A Study on Some of the Common Health Effects of Cell-Phones amongst College Students

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Abstract

**Background:** Cell phones are being used by each and every one today. Their use without any knowledge of their harmful effects is unsafe. Studies on cancers due to electromagnetic radiations from cell phones are available but there is a need to research on the harmful physical and mental effects esp. on rampant users, like college-goers. This study focused on the health effects of cell phone usage amongst students pursuing professional courses in colleges in an urban setting.

**Materials and methods:** College students of both sexes in the age group 17-23 years from urban and rural backgrounds were selected at random (those using cell phones).

**Results:** Expectedly, almost all the subjects (96.1%) possessed cell phones, and used the device for a greater part of the day. Headache was found to be the commonest symptom (51.47%) followed by irritability/anger (50.79%). Other common mental symptoms included lack of concentration and poor academic performance, insomnia, anxiety etc. Among physical symptoms –body aches (32.19%), eye strain (36.51%), digital thumb (13.8%) were found to be frequent. Accidents are caused due to cell phone driving.

**Suggestions:** Less dependence on the device, curtailing time period spent on talking, communicating more by texting, holding the device as much away from the head as possible or using headphones/loudspeaker facility, etc. were some of the take-home messages advocated to the subjects to minimize and prevent the adverse effects.

**Keywords:** Cell phones; Adverse health effects

**Introduction**

A cell phone is a device that can make and receive telephone calls over a radio link whilst moving around a wide geographic area. It does so by connecting to a cellular network provided by a mobile phone operator, allowing access to the public telephone network [1,2].

In addition to telephony, modern-day mobile phones also support a wide range of other services such as text messaging, e mail, internet access, short-range wireless communications (infrared, Bluetooth), business applications, gaming and photography. Today, Smart phones with more advanced computing facilities have come into the market.

In the last 20 years, worldwide mobile phone subscriptions have grown from 12.4 million to over 5.6 billion, penetrating about 70% of the global population [3]. Its usage has also become an important public health problem as there have been reports of plenty of health hazards, both mental and physical, in people of all age groups. While some of these oft-seen effects are critical like cancers, others that cause definite morbidity are both physical and mental. On 31 May 2011 the World Health Organization confirmed that cell phone use indeed represents a health menace, and classified mobile phone radiation as a carcinogenic hazard, possibly carcinogenic to humans.

In spite of some knowledge on unfavorable health effects, the usage of cell phones has increased dramatically especially since the time they have become more affordable and available all over the world [4]. Almost 87-90% of the population in an advanced country like the USA, use cell phones, and a sizeable number of these is school and college going students [5].

In India too, we note that the scenario is similar with people from both rural and urban areas, educated or illiterate, and belonging to almost all ages; now dependent on a cellular phone. The alarming fact is that many of these devices reach the market without any safety testing on their electromagnetic radiation [6].

**Aims and Objectives**

The aim of this study was to assess some of the self-perceived effects of increasing cell phone usage on the well-being of college going students. Certain symptoms related to the major systems of our body like the nervous system (neurological symptoms such as depression, sadness, irritability and headaches, anxiety, loss of memory and lack of sleep) were queried for.

Constant usage and sort of addiction to cell phones has affected the people physically and psychologically by making them have aches and pains and in some a disability too; lose their required number of hours of sleep; get angry and scrap over trivial matters, and so on and so forth [7].

Effects of overuse of cell phone devices in the general population [8,9] have been carried out by many, but few on specific groups like the teenagers, younger generation or say college-students [10].

Hence a study on impact of mobile phone use on the health of students in an urban college setting in the densely populated capital city of Hyderabad (Andhra Pradesh) was deemed apt.

**Keywords:** Cell phones; Adverse health effects

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Materials and Methods

The methodology adopted in the present study is discussed under 3 heads-sample, study design and process of obtaining data and analysis.

Sample

Inclusion criteria: In this study students of both sexes within the age group of 17-23 from both rural and urban backgrounds, using cell phones, enrolled in the professional courses such as engineering, medicine, pharmacy, were included. The colleges included were situated near to one another, for simple logistics.

