

Research Article

A Population-based Study on Risk of Cell Phone Addiction among Youth (16-30 Years) in Rural Karnataka

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A B S T R A C T

Introduction: The present study assessed the risk of cell phone addiction among youth in rural Karnataka in an attempt to address the existing data gaps and help policymakers in planning need and evidence-based interventions.

Material and Methods: Data from youth health impacting behaviour survey undertaken in Srinivasapura taluk of Karnataka was utilised for the present analysis. Stratified two-stage cluster sampling with probability-proportionate-to-population-size sampling technique was used in the survey. Cell phone addiction risk was assessed using the screener questionnaire developed by NIMHANS Centre for Well-being. Descriptive and inferential statistics were done using SPSS version 21.0.

Results: 60% of the total 936 participants were cell phone users; of which, 15.9% were at risk of cell phone addiction. Another 17.4% of the youth could be considered as sitting on the fence with a possibility of developing the risk for cell phone addiction in the future. In multiple logistic regression, gender, occupation and marital status were the factors associated with the risk of cell phone addiction among youth in the study area.

Conclusion: The risk of cell phone addiction among youth in Srinivasapura taluk is a public health concern needing implementation of evidence based interventions on priority. The risk of cell phone addiction is more among males, never-married individuals, and among working population. Further research is required to understand cell phone/technology addiction in all its aspects among youth in Karnataka.

Keywords: Youth, Cell Phone, Addiction, Rural, Karnataka

Introduction

Mobile phones/ cell phones are an important discovery of mankind that has revolutionised the way we communicate today. In addition to being one of the easiest and most effective forms of communication, cell phones, particularly smartphones, have unending uses in all fields including healthcare. From tracking the health status of individuals to education, business and entertainment the list of benefits goes on.^{1,2} Globally, about 5.48 billion people use mobile phones and India ranks 2nd among countries using mobile phones with 1.2 billion subscribers.^{3,4} Although cell phones are a useful invention, their excessive utilisation can have negative consequences among users. The worrying fact is that they also come with a great potential for addiction as they provide a dopamine rush similar to that felt after a workout, coffee consumption, or other common addictions.⁵

With improved affordability, cell phone use has become increasingly common across all ages and the current generation is largely exposed to cell phones very early in life. Studies suggest that in general, young people are drawn to owning cell phones more commonly than other age groups due to their inquisitive and experimentative nature.⁶ With evolving social etiquette, rural youth is equally sensitised to cell phone use as their urban peers. Though there is no information on the number of mobile users among the Indian youth population, recent data show that India has about 651.07 million urban mobile subscribers and 524.01 million rural mobile subscribers.⁷ Cell phone addiction happens in a very subtle way among youth and some of the factors contributing to cell phone addiction in youth are their restless nature, need for peer validation, instant gratification favouring a sense of social connection etc.⁸

Excessive use and/ or addiction to cell phones among youth have wide-ranging health and social consequences. Harm from radiation, eye strain, postural problems, problems with sleep, poor academic performance, and disturbed interpersonal relationships are some common health and social issues.⁹ This, in turn, hampers productivity and efficiency at work contributing significantly to the deterioration of national growth both in terms of health and economy.

There are 1.2 billion mobile subscribers and about 750 million subscribers of smartphones in India, with 31.5% belonging to the age category of 25-34 years and 55.8% belonging to 18-24 years.^{10,11} Youth forms around 30% of the total population in Karnataka and constitutes an important human resource for the overall development of the state.¹² There are 65.7 million cell phone users in the state and there is no data on how many among them are youths.¹³ Owing to the hidden burden of cell phone addiction and the impacts it has on the health and wellbeing of youth, there is a need for addressing it with

appropriate interventions at programme and policy levels. Unfortunately, not much data is available regarding cell phone addiction among youth in general and rural youth in particular who constitute a significant proportion of the total youth population in the state. Most of the existing studies have focussed on smartphones (smartphone users constitute a part of cell phone users more so in the rural area)/ internet/ social media addiction, and/ or limited to the adolescent population done among school/college students largely in urban areas. In this background, the present study conducted in a community setting in rural Karnataka provides information on the risk of cell phone addiction (including smart phones) among youth (16-30 years) in an attempt to address the existing data gaps and help the policymakers in planning need and evidence-based interventions.

