A Cross-Sectional Study on Smartphone Use among Children during the COVID-19 Lockdown in Tamilnadu, India

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Abstract
Smartphones have made internet available at our fingertips. More children around the world are born mobile ready especially kids born after 2015 (Gen Alpha). The COVID induced lockdown had robbed children of other means of entertainment and combined with the easy access to smartphones due to the online classes, the overuse of smartphones is a concept of great concern to parents. An online survey was conducted in India among parents about the usage of smartphone in their children and the parents also filled out a self-constructed questionnaire to find the levels of smartphone addiction in their children. 1330 people participated in the study and their responses were used to analyze the various factors contributing to smartphone overuse. The amount of time spent in smartphone has increased exponentially during COVID 19 induced lockdown, with 14.7% of children spending 5 - 6 hours per day and a small percentage of children (3.3%) spending more than 9 hours per day. Children who owned a smartphone and adolescent children have higher scores in the smartphone addiction scale.
Keywords: Children; Covid-19; Smartphone Use

INTRODUCTION

Technological advances changed human behavior over the decades in all aspects of life events and smartphone usage among children and adolescents for recreational and educational purpose has widely increased which has both benefits & adverse effects. Despite warnings given by child health specialists about the adverse effects of increased Smartphone use(Giunchiglia et al., 2018), the prevalence of smartphone usage among children and adolescents has been increasing exponentially. Though there is a growing necessity of Smartphone use for various activities, studies have shown that excessive use of Smartphone particularly on recreational activities could lead to addiction and additional problems in physical, psychological, social & professional areas (Chun, 2018)(Nayak, 2018).

Smartphone use among children & adolescents has increased because of its easy accessibility, usability, and facilities available for recreational activities such as Face book, Whatsapp, YouTube, Videogames, Movies & Serials, etc. As its recreational usage increases, children & adolescents start to feel that they cannot function normally without it and preoccupation with Smartphone causes trouble in their commitments in life such as academic work (Samaha & Hawi, 2016), physical activity & personal hygiene (Mascheroni & Ólafsson, 2016)(Buctot et al., 2020). An increase in smartphone usage has caused many children and adolescents have levels indicative of addiction as evidenced by recent studies (Buctot et al., 2020)(Kabali et al., 2015). Previous research studies, suggests that smartphone addiction among adolescents could be the result of their personality traits (Choi et al., 2015) and lack of confidence (Yang, 2016) in social communication which make them to engage in Smartphone so that they need not to have face to face conversation. Factors such as time spent in the phone, lack of control in usage, and owning a phone and time spent alone during usage (Kabali et al., 2015) are all studied to see if they act as contributing factors to addictive behavior in children.

COVID 19 lockdown has further fueled the hours of usage due to the compulsory stay at home among children. The covid induced lockdown has paved way for online classes for children, naturally increasing screen time. Parents who had control over the use of mobile phones of their children, now had no other option, but to facilitate the availability of smartphones so that their children can attend online classes. Online classes invariably increased online time for children and adolescents thus making them vulnerable to increased usage of smartphone for purposes not inclusive of academics. This study aims to understand the levels of smartphone use and addiction levels among children during COVID 19 and related issues in various domains of life as perceived by the parents of the children.

RESEARCH METHODS

This study was approved by the Institutional Ethics committee. An online survey through google forms was conducted among parents of children of ages up to 18 years old. Questions regarding basic details about parent's education and economic conditions and details of the children and availability of smartphones to children and their usage were part of the survey questionnaire. The study contained the smartphone addiction

scale for children – parent version (SASC-P) which consisted of 24 statements regarding children's use of smartphone with higher scores indicating higher smartphone use in children.

The questionnaire consists of statements spanning 6 domains namely, physical health, psychological health, family relationships, social relationships, smartphone dependency and academic performance. The statements were designed as a 5 point Likert response scale (with scores 5- strongly agree, 4-agree, 3-neutral, 2-disagree and 1-strongly disagree) (Rajendhiran et al., 2021). The intrinsic validity for the domains ranged from 0.819 to 0.907 and was 0.972 for the whole questionnaire. The reliability coefficient for the whole questionnaire was 0.945. The coefficients were significant indicating that the scale was reliable for use and hence used in the study.

The survey was conducted from May 5th, 2020, to May 20th, 2020. The survey was popularized through social media, including status updates in WhatsApp and Instagram with an invitation to participate and a link to the google form to be filled in. All participants provided an informed consent before participation and no personal information pertaining to their identity were obtained during the study. A total of 1357 responses were collected and 27 of them had to be excluded due to incomplete filling of the forms and 1330 were analyzed.

Received data was statistically analyzed using Statistical Package for Social Services software, (IBM Corp. Released 2016. IBM SPSS Statistics for Windows, Version 24.0. Armonk, NY: IBM Corp). Descriptive statistics was performed. Mean ± standard deviation (SD), median for covariates and 2 tailed Pearson correlation was performed to analyze the correlation between the survey statements and the total score of the SASC-P scale, with significance at <0.01. The relationship between the various variables and the smartphone addiction score as measured by the SASC-P scale were analyzed using analysis of various (ANOVA) at 95% confidence level and significance<.05 indicating a significant relationship between them.

