



## International Journal of Innovative Research in Computer and Communication Engineering

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Website: [www.ijircce.com](http://www.ijircce.com)

Vol. 6, Issue 1, January 2018

# Comprehensive Study on Negative Effects of Mobile Phone/ Smart Phone on Human Health

Asoke Nath

Associate Professor, Department of Computer Science, St. Xavier's College (Autonomous), Kolkata, WB, India

**ABSTRACT:** The smart phone or a mobile phone has become 24hrs attachment with most of the users all over the globe. It is now very difficult to say who are the people not using mobile/smart phone. The mobile phone users can not even think that the mobile phones not working for an hour. The main advantage of using smartphone or mobile phone is that it keeps users online. It is important to point out that smart phones have changed the way we access internet and benefit from the micro computers that they are. The people are empowered as they access information and interact with everyone all the time, on the go. Apart from all the above the mobile phone or smartphone may be used for entertainment or playing games. However, there are many negative effects of mobile phone or smart phone. Quite a number of researchers have made systematic study on evil effects of mobile phone or smart phone on human health. The mobile towers are much more dangerous for human beings. In the present paper the author tried to collect various data from different reliable sources and made a systematic study on the negative effects of mobile phones/smartphones on human body.

**KEYWORDS:** smart phone; mobile phone; internet; computational work; addicted

### I. INTRODUCTION

Before 2 decades the mobile phones were used by few people across the globe and the people were using only in case of emergency and not for 24hrs a day. But in the last 2 decades there is a tremendous advancement in the network technologies and Internet facilities. The scientists and innovators jointly start to improve the mobile technologies to make one unique device which can be used to send and receive audio or video message or to use internet facilities or to perform any computational work at a very nominal cost. Although the mobile phone makes our life smooth but it has many evil effects also. In the present study the author will mainly focus on negative side of using smartphone or a mobile phone. The smart phone or the mobile phone might be affecting one's thought process, behavior and attitudes in a more negative and faster way. It does that so finely and secretly that it becomes difficult to identify and cope up with. It is not an exaggeration to say that smart phones have the power to influence most important decision making processes and choices. It changes personality, it changes the behavior of a person. Smart Phone addiction is a well-recognized condition, known to cause trauma and high level anxiety pains. Addiction to remain online, compulsion to be active on social sites leads to low productivity and impacts the emotional health of the person. Constantly looking for something interesting on web, social sites and games inhibits ones emotional ability to focus on one topic for long. It has been already proved that long hours of gaming makes anyone impatient, addicted and unproductive. Long time effects may be worse, permanent and affecting the more subconscious layer of behavior. So the suggestion is to keep phone away for a while and enjoy all the other good things life has to offer.

#### (i) *Problems created on eyes.*

The abrupt change in graphics, brightness and details while you are gaming is one of the main causes of chronic dry eye syndrome. The eyes bear a tremendous amount of reflexes, stress and dryness. Before the eyes can relax and recover there is a new job ready again within that screen that it's sick of.



# International Journal of Innovative Research in Computer and Communication Engineering

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Website: [www.ijirccce.com](http://www.ijirccce.com)

Vol. 6, Issue 1, January 2018

## *(ii) Problems disconnecting.*

Becoming addicted to your phone has become a conditions that experts now call: "Nomophobia" (no-mobile-phone-phobia). It's not limited to the hardcore Wall Street types with their "crackberries" though; it's more used these days than we realized. A recent survey found that 84 percent of the world's population said they could not go one go about in their day without their smartphones, and current research shows that nearly two-thirds of teens and young adults check their phones every 15 minutes or less. The anxiety and stress over missing out on a text or Facebook update can take such a toll on peoples' health that Morningside Recovery Center in California recently founded the first rehab group for nomophobia.

## *(iii) Lifestyle diseases.*

Hyperactive to hyper stressed takes much less time nowadays, thanks to our phones. It is common to see teenagers and even adults exhausted of the long hours spent on smartphone, be it games or surfing net. It impacts the digestion, breathing rate and heart beat rate. Smart phones have become a new enemy to our sleep in terms of quality and time. Apart from that, the hours that otherwise might have been spent exercising, going out, getting fresh air in parks, interacting with your loved or even pets are all taken up by your smart phones. It's hard to imagine all this making us healthy! Next time when you are consumed by your phone, take a break and breathe, breathe long and easy. You will at once feel the kind of stress it has relieved you from!

