

# REVIEW ON HEALTH HAZARDS AND IT'S EFFECTS ON HUMAN BY USING MOBILE CELLULAR PHONES

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**Abstract :** In today's fast-moving and globalised world it is nearly inconceivable to assume our day-to-day life without mobile-phones. It is one of the most effective innovations of the 20th century, which has ended up a helpful implies of communication. The development in the utilize of cellular phone has raised the concerns around the conceivable interaction between the electromagnetic fields (EMF) radiation and the natural impacts on human tissues, especially the brain and the human resistant framework. The impact of normal use of mobile phone has raised worry about the potential health hazards. It is reported, that people who talk on the phone for several hours a day are 50% more likely to develop brain cancer and degeneration of cells. The cause for this is the radio waves formed by mobile phones. It is measured, that every minute the human mind receives about 220 electromagnetic impulses, which are not essentially harmful, but which definitely affect the brain in cases of prolonged impact. In this paper we aim to provide review of some studies which investigated the possible effects of cell phone radiation on human tissues. This review will provide answers for public concern about the hazard of using cell phone.

**Keywords:** Mobile phone, Radiowaves, Brain cancer, Electro Magnetic radiations, Risk assessment.

## I. INTRODUCTION

New technologies are evolving in day to day life to assist human being. Mobile usage is currently the fastest rising communication system in the telecommunication industry. Due to increased number of users using the mobile phone, the anxiety is now focused towards electromagnetic radiations emitted by the mobile phones itself. Electromagnetic emission can be classify into ionizing and non-ionizing radiation. Ionizing radiation is the emission with high energy which is able to take away tight bonds between electrons and atoms resulting in tissue damage while non-ionizing radiation is the radiation that has sufficient energy to vibrate the atoms and molecule but do not remove the electrons in the molecule. This radiation mainly occurs at low frequency range. Mobile phone is designed with low power transceiver to transmit voice and data to base station is located at few kilometres. The radiation of mobile phones can cause problems like headaches, severe pain in ear, blurring of vision, memory loss, itching, burning sensations, feeling asleep, hypersensitivity exhaustion have been observed when using mobile phone. The quantity of RF generated by cell phone is typically depends on the number of base stations around the area, the cell phone network traffic, and on how far the cell phone from base stations[1]. The quantity of the power which sent from a base station could vary from cell phone to another one even within the same area, depends on the interfering from obstacles such as buildings and trees [2]. The hazard of coverage to electromagnetic field was first highlighted and publicized in the late 1970s by Colorado study [3] that linked magnetic filed exposure from power lines to the possible development of child leukaemia.

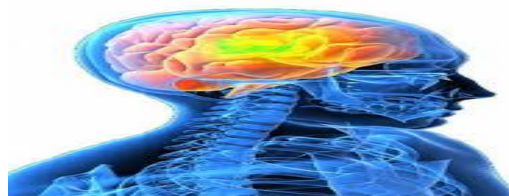


Figure1:Brain affected by EMF exposure

Current studies report two types of brain cancer may occur Glioma and Acoustic neuroma. The figure(1) shows the brain affected due to the Electro Magenetic exposure. The mobile phones usage influence our nervous system. It is the down reality, that nowadays a lot of people, especially youth, experience lack of human contact, and they try to compensate it by mobile-phone communication, which is not an adequate substitute for personal intercourse. Youth is not an easy period of life, and at that time a young person is especially vulnerable. The real world seems to fade in comparison with hours-long chats and hundreds of messages. These aspects cause psychological trouble, as people start to feel tight in face-to-face communication. There is definite risk for pregnant women and their children, so they are sturdily recommended to reduce usage of cell phones. Some studies give information about harmful effects of cell phones on the male reproductive system, so men must not carry phones in the pockets of their trousers.

