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MOBILE PHONES: A THREAT TO HEALTH OF YOUNG GENERATION?

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ABSTRACT

Background: With advancement in technology, the use of mobile phones have become a very essential part of teenagers life. But excessive use of anything can lead to harmful effects. Mobile phones emit radiation for which when exposed to prolonged period of time can lead to various disease conditions as well as generalized body aches and decreased cognitive behavior. **Objective:** The current study was conducted to evaluate the use of mobile phone in teenagers, musculoskeletal, hearing and eye problems developing in teenagers due to its use and overall impact of mobile phones in their lives. **Methodology:** It is survey based study carried on young generation N= 200 age 16-20 years both male and female from different colleges and universities in Karachi. The survey consisted of 10 questions the answers were recorded as open ended. **Result:** From our data we found that 88.5% younger generation possess mobile phones so its use is very common. Head and neck pain was reported in 52% teenagers while there was also trend of generalized body (20.5%) and eye pain (7%). Hearing (36.5%) and concentrating problems (71%) were also reported. Younger generation is so addicted to phone that trend of sleeping with phone in hand or above head (43.5%) was also very common. **Conclusion:** Mobile phones which are considered a necessity in our daily life are being abusively used by teenage generation. The increased trend of constant messaging, facebook, wats app has led to addiction to cell phone in teenagers. There has also been increase complains of musculoskeletal and hearing problems in those who use cell phone excessively with hand free. Mobile phone which was invented for communication should be used properly or else our younger generation will face dire consequences.

KEYWORDS: Mobile phone, Musculoskeletal , hearing, Young generation.

INTRODUCTION

Mobile phones are arguably another revolutionary invention of our time, besides computer and internet technologies. The emerging new technologies have made the mobile phones more attractive and functions similar to mini-computers, facilitating searches for information and enhancing its value in education. While enjoying the benefits in teaching and learning, we should also be aware of the perils that come with it.[1] Although cell phones are considered to be low-powered radiofrequency transmitters, the handset still transmits power when it is on.[2]

Mobile phones transmit and receive Radio Frequency (RF) signals in order to communicate. The RF signals from mobile phones fall within the microwave part of the electromagnetic spectrum. This radiation is also referred to as microwave radiation or electromagnetic radiation.[3] Tissues nearest to where the phone is held can absorb this energy or radiations. Some users of mobile handsets have reported feeling several unspecific symptoms during and after its use; ranging from burning and tingling sensations in the skin of the head and extremities, fatigue, sleep disturbances, dizziness, loss of mental attention, reaction times and memory retentiveness, headaches, malaise, tachycardia (heart palpitations), to disturbances of the digestive system.[4]

High mobile phone use was associated with stress and sleep disturbances for women, whereas with sleep disturbances and symptoms of depression in men. [2] Radiation from mobile phone handsets damages areas of the brain associated with learning, memory and movement.[5] Electromagnetic waves alter electric activity of the brain and cause disturbance in sleep; cause difficulty in concentration, fatigue, and headache; and increase reaction time in a time-dependent manner.[5]

Swedish researchers from Lund University have studied the effects of microwave radiation on the rat brain. They found a leakage of albumin into the brain via a permeated blood–brain barrier. [7] In 2009, a meta-analysis of 23 studies on mobile phone use and tumor risk found that there is possible evidence that mobile phone use causes an increased risk of tumors.[6] Researchers said that people who used cell phones were two and a half times more likely to have a temporal brain tumor on the side of the head where they held their

phone.[6] Recent study showed that when people used a cell phone for 50 minutes, brain tissues on the same side of the head as the phone's antenna metabolized more glucose than did tissues on the opposite side of the brain.[8]

The relationship between mobile phone use and diseases like Alzheimer's and cancer are controversial, but discussed more as different research continues to conclude that the link between mobile phone use and Alzheimer's/cancer/tumor exists.[9]