Materials and Method

The data utilised in the present study were part of a larger study implemented during 2017-2018 which aimed to assess the prevalence of various health-impacting behaviours among youth in Srinivasapura taluk of Kolar district. Kolar District is the Public Health Observatory of the Centre for Public Health, Department of Epidemiology, NIMHANS. Several defined and focussed mental, neurological and Substance use disorder, non-communicable diseases and injuries-related activities are planned and implemented in the district.

Kolar district has five talukas (Sub-districts) and Srinivasapura taluk was selected for the study. The total population of Srinivasapura taluk is 2,02,304 (1,02,075 males and 1,00,229 females). Nearly 13.2% (26793) of the population resides in the urban area and 175511 (86.8%) live in the rural area with an overall literacy rate of 71.29%.¹⁴ The urban population of the taluk is concentrated in Srinivasapura town. However, by characteristics and nature of occupation (predominantly agriculture-based), the town population also is rural in nature.

Youth residing in the study area for 6 months or more constituted the study population. Individuals aged between 16 and 30 years are considered youth which is based on the definition of youth used in Karnataka State Youth Policy 2012.¹⁵ Youth account for 29.6% of the Kolar district population. Assuming a similar proportion in Srinivasapura taluk, 59,882 people between 16 and 30 years of age were expected to be present in the taluk.¹⁴ Youths who were chronically bedridden, who were unable to respond to the interviewer due to medical conditions, and who did not give consent were excluded.

The sample size estimated for the main study was 940 which was calculated based on the following parameters: assumed prevalence of youth health-impacting behaviour to be 50%, 5% absolute precision, 97.0% confidence level,

and design effect of 2. Stratified two-stage cluster sampling with probability-proportionate to population size sampling technique was used. The study area was divided into 2 strata - rural and urban. Ward/ village was considered a cluster and 23 wards (for urban) and 296 villages (for rural) in Srinivasapura taluk constituted the sampling frame. In each cluster, 30 youths were planned to be interviewed and the required number of clusters (4 in urban, 28 in rural) to meet the estimated sample size of 940 was selected.

Selection of Households

In each cluster, field staff adopted the following approach to select the households:

1. Field staff located the boundaries of the cluster, identified all the streets in it, and located its centre.
2. From the centre of the cluster, field staff serially numbered all the streets radiating from the centre.
3. The streets were numbered in a clockwise direction starting from the north-east corner of the cluster. One of these streets was selected randomly using the currency method.
4. Within the randomly selected street, the first household was selected randomly (using the currency method) starting from the field staff's right-hand side of the street. Subsequently, households were selected by next nearest door method.

Selection of Individuals

Basic sociodemographic details of the household were obtained from the most reliable respondent available at the time of the survey. Within the selected household, all individuals in the age group of 16-30 years were interviewed. If the eligible respondent was not available, two more visits were planned depending on the convenience of the respondent. Those not available even after three visits were considered non-responders.

The risk of cell phone addiction among youth in the present study was assessed using a technology addiction screener questionnaire developed by NIMHANS Centre for Well-being.¹⁶ This tool is being used in several large-scale studies undertaken in India.¹⁷ Individuals responding as yes to 4 or more questions on the above tool were identified to be at risk of cell phone addiction. The study instrument was translated into the local language i.e., Kannada with the help of a bilingual expert. The Kannada-translated questionnaire was back-translated to English with the help of another independent language expert to check for discrepancies between the original and back-translated version. Discrepancies observed were resolved and the final Kannada version of the questionnaire was used for data collection. Dedicated and trained field staff collected the data and was supervised regularly by the project investigators to ensure the collection of good quality data.