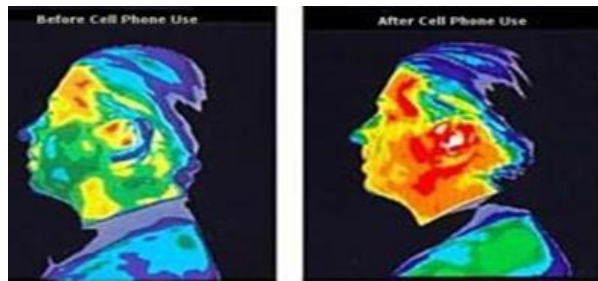


Figure 2. Heat generated due to electro magnetic radiation

Mainly research reports that texting and playing games on mobile phones is also harmful for eyes. Concerning games it also value mentioning, that sometimes they cause irritability and aggressiveness, especially among children and teenagers. Today's world is a world of knowledge and inventions, and there are many tools which essentially facilitate our life. Mobile phones play an significant role in the growth of human civilization, but their excessive use brings severe problems. The World Health Organization based ahead the agreement view of the scientific and medical communities, that serious health effects (e.g. cancer) are very unlikely to be caused by cellular phones or their base stations, and expects to make recommendations about mobile phones [4]. The increase in person on foot related accidents when walking and engaging with a mobile phone has led researchers to investigate the effect of phone use on pedestrian safety. Phone use results in pedestrians walking slower, deviating more from a straight line or changing direction more, and demonstrating reduced situation awareness and/or inattentive blindness. There is at present little research investigating the impact of mobile phone use on adaptive gait.

## II. LITERATURE SURVEY

Since in the year 2000, a significant number of reports and surveys on the association between cell phone utilization and health have been issued by the advisory groups, organizations and agencies around the world. From the publication of the Stewart Report in May 2000, to the end of 2004, the Board an autonomous body that is currently part of the Health security organization has duty regarding educating government divisions concerning insurance for introduction to ionizing and non ionizing radiation, which incorporates electric and attractive fields.

The Stewart report is broadly quoted review on cell phones and wellbeing. The administration of the United Kingdom charged the independent expert group on cell phones which was led by Sir William Stewart to set up the report. The report presumed that the parity of proof did not propose that introduction beneath global rules could cause adverse effects on health. However it is suggested that a methodology of restricting presentation to RF and microwave radiation, arranging the area and setting of base stations and empowering a particular utilization of cell phones be embraced until the point when more definite and experimentally robust information on the adverse effects on health become available.

Braune et.al have reported intense consequences on blood pressure in human volunteers exposed to a traditional GSM digital cell phone situated near the right side of the head. Following 35 minutes of exposure, heart rate, circulatory strain and capillary perfusion were estimated with the subject either prostrate or remaining for 60 seconds. They found that the heart rate during these tests was somewhat lower after exposed to RF radiation than following non uncovered control sessions, and both systolic and diastolic circulatory strain were hoisted by 5– 10 mm of mercury.

The national radiological assurance board [6] synopsis report reasons that introduction to low level RF and microwave fields may cause an assortment of slight natural impacts on cells, creatures or individuals, especially on cerebrum action amid rest, however the likelihood of presentation causing unfavourable consequences for wellbeing stays demonstrated. Dansieh research study looked at how pervasive the consumption of SMS service texting is among students; it's expected effects on students' writing abilities; and what lecturers and students themselves believe about the phenomenon. Kamran conducted a revise that the majority of youth is establish very high user of texting and reduced user of voice calls. The major motivation of high and uncomfortable use among young people is very low cost prepaid packages given by the telecom operators in Pakistan. Thornton et al. conducted study, the poll exposed that Japanese university students use cell phones habitually for sending and receiving e-mail whereas sometimes in their classes.

## III. PROPOSED REVIEW

### a. RF STANDARDS AND APPROACH

Various associations have built up limits for human exposure to RF fields. These incorporate the IEEE and the United Kingdom National Radiation Protection Board (NRPB). For radio stations, International commission for Non ionizing radiation protection proposes two security levels: one for word related exposure, another one for the all inclusive community. There are, furthermore, different legislative limits that are normally founded on these standards.

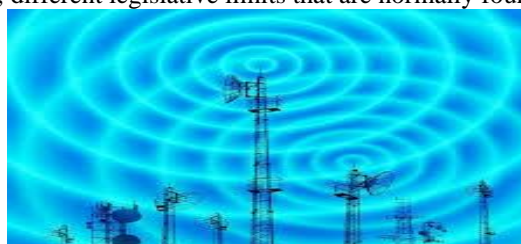


Figure 3. Radiation Effects on human body

The diverse standards fluctuate to some degree in their exposure limits and in other particulars. However, at frequencies utilized for remote correspondences frameworks, these extraordinary rules are extensively similar. All of these principles incorporate arrangements for various presentation circumstances. The benchmarks likewise necessitate that the introduction be arrived at the

midpoint of after some time periods running from 6-30 minutes (which implies that coincidental exposures shorter than the averaging time can be higher than the points of confinement). The figure3 shows the effect of radiation on human body.

