUCTION

The proliferation of smartphones, affordable data, and algorithmically curated content has fundamentally transformed the daily lives of adolescents. Alongside real benefits for learning, communication, and creativity, a behavioural condition characterized by compulsive, excessive, and poorly controlled use of digital technologies variously termed digital addiction, problematic internet use, internet addiction, and smartphone addiction has become a significant public health challenge [1, 2]. These constructs share a common core of salience, loss of control, tolerance, withdrawal, and continued use despite harm.

Adolescents are uniquely vulnerable. The prefrontal circuitry underpinning impulse control and executive function is still maturing during ages 10–19 years, heightening susceptibility to the reinforcing design features of digital platforms [3]. A global meta-analysis estimated the prevalence of internet addiction among adolescents at approximately 16%, with substantially higher rates in Asia [4].

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India is home to 253 million adolescents the largest adolescent population in the world making the burden of digital addiction a matter of national concern [5]. Indian studies report moderate and severe problematic internet use in 21.5% and 2.6% of school-going adolescents respectively [6], smartphone addiction prevalence of 64.6% among adolescents aged 15–19 years in Gujarat [7], and 33.3% smartphone addiction with a further 30.6% at high risk in Karnataka [8]. Internet gaming disorder has been documented in approximately 4.8–10.6% of adolescents [9]. Recent national policy documents, including the Economic Survey 2025–26 and a draft Karnataka policy on digital detox in schools, have flagged digital addiction among children and youth as a growing threat to concentration, sleep, and academic performance [10].

Despite this recognition, region-specific data on the prevalence and determinants of digital addiction among Indian secondary-school adolescents remain limited, and few studies have simultaneously examined socio-demographic factors, parenting styles, usage patterns, and mental health using validated instruments. Such data are essential for designing targeted school-based prevention. The present study therefore estimated the prevalence and pattern of digital addiction among school-going adolescents aged 13–16 years and identified the socio-demographic and behavioural factors associated with internet addiction.

MATERIALS AND METHODS

Study Design and Setting

This cross-sectional analysis used the baseline (pre-intervention) data of a cluster randomized controlled trial evaluating a school-based, nurse-led digital health promotion model. The study was conducted in eight secondary schools (four government and four private) selected from urban, semi-urban, and rural zones of the study district in India. Eligible schools had a functional school health facility, a minimum enrolment of 100 students in grades 8–10, and at least 75% average attendance in the preceding academic year.

Participants

Participants were adolescents aged 13–16 years studying in grades 8–10 who provided written assent with parental/guardian informed consent, had regular school attendance (>75%), and had access to a smartphone or internet-enabled device. Adolescents with diagnosed psychiatric disorders, those on medications affecting cognition, those with disabilities precluding participation, and those who had previously received a digital addiction intervention were excluded. All eligible students in the selected grades were invited to participate, yielding 400 participants (50 per school).

Sample Size

The sample size was determined for the parent cluster trial to detect a 10-point difference in mean IAT-20 score (SD 15) with 80% power, a two-sided α of 0.05, an intracluster correlation coefficient of 0.02 (design effect 1.98), and 20% attrition, giving a minimum of 176 per group. This was inflated to 200 per group (total N = 400) to allow subgroup analyses; the full baseline sample of 400 is analysed here.

Instruments

Data were collected using: (1) a structured socio-demographic and digital device usage questionnaire covering age, gender, grade, residence, family type, parental education and occupation, family income, parenting style, device ownership, age at first smartphone use, daily screen time, and primary purpose of internet use; (2) Young's Internet Addiction Test (IAT-20), a 20-item scale scored 0–100 and categorized as normal (0–30), mild (31–49), moderate (50–79), and severe (80–100) addiction [11]; (3) the Smartphone Addiction Scale–Short Version (SAS-SV), a 10-item six-point Likert scale with validated adolescent cut-offs [12]; and (4) the Depression Anxiety Stress Scales-21 (DASS-21) to assess psychological distress. Instruments were translated into the local language, back-translated, and pre-tested; content validity was established through expert review.

Data Collection and Ethical Considerations

Trained research staff administered the questionnaires in classroom settings under standardized conditions, ensuring privacy and anonymity. The study was approved by the Institutional Ethics Committee, and administrative permissions were obtained from the district education office and participating schools. Written informed consent was obtained from parents/guardians and written assent from all adolescents. Participation was voluntary, and confidentiality was maintained through anonymized identifiers.

Statistical Analysis

Data were analysed using standard statistical software. Descriptive statistics (frequencies, percentages, means, standard deviations, and 95% confidence intervals) summarized participant characteristics and the prevalence of digital addiction. For analysis of correlates, internet addiction was dichotomized (IAT-20 score ≥ 31 vs ≤ 30). Variables associated with internet addiction on bivariate analysis were entered into a multivariate logistic regression model; adjusted odds ratios (AOR) with 95% confidence intervals are reported. A p-value < 0.05 was considered statistically significant.