The researchers found that bone mineral density was slightly less on the side of the pelvis where the mobile phones were carried than on the side that was not in contact with the phones.[10] Blood normally carries excess heat away from internal organs, but the eyes, having fewer vessels than other organs, are more vulnerable to heat. [11] According to a report by England's National Radiological Protection Board, radio waves may cause cataracts through damage caused by the heating.[11] The Federal Communications Commission (FCC) suggests cell phone users to keep a minimum distance of 20 centimeters from their handset to significantly reduce radiation exposure. Adults and especially children can suffer the long-term effects of radiation waves on the brain.[2] The bone marrow of a child's head absorbs 10 times more radiation than that of an adult[12]

A study on mice offspring suggested that cell phone use during pregnancy may cause behavioral problems that resemble the effects of Attention Deficit Hyperactivity Disorder (ADHD). [13] Literature studies have also shown that semen exposed to radiofrequency electromagnetic waves emitted from cell phones had higher levels of damaging free radicals, lower sperm motility and sperm viability and possibly greater oxidative stress. Fertility experts believe male fertility may be more susceptible to damage from cell phone EMR because the male testicles are not as far inside the body as the female ovaries, and thus don't have as much protection from low-dose radiation.[14]

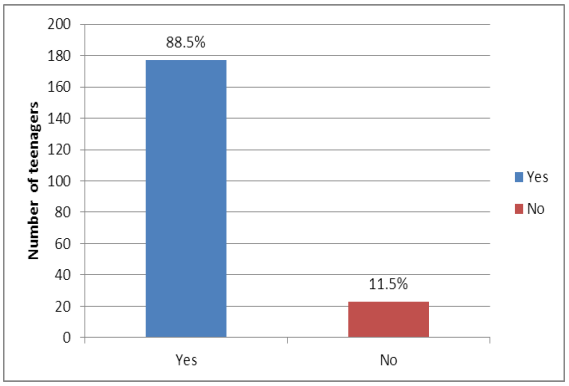
It is not only cell phones, scientists have been researching the effects of electromagnetic radiation (EMR) on human health for years. EMR is all around us. It comes in low doses from household appliances and electronics, such as TVs, laptops, and microwaves, and in higher doses from sources like medical X-rays.[15] Studies have searched for and found links between different EMR sources and various health conditions, such as cancers, however long term effects are still being explored[15] The objective of the study is to evaluate the use of mobile phones among student population, see if they feel addicted to it, purpose for using mobile phones, time spend on phone and side effects faced by students due to mobile phone usage.

METHODOLOGY

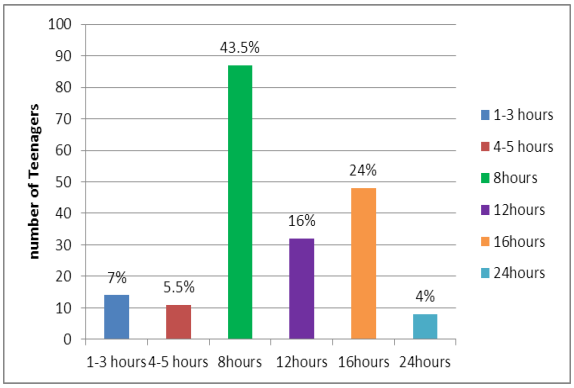
It is a cross-sectional survey based study comprising of N=200 students both male and female belonging to different private and government universities of Karachi. The study was conducted from August 2015-September 2015 and was based on evaluating the use of mobile phones in younger generation and consequences faced by them. Data was collected by directly contacting with them and the answers were recorded as open ended.