## *(iv) Problems with posture.*

There are many diseases resulting from wrong postures while working for long hours. Gazing into your phone for long time with neck bent and arms in a fixed position pose a serious health risk. Pain, muscle spasms and restlessness are just short term effects. In the longer run permanent or chronic diseases may occur. Cervical spondylitis, golfer elbow, chronic dry eye syndrome, stiffness in thumbs, neck and back are a few diseases occurring from habituated wrong postures of using smart phones. The typical head down and neck bent position while one is engrossed in their favorite games or chat should be consciously avoided.

## *(v) Destroying your focus.*

You don't own your phone—it owns you. Researchers in Finland found that most people obsessively check their menu screen, news, e-mail, and apps, even though the likelihood of seeing new and interesting information keeps decreasing. That's very much true. If you are waiting for something and it is very urgent, you will keep refreshing your phone to see if it is there or not.

## II. SOME IMPORTANT FINDINGS ON PROLONGED USE OF SMARTPHONES/MOBILE PHONES

The researchers have made extensive study on real life data on negative effects of using smartphones/mobile phones. The studies shows that there is a link between prolonged mobile phone use and serious health damage. The evidence is both wide-ranging and compelling. The possible health risks identified include not only brain tumors but also damage to fertility, genes, the blood brain barrier and melatonin production as well as other biological effects thought to have a role in cancer development. The largest body of evidence concerns brain tumors. Almost every study of prolonged mobile phone use – roughly half-an-hour a day for 10 years – has found an increased risk of brain tumors. Several large-scale studies have found a doubling of the risk after only 10 years' use. This evidence contributed to the recent classification of mobile phone radiation as 'possibly carcinogenic' by the World Health Organization's scientific panel. And given the average latency period for brain tumors of about 30 years. This is especially so for children. Not only do their thinner skulls, greater tissue conductivity and smaller heads increase their radiation absorption when on a phone call, but their cumulative lifetime exposure to the radiation will also be much greater. Despite the accumulating research, the use of mobile phones continues to grow unchanged. In the UK, 90% of secondary-school children and nearly 60% of 8-11's have a mobile phone. The Department of Health's leaflet on children's risks is available only



# International Journal of Innovative Research in Computer and Communication Engineering

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Website: [www.ijircce.com](http://www.ijircce.com)

Vol. 6, Issue 1, January 2018

online and children, parents and schools are unaware of the vital guidance it contains. The few manufacturers' warnings that exist are almost impossible to follow and are buried in the small print of user manuals where hardly a customer sees them. Consequently, public awareness of the risks remains minimal. It has suited the mobile phone industry selectively to play up the evidence that argues against a causal link between phone use and health damage. Government agencies and departments similarly seek to relieve public fears by emphasizing the studies (mostly short-term) that appear to give phones the all-clear, thereby down-playing the uncertainty over long-term safety. The link to cancer was only proven some 25 years after the first studies were published. The fact that the evidence is not conclusive and that there are gaps in our understanding is not justification for inaction. Both the Government and phone companies could very easily do far more to alert the public, particularly children, to the emerging risks and safety measures. Given almost universal use of the technology, waiting for conclusive evidence before action is taken is irresponsible, especially when there are unrestrictive measures that can substantially cut the risks. Safety advice could be widely publicized at relatively little cost. As the Council of Europe has recommended, the Government and phone companies need now to publicize their warnings and provide practical advice, especially for children. Schools, phone shops and the healthcare system should be enlisted into the effort.

## ***II.1 Cancer and other Tumours:***

Several studies among sizeable populations have found a doubling of the risk of some brain tumours after 10 or more years' mobile phone use for about half an hour a day. Studies indicate a possible link between mobile phone use and tumours of the parotid gland (a salivary gland in the region normally highly exposed to radiation during phone use). The World Health Organization's International Agency for Research on Cancer (IARC) has classified the radiation emitted by mobile phones as "possibly carcinogenic to humans" (Class 2B).

## ***II.2 Damage to Fertility and Reproduction :***

Laboratory and observational studies have found damage to sperm, impaired female fertility and damage to the unborn foetus from exposure to mobile phone radiation.

## ***II.3 Genotoxic Effects :***

Laboratory studies from different research groups suggest that even after short periods of exposure to phone radiation, DNA strands can be broken and there are effects on gene expression. Phone radiation is capable of disturbing the DNA repair mechanism, and this can continue for several hours after the phone use.

## ***II.4 Damage to Other Biological Processes:***

Laboratory studies suggest that phone radiation can damage the blood-brain barrier, causing a leakage of albumin into the brain. Studies have found significantly reduced levels of melatonin in humans after about half an hour's mobile phone use per day. Effects on heat shock proteins (similar to a stress response), oxidative stress, apoptosis (cell death) and damage to cell membranes have been identified in research. These are thought to have a role in cancer development.

