A Cross Sectional Study to Assess the Addiction of Smartphone by Students Attending Higher Secondary School of Urban Community, Lucknow

Lt Col Sarvjeet Kaur[1], MajPreeti Bhatt[2], CaptPooja Upadhyay[3], CaptSudipa Gurung[4], CaptIndu Rai[5], CaptDeuny Susan Varghese[6]

[1]Professor, College of Nursing, CH (CC), Lucknow, India

[2]GD Matron, Command Hospital, Lucknow, India

[3, 4, 5, 6]SrSister, Command Hospital, Lucknow, India

Abstract: _Background: Mobile phones, particularly the smart phones have become our inseparable companions today. Smart phones are a type of mobile phones with different computing devices. The number of smart phone users is forecast to grow from 2.1 billion in 2016 to around 2.5 billion in 2020. Smartphone and internet usage in India is set to massively swell in the next four years. Adolescents are more prone for the addiction as they are more fascinated by smart phone. This study aimed to assess the addiction of the smartphone among higher secondary school students. Method: A cross sectional study was conducted to assess the addiction of smartphone by students attending higher secondary school in Lucknow. A descriptive cross sectional design was used and data was collected by survey approach, a total of 80 samples were selected by two way sampling technique and data was collected by using structured questionnaire. SAS addiction scale was used to assess the addiction in terms of social behavior of students. Results: The findings of study revealed that 59% of the respondents were addicted to smartphone in respect to frequency, duration of usage , availability of smartphone for 24 hrs and usage of other's smartphone. Majority of the respondents 58% were using smartphone more than 2 hours daily. It was also found out that usage was more by the males than females in terms of duration and frequency of usage of smartphone and parental relationship played an important role in this context. All these findings were statistically highly significant._

Keywords: Smartphone, Addiction, Higher secondary school

1. Introduction

The world is rapidly changing owing to the ceaseless advances in technology. In this ever changing and competitive world it's impossible to escape the presence of technology and one such example is the use of smartphones. Smart phones are a type of mobile phones with strong hardware and the extensive operating systems. This may include the internet facility, web browsing, and multimedia including music, games, cameras, videos etc. with varied software. Apart from all this wireless communications are also provided by smart phone which may include Bluetooth, Wi-Fi, and satellite navigation. [1]

The ubiquity of smart phones raises issues of increasing and widespread usage across demographics. Youth has more proclivity towards using mobile phones for activities other than mere communication.

The adolescents are highly impressible, more susceptible to changing fashion trends and style, making them more tech savvy which creates certain behavior typical of their age.

The critical neurobiological and developmental changes that make adolescence a period of both extreme vulnerability and rapid growth, makes this demographic group an interesting subject. This study is an attempt towards understanding the extent of smart phone addiction among adolescents in India. [2] The objective of the study was to gauge the magnitude of smartphone addiction in adolescents and the relationship between smart phone usage and demographic variables

2. Review of Literature

Studies have been conducted focusing on usage and addiction of smart phone focused attention is needed on the addiction of smartphone by adolescents of India.

The impact of smart phone can be seen on the academics of the students with regard to the time spent on smartphone. Dr. K Sumathi, Mrs. N Selva Lakshmi and Mrs. S Kundhusage found that majority i.e. 90% of their studied population was actively using smartphone and 34% used smartphones for an average of 5-7 hrs/day. [3]

The smartphones have diverse applications and thus increase the multitude of the usage. The gender gap is seen in the usage of the smartphone, a recent study conducted by Ramesh Ammatiand AnilKakunje on 328 students shows that females (51.8 %) were using smartphone more than males (41.2 %). [4]
YigitSenBahcesehir revealed that 68% of respondents were addicted to smartphone, in which 56% were using their phone between 2-5 hours a day,33% were using for 1 hour a day,8% were using their phone for 5-10 hours a day,1% of them were using for 10-15 hours a day and 2% of them were using for 15-20 hours a day. [5]

A rapid rise in the use of smartphone is seen among the adolescents, Sanjay Davey and Anuradha Davey found that smart phone addiction magnitude in India ranged from 39% to 44%. It has caused significant negative health risks and

harmful psychological effects on Indian adolescents. It can also lead to damaged interpersonal skills. [6]

Jean M Twenge published article in the year 2017 in which he mentioned that a high percent of73 teens had access to a smartphone.