Subject

Though each of the colleges has more than five hundred students, only a random sample from each was included in the present study. An effort was made to include a good number of students from different professional colleges like engineering, medicine and pharmacy, so that the final assessment would be more precise and "bias" kept at a minimum.

Study design

The study plan was a Cross sectional or Prevalence one. Observations were made, based on a single examination of a cross-section of a population by administering a pre-tested questionnaire, at one point in time.

Process of obtaining data and analysis

On the day of data collection, all students who were available in a particular class were requested to answer the questionnaire. This was conducted during the recess so that teaching sessions would not be disturbed. The respondents were first explained about the rationale of this study. Next, a formal consent was obtained. Confidentiality of the information to be rendered by them was emphasized upon. Data thus collected was systematized for further analysis.

Duration

The research was conducted over a period of 2 months i.e. from July to August 2012.

Results

The outcome of this study has been elaborated and discussed under two main heads, basic information and health effects.

Basic information

The total number of respondents was 459. Two hundred and twenty (48.5%) of the respondents were from the medical college and the rest (236, 51.5%) from non-medical courses. It was observed, that the majority (293, 63.8%) belonged to the age group of 17-20 years. Almost equal number of females (228, 49.7%) and males (231, 50.3%) participated. A majority (293, 63.8%) belonged to an urban background as compared to only 36.2% from rural areas.

As regards ownership of a cell phone, almost all (441, 96.1%) possessed one.

Few (112, 25.4%) of the subjects had been using the cell phone for less than a year while the rest 329 (74.6%) had been using it for more than a year. These findings are summarized in table 1.

Again a clear majority i.e. 88.2% (389 respondents) were found to be using the cell phone for more than half an hour a day, and the rest were using it for less than an hour or so (11.8%).

<table>
<thead>
<tr>
<th>Duration of use (in years)</th>
<th>Nos.(Percentages)</th>
<th>n=441</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>112 (25.4)</td>
<td></td>
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<tr>
<td>2</td>
<td>134 (30.4)</td>
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<tr>
<td>&gt;2</td>
<td>195 (44.2)</td>
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Table 1: Duration of possessing a cell phone, in years.

Common health effects

The part of the questionnaire dealing with health effects was answered by only those 441 students, who owned a cell phone. Of them, very few (10, 2.3%) of the students mentioned that they were already suffering from illnesses like Asthma (6 nos.) and Migraine (4 nos.).

The most common symptom was that of headache followed by irritability. A sizeable number (227, 51.5%) attributed frequent attacks of headaches to their continuous usage of mobile devices. Radiations from the phone affecting the skull part the phone is held against could be a cause. Two hundred and twenty four (50.8%) stated that they got irritated or angry over things told to them on the cell phone by friends and family or due to calls by the company.

Two hundred and nine (47.4%) students responded on the affirmative when queried on lack of concentration. They admitted that they were disturbed by frequent calls/messages from others, which did not allow them to complete their academic activities at one stretch. Related to this was the aspect of slack in academic performance as brought forth by 153 (34.7%). Frequent disturbances due to communication from friends or parents/relatives did affect continuity in studies, and marks secured in examinations were proof of fall in academic performance.

One hundred and seventy (38.5%) said that they did get anxious while using the mobile device. Certain news communicated to them at odd times did cause apprehension. We know that with the advent of cell phones, news is passed to each other almost on an immediate basis without a second thought.

One sixty one (36.5%) of the 441 subjects have stated that cell usage caused them eye strain and understandably so as staring at any screen – small or big – could cause the same. One hundred and fifty six students (35.4%) did answer in the affirmative about some amount of sleeplessness. They complained of getting sleep much later after they lay down, in spite of a ‘tiring’ day or disturbed sleep in which they woke up several times in-between.

That cell phone usage caused exhaustion or tiredness was reported by 144people in this study (32.7%) while the rest did not attribute their getting tired to cell phones. Continuous talking, listening to others, and using the fingers on the keypad could cause fatigue. Body aches and other vague pains were reported by 142 (32.2%). This was attributed to odd postures adopted while conversing on the mobile phone and an additional effect with headaches.