## ***II.5. Contributes to the Development of Insomnia***

Have you ever felt more awake after using Wi-Fi or even struggled to sleep through the night? Reports of these phenomena have been frequent and even prompted a study in 2007 that evaluated low-frequency modulation from cell phones and its impact on sleep. Participants were exposed to the electromagnetic signals from real phones or no signal from fake phones. Those exposed to the electromagnetic radiation had a significantly more difficult time falling asleep and changes in brainwave patterns were observed.



# International Journal of Innovative Research in Computer and Communication Engineering

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Website: [www.ijircce.com](http://www.ijircce.com)

Vol. 6, Issue 1, January 2018

It's been suggested that sleeping near a phone, in a home with Wi-Fi, or in an apartment building with many Wi-Fi signals can create chronic sleep problems as the constant bombardment of Wi-Fi pollution interferes with falling asleep and sleep patterns. For many, sleep deprivation is just the start for larger problems. The development of depression and hypertension have also been linked to inadequate sleep.

## ***II.6. Damaging to Childhood Development***

Exposure to non-thermal radio frequency radiation from Wi-Fi and cellular phones can disrupt normal cellular development, especially fetal development. A 2004 animal study linked exposure to delayed kidney development.<sup>[4]</sup> These findings were supported by a 2009 Austrian study. In fact, the disruption of protein synthesis is so severe that authors specifically noted, "this cell property is especially pronounced in growing tissues, that is, in children and youth. Consequently, these population groups would be more susceptible than average to the described effects."<sup>[5]</sup> In short, bathing the developmentally young in Wi-Fi increases their risk of developmental issues.

## ***II.7. Affects Cell Growth***

When a group of Danish ninth graders experienced difficulty concentrating after sleeping with their cell phones by their head, they performed an experiment to test the effect of wireless Wi-Fi routers on garden cress. One set of plants was grown in a room free of wireless radiation; the other group grew next to two routers that released the same amount of radiation as a cell phone. The results? The plants nearest the radiation didn't grow.

## ***II.8. Derails Brain Function***

Just as the Danish high schoolers noticed problems with concentration, scientists have begun to look at the impact of 4G radiation on brain function. Using MRI technology, research performed just last year found that persons exposed to 4G radiation had several areas of reduced brain activity.

## ***II.9. Reduces Brain Activity in Females***

A group of 30 healthy volunteers, 15 men and 15 women, were given a simple memory test. First, the entire group was tested without any exposure to Wi-Fi radiation — no problem. Then, they were exposed to 2.4 GHz Wi-Fi from a wireless access point for about 45 minutes. During that portion of the testing, brain activity was measured and the women had a noticeable change in brain activity and energy levels.<sup>[8]</sup> Sorry ladies! But guys, don't get too comfortable.

## ***II.10. Neutralizes Sperm***

...Because we've known for a long time that the heat generated by laptops kills sperm. Well, now it turns out that heat isn't the only threat to a man's virility. Research has found exposure to Wi-Fi frequencies reduce sperm movement and cause DNA fragmentation.<sup>[9]</sup> Both human and animal testing has confirmed that exposure negatively affects sperm.

## ***II.11. May Impact Fertility***

The results of an animal study suggest that some wireless frequencies may prevent egg implantation. During the study, mice exposed 2 hours a day for 45 days had significantly increased oxidative stress levels. The cellular damage and impact on DNA structure from exposure suggest a strong possibility of abnormal pregnancy or failure of the egg to implant.



# International Journal of Innovative Research in Computer and Communication Engineering

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Website: [www.ijircce.com](http://www.ijircce.com)

Vol. 6, Issue 1, January 2018

The Karolinska Institute in Sweden released a warning in 2011, stating:

- “Pregnant women are cautioned to avoid using wireless devices themselves and distance themselves from other users,”
- “Current US [and Canada]...standards for radio frequency and microwave radiation from wireless technology are entirely inadequate,” and
- “Safety standards also ignore the developing fetus...”

## II.12. Provokes Cardiac Stress

If you think your heart races when surrounded by wireless networks or 3G or LTE cell phones, it may not be in your head. A study involving 69 subjects reported that many of them experienced a real physical response to electromagnetic frequencies. Exactly what was the physical response? Increased heart rate — similar to the heart rate of an individual under stress.

