Original Research Article

Mobile phone addiction among children aged 5-12 years, a hospital-based study in South Kerala

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ABSTRACT

Background: The uncontrolled, inappropriate or excessive use of the mobile phone can give rise to social, behavioural and affective problems. Mobile phone addiction has emerged as a challenging public health issue. The aim of the study was to find out the proportion and associated factors of mobile phone addiction among children aged 5-12 years.
Methods: A cross-sectional study was conducted among 222 children in the age group of 5-12 years. Data collection was done using a semi-structured questionnaire and outcome variable measured using the diagnostic criteria developed by Lin et al. Chi-square test and binary logistic regression was done to find out the association between exposure and outcome variables.
Results: 42.3% of children aged 5-12 years had mobile phone addiction. Factors like higher socio-economic status of the family, educated father, children with normal weight for age, presence of visual problems, headache, poor concentration and disturbed sleep were found to have statistically significant association with the mobile phone addiction. The predictor variables found on regression were higher socio-economic status, children with normal weight for age, disturbed sleep and poor concentration.
Conclusions: This study found nearly half of the children belonging to 5-12 years was addicted to mobile phones which is higher than expected and is a serious matter for the growing children. The risk factors found in the study are modifiable to an extent and hence regional and national level strategies has to be implemented in accordance with the available studies to tackle this public health problem.

Keywords: Addiction, Children, Kerala, Mobile phone

INTRODUCTION

Mobile phones are a boon to the society for instant communications since its emergence in the market in 1983.[1] But nothing in this world is free from shortcomings. The uncontrolled, inappropriate or excessive use of the mobile phone can give rise to social, behavioural and affective problems.[2] The mobile phone has many attributes and characteristics that make it very attractive to both young and old. Behavioural addiction for mobile phones has been variously termed as mobile phone dependence or addiction or problematic use which make a person unable to regulate its use leading to negative consequences in daily life. It has emerged as a challenging public health issue.

Mobile phone addiction (MPA) not only has physical effects but also psychological and academic effect at the same time. Sleep deficit, anxiety, stress, and depression which are all associated with internet abuse, have been related to mobile phone usage too.[3] Due to multiple factors teenagers are far more likely to become dependent on mobile phones. Nowadays, the age of initiation of mobile phone use is becoming increasingly younger and few studies focussed on younger age groups.

The objective of this study was to find out the proportion of mobile phone addiction and its associated factors among children aged 5-12 years.

METHODS

Approval of the Institutional Ethics Committee was obtained prior to the commencement of this study. All data were kept confidential and was used for the purpose of the study only.

It was a cross-sectional study conducted among children aged 5-12 years admitted in paediatric wards of Sree Avittam Thirunal Hospital, in Thiruvananthapuram district of Kerala state. Study period was from August 2019 to November 2019.

Parents who were not willing to give informed assent and children with serious medical illness were excluded from participating in the study. A study done in adolescent school children showed a prevalence of 31.3%.[4] The sample size calculated was 222 using formula:

$$\frac{Z_{\frac{\alpha}{2}}pq}{d^2}$$

Sampling was done in such a manner that children meeting inclusion criteria were taken till sample size was attained.

The outcome variable studied was mobile phone addiction which was measured using the diagnostic criteria identified by Lin et al.[5]

Lin et al diagnostic criteria comprises six behavioural criteria and four functional criteria. Diagnosis rests upon presence of 3 or more behavioural criteria or 2 or more functional criteria and in which addictive behaviour is not associated with other psychiatric illness like Obsessive compulsive disorder (OCD) or bipolar disorders.

Exposure variables studied were socio-demographic factors and mobile phone usage details. Direct interviews with the participants were carried out using a semi-structured questionnaire.

All data were entered into the Microsoft excel sheet and analysed using Statistical Package for Social Sciences (SPSS) trial version.

RESULTS

Total children participated in the age group 5-12 years were 222. The mean age (SD) of the participants was 8.36 (2.46). The mean body weight (SD) of the children was 25.01 (9.32).

