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Prevalence of Mobile Phone Addiction and Its Ill-Effects on Physical and Mental Health among Pre-University College Adolescents in Bagalkot

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ABSTRACT

Background: Smart-phone use has become widespread among adolescents, raising concerns about addiction and its effects on physical and mental health. This study assessed the prevalence of mobile phone addiction and associated health vulnerabilities among pre-university students in Bagalkot.

Methods: A quantitative, descriptive cross-sectional study was conducted among 120 adolescents aged 17–18 years at Sakri Pre-University College, Bagalkot, using proportionate stratified random sampling. Data were collected using a validated, four-section, self-administered Google Forms questionnaire covering socio-demographic characteristics, smart-phone addiction, physical health, and mental health. Descriptive statistics, Chi-square tests, and Fisher's exact tests were used for analysis.

Results: Moderate and severe smart-phone addiction were observed in 49% and 30% of participants, respectively. Seventy-two students reported moderate physical health constraints, while 45% (54 students) had poor mental health. Among students with poor mental health, 64.8% belonged to the moderate addiction category. Socio-demographic variables were not significantly associated with addiction ($p > 0.05$), whereas daily usage duration, purpose of use, and peer/interpersonal influence showed significant associations ($p < 0.05$).

Conclusion: Moderate-to-severe smart-phone addiction affected 79% of participants, highlighting the need for institutional interventions, time-management counselling, and awareness programmes to promote responsible smart-phone use and adolescent well-being.

Key-words: Mobile Phone Addiction, Adolescents, Pre-University Students, Physical Health, Mental Health, Prevalence

INTRODUCTION

Smart-phone addiction acts as an impulse control disorder sharing clinical parallels with substance dependencies. Excessive screen engagement establishes core behavioral addiction symptoms: salience, tolerance, mood modification, withdrawal, conflicts, and relapse.

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Globally, Smart-phone addiction rates fluctuate widely between 2.4% and 60.3%, with India maintaining a pooled regional baseline near 60%. In Karnataka, data reveals a rising trend, scaling from 15.9% among rural youths up to 54.14% within specialized student groups. [1]
Mobile Phone Addiction/Smart-phone addiction could be categorized as a behavioral addiction, such as Internet addiction. Behavioral and chemical addictions have seven core symptoms in common, that is, salience, tolerance, mood modification, conflict, withdrawal, problems, and relapse. [2]
The prevalence of smart phone addiction varies widely at the global level (2.4%–60.3%), while in India it is notably

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high at around 60% (95% CI: 45%–73%), and in Karnataka it ranges from 15.9% among rural youth to about 43.9%–54.14% among medical students, indicating a significant and context-dependent burden. Overuse of mobile phone leads to behavioral addiction (MPA). This reflects in the everyday behavioral pattern of the patients. [3]

Majority of studies have examined the physical and mental health effects of mobile phone radiation leading to cancer, nervous system disorders and adverse procreative effects. Heavy use is also associated with many orthopedic related problems like Text Claw Elbow and Text Neck and with posture. Constant use of Bright screens and/or small text leads to strain in eye of users. Eye strain is common phenomena noted as „focusing too much on the screen or due to continuous texting and playing games" as reported by the Center on Media and Child Health.[4]

Smart-phone addiction–related problems are predominantly managed within family medicine, community medicine, and primary health-care settings. As the prevalence of smart phone addiction increases, the associated health issues also rise, thereby adding to the burden on the healthcare system. Since these problems generally do not require specialized care for management, most studies on this topic have been planned and conducted within these primary care and community health departments. [5]

The study highlights a significant interrelationship between mobile phone addiction, bedtime procrastination, and physical activity behavior among college students. Mobile phone addiction not only directly reduces physical activity levels but also indirectly affects it through delayed bedtime.

MATERIALS AND METHODS

Research design- A quantitative descriptive cross-sectional research design was adapted to measure the prevalence of smart phone addiction and it's associated with ill-effects on physical and mental health.

Methodology

Setting- The study was conducted for PUC first year and second year students aged between 17-18 years, at Sakri Pre-University College, Bagalkot, Karnataka.