RESULTS AND DISCUSSION

The socio-demographic details pertaining to age of the parents, frequency of children using smartphones before and during the COVID 19, the age of the children using it and their accessibility to private rooms and their own Smart phones were found to be normally distributed as described in table 1 and table 2. It shows that 88.7% of the participants did not have a private room and 87% did not personally own a smartphone.

Table 1. Socio-Demographic Details

	Frequency	Percent
Father's Age		
Below 30 years	31	2.3
31 to 35 years	182	13.7
36 to 40 years	402	30.2
41 to 45 years	425	32.0
46 to 50 years	223	16.8
51 years & above	67	5.0
Mother's Age		
Below 25 years	25	1.9
26 to 30 years	204	15.3
31 to 35 years	368	27.7
36 to 40 years	479	36.0
41 to 45 years	196	14.7
46 years & above	58	4.4
Birth order of child		
Elder	885	66.5
Younger	445	33.5
Age of the child		
Early Childhood	279	21.0
Middle Childhood	310	23.3
Late Childhood	307	23.1
Early Adolescence	242	18.2
Middle Adolescence	158	11.9
Late Adolescence	34	2.6
Private Room		
Yes	150	11.3
No	1180	88.7

Table 2. Details of Smartphone Usage

		Frequency	Percent
Private Smart Phone	Yes	170	12.8
	No	1160	87.2
Hours Spent Before Covid 19	1 hr	1006	75.6
	2 hrs	200	15.0
	3 hrs	67	5.0
	4 hrs	35	2.6
	5 hrs	22	1.7
Hours Spent During Covid 19	1 hr	392	29.5
	2 hrs	322	24.2
	3 hrs	216	16.2
	4 hrs	161	12.1
	5 hrs	117	8.8
	6 hrs	78	5.9
	9 hrs	21	1.6
	10 hrs	23	1.7

The amount of time spent in smartphone has increased exponentially during COVID 19 as shown in fig 1, with 14.7% of children spending 5 - 6 hours per day and a small percentage of children (3.3%) spending more than 9 hours per day.
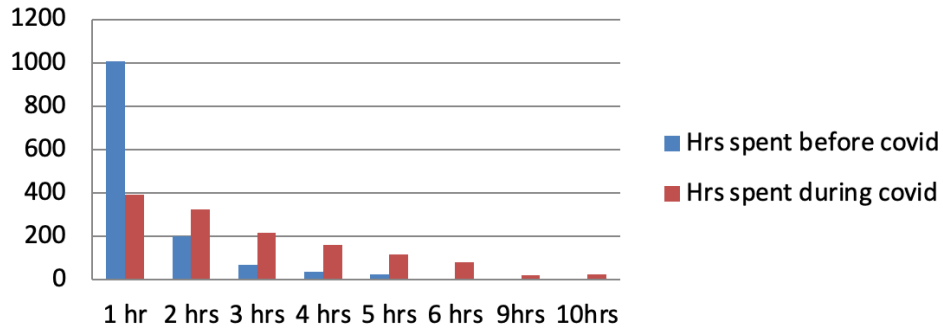

Figure 1. Time Spent in Smartphone

The total scores calculated by the SASC-P ranges from 24-120. The mean SASC-P score is 67.1 and standard deviation is 15.7. The frequency of the scores is shown in figure 2.
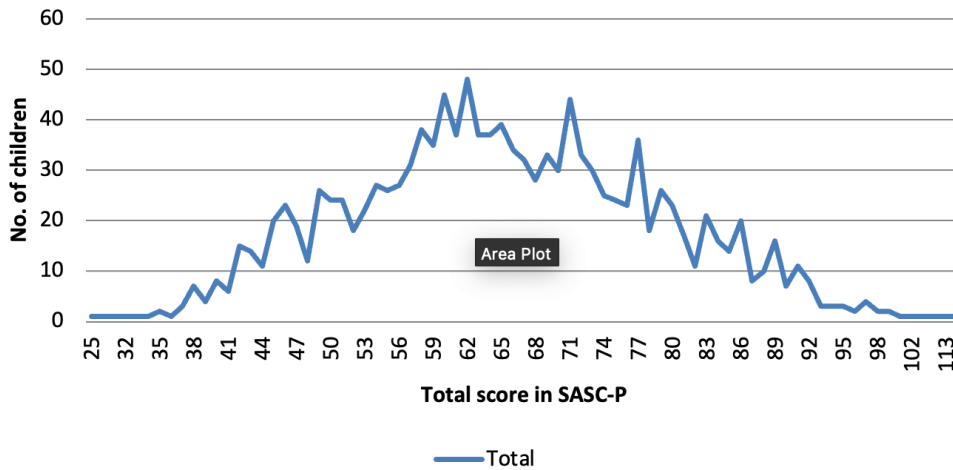