Among the participants 56.3% were boys and 51.8% of the participants belonged to Above poverty line (APL)

category. The distribution of children according to their educational status were, pre-school (20.7%), lower primary (42.3%) and upper primary school (36.9%).

Out of 222, 94 met the diagnostic criteria for mobile phone addiction. The proportion of children having MPA was found to be 42.3%. The most common criteria experienced among study participants were longer duration of mobile phone use than intended.

The number of participants meeting each of the criterion is as shown in Table 1. Median time of using mobile phone was 1 hour with a maximum of up to 10 hours in a day. Among the participants 77% (171/222) were using television with a median usage time of 1 hour with a maximum of up to 6 hours in a day.

Out of 222 participants except for one all others were using mobile phones. Among the users majority (83.3%) were having smart phones. The different kinds of mobile phone usage pattern is as shown in Figure 1. Among the mobile phone users, 149 children had complained of problems which they or their family members perceive as due to over use of mobile phones.

The perceived health problems as reported by participants is as shown in Figure 2. The study participants used mobile phones mainly to access you-tube channels, gallery, social media, game etc. The distribution of participants with the usage pattern of various fields in mobile phones is as shown in Figure 3.

A case-control type analysis was done to find out the association between the exposure variables and outcome variable. Those having MPA were compared against those without MPA and Chi-square test was done.

The independent variables like higher socio-economic status of the family, educated father, children with normal weight for age, presence of visual problems, headache, poor concentration and disturbed sleep were found to be statistically significant with MPA. The bi-variable analysis done is as shown in Table 2.

The predictors of MPA was found using binary logistic regression. Backward conditional regression was employed discarding non-significant exposure variables. Maximum value of Nagelkerke R square with minimum number of variables and significance of the model in the Chi-square table were the criteria used for finalising the model. The model was found to be significant with a p value of 0.023 and could explain 38.5% (Nagelkerke square=0.385) of the variability seen in MPA.

The model variables include higher socio-economic status, children with normal weight for age, disturbed sleep and poor concentration. The multivariable regression done is as shown in (Table 3).

Table 1: Diagnostic criteria for mobile phone addiction and the frequency distribution of each criterion among the participants.

Criteria	Frequency	
	N	%
Behavioural criteria		
Continued inability to resist the impulse to use mobile phone	73	32.8
Symptoms of dysphoria, anxiety or irritability after a period of withdrawal from use	79	35.5
Using mobile phone for a period longer than intended	116	52.5
Persistent desire and/or unsuccessful attempts to quit/reduce mobile phone use	69	31
Heightened attention to using or quitting mobile phone use	109	49
Persistent mobile phone use despite recurrent physical or psychological consequence	30	13.5
Functional criteria		
Excessive use resulting in persistent /recurrent physical/ psychological problems	85	38.2
Use in physically hazardous situations (such as driving or crossing the street) or situations that have other negative impacts on daily life	0	0
Use that impair social relationships/performance at school/work	59	26.5
Use that is very time consuming or causes significant distress	0	0

Table 2: Bi-variable analysis.

Factors	Category	MPA (n=94)	No MPA (n=128)	OR (95%CI)	P value#
Gender	Female	34	63	0.58 (0.3-1.008)	0.053
	Male	60	65		
Socio-economic status	Above poverty line	61	54	2.5 (1.4-4.3)	0.001*
	Below poverty line	33	74		
Education of child	Lower primary and below	65	75	1.5 (0.9-2.7)	0.107
	Upper primary	29	53		
Education of father	High school and below	66	108	0.43 (0.2-0.8)	0.011*
	Above high school	28	20		
Education of mother	High school and below	56	87	0.69 (0.3-1.2)	0.19
	Above high school	38	41		
Outdoor activities	Yes	71	103	0.74 (0.39-1.4)	0.37
	No	23	25		
Duration of outdoor activities (hour)	≤1	70	92	1.1 (0.6-2.0)	0.66
	>1	24	36		
Television use	Yes	77	9	1.6 (0.8-3.1)	0.09
	No	17	34		
Weight for age	Low	52	92	0.4 (0.2-0.8)	0.011*
	Normal	42	36		
Vision problems	Yes	20	11	2.8 (1.3-6.3)	0.007*
	No	74	117		
Headache	Yes	31	16	3.4 (1.7-6.7)	<0.001*
	No	63	112		
Poor concentration	Yes	45	9	12.1 (5.5-26.7)	<0.001*
	No	49	119		
Disturbed sleep	Yes	15	2	11.9 (2.6-53.7)	<0.001*
	No	79	126		

Note: #-Chi-square test; *p value<0.05 is considered significant.