Another study on the teens revealed that 60% of teens of the study group were spending too much time online. More than half of teens (54%) said they spend too much time on their cell phones and 41% said they overdo it on social media.

3. Problem definition

A cross sectional study to assess the addiction of smartphone by the students attending higher secondary school of urban community, Lucknow.

The objectives of the study were as follows-
1) To assess the addiction of smartphone by the higher secondary students
2) To explore the relationship of addiction of smartphone and select socio demographic variables

4. Methodology

A cross sectional approach was taken in the study and the study was conducted in two schools of urban community, Lucknow. The target population was identified and the accessible population in our study were in the age group from 13-19 years, from class 9 to class 12, of higher secondary school. The sample size was determined and two stage sampling was done, using proportionate stratified sampling with kth method and systematic random sampling.

Tool: A structured questionnaire was developed which consisted of two sections.

Section A: It includes demographic variables such as gender, age, class of students, occupation, type of family, education of parents, income, religion, money expenditure on smart phone. This section included total 11 questions.

Section B: It includes questions related to addiction of smart phone like frequency of usage, various features of phone which is been used, money spent on phone, frequency of phone recharge, and total time spent on smart phone. This included 18 questions. SAS (Smart phone addiction scale) was also used to determine usage in terms of social behavior.

5. Results

A total of eighty (80) respondents participated in the study. The addiction of smartphone by them was evaluated as per socio demographic status, place of usage,rules regarding usage and association was derived between various attributes. The findings were tabulated and the data was processed with SPSS and relevant association were elicited as per the objectives of the study.

Table 1: Socio demographic profile of respondents, n = 80

S no	Attributes	Criteria	Frequency	Percentage
1	Gender	Male	38	47
		Female	40	50
		Transgender	02	3
2	Age	13-14	16	20
		15-16	36	45
		17-18	27	33
		>=19	01	02
3	Class	9th	25	31
		10th	13	16
		11th	30	38
		12th	12	15
4	Type of family	Single parent	07	09
		Both parent	47	58
		Joint	16	20
		Relative	10	13
5	Relationship with parents	Open	07	08
		Strict	06	07
		Lenient	10	14
		Friendly	31	39
		Sometimes lenient, sometimes strict	26	32

Table 1 shows that out of the selected respondents, 40(50%) respondents were female and 38(47%) were male remaining 2 (3%) were transgender. Among these respondent's maximum respondents were from age group of 15 -16 years ,36 (45%) followed by 27 (33%) from age group of 17 -18 years, 16(20%) from 13-14. Further according to the class of respondent's maximum respondents 30(38%) were from class 11th,25(31%) were from 9th ,13(16%) were from class 10th and minimum respondents were from class 12th i.e. 12(15%). As per the type of family 47(58%) were living with both parents,16(20%) were living with joint family,10(13%) were living with relative and only7(9%)were living with single parents. Apart from these, respondents were also questioned about the type of relationship they share with their parents and out them 31(39%) shares a friendly relationship, 26(32%) respondent's parents were sometimes strict and sometimes lenient ,10 (14%) parents were lenient ,7(8%) were sharing an open relationship and only 6(7%) respondent's parents were strict.