These principles were created by advisory groups of researchers and specialists, who analysed the logical writing to distinguish potential dangers of RF exposure shown in Figure 3.. Significant models depended on an extensive audit of a few thousand scientific papers, counting building thinks about, entire creature and cell studies, and human (epidemiological) contemplates. The standards were endorsed simply after a long review process including a scope of take holders incorporating into numerous cases the general public. Radio base authorizing techniques have been set up in the dominant part of urban spaces controlled either at city/area, common/state or national level. Cell phone specialist co-ops are, in numerous areas, required to get development licenses, give accreditation of receiving wire emanation levels and guarantee consistence to ICNIRP standards and additionally to other environmental enactment.

## b. Cell phone Effects

Numerous effects have been reported due to exposure to long term EMF radiation from cell phones. These possessions led us to divide the reported results into three major categories. These categories are as follows:

### Effect of electromagnetic waves on human brains

A few impacts have been accounted for because of presentation to long haul EMF radiation from mobile phones. These impacts led us to separate the announced outcomes into three noteworthy classes. These classes are as per the following:

#### a) Effect of electromagnetic waves on human brains

The advanced phone is a source of the eminence of electromagnetic waves. Various examinations have been conducted in the previous years to identify the impact of electromagnetic waves emitted from the mobile phones on human health. The topic has been examined for quite a while, yet in past, it addressed a somewhat narrow circle of people. Indeed, even around then, measures taken to protect people from radiation on the people who work close to near powerful radiation. very high power electromagnetic radiation can source electric currents strong enough to create sparks (electrical arcs) when an induced voltage exceeds the breakdown voltage of the surrounding medium. The biological result of electromagnetic fields is to reason dielectric heating. Complex organic effects of weaker non-thermal electromagnetic fields also exists, including weak Extremely Low Frequency magnetic fields and modulated Radio Frequency and microwave fields. Magnetic fields induce circulating currents within the human body and strength of these magnetic fields depends directly on the strength of the impinging magnetic field. Figure.4 demonstrates the impact of electromagnetic radiation on human head.



Figure 4.Effect of EMF on Human Body

#### a) Harmful Effects of Mobile Phones on childrens & Teenagers

Cell phones have turned a wide spread phenomenon in the present time. These pocket-sized instruments are much smaller than expected PC. A few examinations give information about harmful impacts of mobile phones on the human system appeared in Figure.5 Not simply the grown-ups, this innovation is influencing the children also. But did you know what the destructive effects of cell phones on kids are? Read on to find out about the effect of cell phones on students.



Figure.5.Effect of mobile phone on children



*Academics:*

Children, just like the teens, are addicted to cell phones. They play games shown in figure 6, chat and talk with their companions on their cell phone all the time. Alongside the school supplies, numerous understudies make their every day outings to their school with their cell phones. They chat on the telephone during the spare time and send messages during the classes. In this manner, they miss the exercise instructed and fall behind alternate understudies.



Figure 6. Effect of mobile phone on academics

*Effects on the Brain:*

Researchers have found that only 2 minutes of the telephone call can alter the electrical movement of the child's mind for up to 60 minutes. The radio waves from the mobile enter profound into the mind, not simply around the ear. The disturbed mind action could impair youngsters' learning capacity and other conduct issues. It could even influence their mind-set (figure 7) and capacity to learn in the classroom on the off chance that they have utilized the telephone during the break time.

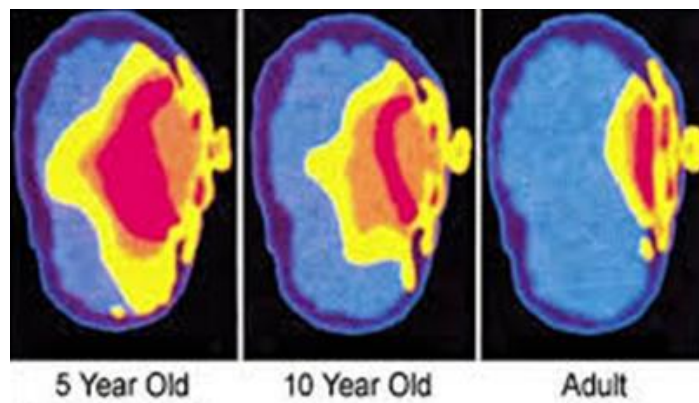


Figure 7. Effect of radiation on brain

*Inappropriate Behaviour:*

Utilization of cell phones can lead children to engage in inappropriate behaviours. Texting and transferring improper pictures are a growing problem with teens. The illustrations go in the wrong hands, giving others admittance to the private photos.