Eighty eight (20%) stated that as they kept so busy with phone calls or texting that they often skipped their meals ultimately resulting in loss of appetite over a period of time. They then lose weight and feel tired out more easily, which could be of serious consequences.

Eighty five (19.3%) students mentioned that continuous cell phone did result in some degree of difficulty in hearing over a period of time. Sixty one students (13.8%) did complain about their fingers esp. the thumb getting jammed (digital thumb) due to overuse of the mobile device. Repeated strain on their fingers being used on the keypad could be the cause.

Forty four (10%) of those who participated, did confess that they...
had been in some sort of accident on the roadside, due to absent-mindedness or failure to hear/see approaching vehicles while using cell phones during driving.

Thus, it was observed that many students felt indisposed due to the continuous stress caused by cell phones in their daily routine. Individuals elaborated that they got frequent headaches, neck pains, limb pains, back aches and had redness in their eyes and tinnitus in their ears due to continuous mobile usage, on some days. The symptoms detected amongst the subjects are summarized in table 2.

Discussion

Basic information

It is evident from the above mentioned results that almost an equal number of subjects from both medical and engineering colleges were included in this study. This was done to avoid any “bias” that could have resulted from the supposed thought that medical students have greater knowledge of side-effects due to cell phones and it’s radiations than their engineering and other counterparts. Similar studies on highly selected study groups though rare have been carried out by Sara Thomme et al. [11] of Gothenburg, Sweden. She and her colleagues have carried out research on perceived stress, depression, sleep disturbances and other mental symptoms on students studying medicine and information technology [12].

As per results seen, a majority of the subjects were below 20 years of age. This is comparable with the study done by MACRO in Mumbai in 2004 [9] where respondents were in the age group 15-29 years, and it was observed that exposure to cell phones has increased drastically in those below the age of 20. Almost an equal number of male and female participants were included in this study. In the landmark MACRO study more females participated in the study as compared to males.

Most respondents belong to the urban background. The reason for rural people to shift to colleges in larger cities could be the availability of better educational facilities as compared to their original place of stay. The MACRO study again, has comparable results.

Almost all students own a cell phone. Of the 4% who did not own a cell phone, it was revealed that they had either lost theirs a few days ago or were new in the city and would procure one in due course of time. It is therefore clear that cell phones are a basic requisite. In the study done it compares with the study done by American Cancer Society, wherein 87% of the total population possessed a cell phone [5].

Seventy five percent of the subjects in the study said that have been using a cell phone for more than a year and this finding compares well with that of the Indian study of 2004 wherein most subjects owned the mobile phone for more than a year [9] and as we will discuss later all of them responded by stating that they were suffering from one or other health effects due to handling of cell phones.

The reason for using the phone for more than half an hour by almost 90% of the participants could be due to a mere addiction to the device or considerable time period available to them. This would also mean their relative exposure to the harmful radiations is more as compared to a senior age group. This fact also shows that today’s younger generation is likely to have many of the adverse health effects, a fact corroborated by Francisca [7] study.

Common health effects

Though it is known that there could be numerous causes of headache: stress of studies and daily travel as well as exposure to pollutants, being a few important ones, yet in this study the perceived view of the respondents was acceptable. Suitable literature on this specific symptom and implications of cell phones for the same could not be homed onto. More research is needed to corroborate this fact.

More than half the subjects complained of bad temper and irritability after things told to them over phone. Listening to music also made them prickly by the end of the day. Studies done by Gaby Badre [12], in Sweden, on teenagers, reveal that restlessness does result amongst those who use their phones excessively.

Another common symptom observed in this study was that almost half the students complained of inability to concentrate on studies and other important aspects of their daily lives, due to friends’ or others’ phone calls or texting activities to which they had / wanted to respond, on an instant basis. Jennifer Meckles [8] in her study reports that “attention” gets affected due to increase in mobile phone usage. Many students subsequently confessed to lagging behind in academics due to their cell phone addiction. In the study by Meckles [8] a similar finding on lack in “performance” has been documented.