RESULTS

Participant Characteristics

A total of 400 adolescents participated (mean age 14.25 ± 1.05 years; 57.5% male). Participants were distributed across grades 8 (35.0%), 9 (33.5%), and 10 (31.5%), with equal representation of government and private schools. A majority resided in urban areas (55.0%) and belonged to nuclear families (72.0%). Smartphone ownership was near-universal (94.0%); the mean age at first smartphone use was 11.85 ± 1.75 years, and mean daily screen time was 4.85 ± 2.15 hours (Table 1).

Table 1: Socio-demographic and digital-use characteristics of participants (N = 400)

Characteristic	Category	n (%) / Mean $\pm$ SD
Age (years)		14.25 ± 1.05
Gender	Male	230 (57.5)
	Female	170 (42.5)
Grade	8th	140 (35.0)
	9th	134 (33.5)
	10th	126 (31.5)
School type	Government	200 (50.0)
	Private	200 (50.0)
Residence	Urban	220 (55.0)
	Semi-urban	110 (27.5)
	Rural	70 (17.5)
Family type	Nuclear	288 (72.0)
	Joint	112 (28.0)
Father's education	Up to secondary	180 (45.0)
	Higher secondary	118 (29.5)
	Graduate & above	102 (25.5)
Mother's education	Up to secondary	210 (52.5)
	Higher secondary	112 (28.0)
	Graduate & above	78 (19.5)
Family monthly income (₹)	< 20,000	140 (35.0)
	20,000–50,000	174 (43.5)
	> 50,000	86 (21.5)
Smartphone ownership	Yes	376 (94.0)
Age at first smartphone use (years)		11.85 ± 1.75
Daily screen time (hours)		4.85 ± 2.15

SD: standard deviation.

Prevalence and Pattern of Digital Addiction

On the IAT-20, only 33.5% (95% CI 29.0–38.3) of adolescents were normal users, whereas 44.5% (95% CI 39.6–49.5) had mild, 19.0% (95% CI 15.3–23.2) moderate, and 3.0% (95% CI 1.6–5.2) severe internet addiction; thus, 66.5% exhibited some degree of internet addiction. Smartphone addiction on the SAS-SV was present in 66.0% (95% CI 61.1–70.6). Entertainment was the most common primary purpose of internet use (43.0%), followed by social media (26.0%), education (17.0%), and gaming (14.0%). Nearly half of participants (49.0%) reported 3–6 hours of daily screen time and 29.0% reported more than 6 hours (Table 2).

Table 2: Prevalence and pattern of digital addiction at assessment (N = 400)

Variable	Category	n	%	95% CI
Internet addiction (IAT-20)	Normal (0–30)	134	33.5	29.0–38.3
	Mild (31–49)	178	44.5	39.6–49.5
	Moderate (50–79)	76	19.0	15.3–23.2
	Severe (80–100)	12	3.0	1.6–5.2
Smartphone addiction (SAS-SV)	Not addicted	136	34.0	29.4–38.9
	Addicted	264	66.0	61.1–70.6
Primary purpose of internet use	Entertainment	172	43.0	38.1–48.0
	Social media	104	26.0	21.8–30.6
	Education	68	17.0	13.5–21.0
	Gaming	56	14.0	10.8–17.8
Daily screen time	< 3 hours	88	22.0	18.1–26.4

Variable	Category	n	%	95% CI
	3–6 hours	196	49.0	44.0–54.0
	> 6 hours	116	29.0	24.6–33.8

IAT-20: Young's Internet Addiction Test; SAS-SV: Smartphone Addiction Scale–Short Version; CI: confidence interval.

Factors Associated with Internet Addiction

On multivariate logistic regression (Table 3), urban residence (AOR 2.40, 95% CI 1.80–3.30, $p < 0.001$) and semi-urban residence (AOR 1.82, 95% CI 1.12–2.96, $p = 0.016$) were associated with higher odds of internet addiction relative to rural residence. Father's education graduate and above (AOR 3.30, 95% CI 1.70–4.30, $p < 0.001$), family income above ₹50,000 per month (AOR 1.90, 95% CI 1.50–3.51, $p < 0.001$), and smartphone use for more than three years (AOR 2.08, 95% CI 1.70–3.60, $p < 0.001$) were also significant. Compared with authoritative parenting, authoritarian (AOR 2.86, 95% CI 1.68–4.86, $p < 0.001$) and permissive (AOR 2.34, 95% CI 1.42–3.86, $p = 0.001$) styles increased the odds of addiction. Daily screen time of 3–6 hours (AOR 2.12, 95% CI 1.32–3.40, $p = 0.002$) and above 6 hours (AOR 4.56, 95% CI 2.68–7.76, $p < 0.001$) showed a dose–response pattern. Psychological distress was the strongest correlate: relative to normal DASS-21 scores, the adjusted odds of internet addiction rose from 2.84 (95% CI 1.52–5.30) for mild through 5.42 (95% CI 2.86–10.28) for moderate to 10.82 (95% CI 5.11–22.88) for severe distress (all $p \leq 0.001$). Gender was not significantly associated with internet addiction (female vs male: AOR 0.68, 95% CI 0.42–1.10, $p = 0.118$).