Table 2: Socio economic status based on Kuppuswamy scale

S no	Socio economic class	Frequency	Percentage
1	Lower	12	15
2	Upper middle	33	42
3	Middle	24	30
4	Upper	11	13

Table 2 shows that out of 80 respondents 33(42%) belonged to upper middle class, 24(30%) to middle class, 12(15%) belonged to lower class and 11(13%) were from upper class.
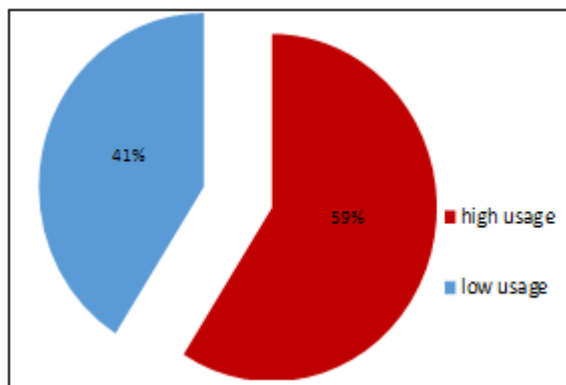
Figure 1: Overall usage of smart phone in respondents, n=80

The above figure depicts that out of 80 respondents 47(59%) were having high usage of smart phone and 33(41%) were having low usage of smart phone. The overall addiction of smartphone was calculated on the basis of the availability of smartphone, use of others smart phone, frequency of usage of smartphone and duration of smart phone.
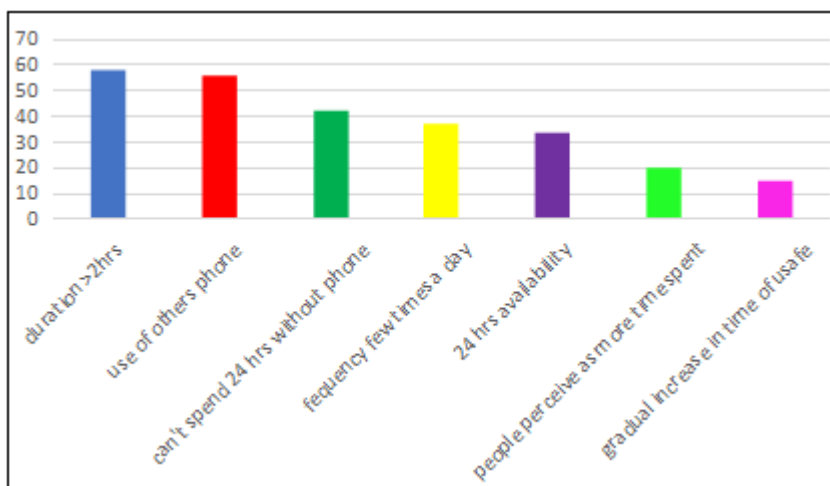

Figure 2: Frequency of addiction of smartphone by respondents

According to the figure, the average hours spent on smartphone by majority of the respondents (58%) lies in more than 2hours per day. It can also find out that (56%) were using others phone which include parents, relatives, friends etc. 57.5 % students said that they can't spend 24hrs without their smartphone which is a major factor for addiction.
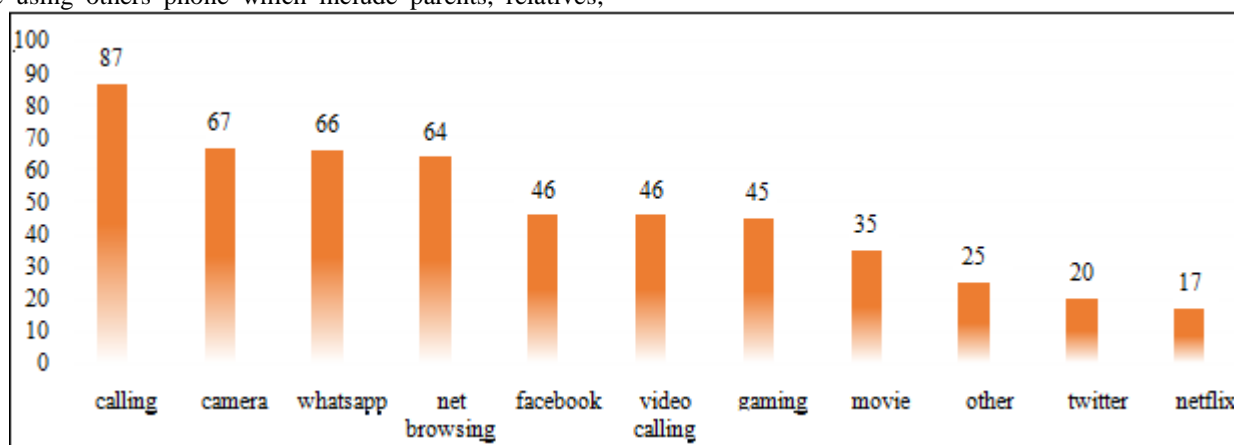

