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Mobile Phone Usage and Awareness of Health Related Issues Among the Male Science Students

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Abstract

The objective of this study was to understand the usage pattern of mobile phones nowadays by the male science students and to check whether they are aware of the fact that the various risk factors associated to their health are these cellular phones only.

Cell phones are considered to be one of the most speedily emerging technologies in the human race especially in younger generation within a short span of time. Youth is more inclined towards using mobile phones for activities other than communication than older generation because in adolescence stage, people are more susceptible to changing fashion trends and style, building them more Tech savvy which creates certain behavioral disorders. The fame of the cell phones is followed by an alarm towards the detrimental effects of cell phone radiation. Fatigue, headache, decreased concentration and local irritation and burning are the major effects of excessive usage of cell phones, as stated by various researches.

A descriptive survey design was used to extract answers to the questionnaires administrated to 10th, 11th and 12th standard male science students in the Kanpur city, Uttar Pradesh, a state in India. Opinion of 30 skilled physicians in the field of ENT, cardiology and IVF specialists were also taken. Data was analyzed using the Statistical Package for Social Sciences (SPSS).

The study concludes that the use of mobile phones is quite common among the science students besides considering it as a status symbol; they treat it as their necessity of life. The crucial role played by parents, schools and the publicity due to advertisements gives a push to such adoption behavior.

Key words: Mobile phones; Science students; Health; Parents

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INTRODUCTION

Cell phones are considered to be one of the most speedily emerging technologies in the human race (Rebello, 2010). By the end of the year 2010, there was a drastic increase in subscription of cell phones in developing countries reaching five billion worldwide which outnumbered the subscription in developed countries (Kelly, 2009; Rebello, 2010). According to Telecom Regulatory Authority of India, there are about 929.37 million mobile phone subscribers in India making it the world's second-largest cell phone using developing country in the month of May, 2012 (TRAI, 2012). Motorola, Nokia, Samsung, Sony Ericsson etc. are the popular mobile phone brands in Indian market luring their customers by introducing latest mobile phones at regular intervals (Singla, 2010).

There has been quite an enormous amount of popularity of cellular phones in younger generation within a short span of time (Hakoama & Hakoyama, 2011). Youth is more inclined towards using mobile phones for activities other than communication than older generation (Mackay & Weidlich, 2007) because in adolescence stage, people are more susceptible to changing fashion trends and style, building them more Tech savvy which creates certain behavioral disorders. On the contrary, administrators and teachers frequently consider the use of

cell phones by students at schools, restraining them from their education and this arises as hurdles in their education (Johnson & Kritsonis, 2007). Moreover, mobile phones have aided in smoothening the progress of social release of youngsters from parental authority (Ling, 2004). But, their parents often have more sense of security when their children travel independently outside their home along with their phones (Baron, 2010).

The improved popularity of cellular phones is now alluring various research sectors' attention towards them (Hakoama & Hakoyama, 2011). The cell phone culture, changes in behavioral patterns (Campbell & Park, 2008; Bakke, 2010; Ling, 2004), and health risks from the hazardous radiations coming from the cell phones (Anna *et al*., 2006) are the major reasons behind this interest. Cell phones are no more considered to be an accessory and have become a basic requirement of our lives and people are dedicating a major part of their daily routine to these mobile phones. According to Psychiatrists, mobile phone obsession is now a foremost major non-drug addiction of this century (Ahmed & Qazi, 2011). The fame of the cell phones is followed by an alarm towards the detrimental effects of cell phone radiations (Makker *et al.*, 2008). Fatigue, headache, decreased concentration and local irritation and burning are the major effects of excessive usage of cell phones, as stated by various researches (Sandstrom *et al.*, 2001). Because ear is the first organ dealing with the cell phones, there is a elevated energy deposition in the ear as compared to other organs and its effect on hearing are debated (Ozturan *et al.*, 2002). Along with the severe effects on general health, there was some research conducted which depicted reduction in male fertility potential (Agarwal *et al.*, 2008).

The objective of this study was to understand the usage pattern of mobile phones nowadays by the male science students and to check whether they are aware of the fact that the various risk factors associated to their health are these cellular phones only.