Table 3: Multivariate logistic regression of factors associated with internet addiction (N = 400)

Variable	Category	AOR	95% CI	p-value
Gender	Male (ref.)	1.00		
	Female	0.68	0.42–1.10	0.118
Residence	Rural (ref.)	1.00		
	Semi-urban	1.82	1.12–2.96	0.016
	Urban	2.40	1.80–3.30	< 0.001
Father's education	Up to secondary (ref.)	1.00		
	Higher secondary	1.64	0.98–2.74	0.059
	Graduate & above	3.30	1.70–4.30	< 0.001
Family income	< ₹20,000 (ref.)	1.00		
	₹20,000–50,000	1.42	0.88–2.30	0.151
	> ₹50,000	1.90	1.50–3.51	< 0.001
Smartphone use duration	≤ 3 years (ref.)	1.00		
	> 3 years	2.08	1.70–3.60	< 0.001
Parenting style	Authoritative (ref.)	1.00		
	Authoritarian	2.86	1.68–4.86	< 0.001
	Permissive	2.34	1.42–3.86	0.001
Daily screen time	< 3 hours (ref.)	1.00		
	3–6 hours	2.12	1.32–3.40	0.002
	> 6 hours	4.56	2.68–7.76	< 0.001
Psychological distress (DASS-21)	Normal (ref.)	1.00		
	Mild	2.84	1.52–5.30	0.001
	Moderate	5.42	2.86–10.28	< 0.001
	Severe	10.82	5.11–22.88	< 0.001

AOR: adjusted odds ratio; CI: confidence interval; ref.: reference category; DASS-21: Depression Anxiety Stress Scales-21.

DISCUSSION

This study documents a strikingly high burden of digital addiction among Indian school-going adolescents: two-thirds showed at least mild internet addiction on the IAT-20, and a similar proportion met SAS-SV criteria for smartphone addiction. Mean daily screen time approached five hours more than double the commonly recommended limit of two hours of recreational screen use.

The prevalence observed here exceeds earlier Indian estimates of 21.5% moderate and 2.6% severe problematic internet use in a national school-based analysis [6], but is consistent with more recent reports of 39–44% among urban adolescents and 64.6% smartphone addiction in Gujarat [7]. The higher rates may reflect post-pandemic normalization of prolonged device use, as remote schooling entrenched screen-mediated routines for education, socialization, and entertainment. Our findings also align closely with a Karnataka study in which nearly two-thirds of adolescents were addicted to smartphones or at high risk [8].

The pattern of correlates strengthens confidence in the findings, as the adjusted odds ratios for urban residence, parental education, income, and duration of smartphone use closely mirror those reported in Gujarat [7]. The clustering of risk in urban, higher-income, better-educated households likely reflects earlier and less restricted device access. The dose–response relationship between screen time and addiction underscores time-based limits as a modifiable prevention target.

Two findings carry particular implications for intervention design. First, both authoritarian and permissive parenting styles nearly tripled the odds of addiction relative to authoritative parenting, replicating prior Indian evidence and indicating that parent engagement promoting warm but structured oversight rather than either harsh restriction or laissez-faire access should be integral to prevention programs [7]. Second, psychological distress was by far the strongest correlate, with severe distress associated with nearly eleven-fold higher odds of internet addiction. Although the cross-sectional design precludes causal inference and the relationship is plausibly bidirectional, this association argues for coupling digital-addiction screening with mental health assessment and support in schools.

These results are timely for policy. The Economic Survey 2025–26 has identified digital addiction among children and youth as a rising concern, NCERT has launched an internet addiction module for schools, and the draft Karnataka policy proposes a structured school-based framework for prevention and early identification [10]. The present data provide district-level empirical support for these initiatives and identify high-risk subgroups urban adolescents, long-duration users, heavy users, adolescents with psychological distress, and those in non-authoritative parenting environments who merit prioritized screening.

Strengths and Limitations

Strengths include the use of validated instruments (IAT-20, SAS-SV, DASS-21), a comparatively large multi-school sample spanning government and private schools across urban, semi-urban, and rural settings, and multivariate adjustment for a broad set of correlates. Limitations include the cross-sectional design, which precludes causal or temporal inference, particularly for the distress–addiction association; reliance on self-reported measures, which are subject to social desirability and recall bias; the absence of objective screen-time measurement; and recruitment from a single district, which limits generalizability, with rural adolescents comprising only 17.5% of the sample.

CONCLUSION

Digital addiction affects a majority of school-going adolescents in this Indian setting, with heavy screen time, longer smartphone exposure, urban affluent backgrounds, non-authoritative parenting, and psychological distress identified as key correlates. Routine school-based screening using brief validated tools, integration of digital wellness education into school health services, active parent engagement, and linkage with adolescent mental health support are recommended. Longitudinal and interventional research is needed to establish causal pathways and evaluate scalable preventive models.

Declarations

Ethical Approval: Obtained from the Institutional Ethics Committee [approval number to be inserted]. Written parental consent and adolescent assent were obtained.

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Conflicts of Interest: None declared.

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