



## ORIGINAL RESEARCH ARTICLE

### KNOWLEDGE REGARDING HARMFUL EFFECTS ON CELL PHONE USE AMONG HIGHER SECONDARY SCHOOL STUDENTS BHARATPUR CHITWAN, NEPAL S GAUTAM<sup>1</sup>, J SHAKYA<sup>1\*</sup>

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#### ABSTRACT

There is no doubt that the cell phone is a very useful today, cell phones are a major part of society. It eases communication with colleagues, friends and relatives. But every technology that provides such benefits comes with consequences. The effect of cell phones on youth and society is excessive. A descriptive cross-sectional study was used to identify the knowledge regarding harmful effects on cell phone use among higher secondary school students. The study population consisted of 70 higher secondary school students of Saptagandaki Multiple College, Bharatpur10, Chitwan. Non-probability purposive sampling technique was used to select the college and faculty. Whereas, out of 145 students, 70 students were selected respectively by using simple random sampling technique from the lottery method. Data was analyzed by using SPSS and various tests frequency, mean, median, percentage and standard deviation and the findings were presented in tables. Chi-square test as inferential statistics was used to analyze the associations between the independent and dependent variables. The study findings revealed that out of the 70 respondents, 24 (34.3%) respondents were in the age of 17 years and 3 (4.3%) respondents were in age of 15 years. The mean age was 17.31 with standard deviation of 1.04. Similarly regarding the sex 45 (64.3%) were male and 25 (35.7%) were female. Respondents' have good level of knowledge regarding harmful effects of cell phone as it causes addiction on cell phone 90.0% but have average level of knowledge as it causes headache 78.6%, gradual loss of hearing 77.1%, eye strain 70.0%, dizziness 71.4%, skin allergy 71.45%, risk for breast cancer 75.7% and have poor level of knowledge as it causes dry eye 47.1%, warmness around ear 35.7%, decrease fertility rate 22.9%, tiredness if used after lights out. Out of 70 respondents, 53 (75.7%) of respondents answered risk for breast cancer is the harmful effects of cell phone if kept on chest region, and 20 (28.6%) answered chest injury. The level of knowledge regarding harmful effects on cell phone use is statistically not- significant with age ( $p=0.141$ ), sex ( $p=0.943$ ), faculty ( $p=0.632$ ), grade ( $p=0.490$ ) and previous experience ( $p=0.311$ ). The study concluded that the some educational intervention need to lunch by institution in order to enhance the awareness among higher secondary school students.

**Key words:** Adolescence, Cell phone, Harmful effect, Knowledge.

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#### INTRODUCTION

Adolescence is the period of transition, the time when physiological, psychological and social development takes place. The adolescents are large in number and are the citizens of tomorrow.<sup>1</sup>

A mobile telephone or cellular telephone is a long-range, portable electronic device used for mobile communication. In addition to the standard voice function of a telephone, current mobile phones can support many additional services such as SMS for text messaging, e-mail, pocket switching for access

to the Internet, and MMS for sending and receiving photos and video.<sup>2</sup>

Nowadays technology is advancing and widening rapidly as per the needs of the generation that helps the people of the current world to perform each and every task at a fast pace. Any technology is useful if it is properly used. Cell phone is one of the recent advancements that influenced and captured the minds of people irrespective of all age groups. Back

in 1980, the number of cell phones in the world was a mere 11.2 million or 2 cell phones/1000 people. Over last few years 61% of global population now using cell phones i.e., around the world, there are more than 2.4 billion cell phone users and more than 1000 new customers are added every minute.<sup>3</sup>

In Chandigarh, India, a study on audio logic disturbances in long-term mobile phone users found that high-frequency loss and absent distortion product otoacoustic emissions were observed with an increase in the duration of mobile phone use. The study concluded that Long-term and intensive mobile phone use may cause 80% of inner ear damage.<sup>4</sup>

The impact of cell phone use on social networking and development showed that 99% owned cell phones and nearly 90% have had cell phones for more than three years. Excessive internet use, along with pathological gambling and addictive disorder, health risk from cell phone radiation and cell phone dependency are the major social impacts found in teenagers. The study concluded that there is a negative impact of cell phone use on social networking among adolescents.<sup>5</sup>

In Iran, a study on effects of mobile phone radiofrequency on the structure and function of the normal human hemoglobin found that mobile phone electromagnetic frequencies altered oxygen affinity and tertiary structure of Hemoglobin. Furthermore, the research concluded that decrease of oxygen affinity of Hemoglobin corresponded to the electromagnetic frequencies intensity and time of exposure.<sup>6</sup>

Among the Malaysian students in medical school found that 124 subjects were aware of the side effects of mobile phone usage. (78 females and 46 males were aware of the hazards) Out of the 124 subjects who were aware of the side effects, 5% of the males and 10% of the females felt that there is

no need to minimize the unwanted effects.<sup>7</sup>

An article was published on the topic "Is cell phone radiation bad for our eyes?" which revealed that according to German science study, a cell phone has been linked to cancer of the eyes, using a cell phone may increase chances of getting eye cancer by 300%.<sup>8</sup>

## MATERIALS AND METHODS

This study was designed to find out the knowledge regarding harmful effects on cell phone use among higher secondary school students. The study population consisted of 70 higher secondary school students of Saptagandaki Multiple College, Bharatpur10, Chitwan. Non-probability purposive sampling technique was used to select the college and faculty. Out of 145 students 70 students were selected respectively by using simple random sampling technique from the lottery method.