## III. HEALTH HAZARDS ARISING DUE TO RADIO FREQUENCY RADIATION FROM MOBILE TOWERS/ ANTENNA

III.1 “Fachkrankenhaus Nordfriesland”; the German hospital dealing with health problem arising from Electromagnetic fields has come out with its research findings (on their website [www.fachkrankenhausnf.de](http://www.fachkrankenhausnf.de)) about E-smog. It is discovered that due to E-smog, there is massive reduction in “Melatonin hormonal levels. Melatonin is an important hormone required for sound sleep & stable immune system. Further it exercises a protective function against neuro – generative diseases like Alzheimer’s & Parkinson’s diseases & multiple sclerosis. It lowers blood pressure & cholesterol. Massive reduction in Melatonin levels of @ 30 % are observed in case studies.

III.2 Dr Vini Khurana, Australian neurosurgeon of Indian origin says, Cell phones are today, what tobacco and asbestos companies were 40 yrs ago. **Cell phones cause more cancer than smoking & asbestos.**

III.3 Dr. Neil Cherry, biophysicist from Lincoln university of New Zealand, said at Scientific workshop on biological & health effects of RF – EMF held in Vienna in 1999, “Every night, as we go to sleep, our melatonin level rise. Melatonin goes through our blood & clears our cells up, that is to say, scavenges free radicals, which are highly damaging chemicals. If free radicals persist for long, they damage the DNA, cause damaged cells & are shown to be carcinogenic. Melatonin is one of those agents, that cleans us up every night to reduce the possibility that cells will become carcinogenic. Power lines, Radio, TV & Cell phone towers must be kept away from houses, hospitals, schools.

III.4 The earth is fully covered with haze of electro-smog from a host of wire-less radiation devices, which is showing its effect only on human population but plants, animals & climate. We are engaging into a world were biology & physics are co-dependent/ interdependent.

III.5 Scientists are now zeroing on how man made RF/ microwave frequency signal can interfere with the body. The process is called frequency coupling/ resonance. The theory concludes, “When a material (the body) is activated by interaction with another source of energy (RF/MW) at same resonant frequency; a more powerful & intensive response occurs. If frequency is pulse modulated; a significant changes can be created in the codes of DNAs of human body. Scientists have observed how EM-RF radiation alter biological processes. Scientists have shown, that wireless radiation affects everything from cellular functions to general well being to more end point diseases. EM – RF radiations cause increase in micronuclei levels & reduced Melatonin levels. Micronuclei are indicators of compromised immune factors & precursors to cancer. RF radiation impacts & penetrates cellular growth & division processes, which could ultimately be linked with more acute & chronic diseases such as DNA damage, increased micronuclei formation, activation of stress proteins etc. EM-RF frequencies break in the blood – brain barrier, a barrier which keeps toxins from entering the



# International Journal of Innovative Research in Computer and Communication Engineering

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Website: [www.ijircce.com](http://www.ijircce.com)

Vol. 6, Issue 1, January 2018

brain. Breaking blood – brain barrier contributes to increase in development of Alzheimer, Parkinson & other neurological diseases; reduced sperm count.

## IV. SOME CASE STUDIES IN INDIA

RIDDHI PARK, THAKURLEE (WEST):

Mrs Roopa Bhat, Builder had installed mobile tower before the residents had occupied the building. Within 4 months of occupying the top floor flat, Mrs Roopa Bhat started suffering from “brain tumor”. She used to feel fatigued; and also suffered from white rashes on the body.

Mrs Roopa Bhat’s neighbor delivered a baby with cancer of spinal chord name not disclosed at request of the patient’s parents.

Another neighbor (name not to disclosed) gave birth to child having “BIRTH DEFECTS”; and the child died immediately after birth.

All the residents of the building are now demanding the demolition of the tower. In spite of these demands by residents, builder has installed another “VODAPHONE” tower. Mrs. Roopa Bhat has left her flat in Thakurlee and she is now staying in Goregaon and spent @ Rs. 10 lakhs for treatment on brain tumor. She has to pay for additional rental money. However her health is now improving.

(ii) Mr. Bhagwant Deshpande, of North Kasba peth, Deshpande galli, Solapur; has come out with an interesting statistics about people staying in 300 ft radius of “Vodafone” & “Airtel” mobile towers. There has been a death of 9 persons in last four years.

Many persons are facing sleep disorders, restlessness and fatigue due to radiation coming from mobile towers.

Sleep disorders in an individual, if observed after installation of mobile tower on his/ her respective building, in fact violate Section 21 of “Indian Constitution”, which guarantees peaceful living & liberty. If one can’t sleep, how his/ her life would be peaceful?