Figure 3: Frequency of addiction of smart phone based on mostly used features, n= 80

Most of the respondents 70(87%) used their smartphones for communication followed by usage of camera 54(67%). Use of whatsapp was around (66%) while net browsing was (64%) followed by the use of Facebook (46%).
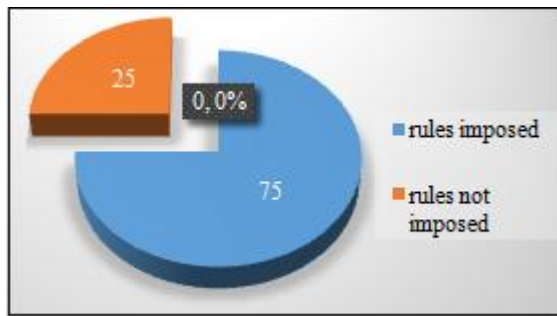
Figure 4: Distribution of rules imposed on respondents, n= 80

Fig 5 shows that among 80 respondents, 60(75%) had rules imposed on them regarding the usage of smartphone while 20 (25%) did not have any rules.

Table 3: Description of Pocket money received by respondents

S.no	Category	Attributes	Frequency	Percentage
1.	Pocket money received by respondents	Yes	64	80
		No	16	20
2.	Amount of pocket money received by respondent	100-200	49	76
		200-300	10	16
		300-400	01	2
		>=500	04	6
3.	Frequency of getting pocket money	Daily	06	09
		Weekly	07	11
		Monthly	10	16
		Not fixed	41	64

Table 3 depicts that out of 64 students, 49(76%) students were getting pocket money from Rs100-200. Although pocket money was provided to maximum respondents but the frequency of getting pocket money was not fixed for 41(64%) students.
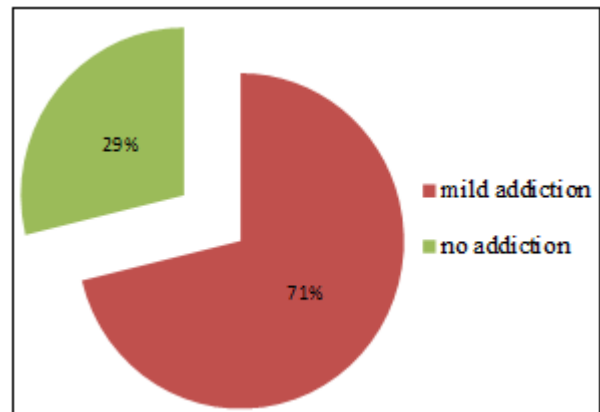

Figure 5: Overall addiction of smart phone on social behaviour of respondents, n= 80

The above fig denotes overall addiction on social behaviour, according to it 57(71%) respondents had mild addiction and 23(29%) had no addiction.