METHODOLOGY

A descriptive survey design was used to extract answers to the questionnaires administrated to 10th, 11th and 12th standard male science students who have joined the private coaching classes for the preparation of pre-medical and pre-engineering entrance tests with prior approval of the Coaching classes' owners and their teachers in Kanpur city, Uttar Pradesh, a state in India. Characteristic profile (Age, educational status, area and family income) and health risks associated with mobile phone usage were the two main criterions on which study of mobile phone usage among the students was conducted. A total of 602 students were selected for the survey. Furthermore, opinion of 30 skilled physicians in the field of ENT, cardiology and IVF specialists, 10 volunteers from each were chosen to answer the questions regarding the use of mobile phones by the school going children and its effects on their body, in the questionnaire format. Data was analyzed using the Statistical Package for Social Sciences (SPSS) program version 16 to calculate the frequencies and percentages.

RESULTS

Table 1 shows characteristic profile, whereas Table 2 shows the responses of the students. Majority of students using cell phones fell into the age group of 16-18 years (57.6%). The percentage of students using cell phones was 36.5%, 28.4% and 35.0% for the 10th, 11th and 12th standard students, respectively with most of them residing in urban areas (78.9%). The majority of their parents' monthly income was more than Rs. 30,000 p. m (49.8%). For students, mobile phones are now treated as a life necessity (62.1%).

Table 1
Characteristics Profile of the Students

Characteristics	n= 602	%
Age, Y		
13-15	255	42.4
16-18	347	57.6
Education		
10th Standard	220	36.5
11th Standard	171	28.4
12th Standard	211	35.0
Area		
Urban	475	78.9
Semi- Urban	83	13.8
Rural	44	7.3
Family Type		
Nuclear	364	60.5
Joint	238	39.5
Family Income/Month		
10,000-15,000 Rs	94	15.6
20,000-25,000 Rs	208	34.6
>30,000 Rs	300	49.8

Many students approved of carrying the cell phones during the school hours (36.1%) and a greater percentage of them accepted that their teachers were acquainted with the fact that the students used mobile phones in the school (51.0%). A greater part of the students were not familiar with the hazardous effects which mobile phones have on the ecosystem (51.3%), although they are entirely aware about the effects on health (52.8%). The phone advertisements are found to be the major reason which lures the students to buy these gadgets (48.3%).

Table 3 shows the responses of the physicians. A major percentage (58.6%) of the physician's community believed that the usage of mobile phones by school going children

is not justified and the time limit for the cell phone usage should be in the range of 1-2 hrs/day (69.0%). According to the IVF specialists, constant usage of cell phones by adolescents can lead to the decrease in their fertility level (44.4%) and when they reach their marriageable age, the fertility level is believed to decrease by 10-20% (55.6%). ENT specialists believed that the hearing power might also plummet and could be 5-10% less at the age of marriage (60.0%). Likewise, according to the cardiac specialists, heart's function in children got affected in the children using mobile phones (50.0%) and the level of functioning may get reduced by 5-10% (77.8%).

Table 2
Questionnaire Based on Mobile Phone Usage and Awareness of Health Related Issues

Questions	n= 602	%
How many mobile phones do you have*?		
One	423	77.0
Two	126	23.0
Which company mobile phone do you use*?		
Nokia		
Sony Ericson	179	32.6
Samsung	114	20.8
Other	145	26.4
	111	20.2
Why do you use mobile phone*?		
As a status symbol	208	37.9
its life necessity	341	62.1
Do you carry mobile phone with you during your school hours*?		
Yes	198	36.1
No	351	63.9
Do your school teachers know that you have mobile phone with you*?		
Yes	280	51.0
No	269	49.0
In a day how many hours you are using your mobile*?	192	35.0
2hrs	241	43.9
4rhs	116	21.1
6hrs		
You keep your mobile mostly*?		
In Hand	152	27.6
In Trouser pocket	346	62.9
In Shirts pocket	51	9.3
In which mode you usually keep your phone*?		
Silent	171	31.1
General	233	42.4
Vibration	145	26.4
Do you know that mobile phone usage is responsible for ecosystem disturbance?		
Yes	293	48.7
No	309	51.3
Do you know that mobile phone usage is responsible for number of ill effects like hearing problems, cardiac problems and infertility?		
Yes	318	52.8
No	176	29.2
Cannot Say	108	17.9
Do you feel that mobile advertisements attract you to buy the mobile phones?		
Yes	291	48.3
No	311	51.7

* Missing value existing.