After the administrative approval from concerned authorities of Saptagandaki Multiple College, the data collection was done by using semi-structured self administered questionnaire. The respondents themselves attempted the questionnaire regarding the study. Data was analyzed by using SPSS and various tests frequency, mean, median, percentage and standard deviation and Chi-square test as inferential statistics was used to analyze the association between the independent and dependent variables. The findings were presented in tables.

## RESULTS

**Table 1: Respondents' Socio Demographic Characteristics (n= 70)**

Variables	Freq.	%
<b>AGE</b>		
15	3	4.3
16	12	17.1
17	24	34.3
18	22	31.4
19	9	12.9
<b>Mean ± SD : 17.31 ± 1.04</b>		
<b>SEX</b>		
male		
female	45	64.3
	25	35.7
<b>GRADE</b>		
11	30	42.9
12	40	57.1
<b>Mean ± SD = 1.57 ± 0.49</b>		
<b>FACULTY</b>		
Science	35	50
Management	35	50

Table 1 reveals that out of the 70 respondents, 24 (34.3%) respondents were in the age of 17 years and 3 (4.3%) respondents were in age of 15 years. The mean age was 17.31 with standard deviation of 1.04. Similarly regarding the sex 45 (64.3%) were male and 25 (35.7%) were female.

Likewise 30 (42.9%) were studying in grade 11 and 40 (57.1%) were studying in grade 12.

Half of the respondents 35 (50%) were studying in the science faculty and half of the respondents 35 (50%) were studying in management faculty.

**Table 2: Respondents' Information Regarding Use of Cell Phone, Duration and Frequency (n = 70)**

Variables	Freq.	Percentage
<b>Durations in years</b>		
1	17	24.3
2	28	40.0
3	12	17.1
4	8	11.4
5	5	7.1
<b>Frequency in hours</b>		
<5	50	71.4
5-10	14	20.0
>10	6	8.6
<b>Mean± SD=4.43± 3.25</b>		

Table 2 shows that, regarding use of the cell phone cent percent respondents were using their cell phone.

Among them, 28 (40.0%) of respondents were using their cell phone since 2 years, and 5 (7.1%) respondents were using cell phone since 5 years.

Regarding the frequency of cell phone use, 50 (71.4%) of respondents use their cell phone less than five hours per day only 6 (8.6%) of respondents use their cell phone for more than ten hours. The mean frequency of use was 4.43 with standard deviation of 3.25.

**Table 3: Respondents’ Sources of Information and Experience on Harmful Effects on Cell Phone Use**

Variables	Freq.	%
<b>Information (n=70)</b>		
Yes	27	38.6
No	43	61.4
<b>Sources of information(n=27)</b>		
TV	15	53.6
Internet	18	64.3
Magazine	12	42.9
Radio	9	32.1
Family members	10	35.7
Peers	9	32.1
<b>Experience on harmful effects of cell phone use (n=70)</b>		
Yes	29	41.4
No	41	58.6

Table 3 reveals that among 70 respondents, 43 (61.4%) have not got information about the harmful effects on cell phone use and 27 (38.6%) of respondents have got information.

Similarly among 27 respondents 18(64.3%) of respondents had got the information from internet, and 9 (32.1%) respondents had got information from radio and peers.

Likewise among 70 respondents 41 (58.6%) of respondents had not experienced of harmful effects of cell phone use and 29 (41.4%) of respondents had experienced.

**Table 4: Respondents’ Knowledge on Harmful Effects on Cell Phone Use in Eyes, Ears and skin (n=70)**

Variables	Freq.	%
<b>Effects in Eyes**</b>		
Eye cancer*	48	68.6
Eye injury	41	58.6
Dry eye*	33	47.1
Eye strain*	49	70.0
Glaucoma	19	27.1
<b>Effects in Ear**</b>		
Itching around ear	22	31.4
Gradual loss of hearing*	54	77.1
Inner ear damage*	46	65.7
Warmness around ear*	25	35.7
Discharge from ear*	35	50.0
Swelling of ear	19	27.1
<b>Effects in Skin**</b>		
Skin allergy*	50	71.4
Eczema*	49	69.8
Extraction of protein molecules from skin*	40	57.1
Pimples	26	37.1
Excessive growth of facial hair	11	15.7

Multiple response\*\*                      Correct response\*

Table4 indicates that regarding harmful effects of cell phone on eyes, out of 70 respondent’s majority of the respondents 49 (70.0%) answered eye strain and 19 (27.1%) respondents answered glaucoma.