## V. CONCLUSION AND FUTURE SCOPE

Smartphones and mobile phones are now almost integral part almost every persons in the globe. As it is not good for health so therefore, more research work should be done on prolonged usage of smartphone/mobile phone. The time is coming when most of the household goods will be operated my smart phones. So therefore it must be full proof that there should not be any kind of risk factor of using this small electronic device. Especially the pregnant women and children are in greater danger from cell phone towers than the normal population. A recent study on pregnant women with heavy cell phone use found behavior problems in their children. According to Dr. Om Gandhi, an eminent scientist in the area of bio electromagnetics, cell phone radiation makes children more susceptible to DNA breakage, genetic damage, and incidence of cancer. It reduces their life span. However, we are hopeful that the manufacturer, the big industries must come forward and do extensive research work on effects of usage of smartphone/mobile phone on human health.

## VI. CONCLUSION AND FUTURE SCOPE

The simulation results showed that the proposed algorithm performs better with the total transmission energy metric than the maximum number of hops metric. The proposed algorithm provides energy efficient path for data transmission and maximizes the lifetime of entire network. As the performance of the proposed algorithm is analyzed between two metrics in future with some modifications in design considerations the performance of the proposed algorithm can be compared with other energy efficient algorithm. We have used very small network of 5 nodes, as number of nodes increases the complexity will increase. We can increase the number of nodes and analyze the performance.



ISSN(Online): 2320-9801  
ISSN (Print) : 2320-9798

# International Journal of Innovative Research in Computer and Communication Engineering

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Website: [www.ijircce.com](http://www.ijircce.com)

Vol. 6, Issue 1, January 2018

## REFERENCES

1. Asoke Nath, Sneha Mukherjee, "Impact vof Mobile Phone/Smartphone: A pilot study on positive and negative effects", International HJournal of Advance Research in Computer Science and Management Studies(IJARCSMS, ISSN:2321-7782, Impact Factor SJIF 2017 : 7.327), Vol-3, Issue-5, Page: 294-302, May(2015).
2. (a) Khurance VG, Teo C, Kindi M, Hardell L, Carlberg M. (2009) Cell phones and brain tumors: a review including the long-term epidemiologic data. *Surg Neurol*;72:205-14. (b) Sarah J Hepworth, Minouk J Schoemaker, Kenneth R Muir, Anthony J Swerdlow, Martie J A van Tongeren, Patricia A McKinney: Mobile phone use and risk of glioma in adults: case-control study. *BMJ*, doi:10.1136/bmj.38720.687975.55 (published 20 January 2006).
3. "The Impacts of Radiofrequency Radiation from Mobile Phone Antennas", *EMR Australia PL*, 2008.
4. Santini, R., Santini, P., Danze, J.M., Le Ruz, P., Seigne, M. (2002). Study of the health of people living in the vicinity of mobile phone base stations: I. Influences of distance and sex. *Pathol. Biol.* 50:369-373
5. Santini, R., Santini, P., Danze, J.M., Le Ruz, P., Seigne, M. (2003). Symptoms experienced by people in vicinity of base stations: II. Incidences of age, duration of exposure, location of subjects in relation to the antennas and other electromagnetic factors. *Pathol. Biol.* 51:412-415.
6. Microwave and Radio Frequency Radiation Exposure, *San Francisco Medicine*, Vol. 74, No 3, March 2001.
7. Navarro, E.A., Segura, J., Portolés, M., Gómez-Perretta de Mateo, C. (2003). The Microwave Syndrome: A Preliminary Study in Spain. *Electromagn. Biol. Med.* 22:161-169.
8. Bortkiewicz, A., Zmyslony, M., Szyjkowska, A., Gadzicka, E. (2004). Subjective symptoms reported by people living in the vicinity of cellular phone base stations. *Med. Pr.* 55:345-351.
9. Hutter, H.P., Moshammer, H., Wallner, P., Kundi, M. (2006). Subjective symptoms, sleeping problems, and cognitive performance in subjects living near mobile phone base stations. *Occup. Environ. Med.* 63:307-313.
10. Abdel-Rassoul, G., Abou El-Fateh, O., Abou Salem, M., Michael, A., Farahat, F., El-Batanouny, M., Salem, E. (2007). Neurobehavioral effects among inhabitants around mobile phone base stations. *Neurotoxicology* 28:434-440.
11. Wolf, R., Wolf, D. (2004). Increased incidence of cancer near a cellphone transmitter station. *Int. J. Cancer Prev.* 1:123-128.
12. Eger, H., Hagen, K.U., Lucas, B., Vogel, P., Voit, H. (2004). Influence of the spatial proximity of mobile phone base stations on cancer rates. *Umwelt-Medizin-Gesellschaft* 17:273-356. [13]
13. Meyer, M., Gärtig-Daugas, A., Radespiel-Tröger, M. (2006). Cellular telephone relay stations and cancer incidence. *Umweltmed. Forsch. Prax.* 11:89-97