Statistical Analysis

Data were entered in a Microsoft Excel sheet on a specific password-protected system. In order to ensure minimal error in data collection and entry, most of the questions were structured and coded. A validation mechanism was put in place in the Microsoft Excel sheet which reduced the chances of wrong entries. Despite these measures, some errors in data collection and entry were observed and the same were corrected to prepare an error-free data set. Data were analysed with the help of statistical software SPSS version 21.0. The socio-demographic characteristics of the study participants were summarised as frequency and percentage for qualitative data and as mean and standard deviation for quantitative data. Multiple logistic regression analysis was undertaken to identify the factors associated with the risk of cell phone addiction among youth in the study area.

Ethical Consideration

Since, the study involves the collection of personal details, behaviours and sensitive information all the ethical standards were met. During the training of the field staff, emphasis was laid on the principles of conducting the survey in an ethically acceptable and desirable manner (minimising the risk, obtaining informed assent and consent, protecting anonymity and confidentiality, avoiding deceptive practices, and providing the right to withdraw). Investigators informed the District and Taluk authorities and community leaders about the survey and sought their support and cooperation. Informed consent for study participants of more than 18 years of age and informed assent for study participants of less than 18 years of age were obtained from all the eligible participants before conducting the interview. Field staff assured the respondents that any information provided by them would be treated as strictly confidential. They were informed that only pooled inferences would be utilised for the purposes of the study. Access to identifiable data was restricted to the Principal Investigator, Co-Principal Investigator or authorised persons named by the Principal Investigators. Data were transferred to a dedicated computer with strict access control. All respondents who expressed a need for service or where the field staff felt that there was a need for care were appropriately referred. The scientific and ethical clearance for the project was obtained from NIMHANS Institute Ethics Committee vide letter No: NIMHANS/IEC (BS & NS DIV.) 4th MEETING/2017, dated 28/2/2017.

Results

Youth in the age group of 16-20 years comprised 40.5% of the study population followed by those in the age group of 21-25 years (33.8%). The Proportion of males (53.5%) was higher as compared to females (46.5%). Most of the study population had schooling with not literate being only

1.7% of the study population. Almost similar Proportions of the youth population in the study area had high school (27.7%), pre-university (29.2%) and degree/ diploma (28.0%) education. The Proportion of students in the study population was 33.8%, which indicated that the survey had covered a wide range of the youth population. Though the study was undertaken in a rural area, only 13.2% of the youth were engaged in agriculture-related occupations. The majority of the youth were not married at the time of the survey (62.6%) (Table 1). The socio-demographic characteristics of the study population, by and large, are representative of the youth population in the Kolar district with minor exceptions.

Table 1. Socio-demographic Characteristics of the Study Population

Socio-demographic Characteristic (N = 936)		n (%)
Age (in completed years)	16-20	379 (40.5)
	21-25	316 (33.8)
	26-30	241 (25.7)
Gender	Female	435 (46.5)
	Male	501 (53.5)
Religion	Hindu	850 (90.8)
	Muslim	86 (9.2)
Education	Not literate	16 (1.7)
	Primary school (1st to 5th std)	29 (3.1)
	Middle school (6th & 7th std)	63 (6.7)
	High school (8th to 10th std)	259 (27.7)
	Pre-university education (11th & 12th std)	273 (29.2)
	Degree/ diploma	262 (28.0)
	Postgraduate and above	34 (3.6)
Occupation	Student	316 (33.8)
	Agricultural labourer	90 (9.6)
	Non-Agricultural labourer	68 (7.3)
	Cultivator	34 (3.6)
	Salaried employment	144 (15.4)
	Business	25 (2.7)
	Housework	230 (24.6)
	Not working/ unemployed	29 (3.1)

Marital status	Never married	586 (62.6)
	Currently married	347 (37.1)
	Widowed/ divorced/ separated/ deserted	3 (0.3)

The penetration of technology into Srinivasapura taluk (a rural area of Karnataka) is considerable as can be noted from the fact that 60% of youth in the study area were using cell phones. The risk of cell phone addiction among youth is high in the study area with 1 in every 10 youth being at risk of cell phone addiction (Figure 1). However, the Proportion of the risk of cell phone addiction is much higher (15.9%) when considered among those with cell phone use (Figure 1).