RESULTS

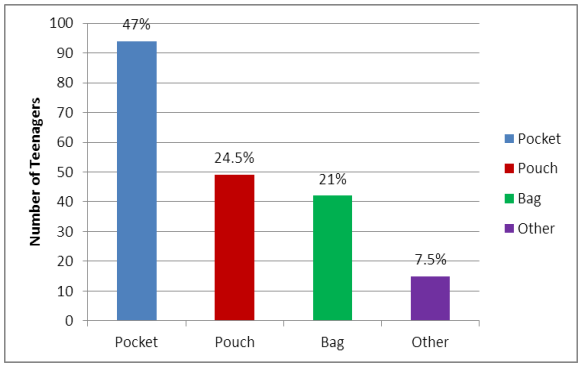
The graphical representation has been shown depicting the percentage of student's response to different questions. For statistical evaluation SPSS 19 was employed and Chi-square test and binomial test were done. P value of 0.05 (5%) was considered as statistically significant.



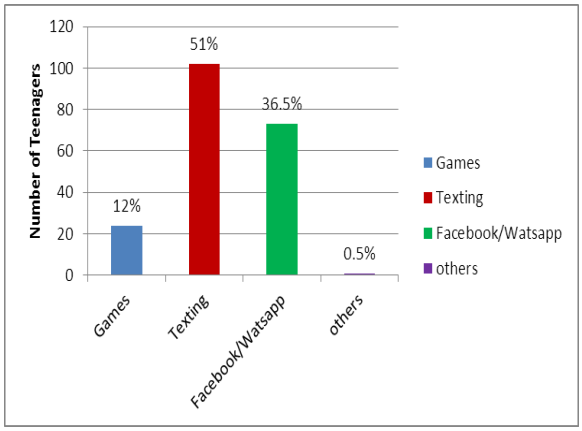
Graph 1: Trend of Mobile phone users.



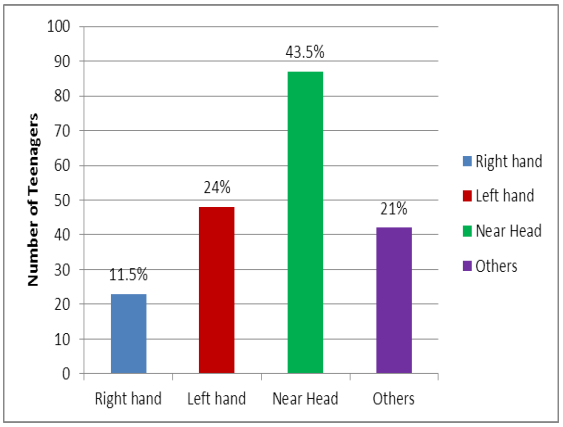
Graph 2: Number of Hours usage per day of mobile.



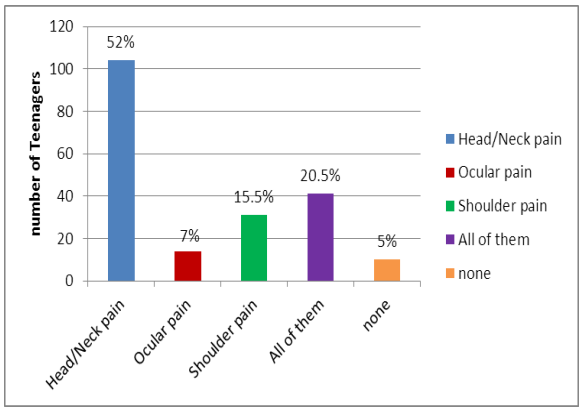
Graph 3: Location where mobile phone kept.



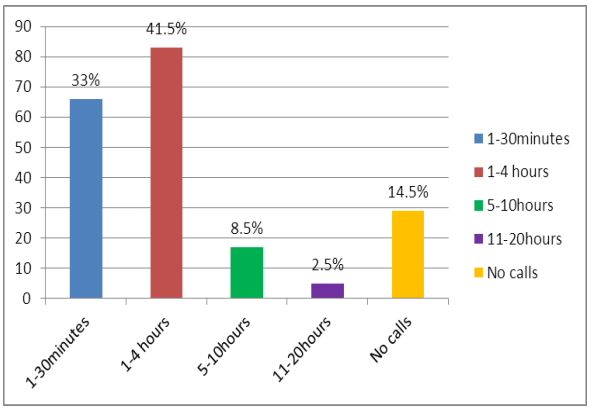
Graph 4: Purpose Mobile phone used for.