Table 3
Doctors Opinion About the Use of Mobile Phone by the Students

Questions	n= 30	%
Do you feel that use of mobile phone by school going kids is worth it*?		
Yes	7	24.1
No	17	58.6
Cannot Say	5	17.2
According to you, if an adolescent uses a mobile phone daily, what should be the time limit for them*?		
1-2hrs	20	69.0
2-4hrs	5	17.2
>4hrs	4	13.8
Do you agree that use of mobile phones at adolescence stage will decrease their fertility in near future**?		
Yes	4	44.4
No	2	22.2
Cannot say	3	33.3
In India the average marriage age in these days for boys is 25- 30 years, so if a male continuously using the mobile phone from their adolescence stage, According to you what will be level of % in terms of decrease in their fertility**?		
5-10%	2	22.2
10-20%	5	55.6
>20%	2	22.2
Do you agree that use of mobile phones at adolescence stage will decrease their hearing power in near future***?		
Yes	6	60.0
No	2	20.0
Cannot say	2	20.0
In India the average marriage age in these days for boys is 25- 30 years, so if a male continuously using the mobile phone from their adolescence stage, According to you what will be level of % in terms of decrease in their hearing power***?		
5-10%	6	60.0
10-20%	4	40.0
>20%	Nil	-
Do you agree that use of mobile phones at adolescence stage will affect their heart functioning in near future****?		
Yes	5	50.0
No	4	40.0
Cannot say	1	10.0
In India the average marriage age in these days for boys is 25- 30 years, so if a male continuously uses the mobile phone from their adolescence stage, According to you what will be level of % in terms of affecting their normal heart functioning****?		
5-10%	7	77.8
10-20%	2	22.2
>20%	Nil	-

*Missing value existing, **IVF, ***ENT, ****Cardiologist

DISCUSSION

Originally, cell phones were created for adults for their business purpose (Aoki & Downes, 2003) which is quite similar to the fixed telephone in the early 20th century (Flinchy, 1997). In 2002, the number of mobile phone users worldwide surpassed those of fixed-phone

users depicting the growth of mobile phone technology (Srivastva, 2005). The speed of rising popularity of cell phones among youngsters around the world is quite remarkable (Campbell, 2005). The major pull experienced by youngsters towards different cell phones is due to the drop in the rate of the handsets, their smaller size and introduction of the pre-paid phone card (Ling, 2003). Although mobile phone is now considered to be the status emblem (Netsafe, 2005) and people have become more particular in buying their phones and are quite brand conscious too, the study conducted on the youngsters provided results, which showed that around 62.1% respondents feels cell phones as a basic necessity in their lives.

The major cause of the tendency of the cell phone adoption by the youngsters is their parents. Parents have started providing their young ones cell phones, in order to maintain their children's safety when the parents send their young ones outside the home to face the world (Oksman & Rautianinen, 2003; Geser, 2004). On the contrary, parents believe the safety issues faced by their kids can only be sorted out by providing them a cell phone, but this turns out to be a bigger disaster for them as it leaves a larger impact on the whole family (Campbell, 2005). Cyber-bullying is the major danger faced by the youth and their parents as well indirectly due to the use of cellular phones (Williams & Williams, 2005; Keith & Martin, 2005). As in our finding, the students agreed that their parents provide them mobile phones as a birthday or a prize gift (33.9%, 47.5%). (Figure 1)

Figure 1
Cartoon

An additional reason is the use of mobile phones during the school hours, as in the result outcome, 36.1% students use the mobile phone in the School premises and 51.0% said that their teacher are familiar with their mobile usage in the schools. In the United States, the majority of public schools have a rule against the use of cell phones in school, which requires students to either leave their phones at home or keep them in the switched off mode during the school hours (Obringer & Coffey, 2007). Other schools have started a policy where students are allowed to use cell phones either before or after the school hours only and not within school hours (Gerard, 2006). Conversely, parents feel that cell phones improves the safety of their children and they can maintain their protection by being in their constant touch and maintain a record of their children school activities or even contact them if any emergency arises (Obringer & Coffey, 2007; Zirkel, 2008).

