

## **Cell phone and the mental health of the students- a short review**

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**Abstract:** The state of mind and mental health makes a huge difference to our overall well-being. Mobile phone usage is alarmingly increasing especially in the younger generation. The younger generation especially is glued to their cell phones and is supposedly a form of addiction according to some studies. There is an integration of machine- man and a growing concern about health as individuals are exposed to electromagnetic field (EMF) emitted by cell-phones. The radio-frequency radiation emitted by cell-phones as placed near to ear has effect on functional changes in the brain and affects cognition and mental well-being. The real concern is about the effect of these radiations on mental health and cognition of students.

**Keywords:** Mobile phone, electromagnetic field, mental health, cognition.

### **DISCUSSION**

Communication has been a life- long process in human beings. Nowadays technology has been integrated into our lives and we stay connected with others constantly. There is an integration of machine- man and there is a rising concern about overall health as individuals are exposed to electromagnetic field emitted by cell-phones. The signals transmitted and received by mobile phones are in the form of waves in the radio frequency (RF)[3 kHz to 300 MHz] and microwave [300 MHz to 300 GHz] parts of the electromagnetic spectrum. The frequencies that mobile phones use range from 900 MHz to 2.1 GHz [1].

Cell phones at first glance could be considered as substance free or psychological addiction. But since cell phones emit radiation waves that reach the brain, there could be a physiological reason behind such addiction. A hypothesis has been proposed that the cell phones could have a neurophysiological basis similar to substance abuse drugs, might act on neurotransmitters and have similar effects on the cerebral reward circuit [2].

The radio-frequency radiation emitted by cell-phones as placed near to ear has effect on functional changes in the brain and effects cognition and mental well-being. This possible might indicate that EMF hinders information transfer pathway connecting the entorhinal-para hippocampal regions in the memory task[1]. A study suggested that cell phone use should be limited when performing a task that relies on attentiveness [3].

Several studies conducted have shown an association of mobile phone overuse and mental health symptoms like anxiety, and insomnia, depression, and psychological distress.<sup>4</sup> Researchers have also shown that mobile phone radiation causes auditory and visual problems, headache, memory loss, and fatigue. Mobile phone overuse is considered a form of technological addiction. Hooper and Zhou have published data which shows that the university students' rate of mobile phone use is very high. Results of a survey conducted among students showed that when the students' rate of cell phone use was reduced, an improved mental health followed [5].

There are some new devices referred to as EEG devices available in the market which are compatible with the smart phones. These devices are available in the form of a headband. This device supposedly measures general brain activity in the left prefrontal cortex. Its readings can be transferred to a computer or smart phone and analyzed to give a more accurate association of mobile phone use and its effects on mental health. Brainwaves are typically broken up into five bands. The device records a full range of brainwave activity which includes, Delta waves present during deep sleep, Theta waves during drowsiness, and light sleep, Alpha waves associated with wakeful relaxation, Beta waves which are seen when alert, actively thinking or during problem-solving and Gamma waves which occur when involved in higher mental activity and consolidation of information [6,7]. Studies should analyze effect of cell phones on mental

health of students and the results can be used to demonstrate to the younger generation and their parents, the ill effects of cell phones on their mental health and thus prevent further damage. Such studies will lead to intervention by the policy makers in passing scientific evidence based recommendations which include restricting exposure and providing the public with information and options. At the same time the students and even general public for that matter should be encouraged to follow natural method in reducing stress like meditation as it helps to calm the mind and improves the mental health which is our ultimate goal.

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