Regarding harmful effects on ear, 54 (77.1%) of respondents answered gradual loss of hearing and 22 ( 31.4%) respondents answered itching around ear.Regarding the harmful effects on skin, 50 (71.4%) respondents answered skin allergy and 11 (15.7%) answered excessive growth of facial hair.

**Table 5: Respondents’ Knowledge on Harmful Effects on Cell Phone Use on Chest Region( n = 70)**

Effects in Chest region **	Freq.	%
Chest pain	25	35.7
Risk for breast cancer *	53	75.7
Increases the blood pressure*	45	64.3
Decreases the heart rate*	48	68.6
Chest injury	20	28.6

Multiple response\*\* Correct response\*

Table 5. reveals that, out of 70 respondents, 53 (75.7%) of respondents answered risk for breast cancer is the harmful effects of cell phone if kept on chest region, and 20 (28.6%) answered chest injury.

**Table 6: Respondents’ Knowledge on Harmful Effect on Cell Phone after Lights Out (n =70)**

Effect after lights out	Freq.	%
Tiredness*	19	27.1
Fever	14	20
Headache	32	45.7
Common cold	5	7.1

Correct response\*

Table 6.reveals that out of 70 respondents, 32 (45.7%) of respondents answered headache if cell phone used after bed time, 5 (7.1%) respondents answered common cold.

**Table 7: Respondents’ Knowledge Regarding the Harmful Psychological Effects (n= 70)**

Variables	Freq.	%
<b>Effects in psychological function</b>		
Headache	14	20.0
poor memory*	36	51.4
Head injury	14	20.0
Irritation	6	8.6
<b>Effects on psychological health**</b>		
Addiction on cell phone use*	63	90.0
Sleep disturbance*	38	54.3
Tension*	31	44.9
Memory capacity increases	27	39.15
Feeling of loneliness	29	42.0
Lower self- esteem*	34	48.6

Multiple response\*\* Correct response\*

Table 7reveals that cent percent of the respondents answered that cell phone use can cause harmful effects on our psychological health (not shown in table.)

Regarding the knowledge on harmful effects of cell phone use on psychological function, 36 (51.4%) of respondents answered poor memory and 6 (8.6%) respondents answered head injury.

Regarding the harmful effects on psychological health, majority of the respondent 63 (90%) answered addiction on cell phone use and 27 (39.15%) respondents answered feeling of loneliness

**TABLE 8: Respondents’ Level of Knowledge regarding Harmful Effects on Cell Phone Use (n =70)**

Variables	Freq.	%
Poor knowledge = < 60%.	36	51.4
Average Knowledge = 60-79%	32	45.7
Good knowledge = 80-100%	2	2.9

Table 8 reveals that out of the 70 respondents, half of the respondents 36(51.4%) have poor knowledge regarding harmful effects on cell phone use, 32 (45.7%) of respondents have average knowledge and only 2 (2.9%) respondents have good knowledge.

**Table 9: Association between Respondents' Level of Knowledge and Selected Variables**

Variables	Level of Knowledge		$\chi^2$	p value
	Poor	Good		
<b>Age</b>				
15-17 years	17(43.6%)	22(56.4%)	2.166	0.141
18-19 years	19(61.3%)	12(38.7)		
<b>Sex</b>				
Male	23 (51.1%)	22(48.9%)	0.05	0.943
Female	13 (52.0%)	12(48.0%)		
<b>Faculty</b>				
Science	17 (48.6%)	18 (51.4%)	0.229	0.632
Management	19 (54.3%)	16 (45.7%)		
<b>Grade</b>				
11	14 (46.7%)	16 (53.3%)	0.477	0.490
12	22 (55.0%)	18 (45.0%)		
<b>Previous experience</b>				
Yes	17(58.6%)	12(41.4%)	1.025	0.311
No	19(46.3%)	22(53.7%)		

Significant level at 0.05

Table 9 shows that the level of knowledge regarding harmful effects on cell phone use is statistically not-significant with age ( $p=0.141$ ), sex ( $p=0.943$ ), faculty ( $p=0.632$ ), grade ( $p=0.490$ ) and previous experience ( $p=0.311$ ).