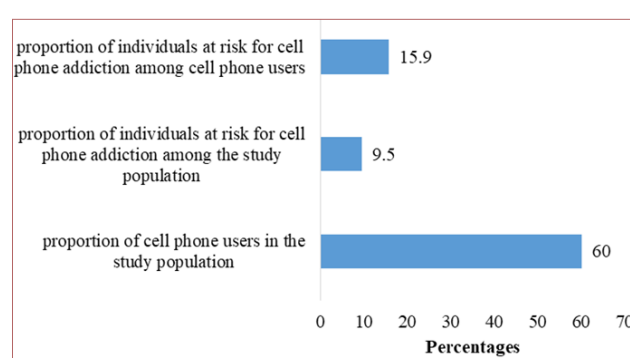


Figure 1. Percentage of Cell Phone Users and Percentage of Youth at Risk of Cell Phone Addiction

The prevalence of risk of cell phone addiction was higher in the age group of 21-25 years (18.0%), among males (18%) and among those who were never married (20.6%). The prevalence was also high among those who were educated up to a degree/ diploma (20%) or had a postgraduate degree and above (17.9%). It was more among students (18.7%) and the working population, particularly salaried employees (24.2%) and those involved in a business (30.4%) (Table 2).

Table 3 shows the response of youth to the questions assessing the risk of cell phone addiction. Though 15.9% of the youth with cell phone use were at risk of cell phone addiction, a closer look into the questions (Table 3) throws more light on the behavioural pattern of the youth with respect to cell phone use. Nearly 70% of the youth using cell phones said that they would always have their cell phones close to them, even when not expecting an important call or text message. 63.3% stated that it is difficult for them to reduce the usage of mobile phones and 34.9% of the youth reported that they would feel uncomfortable and restless when not using cell phones or when it is unavailable. Such behaviour among a very high proportion of the youth in the study area is a cause for concern.

Table 2. Prevalence of Risk of Cell Phone Addiction among Youth using Cell Phones in the Study Area (N = 559)

Characteristics	Risk of Cell Phone Addiction (n %)	
	Yes	No
Age (years)		
16-20 (158)	28 (17.7)	130 (82.3)
21-25 (221)	40 (18.0)	181 (82.0)
26-30 (180)	21 (11.7)	159 (88.3)
Gender		
Female (174)	20 (11.5)	154 (88.5)
Male (385)	69 (18.0)	316 (82.0)
Religion		
Hindu (515)	81 (15.8)	434 (84.2)
Muslim (44)	8 (18.1)	36 (81.9)
Education		
Not literate (5)	1 (20.0)	4 (80.0)
Primary school (14)	1 (7.1)	13 (92.9)
Middle school (45)	2 (4.4)	43 (95.6)
High school (129)	19 (14.8)	110 (85.2)
Pre-university education (143)	22 (15.4)	121 (84.6)
Degree/ diploma (195)	39 (20.0)	156 (80.0)
Postgraduate and above (28)	5 (17.9)	23 (82.1)
Occupation		
Student (134)	25 (18.7)	109 (81.3)
Agricultural labourer (69)	5 (7.2)	64 (92.8)
Non-agricultural labourer (57)	8 (14.0)	49 (86.0)
Cultivator (28)	4 (14.2)	24 (85.0)
Salaried employment (124)	30 (24.2)	94 (75.8)
Business (23)	7 (30.4)	16 (69.6)
Housework (107)	5 (4.6)	102 (95.4)
Not working/ unemployed (17)	5 (29.4)	12 (70.6)
Marital status		
Never married (345)	71 (20.6)	274 (79.4)
Currently married (212)	18 (8.5)	194 (91.5)
WDS (2)	0 (0.0)	2 (100.0)