Anxiety is a displeasing feeling of fear and concern. Subjects complained of performance-related anxiety, especially on performing well in exams, so as to get better opportunities. Most mobile addicts are people with low self-esteem and are prone to develop friction in their social relations. They feel the urge to be constantly connected and in contact with others and if they are deprived of their cell phones, regardless of the reason they become anxious and irritable. The fact is stated in Francisca Lopez’s study [7].

It was observed that continuous usage, staring at the screen caused the subjects eye strain so much so that some of them had to go to a Doctor for an eye checkup. However none were diagnosed with a refractive error or other serious eye ailments. Eye strain is obvious due to focusing on the screen or due to continuous texting and playing games. The same is mentioned by the Center on Media and Child Health in their article “Cell Phones” [4]. Another study by the International Commission on non-ionizing radiation protection (April 1998) reports that “premature cataracts” are not linked to cell phone use due to lower power output of mobiles [1].

Lack of sleep or insomnia was one of the most common symptoms observed among this class of subjects. Besides, long hours of travel and the stress of studies, continuous usage of cell phones was thought to be responsible for this outcome. A few answered in the affirmative about some amount of sleeplessness as mentioned above. Sara Thomme et al. [11] in Gothenburg, Sweden found out that high mobile phone use was associated with sleep disturbances and symptoms of depression. The Daily Galaxy reports that top sleep experts have raised serious concerns over the more than sufficient evidence showing that radiation from headphones affects deep sleep [13].

For the few who had body aches the causes could be - odd postures,
use while driving vehicles and continuous hearing of voices. More literature search and studies are required on this particular feature.

Chatting for lengthy periods during breaks between classes resulted in giving their lunch a miss affected their appetite. At home, a similar situation may arise when the students indulge in conversations during their meal times. A study on brain glucose metabolism has been carried out by Volkow et al. [14] keeping this aspect in mind

Loud music over the phone may be a contributing factor for hearing loss. The FYI Living study reports that the response in the “distracted” listening test was late and of less amplitude in the group exposed to cell phones [15].

Digital thumb is a nagging problem due to continuous usage of fingers esp. the thumb over the small keypad on the cell phones. Like Computer-related stress injuries, this ailment is here to stay as students use the cell phone excessively now-a-days. Repetitive strain injuries like digital thumb, resulting from repetitive tasks as in typing on small buttons has been mentioned by the Center on Media and Health as a ‘Downside of Cell Phones’ [4].

Cell phone driving, no doubt is a major cause road accidents today. Often we see accidents happening in front of our eyes, or have been through one as our friend/driver used the device en route to some place. A major study has been done on this important public health aspect by Karen et al. [16] section 3 of their study deals with driver performance studies, case reports of crashes, overall trends, epidemiological studies and risk comparisons. Legislative, Legal and Policy perspectives are also mentioned in this study. In the present study a very low percentage of the students have been in a similar situation.

It comes to light then that ‘alarming’ percentages of the student community in professional colleges in urban settings in our country do suffer from symptoms of both mental and physical nature due to overuse of cell devices, and that these cannot and should not be ignored. Timely prevention and control measures will have to be executed.

Suggestions

During the process of data collection, the Investigators interacted with the respondents and gave short talks on minimizing undesirable health effects due to cell phone usage. The point on limiting the usage of the cell phones in 2 aspects was stressed upon—cutting down both on the number and duration of the calls. It was informed that, though cell phones have many obscure short term effects like digital thumb and other generalized aches and pains, the long term effects were more manifest and well-defined. The electromagnetic radiations emanating from the phones are the cause of various cancers of the human body. Listening to loud music and keeping the volume at a higher level has auditory effects which may prove detrimental over a period of time. Eye strain and any subsequent damage could be also avoided by restricted use.

Finally, it was emphasized upon that accidents due to cell phone driving, commonly seen in the roads today, could be prevented in totality. Students were urged not to use the phone while driving and in case of any emergency call, stop the vehicle and then take the call.

References

1. Mobile Phone radiation and health.
2. Electromagnetic Radiation and health.
13. New Study Finds that Mobile Phones Affect our Brains and Disrupts Sleep.
15. Hearing Damaged by Headphone Use.