

**ENVIRONMENT CONSERVATION,
CHALLENGES THREATS IN
CONSERVATION OF
BIODIVERSITY (VOL - V)**



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EXTENSIVE USAGE OF MOBILE PHONES AND THEIR ASSOCIATED COMPLICATIONS – A SYSTEMATIC REVIEW

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ABSTRACT

The use of mobile phones has drastically increased among the population over the past few decades. Despite its do's it also has its don'ts in the human body which seriously affects physiology. Hand phones are used widely for entertainment, social media, reading books, shopping, online business, gaming, study purpose, photography, videography, and watching movies. In earlier days' people use the telephone to communicate with people. Mobile phone addiction stimulates the urge in people to use it extensively for a longer period of time. It leads to many external and also internal problems like eye irritation, laziness, insomnia, tiredness, wrist pain, neck pain, etc. The frequency of mobile phone use, the degree of neck flexion while using the phone and the body position are the factors associated with neck and shoulder pain and its severity. Extensive use of mobile phones creates additional stress on the body. Especially, oxidative stress leads to changes in the level of oxidative biomarkers. This particular review concentrates on the extensive usage of mobile phones and their associated complications.

KEYWORDS: Mobile phones, Health effects, and Oxidative stress

INTRODUCTION

Mobile phones are powerful communication devices, first demonstrated by Motorola in 1973, and made commercially available in 1984. Now those Portable devices became an integral part of our lives. The mobile phone has become the most dominant portal for information and communication technology. A mental impairment resulting has come to the attention of sociologists, psychologists, and scholars of education on mobile addiction. Over time usage of Mobile phones may increase anger, tension, depression, irritability, and restlessness which may alter physiological behavior and reduce work efficacy (Parasuraman, S *et. al.*, 2017).

The smartphone has been used more widely over the past 1 decade. There are emerging reports of problematic behavior patterns concerning smartphones. Smartphone addiction describes a decreased interest in face-to-face relationships. Measuring the duration of use is an inexact proxy for addiction, as some people may experience the features of addiction with a lower duration of use while others may adaptively use their phone for long periods but be able to put the phone down without distress and attend to appropriate activities such as communicating with family members or going to bed on time. Smartphone overuse has been associated with daytime tiredness and reduced sleep duration. In particular, smartphone use close to sleep initiation has been shown to delay circadian rhythm and found associated with total sleep time, whereas longer- usage was associated with poor sleep. Furthermore, poor sleep outcomes may mediate the relationships between smartphone addiction and behavior (Rafique, N *et. al.*, 2020).

SMARTPHONE USAGE

Mobile phone technology has brought the world closer. It provided convenience in communication among people by way of calling or texting. Mobile phones are coming up with a variety of features like internet access, sending e-mails, games, access to social networking sites like Facebook, listening to music, playing radio, reading books, dictionaries, and so on. Mobile phones are also used to overcome the feeling of loneliness. The contacts are established instantly with the help of mobile phones which was not possible earlier. However, though the mobile phone provided many advantages, it has also caused some problems. Some people are using mobile phones so extensively that it assumes the form of addiction.

The use of mobile phones has reduced face-to-face communication. It is observed that people send text messages while talking to others. The students are using mobile phones for playing games, sending messages, and calling even when the class is in progress. Earlier studies have shown that various personality traits like neuroticism, extraversion, and psychoticism have some relation with mobile phone usage (Auvinen, A *et al.*, 2019).

POSTURE OF MOBILE USAGE

Smartphone users tend to report pain in the neck, shoulder, and thumb, and the severity of the symptoms increases as the total time spent using the smartphone (Kang *et al.*, 2012). Prolonged smartphone usage causes faulty posture such as forward neck posture or rounded shoulders. Sustained forward neck posture can cause injury to the structure of the cervical and lumbar spine, as well as ligaments. These structural problems caused by posture can also lead to respiratory dysfunction. People tend to have comfortable tilted head and neck position for a long period of the time unknowingly which in turn cause serious effects. This is because of too much addiction to mobile phones. In other cases, people who work in a software company or any other related field have to sit in front of a laptop for about 8 hours for work. This will also cause serious effects on the neck and spine position.

Kim, 2015 studied the association between smartphone usage and neck pain, where he reported that smartphone users had neck pain due to the increased cervical angle. Gak *et al.*, 2013 reported that prolonged sitting and using a smartphone cause a rounded shoulder

which is associated with FHP (Forward Head Position). FHP is caused when a person leans their head forward which is out of neutral alignment with their spine.

Perri and Halford 2004 investigated the possible correlation between dysfunctional breathing and musculoskeletal pain patterns. Their result showed that 83% of patients with neck pain (caused by faulty posture) experienced a changed breathing pattern. This study indicated that there was a relationship between neck pain and respiration.