A 6 points likerts scale was prepared modifying the smartphone addiction scale(SAS) to analyse the effect of smartphone on social behaviour. The standard scale consisted of 33 questions which was modified for our study based on Indian scenario.The modified scale contains 14 questions and graded as strongly agree, agree, weakly agree, weakly disagree4, disagree, and strongly disagree.The data was analysed and grading was done as severe addiction, mild addiction and no addiction as mentioned above in table
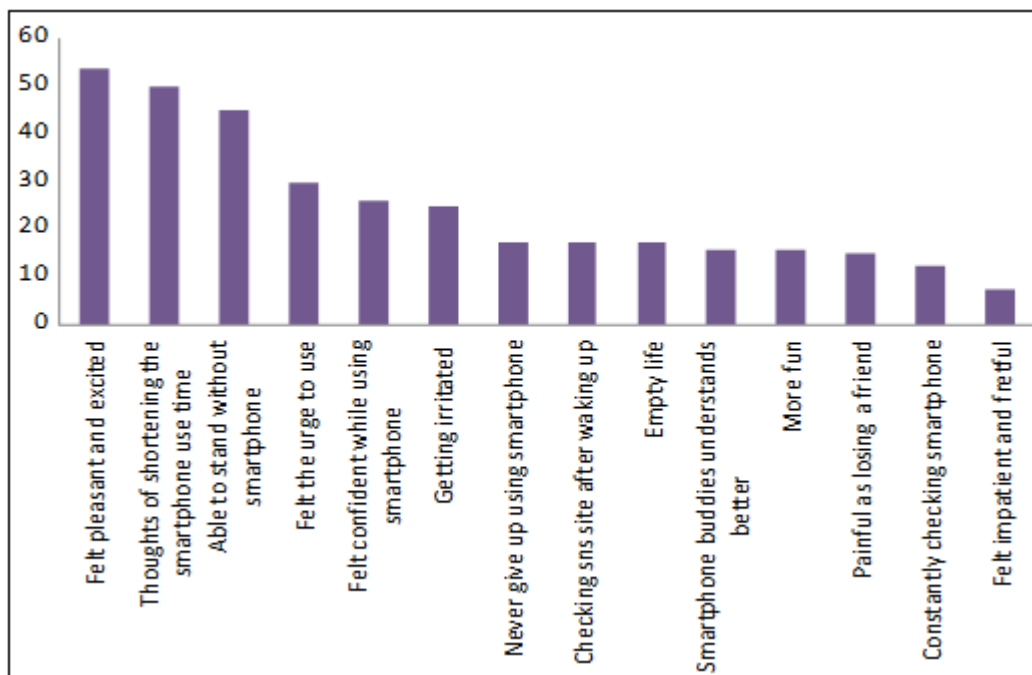

Figure 6: Effect of addiction of smart phone on social behavior, n= 80

Addiction to smartphone can lead to various personality problems, communication problems and psychological issues. Figure shows that out of 80 respondents, 14(17%) respondents feels their life would be empty without smart phone, 13(16%) feels that there nothing more fun than using smart phone, 20(25%) feels irritated when bothered by

others while using smart phone, 24(30%) feels the urge of using Smart phone again right after they stopped using it,and 40(50%) respondents feels that they should shorten the smart phone use time.

Association of the addiction of smartphone with sociodemograhic variables

Table 4: Analysis of the relationship of the gender of the respondent with the addiction of smartphone, n=80

Usage		Gender			Total	Chi Square	P Value	Inference
		Male	Female	Transgender				
Frequency of usage	High	19(23.8%)	9((11.2%)	1(1.2%)	29(36.2%)	87.62	<0.001	Highly Significant
	Low	19(23.8%)	31(38.7%)	1(1.2%)	51(63.7%)			
Duration of usage	High	33(41.2%)	12(15.0%)	1(1.2%)	46(57.5%)	107.14	<0.001	Highly Significant
	Low	5(6.2%)	28(35.0%)	1(1.2%)	34(42.5%)			
24 hours availability of smartphone	Yes	19(23.7%)	8(10.0%)	1(1.2%)	28(35%)	89.01	<0.001	Highly Significant
	No	19(23.7%)	32(40.0%)	1(1.2%)	52(65%)			
Usage of other's phone	Yes	14(17.5%)	29(36.2%)	2(2.5%)	45(56.2%)	92.81	<0.001	Highly Significant

Data in parenthesis denote percentage, df=6

In table 4, the relationship of gender of the respondent with frequency and duration of usage of smartphone by respondent was computed and it was seen that 38.7 % of respondent were females and had less addiction compared to males while 41.2 % of male respondents had high duration of usage compared to females which was statistically highly significant with $\chi2$ 87.62 and $\chi2$ 107.41 respectively with p value < 0.001 .

