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Adolescent's Perception of Health Hazards caused due to Mobile Usage

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Abstract: *In the past decades humanity has moved into a digital era where billions of people are connected via an ever advancing technology boom. The phenomenon of technology usage has taken today's youth culture by storm. As technology shows no signs of slowing its expansion into every facet of our lives, these changes are becoming more prominent affecting our lives in every aspect. The paper focuses on the adolescent's perception of health hazards among mobile users. The study was conducted on 100 adolescents in the age group of 13-18 years of Jammu city. The data was gathered through the use of a self devised interview schedule. The results reveal that all the sample adolescents were using mobile phones. The data on awareness about health ill effects of mobiles shows 59% of the adolescents were aware of the health ill effects of mobiles. More late adolescents (84%) than early adolescents (34%) were aware of these ill effects and between the two sexes, females (64%) were found to be slightly more aware than males (54%). They all knew that the radiation from the mobile are harmful for the human body and when the cell phone is used for the prolonged duration it can lead to various health diseases. Most of the adolescents were aware that diseases like heart problems, cancer and headaches were caused due to extended usage of cell phone. Most of them were aware about these diseases through media (internet, articles, newspapers, etc.) and also from friends and parents. However, most of the sample adolescents reported not suffering from any health problems due to mobile usage. Yet, some of them faced minor headaches, irritation, and mood swings on constant use. Further, it was suggested that the precautionary principle should be voluntarily be adopted to control usage of mobile phones.*

Key words: *Adolescents, Mobile usage, Health Adolescent's Perception of Health Hazards caused due to Mobile Usage*

I. INTRODUCTION

Mobile phones were launched in the early nineties which have managed to reach many parts of the world enabling telecommunications across areas where it was not possible before. In the year 2000, there were an estimated 500 million mobile phone users worldwide. Today, there are about 3.3 billion users. The use of mobile phones among young children and adolescents is also increasing (Ridley, 2007). India has emerged as second largest market for mobile phones. Wireless subscriber base increased from 471.73 Million in September-09 to 488.40 Million at the end of October-09 at a monthly growth rate of 3.53 % (Telecom Regulatory Authority of India).

Mobile phone use has proved to be life saving in certain circumstances (e.g., after accidents) and has helped improve the quality of life in some sectors. But many health issues are also opposing the idea of using mobile phones as a tool for communication. The harmful effects of radiation of hours of cell phone chatting on the brain, affected sleep patterns in pre-teens and teens is a more serious issue. Other anomalies in behavioral patterns, such as irritability, lack of patience and abruptness, sometimes affect heavy users of cell phones (Dutta,2015) The adoption of the mobile phone by young people especially children and adolescents has been a global phenomenon in recent years. It is now an integral part of adolescents' daily lives. Concerns continue to be raised about potential adverse health impacts associated with the mobile phone use. These range from cancer and cognitive deficiencies to subjective effects (Eurostat, 2006; Abeshu and Geleta, 2015).

A study was conducted in Amritsar, India, on 24 Mobile phone users. In this study, DNA and chromosomal damage investigation were carried out on the peripheral blood lymphocytes. Results showed mean comet tail length (26.76 ± 0.054 mm; 39.75 % of cells damaged) in mobile phone users. The study concluded that a connection exists between mobile phone uses (exposure to radio frequencies radiation) and genetic damage; and require interim public health actions in the wake of widespread use of mobile telephony. In 2011, International Agency for Research on Cancer (IARC) classified mobile phone radiation as Group 2B - possibly carcinogenic (**not** Group 2A - probably carcinogenic - nor the dangerous Group 1). That means that there "could be some risk" of carcinogenicity, so additional research into the long-term, heavy use of mobile phones needs to be conducted IARC (2011). Some national radiation advisory authorities IEEE (2005) have recommended measures to minimize exposure to their citizens as

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a precautionary approach.

A research was carried out in Mumbai among 175 teenagers and youths in the age group of 15-30 years. Findings showed that, out of 165 respondents interviewed 55% males and 45% females owned mobile phones. 58 % reported that they couldn't manage without a mobile even for a day. 68 % do not perceive the medical side effects. The study concluded that the notion of socio-Economic class is useful for a large number of products and services MACRO (2004). A study was also conducted on cognitive function and symptoms in adults and adolescents in relation to radio frequency radiation. It was conducted among 40 adolescents (15-16 years) and 40 adults (25-40 years). The results showed no significant changes in any of the cognitive tasks. An increase in 'headache rating' was observed when data from the adolescents and adults were combined. The study concluded that the hypothesis of subjective symptoms and EMF exposure need further research. A study conducted in Taiwan among 10,191 adolescent students on symptoms of problematic cellular phone use, functional and its association with depression among adolescents reveals that the symptoms of problematic cell phone use were prevalent in adolescents. The adolescents who had symptoms of problematic cell phone use were having functional impairment. The study concluded that the results may provide a basis of detecting symptoms of problematic cell phone use in adolescents (Yena et.al, 2009).