Participants & Sample Size- The sample size was calculated using the standard prevalence formula: $N=\frac{4PQ}{I^{2}}$ Based on National Family Health Survey (NFHS-5) adolescent indicators (P = 46%, Q = 54%, allowable error I = 20% of P), the target number was 117. Considering drop-outs, 120 students aged 17–18 years were successfully recruited into the research study.

Sampling Technique- Proportionate stratified random sampling technique was used to select the sample of 120 out of 200 students. to have an equal representation across academic years and genders:

PUC I Year (n=60): 40 Girls, 20 Boys

PUC II Year (n=60): 35 Girls, 25 Boys.

Accessible population in the study is 200 students studying in first and Second year PUC at Sakri PU College Bagalkot. Among these 200 students PUC First year students were 100, out of which 34 Boys and 66 students were girls. Similarly PUC Second year students were 100, out of which 42 Boys and 58 students were boys. Sample was selected by proportionate stratified random sampling technique. Total 120 sample was selected as follows, 60 students from PUC First year batch, out of which 20 boys and 40 students are girls. Similarly 60 students from PUC second year batch, out of which 25 boys and 35 students are girls.

Inclusion Criteria - The study includes the PUC students, who are,

1. Aged between 17 to 18 years
2. Studying in Sakri PU College Bagalkot
3. Willing to Participate in the study
4. Available at the time of data collection

Exclusion Criteria -The study excludes the PUC students, who are

1. Sick and not in a condition to provide data
2. Mentally unhealthy and not able to provide data
3. Not able to cooperate throughout the period of study**.**

Data Collection Tools- Self-administered structured questionnaire was used through digital Google Forms from 09:00 AM to 05:00 PM. The tool is divided into various sections:

Section I: Socio-demographic variables (Age, Gender, Religion, type of family, residence, field of study, whom among the following influence you more for use of smart phone, Duration of smart phone usage per day and purpose of smart phone use).

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Section II: Standardized Smart-phone Addiction Scale.
Section III: Structured Physical Health Rating Matrix.
Section IV: Structured Mental Health Assessment Inventory.

Statistical Analysis- Collected information was analyzed. Descriptive statistics (frequencies, percentages, means, and standard deviations) mapped demographic and prevalence distribution parameters. Inferential testing applied Pearson's Chi-Square (χ^2) and Fisher's Exact tests to evaluate the hypotheses (H_1, H_2, H_3) verifying correlations between socio-demographic factors and addiction severity categories at a 95% confidence interval ($\alpha = 0.05$).

Ethical Considerations- Protocol approval was granted by the Institutional Ethics Committee of SCT Shanti Institute of Nursing Sciences, Bagalkot under registration number SCT-SIONS-IEC-10.

RESULTS

Table 1 depicts that 65 students belongs to 17 years, 61 students were boys, 92 students were belonging to Hindu religion, 85 students were from rural area, 72 students were from joint family, 87 students were from Arts category, 37 students were influenced by the peer group for usage of mobiles. 50studentys were using the mobile phone 2 – 4 Hrs per day, 95 students were using the mobile phone for their education purpose.

Table 1: Socio-Demographic and Mobile Phone Addiction Profile (N = 120)

Socio-Demographic Variable	Category	Frequency (f)	Percentage (%)
Age	17 Years	65	65
	18 Years	55	45
Gender	Male	61	50.8
	Female	59	49.2
Religion	Hindu	92	76.7
	Muslim	15	12.5
	Others	13	10.8
Residence	Urban	35	29.2
	Rural	85	70.8
Type of Family	Nuclear	47	39.2
	Joint	72	60
	Extended	1	0.8
Field of Study	Science	4	3.3
	Commerce	29	24.2
	Arts	87	72.5
Primary Digital Influence	Parents	29	24.2
	Teachers	29	24.2
	Peers	37	30.8
	Relatives	25	20.8
Daily Screen Time Duration	< 2 Hours	46	38.3
	2 – 4 Hours	50	41.7
	4 – 6 Hours	11	9.2
Primary Usage Purpose	Communication	5	4.2
	Education	95	79.2
	Recreation	3	2.5
	Others	17	14.1

59 students were moderately addicted to mobile phone, whereas 35 students addicted severely and 26 students had mild or no addition for mobile phone.