Table 3: Multi-variable analysis.

Factors	Adjusted OR	95% CI	P value
Socio-economic status	2.1	1.1-4.1	0.020
Weight for age	0.45	0.22-0.89	0.023
Disturbed sleep	6.9	1.2-39	0.027
Poor concentration	12.5	5.4-29.2	<0.001
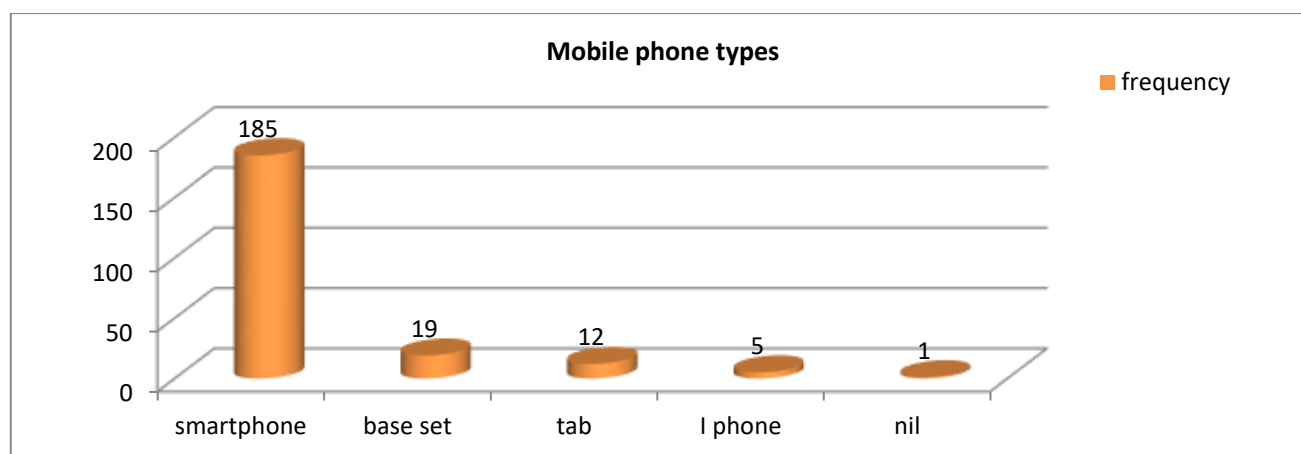
Mobile phone types

Figure 1: Usage pattern of different types of mobile phones.