Figure 8. Effect of mobile phone inappropriate behaviour

**More Distraction:**

Texting a friend is a alluring diversion that many students select over listening to a lecture or finishing a class assignment. If not silenced, cell phones can circle during class, drawing everyone's concentration away from the lesson and disrupting the flow of learning. Many teachers worry that this added interruption negatively impacts students' school performance as it stops them from dedicating their full attention to their studies. Teens often fail to recognize the long-term implications of inappropriate behaviour and engage in the behaviour without considering the consequences.

**C. Reasons Why Cell phones are Bad For Health:***Increases Stress Levels*

The high frequency of mobile use can have depressing effects on our stress levels. The constant buzzing vibrating alerts, and reminders can put a cell phone user on edge. Researchers initiate high mobile phone use was associated with stress and sleep

turbulence for women, whereas high mobile phone use was associated with sleep disturbances and symptoms of depression in men. Overall, extreme cell phone use can be a risk factor for mental health issues in young adults.

#### *Increases Risk of Illnesses In Your Immune System*

The incessant emotive of your phone can harbour germs on your handset. The greasy, oily remains you may see on your cell phone after a day's use can contain more disease-prone germs than those found on a toilet seat.

Cell phones need constant use of your hands, particularly when sending text messages and e-mails. Responding to communication at rapid speed can cause pain and irritation of your joints. Back pain is also common with increased cell phone use, particularly if you hold the phone stuck between your neck and shoulders as you multitask.

#### *Increases Risk of Eye Vision Problems*

Staring at your movable device can cause trouble in your vision later in life. Screens on mobile devices be likely to be smaller than computer screens, which means you are more likely to look and strain your eyes while reading messages

## IV. RESULTS AND DISCUSSION

1. **Use your cell phone for emergencies or important calls only.** "Turn your cell phone off more often. Reserve it for emergencies or important matters. As wide as your mobile is on, it emits radiation intermittently, even while you are not actually making a call.
2. **When the signal is weak you should wait.** "When response is bad (such as in a rural areas or when you're driving) use your phone for emergencies only. The weaker the signal, the additional the radio frequency has to increase itself to get connected, increasing your exposure.
3. **At night turn it off to lower EMF exposure.** "This is one of the most excellent ways to defend your immune system and, therefore, your dental health. Provide your body a break by maintenance your cell phone far from your head while sleeping. Spend in a landline if needed and turn off all routers before bed.
4. **Check your child's cell phone records.** "Review cellular phone records for any unknown information and late night phone calls and texts." While it may feel as although you're snooping on your kids, review their calling and texting records can help you identify warning signs such as bizarre calling patterns or unfamiliar numbers that could specify that your child is communicating with someone they shouldn't be such as a potential predator.
5. **Don't use your cell phone in a closed-in metal area.** "Attempt not to use your mobile in elevators, cars, trains or planes. Cell Phones depict more power, and produce more radiation, in enclosed metal spaces.
6. **Keep conversations to a minimum while driving.** "Keep conversation small and sweet. increase ways to get free of long-winded friends and connections while on the road. Don't use the cell phone for social visiting while you drive.
7. **Keep it locked.** "Make certain that you have a secret PIN (personal identification number), a password, fingerprint location or other security measures in position so that only you can access your phone.
8. **Program an emergency number.** "Program a contact listed as ICE ("in case of emergency") into your phone book, so that police and other disaster personnel be familiar with who to call if you require help.
9. **Be careful what you share.** Once the text, photos, and video are posted they are difficult to take back, can be copied and pasted elsewhere hence be careful.

### IV. Conclusions

A mobile phone started out as plain device that had simply numbers, and most people used them for emergencies only. These days, cell phones have numerous features such as phone calls, text messaging, taking pictures accessing the web, using calculator etc as many trimmings. People turn out to be addicted in cell phone because they are receiving many facilities by using it. For example whenever they go outside they can take the phone with them because of its size, networking range, a full charge battery, essay connection etc. There is no hesitation about the benefits of mobile phones. There are advantages and disadvantages of mobile phones. In the end, it all depends on our usage. Cell phones are the most individual device to us and we should create an optimal use of them. The mobile network and mobile phones give great convenience for mobile users and in information it is a main part of technological growth also. However, they release RF radiations, which can be damaging to humans. To minimize the harmful effects. The local SARs produced by hand-held, transportable and mobile transceivers and cellular telephones normally do not go beyond safety limits. The base stations be supposed to be located as far away from densely occupied sites as possible in network planning.. One should reduce the use of cell phone as much as we can it. One be supposed to avoid using cellular phone more than 3 minutes continuously and have to maintain a gap of 15 minutes flanked by two uses.

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