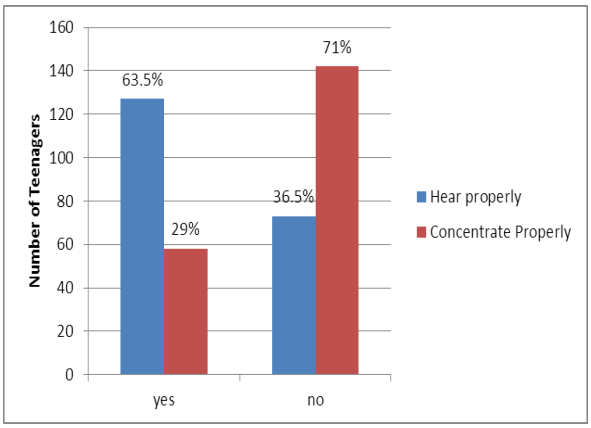
Graph 7: Placement of mobile during sleep.



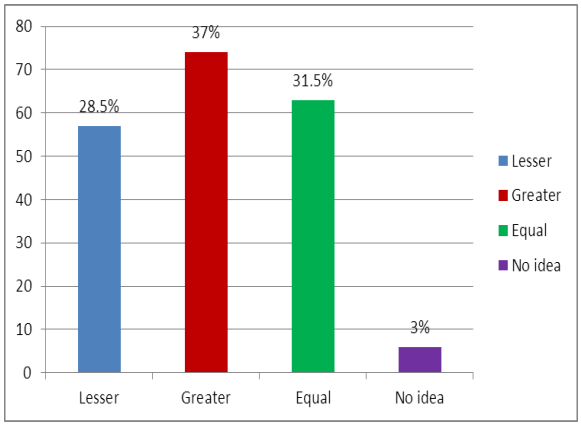
Graph 5: Symptoms common in Mobile users.



Graph 8: Time spend on phone call.



Graph 6: Hearing and concentration problems in mobile users.



Graph 9: Ratio of mobile phones to number of family members in house.

Table 1 Chi-Square Interpretation

	Usage per day of Mobile	Location where mobile phone kept	Purpose Mobile phone used for	Symptoms common in mobile users	Placement of Mobile during sleep	Time spend on Phone call	Ratio of Mobiles to Family members
Chi-Square	138.340[a]	64.520[b]	126.200[b]	143.850[c]	43.320[b]	110.000[c]	54.600[b]
df	5	3	3	4	3	4	3
Asymp. Sig.	.000	.000	.000	.000	.000	.000	.000
a. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 33.3.							
b. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 50.0.							
c. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 40.0.							

Table 2: Binomial Test Interpretation.

		Category	N	Observed Prop.	Test Prop.	Exact Sig. (2-tailed)
Trend of mobile phone users	Group 1	yes	177	.89	.50	.000
	Group 2	no	23	.11		
	Total		200	1.00		
Hearing Problems	Group 1	yes	127	.64	.50	.000
	Group 2	no	73	.37		
	Total		200	1.00		
Concentration Problems	Group 1	yes	58	.29	.50	.000
	Group 2	no	142	.71		
	Total		200	1.00		

DISCUSSION

John F. Mitchell and Martin Cooper of Motorola in 1973 developed the first hand cell phone [16] Advantage of mobile phone is that it can make and receive call by radio waves over a wide range of geographic area [17] Nowadays the advent of smart phones have made life very easy with multiple softwares. The topnotch mobile manufacturer companies reported in 2014 were Samsung, Nokia and Apple.[18]

Graph 1 shows trend of mobile phone users in the population. Our results show that 88.5% of population uses Mobile Phones. Recently issued stats by Pakistan Telecommunication Authority in first quarter of 2014 reported cellular teledensity of 74.9 percent, with 136,469,886 mobile phone users in Pakistan, which are still increasing day by day.[19]

Graph 2 shows number of hours consumed on mobile per day. Our results show highly significant figure of 8 hours usage of mobile phone per day by 43.5 % of population where as 24% use mobile phone per day for 16 hours.