It was found that 40 % of female respondents were not provided smartphone for 24 hrs and it was seen that 36.2 % of female respondents were using other's smartphone compared to males which was statistically highly significant with $\chi2$ 89.01 and $\chi2$ 92.81 and p value < 0.001 .

Table 5: Analysis of association between type of family with addiction of smartphones among respondents

Usage		Type of family				Total	Chi square value	p value	Inference
		Single	Both	Joint	Relatives				
Frequency of usage	High	3(3.7%)	17(21.2%)	5(6.25%)	4(5.0%)	29(36.2%)	81.67	<0.001	Highly Significant
	Low	3(3.7%)	30(37.5)	11(13.7%)	7(8.7%)	51(63.7%)			
Duration of usage	High	5(6.2%)	26(32.5%)	8(10.0%)	7(8.7%)	46(57.5%)	83.29	<0.001	Highly Significant
	Low	1(1.2%)	21(26.2%)	8(10.0%)	4(5.0%)	34(42.5%)			
24 Hours availability of smartphone	Yes	2(2.5%)	14(17.5%)	6(7.5%)	6(7.5%)	28(35%)	83.49	<0.001	Highly Significant
	No	4(5.0%)	33(41.2%)	10(12.5%)	5(6.2%)	52(65%)			
Usage of other's phone	Yes	4(5.0%)	29(36.2%)	7(8.7%)	5(6.2%)	45(56.2%)	83.39	<0.001	Highly Significant
	No	2(2.5%)	18(22.5%)	9(11.2%)	6(7.5%)	35(43.2%)			

n=80 *Data in parenthesis denote percentage, df=8*

It was found that type of family of respondents and frequency of usage was highly significant at a chi square value of 81.67 and at a p value of < 0.001. The type of family of respondents and duration of usage was also found to be highly significant at a chi square value of 83.29 and at a p value of < 0.001. Similarly, 24hrs availability of smartphone and type of family of respondents was highly significant at a chi square value of 83.49 and at a p value of < 0.001. It was also found that usage of other's smartphone and type of family of respondents was highly significant at a chi square value of 83.39 and at a p value of < 0.001.

It can be concluded that frequency of usage was low (37.50%) among respondents living with both the parents whereas their duration of usage was high (32.50) . It was also found that 24hrs availability of smartphone was low (41.2%) among respondents living both the parents but usage of other's phone was high (36.2%) among them.

6. Discussion

The present study focused on the addiction of smartphone, in terms of frequency and duration of smartphone usage, 24 hrs availability of smartphone to the respondents and use of other's smartphone. Further the smart phone addiction was assessed on the basis of the gender of respondents, type of their family, relationship with the family members and provision of pocket money to them.

It was found that, 46 (57.5 %) were using smartphone >2hrs /day and 29 (36.25 %) used smartphone frequently .The overall high usage of smartphone was found among 59 % of the respondents similarly study done by Yigit Sen Bahcesehir reported that 68% of respondents were addicted to smart phone and they were using their phones for more than 2-4 hrs a day whileDr. K Sumathi et al reported that 60% of students were in possession of smart phone and among that 90% were actively using phone and 34% used 5-7 hrs/day.

It was seen that 38.7 % of respondents were females and had less frequency of addiction compared to 41.2% males while 41.2 % of male respondents had more addiction compared to females which was statistically highly significant with $\chi2$ 87.62 and $\chi2$ 107.41 respectively with p value < 0.001 .