Table 3. Response to Individual Questions of the Tool used to assess Risk of Cell Phone Addiction among Youth using Cell Phones (N = 559)

Questions	Yes n (%)
Feeling the need to talk on a phone/ SMS all the time	29 (5.2)
Steadily increased frequency of phone recharge and amount	22 (3.9)
Having been teased or scolded for using a cell phone in restricted situations (meetings, exercise, cinema)	84 (15.0)
Cell phone always kept close – even when not expecting an important call/ text message	386 (69.1)
Invariably feeling anxious if unable to use call phone (in meetings, on a flight, in class, places of worship)	60 (10.7)
Feeling uncomfortable and restless when not using a cell phone or when it is unavailable	195 (34.9)
Feeling difficulty to reduce the usage of mobile phone	354 (63.3)

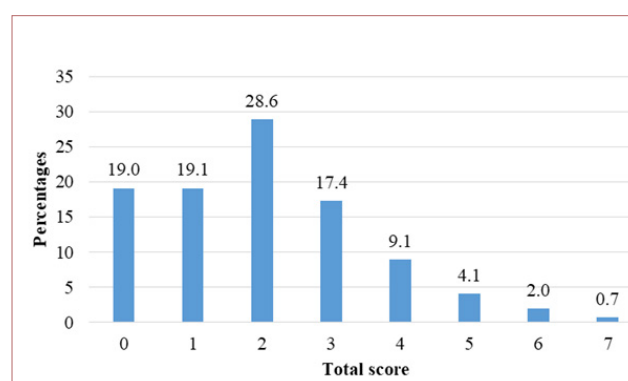


Figure 2. Scores Obtained by Individuals on a Scale of 0 – 7 for Questions regarding Risk of Cell Phone Addiction

The participants were assessed for risk of cell phone addiction using 7 questions (Table 3) and the responses to each question were scored 1 if they responded “yes” and 0 for responding “no”. A score of ≥ 4 was considered as having a risk of cell phone addiction. Accordingly, the prevalence of risk of cell phone addiction among youth using cell phones in the study area is 15.9%. Worryingly, 17.4% of the youth with cell phone use had scored 3, and they can be considered as sitting on the fence and there is a possibility that they could any time move towards a score of 4 or more i.e., develop an addiction to cell phones (Figure 2).

Univariate analysis showed that youth who were never married (Crude OR = 2.793, P value < 0.0001) were at higher risk of cell phone addiction. As part of the larger study, information on various health-impacting behaviours among youth was collected along with cell phone use behaviour in the study area. Accordingly, youth who had shown violent behaviour towards others in the past six months (Crude OR = 2.013, P value = 0.003) and those who reported poor quality of physical health (Crude OR = 1.589, P value = 0.007) were having a significantly higher risk of cell phone addiction. However, on multiple logistic regression, only gender (males), certain occupations (students, business, having salaried employment, unemployed) and marital status (never married) were associated with a higher risk of cell phone addiction among youth in the study area.

Discussion

Technology addiction is an emerging public health concern. Technology addiction is broader in nature and includes addiction to the internet, social networking sites, video games, and cell phones including smartphones. The present study assessed the prevalence of risk of cell phone addiction among youth (16-30 years) in rural Karnataka. Accordingly, 1 in every 10 youth in the study area is at risk of cell phone addiction. However, among the youth using cell phones, 15.9% are at risk of addiction. The prevalence of cell phone addiction among youth varied widely across the studies conducted in India ranging from 25.0% to 59.4% and were higher compared to the present study.¹⁸⁻²⁴ This difference is primarily because of the varying study population, as most of the studies have considered a particular segment of the youth population viz school or college-going students unlike the present study focussing on youth in the age group of 16-30 years. Also, differing study instruments, study areas and study methodology could have contributed to the observed difference in the prevalence of risk of cell phone addiction.