[No/Mild] (21%) ▓▓▓▓▓▓▓▓ 26 Students
[Moderate] (49%)
▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓ 59 Students
[Severe] (30%) ▓▓▓▓▓▓▓▓▓▓▓▓ 35 Students

Table 2 reveals that in moderate physical health category, 16 students with mild mobile phone addiction were having moderate physical health; similarly 35 students with moderate mobile phone addiction were having moderate physical health and 21 students with severe mobile phone addiction had moderate physical health. In good physical health category 10students with mild mobile phone addiction had good physical health, 24 students with moderate mobile phone addiction had good physical health and 14 students with severe nubile phone addiction had good physical health.

Table 2: Cross-Tabulation of Addiction Levels and Physical Health Status (N = 120)

Level of Mobile Phone Addiction	Moderate Physical Health f (%)	Good Physical Health f (%)	Total
No/Mild addiction	16 (22.2%)	10 (20.8%)	26 (21.7%)
Moderate Addiction	35 (48.6%)	24 (50.0%)	59 (49.1%)
Severe Addiction	21 (29.2%)	14 (29.2%)	35 (29.2%)
Total	72 (100%)	48 (100%)	120 (100%)

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Table 3 reveals that in Poor Mental health category, 16 students with mild mobile phone addiction were having poor mental health; similarly 35 students with moderate mobile phone addiction were having poor mental health and only 3 students with severe mobile phone addiction had poor mental health, similarly in good mental health category, 10 students with mild mobile phone addiction were having good mental health; similarly 24 students with moderate mobile phone addiction were having good mental health and 21 students with severe mobile phone addiction had good mental health, and 11 students with severe mobile phone addiction were having very good mental health.

Table 3: Cross-Tabulation of Addiction Levels and Mental Health Status (N = 120)

Level of Mobile Phone Addiction	Moderate Physical Health f (%)	Good Physical Health f (%)	Very good Mental Health f (%)	Total f (%)
No/Mild addiction	16 (29.6%)	10 (18.2%)	0 (0.0%)	26 (21.7%)
Moderate Addiction	35 (64.8%)	24 (43.6%)	0 (0.0%)	59 (49.2%)
Severe Addiction	3 (5.6%)	21 (38.2%)	11 (100%)	35 (29.2%)
Total	54 (100%)	55 (100%)	11 (100%)	120 (100%)

Association between sociodemographic and behavioural variables and smartphone addiction was assessed using Pearson's Chi-square and Fisher's Exact tests, as appropriate. No significant association was observed with age ($\chi^2 = 3.722$, $p = 0.714$), gender ($\chi^2 = 1.781$, $p = 0.410$), religion ($\chi^2 = 3.216$, $p = 0.522$), residence ($\chi^2 = 1.409$, $p = 0.494$), or family type ($\chi^2 = 6.008$, $p = 0.199$). However, significant associations were found with field of study ($\chi^2 = 11.003$, $p = 0.027$), primary source of influence ($\chi^2 = 19.055$, $p = 0.004$), daily smartphone usage duration ($\chi^2 = 17.152$, $p = 0.009$), and primary purpose of smartphone use ($\chi^2 = 17.631$, $p = 0.007$).

DISCUSSION

The present study assessed smart-phone addiction and its relationship with physical health, mental health, and interpersonal influences among 120 pre-university adolescents aged 17–18 years at Sakri Pre-University College, Bagalkot. The findings revealed that 79% of participants experienced moderate-to-severe smart-phone addiction, 60% reported moderate physical health impairment, and 45% had poor mental health scores. A statistically significant association was also observed between interpersonal influence and smart-phone addiction ($p = 0.004$). These findings indicate that problematic smart-phone use is an important adolescent health concern that warrants attention from educational institutions, families, and healthcare professionals.