The mobile phone advertisements are considered to be another factor responsible for the adoption behavior of the mobiles in the younger generations, a fact accepted by many mobile phone users (48.3%). To a certain extent, it becomes easy for the companies to influence customers, if they are able to guess their behavior and their requirements (Dinesh, 2012). Teenagers are an important part to this system, owing to their discretionary expenditure quality. Marketers create ads using movie actors as role models in order to attract the younger generation to sell their brands. Furthermore, the branded companies also employs the website corners to attract the customer as internet nowadays is considered to be an integral part of the society.

The major issues faced in the 21st century are the health risks and the problems which the ecosystem is facing due to the increased usage of mobile phones. Several studies showed that the cell phone's harmful radiations were able to degrade the quality of sperm with regard to quantity, viability, motility, morphology and few mutations in DNA causing severe changes in sperms (Agarwal *et al*., 2008; Agarwal *et al.*, 2009; Diem *et al.*, 2005). When a study was conducted on an animal, it was observed that there was an increase in oxidative stress in rat myocardium when exposed to 900MHz RF-EMW (30min/day, for 10 days) (Ozguner *et al.*, 2007). In a study presented at American Academy of Otolaryngology-Head and Neck surgery Annual Meeting, 100 cell phone users when studied for a year showed remarkable increased degree of hearing loss over the past period of 12 months (Oktay & Dasdag, 2006). In our study, 52.8% of the students approved of knowing about the ill effects of the mobile usage on health but, this fact does not stop them to use mobile phones.

In our survey, we found that 51.3% of the students were not aware about the ecosystem disturbance by the use of mobile phones which is quite critical. Our fauna system suffers the ill effects of mobile phone radiations as well. The most recent example is the noticeable decline in the population of house sparrow. A sharp decline in the population of house sparrow has been observed in London; a 70% drop since 1994 (Summer-Smith, 2003).

Recently, the house sparrow population has plummeted across Bangalore, Mumbai, Hyderabad and other cities in India, as observed by some ornithologists (Dandapat *et al.*, 2010) and the major reason behind this is the hazardous effects of electromagnetic waves from cell phone towers injures the sparrows and reduces their fertility (Dandapat *et al.*, 2010).

Not only have these waves showed their effects on sparrows, but on the bees as well. This is confirmed by the fact that bees simply leave their hives and never return back (Hamzelou, 2007). Colony Collapse Disorder (CCD) is the name given to this problem. Electromagnetic field has now thus emerged out to be a powerful criminal when the reports showed remarkable influences on honeybee behavioral patterns and physiology (Carlo, 2007). Similar experiments are also being conducted on honeybee behavior changes due to electromagnetic radiations in India as well (Sharma & Kumar, 2010); Kerala state having the major reduction in honeybee population posing a serious threat overall the country (DNA, 2009).

CONCLUSION

The study concludes that the use of mobile phones is quite common among the science students besides considering it as a status symbol; they treat it as their necessity of life. Similar results were obtained when a survey was conducted on university students in Pakistan (Ahmed & Qazi, 2011). The crucial role played by parents, schools and the publicity due to advertisements gives a push to such adoption behavior. There has been a strict regulation issued on the use of cellular phones by the school children by various governments and advisory bodies of countries like Europe, USA and Russia (Mobilewise, 2011). A circular prohibiting the use of cell phones in all government and private colleges, has been issued by department of collegiate education in Karnataka state, India (The Hindu, 2009). What we have discovered is that the students are totally aware about the ill effects of the mobile phones but still they continue using it so as to maintain a place in the society owing to the fact that cell phones are now a status symbol and the more expensive the phone, higher is the status of a person. To decrease this addiction to certain extent, we believe that parents, doctors and the school teachers are required to play a key role and widen their horizon regarding the use of cell phones to prevent their kids from various dangers like cyber bullying and wrong company of their kids.

AUTHOR'S CONTRIBUTION

Aanchal Vasudev developed the questionnaire for the students, collected the data from the students and participated in scientific discussion. Manmeet Kaur collected the data from the physicians, participated in the discussion and drafting the manuscript. Harsh Kumar conceptualized the study and designed the research protocol, directed all aspects of this research, wrote the final draft. Rini Chaturvedi developed the questionnaire for physicians, participated in the scientific discussion and drafting the manuscript.

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