In the present study, the risk of cell phone addiction was assessed using a questionnaire developed by NIMHANS Centre for wellbeing. The tool has a total of 7 questions and those individuals scoring 4 and above were considered at risk of cell phone addiction. Though the prevalence of risk of cell phone addiction is 15.9% among youth cell phone users, the more concerning part is that around 17.4% of the youth scored 3 on the scale. In the absence of intervention, there is a high possibility of these youths moving towards the risk of cell phone addiction. Hence, the problem of the risk of cell phone addiction among youth is like a time bomb waiting to explode. This also should be looked at the background that the penetration of cell phones among youth is 60% in the study area. India has over 1.2 billion cell phone users and 600 million smartphone users.²⁵ According to a survey conducted in 2019, the highest penetration rate

in the use of smartphones was for the age group of 18 to 24 years, with 37%.¹¹ Hence, there is an imminent need for public health intervention to address the risk of cell phone addiction among youth in the study area and in India.

A higher risk of cell phone addiction was seen in males (18.0%) when compared to females (11.5%) in the present study. However, there is no consistency in results with respect to cell phone addiction and gender. Females are more active users of social networking sites and entertainment applications while males are more into gaming and online shopping applications.²⁶ These varied results imply that further studies have to be conducted to clarify the association of gender with cell phone addiction.

Looking at the occupational status of the participants, youth doing business (30.4%) or having salaried employment (24.2%) or students (18.7%) tend to be at high risk of cell phone addiction. A study conducted by Renuka et al. also showed that employed personnel were addicted more to cell phones when compared to the unemployed¹⁸ indicating that with employment comes the need for social connectivity, for relief of stress and anxiety for which cell phones are mainly used.²⁷ We also feel that apart from the above-mentioned reasons, use of cell phones might be directly related to the working nature of the people. Contrastingly, in the present study, the risk of cell phone addiction was high among unemployed youth too (29.4%). Hence, the relationship between occupation and risk of cell phone addiction is complex and further studies are required to explain the association. People who are never married were found to be at a higher risk of cell phone addiction and similar findings have been reported by Pradeep et al.¹⁷ Never-married individuals also include the student category and we assume never married individuals have less family commitment and hence more free time which could be the reason for above findings. However, this needs to be explored further.

To the best of our knowledge, this is the first population-based study on the risk of cell phone addiction among youth (16-30 years) in rural Karnataka. The study was conducted following a robust scientific methodology and a structured tool was used for assessing the risk of cell phone addiction. These ensure that the findings of the study are generalised to the youth of Srinivasapura sub-district of Kolar district. The geographical diversity of youth and youths' behaviour across rural areas of Karnataka has to be considered before generalising the findings of the present study to the youth in rural Karnataka. However, the present study could indicate the public health burden of risk of cell phone addiction among youth in rural Karnataka. The study is not without its limitations. The study only measured the risk of addiction to cell phones and not the addiction to cell phones per se. Also, technology addiction is

a much broader (addiction to internet, gaming etc.) field and detailed information about various aspects of technology addiction that is beyond the risk of cell phone addiction is needed to develop intervention programmes. Finally, the study also undertook only a preliminary exploration of identifying the factors associated with the risk of cell phone addiction.

Conclusion

Technology penetration is inevitable and with the world becoming digital, cell phones have become an important part of our day-to-day life. Hence it is high time youth realises the need for proper utilisation of cell phones and for preventing their harmful usage.^{28,29} The risk of cell phone addiction among youth in rural Karnataka is a public health concern which needs to be addressed with data-driven and evidence-based public health intervention and includes both population-based and high-risk strategies. While it is noted that the young population, our future generation are more vulnerable to cell phone addiction, people with signs of dependence or addiction to mobile phones display an array of health and mental health issues that can range from psychological problems like depression, restlessness, insomnia and anxiety etc. It can also result in poor social skills, relationship issues, academic difficulties and low self-esteem among other problems.³⁰ The truth is that this harm extends far beyond an individual and places a socioeconomic burden on our nation and its communities.

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