The present study found that 49% of adolescents had moderate smart-phone addiction and 30% had severe addiction, while 21% were classified as having no or mild addiction. Thus, nearly four out of every five participants fell into the moderate-to-severe categories. This finding indicates a substantial burden of problematic smart-phone use in the study population.

Similarly, a community-based cross-sectional study by Bhatia *et al.* involving 264 adolescents from low-income urban areas of Delhi reported mobile phone addiction in 33.0% of participants (95% confidence interval: 27.2%–38.6%). The higher proportion identified in the present study may reflect differences in the age composition, educational setting, sampling characteristics, and classification criteria used in the two studies. These comparisons suggest that the magnitude of problematic smart-phone use varies across adolescent populations and settings. [6]

A more recent mixed-method study among 560 school-going adolescents aged 15–19 years reported smart-phone addiction in 64% of smart-phone users. This finding provides further evidence that problematic smart-phone use may be common among older school-going adolescents. Although the estimate remains lower than the 79% moderate-to-severe category reported in the present study, differences in measurement and categorization must be considered when interpreting the results. [7]

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The present study revealed that 60% of participants experienced moderate physical health impairment. This finding raises concerns regarding possible physical consequences associated with prolonged or poorly regulated smart-phone use. Potential concerns include neck and shoulder discomfort, back pain, eye strain, headaches, reduced physical activity, and disruption of sleep routines. Nevertheless, because the present study used a cross-sectional design, the findings do not establish that smart-phone addiction directly caused the reported physical health problems.

Evidence from other studies supports the plausibility of these concerns. A prospective longitudinal study by Toh *et al.* followed 1,691 adolescents in Singapore and examined mobile touch screen device use in relation to musculoskeletal symptoms and visual health. After adjustment for potential confounding factors, baseline smart-phone use was associated with neck and shoulder symptoms at follow-up (odds ratio [OR] = 1.61; 95% confidence interval [CI]: 1.06–2.44) and lower-back symptoms (OR = 1.86; 95% CI: 1.10–3.14). These findings suggest that patterns of mobile device use may be relevant to musculoskeletal health during adolescence. [8]

The present study found that 45% of participants had poor mental health scores. This suggests that a considerable proportion of adolescents experienced psychological difficulties, although the nature and severity of these difficulties depend on the mental health assessment tool and its scoring criteria. Potential concerns associated with problematic smart-phone use include anxiety, low mood, irritability, sleep disturbance, reduced concentration, and difficulties maintaining healthy social relationships.

A systematic review by Sohn *et al.* examined mobile phone addiction among children and adolescents. The review identified 12 descriptive studies and highlighted the need for a more comprehensive understanding of problematic mobile phone use and its consequences. The authors also identified a lack of intervention studies, indicating that further research is required to determine which approaches effectively prevent or reduce problematic use among young people. [9]

The combined findings of high moderate-to-severe smart-phone addiction, moderate physical health impairment, poor mental health scores, and a significant association with interpersonal influence indicate a need for comprehensive adolescent health education.

At the individual level, adolescents should be encouraged to monitor their smart-phone habits, take regular breaks during prolonged screen use, maintain appropriate posture, participate in physical activity, and establish consistent sleep routines. They should also be supported in recognizing situations in which smart-phone use interferes with academic responsibilities, family relationships, recreation, or emotional well-being.

CONCLUSIONS

The present study concludes that smartphone addiction is highly prevalent among pre-university adolescents in Bagalkot, with 79% experiencing moderate-to-severe dependency and associated physical and mental health vulnerabilities. Although age, gender, and residence showed no significant association with addiction, daily screen time, usage purpose, and peer influence were important behavioral factors. Regular institutional screening, accessible counseling, and digital literacy programs involving parents, teachers, and healthcare professionals are essential to promote healthy digital habits and protect adolescents' overall well-being. Future research should include multicentric and longitudinal studies to assess the long-term effects of smartphone addiction on adolescents' physical and mental health, academic performance, sleep, and social relationships. Further studies should evaluate school-based education, counseling, parental monitoring, and digital wellness programs. Collaborative, evidence-based interventions may help identify at-risk adolescents, reduce problematic smartphone use, and promote healthy physical, psychological, academic, and social development.

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