Health problems
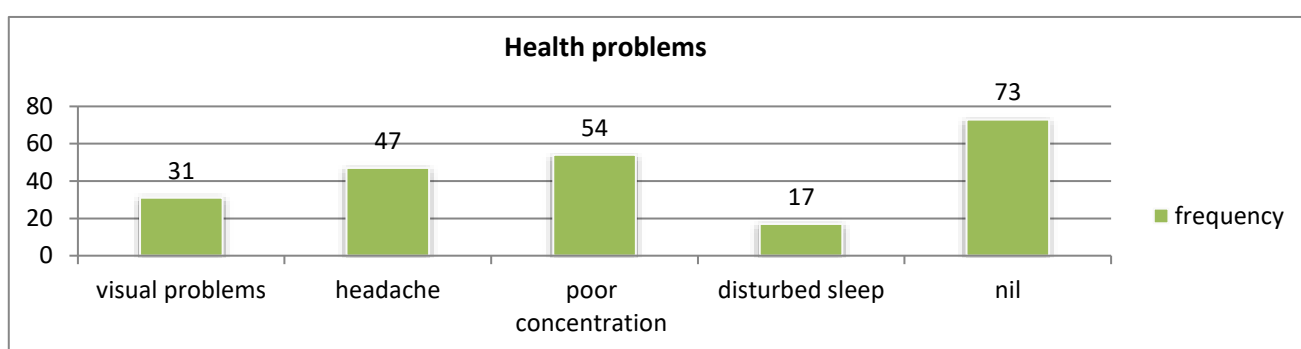
Figure 2: The perceived health consequences following mobile phone use.
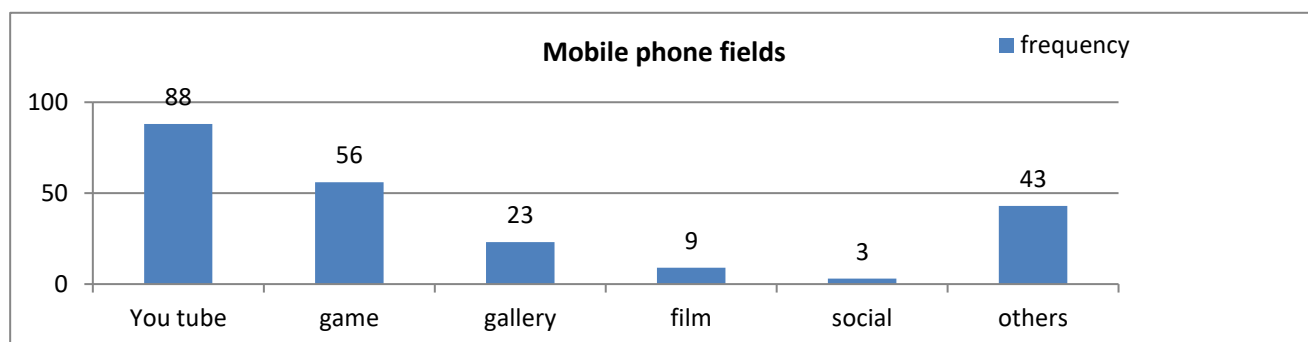
Mobile phone fields

Figure 3: Usage pattern of different fields in the mobile phone.

DISCUSSION

In our study, except for one child, all were using mobile phones and 42.3% of the participants were addicted to mobile phones which is a very high rate particularly in that age group. Majority were using smart phones and the main reason for its use was to access you-tube application. One systematic review conducted among children and young people found a prevalence ranging from 10-30%.[6] A prevalence study among students in Tehran University conducted in the year 2017, found that 25% were addicted to mobile phones.[7] The main reason for the mobile phone usage in a study conducted in Hong-Kong was to use for entertainment.[8] In our study,

children having higher socio-economic profile like, belonging to APL, normal weight for age (W/A) and higher education of father, were at risk of developing MPA. The hypothetical explanation for this is, as one's income and social class is high, obviously such people can afford a greater number of mobile phones, at the least one and which are accessible to their children for use and overuse finally leading to addiction. Contrary to this, a Korean study found there was no difference with respect to family income in the two groups.[9] It can be due to the homogeneity of the study group.

Similar to our study result, one study conducted in South Korea also found a strong association of MPA with poor

quality of sleep.[10] MPA was associated with poor concentration among children in our study but in a study among college students, even the absence of mobile phone can result in loss of concentration.[11] Physical and psychological problems have reportedly resulted from mobile phone use, including visual disturbances as explained in a review.[3] Similarly, our study also revealed a strong association between MPA and vision problem. MPA and psychological distress showed a positive correlation in one study conducted in Chinese schools.[12]

Limitations

The temporality of study and outcome variables cannot be ascertained with the study design. Sample size calculated was not adequate to find out the associated factors. The validity of questionnaire in the local language was not established.

CONCLUSION

Mobile phone addiction among children was higher than expected and the most frequent criteria identified was using for longer period than intended. MPA has an association with societal affluence as indicated by higher socioeconomic status, better education of father and children with normal weight for age. Health education regarding the problem and its effective implementation in school curriculum is needed.

Recommendation

Public health awareness program, mobile phone addiction screening and brief interventions in the primary health care focussing children are also required.

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