A 2009 study examined the effects of exposure to radiofrequency radiation (RFR) emitted by standard GSM cell phones on the cognitive functions of humans. The study confirmed longer (slower) response times to a spatial working memory task when exposed to RFR from a standard GSM cellular phone placed next to the head of male subjects, and showed that longer duration of exposure to RFR may increase the effects on performance. Right-handed subjects exposed to RFR on the left side of their head on average had significantly longer response times when compared to exposure to the right side and sham-exposure (Baum, 2006).

The literature found that the mobile addiction among adolescent is a leading cause for physical and psychological health problems. They have disrupted sleep, restlessness, stress and fatigue. The misuse of text messages, calls, camera and videos can also have a negative social impact. Many adolescents have more than one mobile phones with them. The effect of radiation will be evidenced only in later life with some neurological or psychological problem.

With this as background the present study was designed to assess sample adolescent's perception of the health hazards mobile users can face. Adolescent's awareness about the ill health effects of mobile usage was analysed along with an assessment of the health problems they encountered.

II. RESEARCH METHODOLOGY

The total sample size was 100 adolescents, half of who were males and rest females. Also according to their age group they were further subdivided as 50 early and 50 late adolescents. The sample for the study was selected by multistage sampling where in the actual sample was selected randomly. Out of the five educational zones of Jammu district one zones was selected namely Jammu city by lottery method. The comprehensive list of schools and high school in the selected zones was prepared. In the next stage by lottery method 10 schools were selected randomly. From each of these schools 10 adolescents (5 boys and 5 girls) were selected again by lottery method. Thus, a total of 100 adolescents were selected randomly from the identified schools. An interview schedule was prepared to gather information regarding the usage of mobile phones and its impact on physical health of adolescents. The schedule elicited response related to frequency of usage and dependency of adolescents for the gadgets and its effect on their physical health. Further, the qualitative and quantitative analysis was done. Statistical analysis using SPSS was done to authenticate the results.

III. RESULTS AND DISCUSSION

All the sample adolescents were noted to use mobile phones. None of the adolescents reported not having used mobiles. Further analyses revealed that most (60%) of the adolescents owned their personal mobile, while the others were handed over mobiles by their parents or elder siblings.

A. Daily frequency of mobile usage

Results in table 1 reveal that 50% of adolescents used mobile phone for less than 2 hour daily. 32% of respondent used it for 2-3 hour daily, 11% used it for 3-4 hours on a daily basis. Between groups, it was found that boys used the mobile more frequently than girls and late adolescents used it more than the early adolescents.

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Table 1
 Daily frequency of mobile usage

| Male | | | Female | | | Overall | | | |
|--------------------|------------|------------|---------------|------------|------------|---------------|------------|------------|----------------|
| Daily | EA n=25 | LA n=25 | Total n=50 | EA n=25 | LA n=25 | Total n=50 | EA n=50 | LA n=50 | Total n=100 |
| Less than two hour | 20 80% | -- | 20 40% | 16 64% | 14 56% | 30 60% | 36 72% | 14 28% | 50 50% |
| 2-3 hr | 5 20% | 14 56% | 19 38% | 6 24% | 7 28% | 13 26% | 11 22% | 21 42% | 32 32% |
| 3-4 hr | -- | 5 20% | 5 10% | 2 8% | 4 16% | 6 12% | 2 4% | 9 18% | 11 11% |
| 4-6 hr | -- | 3 12% | 3 6% | 1 4% | -- | 1 2% | 1 2% | 3 6% | 4 4% |
| More than above | -- | 3 12% | 3 6% | -- | -- | -- | -- | 3 6% | 3 3% |

The results highlight that mobile is a means of communication which is frequently used by adolescents. It is a device of everyday use, without which most children feel incomplete. Further, investigation revealed that apart from making and receiving calls, adolescents also used it for texting, listening to music and playing games.