Figure 2. Frequency of the Scores in SAC-P

One - way ANOVA between subjects, was conducted to compare the effect of the variables on the scores of SASC-P with $p<0.05$ showing significant relationship. There is a significant effect on the categories of the age of the fathers [$F_{(5,1324)} = 2.559$, $p= 0.026$] and the of age of mothers [$F_{(5,1324)} = 3.186$, $p = 0.007$] to the scores of smartphone addiction as measured by SASC-P. The birth order of the children or the fact whether they had a private room to themselves had no influence on the scores on smartphone addiction. But the age group of the children has a significant influence on the smartphone addiction scores [$F_{(5,1324)} =6.248$, $p=0.000$) and children in their late adolescence who comprised 2.6% if of the sample, had the highest mean score (M=59.58, SD=17.43) followed by children in their early childhood who consisted of 21% of the sample. Owning a smartphone has a significant impact to the addiction scores (M=55.24, SD=14.79) when compared to children who did not have a Smartphone (M=50.41, SD=14.61). Hours spent

in the Smartphone before COVID [F (4,1325) = 21.30, p=0.000] and during COVID [F (7,1322) = 39.26, p = 0.000] has a significant influence on the Smartphone addiction scores.

Pearsons correlation coefficient between the various variables and the Smartphone addiction score showed significant correlation between the variables in relation to the scores in SASC-P, as indicated in table 3. The age of the child has a significant negative relationship to the scores on SASC-P, with younger children being more prone to getting higher scores in the SASC-P and the video games has a positive relationship to the scores on SASC-P.

Table 3. Correlation between variables and total score in the SASC–P

	Pearsons correlation	Sig (2- tailed)
Father's Age	-.078	.005**
Mother's Age	-.076	.006**
Child Birth Order	-.022	.414
Children's Age	-.069	.011*
Hours Spent Before COVID 19	.235	.000**
Hours Spent During COVID 19	.404	.000**
Video Games	.090	.001**
Face book	.031	.253
WhatsApp	-.001	.979
Cartoon	.014	.610
Reality Show	-.019	.494
Movies	.040	.147
Serials	-.018	.514
Tik Tok	-.068	.014*

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

The results shows that children have been spending a lot of time in smartphones and higher scores in the SASC-P scale indicates that many children have some level of smartphone addiction. This study correlates with a 2010 global report (GSMA & NTT Docomo, 2012) that indicated that 10.8% of children own a smartphone in India, with 12.8% of children found to have a personal smartphone in this study. The report also indicated that owning a smartphone also increased the time spent in the smartphone for activities other than academics as also shown in this study by the strong correlation it has on the increased scores in the smartphone addiction scale.

Contrary to previous studies (Cocorada et al., 2018), where older children were found to have a higher risk of becoming addicted to smartphones, it has been found in this study that although elder children have high scores, younger children are more prone to have higher scores in SASC-P. This is contrary to a meta-analysis done on Smartphone addiction among teenage students in 2014 (Davey & Davey, 2014). The use of smartphones and the accessibility to the internet has increased in the past 5 years and the present pandemic situation has made smartphones accessible to children of all ages

which could have resulted in the younger children getting more addictive to smartphones as evident by the SASC-P score in this study.

The data in this study shows that the time spent on smartphones before COVID has increased has risen to 15% as opposed to 2.9% for 2 hours per day found in a study conducted in 2010 (GSMA & NTT Docomo, 2012). This increased to 24.2% during the COVID induced lockdown and parents are clearly concerned about the increasing hours spent in smartphone at the expense of family time, physical health, and productivity. On the positive side, parents have some degree of control over young children when it comes to smartphone usage as clearly evidenced in this study. Parental control decreases as children age, resulting in an increase in scores in adolescents. This study also proves that video games have a strong addictive component as opposed to other sources of entertainment that the children and adolescents indulge in. Time spent in smartphones and the contents browsed are a major contributing factor to higher scores in the smartphone addiction scale and is similar to results from a previous study conducted in 2014 (Lee et al., 2014). The negative relationship between use of TikTok and the scores on SASC-P in this study is contradictory to other studies done globally. This could be because TikTok was primarily used by the young adults and hence viewed as a negative influence on children by parents due to the physical risks involved. It was considered as a deviance from the norms of many socio-cultural societies in India and parents usually avoided its exposure to children. TikTok was eventually banned in India due to this widespread negative attitude in June 2020 shortly after this study was conducted.

CONCLUSION

Easy accessibility to smartphones due to the pandemic induced lockdown has indeed made parents feel helpless as they watch children suffer setbacks in family, social and personal commitments while they indulge in a virtual world that is more appealing to their young minds. Steps should be taken to ensure that this trend does not become permanent. It is still a positive outlook when we find that most children do not own a smartphone when compared to other countries and it would serve as a protective factor against overuse or addiction.

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