Graph 3 shows the location where mobile phones usually kept. Carrying mobile phones in pockets is the highest trend observed in 47% of our population while carrying mobile phones in pouches is the second highest figure (24.5%). Nokia interviewed more than 1500 people around the world, in cities including New York, Milan, Kampala, Tokyo and Beijing, to understand how people carry their mobile phones and why they carry them that way. Turns out that most men (60 %) carry their phone in their right front trouser pocket reason being easy to reach, 61% of women liketo keep their phone in a handbag, despite 50 % missing their calls because they can't get to it in time.[20]

Graph 4 shows purpose of using mobile phones. 51% of the Population use mobile phones for texting purposes. Literature study shows that majority of teens exchange texts daily with each other and half exchange texts daily specifically with their best friends. 63% of all teens say they exchange text messages every day with people in their lives. 1% of teens said that they text less than once a week. Second highest observed trend (36.5%) in our results is using mobile phones for facebook/ whatsApp.[21]

Graph 5 shows health related symptoms common in Mobile users. Our results show highly significant figure of 52% Head/neck pain observed in mobile phone users while second highest figure (20.5%) shows all above symptoms (head/ neck , shoulder and ocular pain) found in mobile phone users. According to the Centers for Disease Control and Prevention (CDC) they have not found significant data relating mobile phone use to brain cancers however they are postulations found and research study is still being conducted on it. According to the National Institute of Environmental Health Sciences (NIEHS), which is currently conducting studies of the possible health effects of cell phones current study has not come with long term adverse health effects however postural changes while using mobile phones lead to number of problems.[22-23]

Graph 6 shows Hearing and Concentration problems in mobile users. Our results show 36.5% users suffer from hearing problems where as 71% users have problem concentrating on one thing. Radiofrequency exposure emitted from mobile phones is concentrated in the tissue closest to the handset, which includes the auditory nerve. If this type of exposure increases tumor risk, acoustic neuroma would be a potential concern and some medical studies showed that mobile phones may cause adverse health problems such as headache, sleep disturbances, impairment of short term memory, lack of concentration, brain tumors and high blood pressure amongst users of mobile phones.[24]

Graph 7 shows placement of mobile phones during sleep. Our results show that majority of people keep their mobile phones near to the head during sleep (43.5%). Mobile phones use electromagnetic radiation in the microwave range. Sleeping with a phone nearby boosts your radiation exposure just a bit, which can prevent an optimal sleep cycle. Smartphones affect deep non-REM sleep, which leaves less time for bloodflow to be directed to the muscles. Therefore in the morning, people may experience lack of concentration, soreness, and unfocused performance. [25]

Graph 8 shows Time spend on phone call each day. Our results show the highest figure (41.5%) of 1-4 hour of total call time each day a person spends. [26]

Graph 9 shows Ratio of Mobile phones to number of Family members in house. Our results show the highly significant figure of 37% family member to mobile ratio i.e 37% people have more than one mobile phone for each family member. For the first time ever there are more gadgets in the world than there are people. Gadgets like tablets, smartphones and not-so-smart phones are multiplying five times faster than the population. Kevin Kimberlin remarked that no other technology has impacted human live like the mobile phone. It's the fastest growing manmade phenomenon ever -- from zero to 7.2 billion in three decades.[27] Table 1 and Table 2 show chi-square and Binomial test results from which we found that all our data is statistically highly significant having $p<0.000$.

CONCLUSION

From our study we came to conclude that mobile phone use is very popular among younger generation. They are also facing issues because of its increased use and have become dependent on the gadgets. There is urgent need to create awareness regarding mobile phone addiction and its adverse consequences in younger generation so we can save them from facing dire consequences.

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