B. Daily frequency of Outgoing call

Table 2
 Daily frequency of Outgoing call

| Male | | | Female | | | Overall | | | |
|------------------|------------|------------|---------------|------------|------------|---------------|------------|------------|----------------|
| Daily | EA n=25 | LA n=25 | Total n=50 | EA n=25 | LA n=25 | Total n=50 | EA n=50 | LA n=50 | Total n=100 |
| Less than 1 hour | 22 88% | 2 8% | 24 48% | 12 48% | 12 60% | 24 48% | 34 68% | 14 28% | 48 48% |
| 1-3 hour | 3 12% | 15 60% | 18 36% | 9 36% | 10 40% | 19 38% | 12 24% | 25 50% | 37 37% |
| 4-6 hour | -- | 8 32% | 8 16% | 4 16% | 3 12% | 7 14% | 4 8% | 11 22% | 15 15% |

With regard to the frequency of outgoing calls significant differences in the usage pattern of early and late adolescents was found. Most of the early adolescents (68%) had a outgoing call frequency of less than 1 hour daily while most of the late adolescents (50%) had a frequency of 1-3 hours. On an average, late adolescents made more outgoing calls than the early adolescents. However, not much difference was seen among males and females outgoing call status. Equal number of males and females reported that they

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made outgoing calls, of up to one hour duration.

C. Daily frequency of incoming calls

Table 3
 Daily frequency of incoming calls

| Male | | | | Female | | | Overall | | |
|-----------|------|------|-------|--------|------|-------|---------|------|-------|
| Daily | EA | LA | Total | EA | LA | Total | EA | LA | Total |
| | N=25 | N=25 | N=50 | N=25 | N=25 | N=50 | N=50 | N=50 | N=100 |
| Less than | 18 | 10 | 28 | 10 | 16 | 26 | 28 | 26 | 54 |
| 1 hour | 72% | 40% | 56% | 40% | 64% | 52% | 56% | 52% | 54% |
| 1-3 hour | 7 | 8 | 15 | 14 | 8 | 22 | 21 | 16 | 37 |
| | 28% | 32% | 30% | 56% | 32% | 44% | 42% | 32% | 37% |
| 4-6 hour | -- | 7 | 7 | 1 | 1 | 2 | 1 | 8 | 9 |
| | | 28% | 14% | 4% | 4% | 4% | 2% | 16% | 9% |

It is noted in table 3 that most of the adolescents (54%) had a daily frequency of less than 1 hour of incoming calls. There were apparent differences in the usage pattern of males and females as well as early and late adolescent. More males (56%) than females (52%) had incoming calls of 1 hour. While, more males (14%) than females (4%) had incoming calls frequency of 4-6 hours daily. Also it was found that more early adolescents (56%) than late adolescents (52%) had incoming calls of up to 1 hour duration. This implies that males had more incoming call than females and likewise late adolescents received more incoming calls than early adolescents.

D. Awareness about health ill effects of mobiles

Table 4
 Awareness about health ill effects of mobiles

| Male | | | | Female | | | Overall | | |
|----------|------|------|-------|--------|------|-------|---------|------|-------|
| Category | EA | LA | Total | EA | LA | Total | EA | LA | Total |
| | (%) | (%) | (%) | (%) | (%) | (%) | (%) | (%) | (%) |
| | N=25 | N=25 | N=50 | N=25 | N=25 | N=50 | N=50 | N=50 | N=100 |
| Yes | 7 | 20 | 27 | 10 | 22 | 12 | 17 | 42 | 59 |
| | (28) | (80) | (54) | (40) | (88) | (64) | (34) | (84) | (59) |
| No | 18 | 5 | 23 | 15 | 3 | 18 | 33 | 8 | 41 |
| | (72) | (20) | (46) | (60) | (12) | (36) | (66) | (16) | (41) |

The data on awareness about health ill effects of mobiles (table 4) shows 59% of the adolescents accepted that mobile usage can lead to health ill effects. This implies that though all adolescents used mobiles however, only a few accepted that its usage can lead

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to physical health problems. More late adolescents (84%) than early adolescents (34%) replied in affirmative about the linkage of mobile usage and health problems. Between the two sexes, females (64%) were found to be slightly more aware than males (54%) about the health problems.