Further it was evident that 40 % of female respondents were not provided smartphone for 24 hrs and it was seen that 36.2 % of female respondents were using other's smartphone

compared to males which was statistically highly significant with χ^2 89.01 and χ^2 92.81 and p value < 0.001 .

As per the relationship with parent, 35 (43.75 %) respondents who had friendly as well as strict relationship with parents had low frequency but high duration of usage with χ^2 83.34 and 93.22 respectively with p value < 0.001. Although the smartphone was not provided to 37 (46.25 %) of respondents for 24 hrs but still 32 (40 %) of respondents were using other's smartphone. It was found highly significant with χ^2 86.50 and 82.59 with p value < 0.001. Thus it can be elicited that the type of relationship with parents had an effect on the addiction of smartphone.

Similar study conducted by Seong -Soo Cha and Bo- Kyung Seo on 1824 middle school students found that out of 1824 participants, 563(30.9%) were identified as a risk group for smartphone addiction and 1261(69.1%) were classified as a normal user group according to their scores on the Smartphone addiction proneness scale. [7]

Jean Twenge published an article in 2017 found that teens who spent five or more hours a day online were 71 percent more likely to have at least one suicide risk factor (depression, thinking about suicide, making a suicide plan or attempting suicide). Present study also brought out that smart phone use affected social behaviour. 25% felt more irritated, 30% had urges to use phone, 17% felt their life will be empty without smartphone.

The study also brought out that there is huge need to monitor the addiction of smartphone by the students of higher secondary school to prevent ill effects of excessive smartphone usage.

7. Recommendations/ Future Scope

The rapid advancement in technology has led to development of many gadgets and smartphone is one of them. People spend most of their time likely on social media, do business mails, academic search, find answers to questions and playing games. [8]

The smartphone is 24/7 accessible with applications that stimulates its continuous usage. On the basis of our research findings, following recommendations are made:

a) Strategies at the National level
A national policy must be formulated for the strict adherence by the school authorities to limit the usage of smartphone by the school going children. Research must be conducted to develop such smartphones which can be used only for academic purposes by the students. Guidelines for the teachers must be formulated and enforced in the schools regarding awareness of the ill effects of usage of smartphone Parental awareness programmes must be conducted on regular basis to prevent the adverse effects of the smartphone. Counselling sessions must be conducted at the health care centre and all health care professionals must be made aware to recognise the smartphone addiction and curb it at the root level.

b) School level strategies
The schools are the building blocks of the student's mindset and attitude towards life. The school authorities must focus on guiding the students regarding the derogatory effects of the smartphone. Regular counselling sessions should be conducted by the teachers. The findings of the smartphone's ill effects must be endorsed and notified to higher authorities

c) Parental
Family is the first school of a child and a child learns most from his family members. Smartphone must not be provided to young children at the tender age. Children must be encouraged to participate in co –curricular activities rather spending valuable time fiddling with the gadgets. In this fast moving era parents must take out time to interact ,play and spend quality time with their off springs rather on the gadgets.

8. Conclusion

A diligent search on the addiction of the smartphone by the adolescent school going children was the motive of the research. A cross sectional study was undertaken to assess the addiction of the smartphone by the students of higher secondary students in the region of Lucknow. It was found that, 46 (57.5 %) were using smartphone >2hrs /day and 29 (36.25 %) used smartphone frequently. The overall high usage of smartphone was found among 59 % of the respondents. Females had less frequency of addiction compared to males while 41.2 % of male respondents had more addiction. Parents who had flexible relationship with their children were able to control the usage and addiction of the smartphone.

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Author Profile

Lt Col Sarvjeet Kaur Professor, Msc Community health nursing,
Phd Public Administration

MajPreeti Bhatt PBBSc, GD Matron

CaptPoojaUpadhyayPBBSc, Senior Sister

Capt Sudipa GurungPBBSc, Senior Sister

Capt Indu Rai PBBSc, Senior Sister

Capt Deuny Susan Varghese PBBSc, Senior Sister