## DISCUSSION OF THE STUDY

Regarding the demographic characteristics, the study revealed that out of 70 students, 34.3% of the students belongs to the age of 17 years and majority 64.3% of the students were male. This findings were supported by study done by Pendse and Zagade where sample size were 120, which revealed that 38% of the students belongs to the age of 17 years and majority 59% of the students were male.<sup>9</sup>

Regarding the faculty, there were equal distribution of respondents 50% each in both science and management faculty and regarding the duration of cell phone use, 40.0% of respondents were using their cell phone since 2 years. This finding were supported by the study done by Pendse and Zagade which revealed that there were equal distribution of respondents 50% each in both science and management faculty and majority of the respondents 34% were using their cell phone since 2 years.<sup>9</sup>

Regarding the information of harmful effects on cell phone use, 38.6% of respondents had not got information

regarding harmful effects of cell phone use. This study was not supported by study conducted by G.S,S.which revealed that 63% had got information regarding the harmful effects on cell phone use.<sup>10</sup>

## CONCLUSION

The conclusions made are based on the findings of the study. Students of Saptagandaki Multiple College showed that more than half (51.4%)of the students had a poor level of knowledge on harmful effects of cell phone use, 45.7% had average level of knowledge and only 2.9% of the students had good level of knowledge.

Respondents' have good level of knowledge regarding harmful effects of cell phone as it causes addiction on cell phone 90.0% but have average level of knowledge as it causes headache 78.6%, gradual loss of hearing 77.1%, eye strain 70.0%, dizziness 71.4%, skin allergy 71.45%, risk for breast cancer 75.7% and have poor level of knowledge as it causes dry eye 47.1%, warmness around ear 35.7%, tiredness if used after lights out. Regarding the harmful effects on psychological health, majority of the respondent 63 (90%) answered addiction on cell phone use and 27 (39.15%) respondents answered feeling of loneliness. Statistically there was no significant association between level of knowledge of the respondents' regarding harmful effects on cell phone use and selected variables.

By considering all this major findings it's clear that the some educational intervention has to lunch by institution in order to enhance the awareness among higher secondary school students. So the authorities of educational Institute should allocate some amount of time to enlighten the harmful effects on cell phone use among them.

## REFERENCES

1. Ghai OP. Essential Pediatrics. 2007. 6th ed. New Delhi: CBS Publishers.
2. Ganesamurthy VS. Cell phone misuse. The Hindu 5(2). April 24, 2007. Retrieved from <http://www.thehindu.com/todays-paper/tp-national/tp-tamilnadu/cell-phone-misuse/article1832720.ece>.
3. Winder D. Global Icons Cell phones and Globalization. 2008. Retrieved from URL: <http://www.the-globalist.com>.
4. Panda NK, Jain R, Bakshi J, Munjal S. Audiologic disturbances in long-term mobile phone users. Journal of Otolaryngology- head and neck surgery 2010; 39(1):5-11. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/20122338>
5. Hakoama M, Hakoyama S. The impact of cell phone use on social networking and development among college students. The American association of behavioral and social sciences journal, 2011. Retrieved from <https://43f7cb640225fbfc67686e0928f1de5be0b26d7e.googledrive.com/host/0bwyza6ed9smqn0k5qv9ymkhgz00/journal/journal2011/05hakoamafinal.pdf>
6. Mousavy SJ. Effects of mobile phone radiofrequency on the structure and function of the normal human haemoglobin. International Journal of Biological Macromolecules 2009;44(3):278-85. Retrieved from :<http://www.i-md.com/docsearch/doc/122abe60-e7bd-48ab-ad08-d3637c95bba5>.
7. Schreier N, Huss A, Roosli M. The prevalence of symptoms attributed to electro Magnetic exposure in Switzerland. SOZ Praventivmed 2004;51(4):202-209. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/17193782>.
8. Burrell L. Cell phone radiation breast cancer link - New study raises grave concerns. Natural News. Nov. 27, 2013. Retrieved from [http://www.naturalnews.com/043070\\_cell\\_phone\\_radiation\\_breast\\_cancer\\_electromagnetic\\_fields.htmlxzz3LmEY0B6G](http://www.naturalnews.com/043070_cell_phone_radiation_breast_cancer_electromagnetic_fields.htmlxzz3LmEY0B6G)
9. Pendse N, Zagade T. Knowledge and Attitude Regarding Health Hazards of Mobile Phone Users among the Junior College Students. International Journal of Science and Research (IJSR) 2014;3(5). Retrieved from [file:///C:/Users/Fujitsu/Downloads/mobile%20use%20\(1\).pdf](file:///C:/Users/Fujitsu/Downloads/mobile%20use%20(1).pdf).
10. G SS. The knowledge and attitude on ill effects of mobile phone use and its prevention among adolescents. International Journal of Recent Scientific Research 2014; 5(9): 1678-1681. Retrieved from [http://www.recentscientific.com/sites/default/files/download\\_140.pdf](http://www.recentscientific.com/sites/default/files/download_140.pdf)