E. Awareness about effects of Mobile Radiation

Table 5
 Awareness about effects of Mobile Radiation

| Effects | Male | | | Female | | | Overall | | |
|----------------|----------------|----------------|-------------------|----------------|----------------|-------------------|----------------|----------------|--------------------|
| | EA (%) N=25 | LA (%) N=25 | Total (%) N=50 | EA (%) N=25 | LA (%) N=25 | Total (%) N=50 | EA (%) N=50 | LA (%) N=50 | Total (%) N=100 |
| Heart problems | 18 (72) | 14 (16) | 32 (64) | 13 (52) | 18 (72) | 31 (62) | 31 (62) | 32 (64) | 63 (63) |
| Headache | 10 (40) | 14 (16) | 24 (48) | 10 (40) | 4 (16) | 14 (28) | 20 (40) | 24 (48) | 44 (44) |
| Cancer | 4 (16) | 10 (40) | 14 (28) | 9 (36) | 4 (16) | 13 (26) | 13 (26) | 14 (28) | 27 (27) |

Results depicts that all the respondents were aware of the effect of mobile radiations on the users. They all knew that the radiation from the mobile are harmful for the human body and when the cell phone is used for the prolonged duration it can lead to various health diseases. Most of the adolescents were aware that diseases like heart problems, cancer and headaches can occur due to prolonged usage of cell phone. Most of them had come to know about these diseases through media (internet, articles, newspapers, etc.) also from friends and parents.

F. Suffering from Health Problems due to Mobile Usage

Table 6
 Suffering from Health Problems due to Mobile Usage

| Categories | Male | | | Female | | | Overall | | |
|------------|------------|------------|------------|-------------|------------|------------|------------|------------|------------|
| | EA (%) | LA (%) | Total (%) | EA (%) | LA (%) | Total (%) | EA (%) | LA (%) | Total (%) |
| Yes | 02 (8) | 5 (20) | 7 (14) | -- | 6 (24) | 6 (12) | 2 (4) | 11 (22) | 13 (13) |
| No | 23 (92) | 20 (80) | 43 (80) | 25 (100) | 19 (76) | 44 (88) | 48 (96) | 39 (78) | 87 (87) |

It is revealed in table 11 that 87% of adolescents were not suffering from health problems. 11% of late adolescents as compared to 2% of early adolescents suffered from some health problems usually complaint with minor headaches, irritation, mood swings, etc.

IV. CONCLUSION

The new digital environment has presented an exceptional array of possibilities for communication, interaction, and information retrieval at the fingertips that was never before available (Abeshu and Geleta, 2015). The entire communication pattern has undergone change due the mobile telephone phenomenon. Worldwide as well as in India there has been a significant increase in the number of mobile users. Ridley (2007) noted that the global mobile usage has passed 3 billion.

The findings of the study highlight the significant role mobile plays in the lives of the adolescents. Mobile networks are an essential

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medium of communication and in fact there was no sample adolescent who hadn't used mobiles at all. Owing a mobile is today considered to be both a necessity and a status symbol. The various features of mobiles especially the ability to download applications and internet usage finds high level of acceptability among the young teenagers. Mitchell et al (2011) in their study had noted that adolescents of Uganda are heavy users of the medium and rely on it as a major source of information. It has gone beyond from just being a means of verbal communication and is in fact, a gadget viewed as multi quality apparatus. Researchers have found that mobile have become an essential part of the life of youth today (Krithika and Vasantha, 2013)).

The results of the present study highlight that many sample adolescents were aware of the physical hazards associated with prolonged mobile usage. Though the adolescents did not understand the exact impact mobile radiations can have on them, yet many of them acknowledged being aware of the fact that these mobiles can have serious health implications for its users. At least some teenage users were aware of the interference of mobile radiations on the cardio vascular system; and its carcinogenic effects besides its role in causing headache and mental fatigue. A small segment of the respondents reported facing physical health conditions such as headaches, irritability, ear pain, mood swings etc. Several past researches have also pointed that there are self-reported non-specific symptoms of mobile telephone uses which include headache, cold hands or feet, difficulties in concentration, memory changes, dizziness, depressive symptoms, sleep disturbances (Repacholi, 2001; Hossman and Hermann, 2003; Schu et al 2009; Cooke et al 2010). Thomee et al (2011) have also pointed that constant use of mobile phones can cause stress, sleep disturbances and symptoms of depression among youth and young adults.

Therefore, this study recommends that the precautionary principle should voluntarily be adopted to control usage of mobile phones. It is suggested that there should be limited use of it especially by at-risk population such as children and youth, pregnant women and the aged. Other strategies suggested include, adoption of cell phones and microcells with as low as reasonably practicable levels of radiation, the wider use of hands-free and earphone technologies such as Bluetooth, headsets, the adoption of maximal standards of exposure, RF field intensity and distance of base stations antennas from human habitations, and so forth. It is also recommended that widespread awareness be created among its users about the potential effect it can have on their health and encourage them to make minimal and safe usage of this highly useful but an equally dangerous electronic gadget.

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