THE CONSEQUENCES OF SAMRT PHONE USAGE

Samoekan Sophohnhiran rank 2021 said faculty members should address the use of electronic devices in the classroom in their syllabi. No present theory addresses this but offers an important avenue for the appropriateness of electronic devices in the classroom. According to his theory, students in the library use email, instant messaging, and web surfing rather than checking the library's online resources. It was found that students focus more on updating their Facebook statuses than downloading their homework assignments.

EFFECT ON SLEEP

Sleep plays an important role in our body. It regulates the physical functions, cellular toxin removal, disease prevention, and restoration of both the mind and body (Curcio *et al.*, 2015). Proper sleep is important for all age people. Owens (2014) states that lack of sleep in adolescents is becoming an important health issue worldwide. Bedtime use of media devices was positively associated with poor sleep quality and excessive daytime sleepiness. In most houses, lights will be switched off after 10 pm. Mobile phones while used at bedtime with no lights may lead to poor quality sleep by various mechanisms (Mireku *et al.*, 2019). Chang *et al.*, (2015) state that this blue light from the mobile screen can cause a decrease in the production of melatonin. Melatonin is a hormone that controls the sleep/wake cycle or circadian rhythm. So, a reduction in melatonin causes difficulties to fall and stay asleep.

Rafique *et al.*, 2020 reported that using mobile phones after lights off for at least 30 minutes can lead to poor sleep quality, daytime sleepiness, sleep disturbances, and increased sleep latency. Sometimes placing mobile phones near the head will stimulate some urge to check mobile phones frequently, reply to messages will also affect sleep.

ADDICTION BEHAVIOUR AND MENTAL ILLNESS

Rapid development in technology has created so many gadgets that smartphones play a major role. From younger people to old people are now of mobile phones. According to the quote, too much of anything is good for nothing; people now have started to use the mobile phone most of the time. It has now become a part of a body. Mobile addiction makes people too dependent on it. Notably, younger people now tend to use mobile phones for the whole day. Youngsters now use mobile phones widely at the time sleep which will lead to mental disturbances, anxiety, and depression.

Schoeni *et al.*, (2015) report that mobile phone usage during night hours was common among youngsters and reported that poor perceived health was shown due to staying up all

night. But, a recordable association was not found between memory performance and mobile phones.

Boumosleh and Jaalouk (2017) investigated whether anxiety and depression independently contributed to smartphone addiction. Their sample was 668 random Lebanese undergraduate students. Their cross-sectional study proposed that depression and anxiety were also positive predictors of smartphone addiction. They also revealed that depression scores were a more powerful predictor as compared to anxiety.

PSYCHOLOGICAL STRESS

Excessive use of smartphones makes negative attitudes and feelings of anxiety and dependency on may increase the risk of anxiety and depression (Cha and Seo, 2018; Rosen *et al.*, 2013).

Mobile phone addiction and withdrawal from the mobile network may increase anger, tension, depression, irritability, and restlessness which may alter physiological behavior and reduce work efficacy. Problematic smartphone usage has been consistently associated with measures of poor mental health including depression, anxiety, stress, and poor sleep quality. There are some signs of smartphone addiction are constantly checking the phone for no reason, feeling anxious or restless without the phone, waking up in the middle of the night to check the mobile and communication updates, and delays in professional/Institution performance as a result of prolonged phone activities, and distracted with smartphone applications (Parasuraman S. *et al.*, 2017).

Excessive use of mobile phones is paired with the negative effect on the human. It creates dependence on the gadget may increase the level of anxiety and depression (Rosen *et al.*, 2013). Jones 2014 conducted an online survey and found that students are addicted more to the mobile phone which may cause serious negative psychological effects. Boumosleh and Jaalouk 2017 investigated whether anxiety and depression independently led to smartphone addiction in 668 random Lebanese undergraduate students. Depression and anxiety were also found to be positive predictors of smartphone addiction in their cross-sectional investigation.

OXIDATIVE STRESS

Antioxidants (free radical scavengers) are substances that can prevent or slow damage to cells caused by free radicals, unstable molecules that the body produces as a reaction to environmental and other pressures. Free radicals are waste substances produced as the body processes food and reacts to the environment. If the body cannot process and remove free radicals efficiently that leads to oxidative stress. This can harm cells and body function (Harrison *et al.*, 2003; (Di Meo *et al.*, 2016).

Radiofrequency electromagnetic waves (RF-EMW) from a mobile phone might disturb antioxidant metabolism by increasing the production of Reactive Oxygen Species or by decreasing antioxidant enzyme activity. Studies have also demonstrated that antioxidants such as melatonin, caffeic acid phenyl ester, vitamin C, and vitamin E prevent oxidative stress or apoptosis caused by RF-EMW in animal tissues. Recent studies on human semen

also suggested increased ROS production in human semen due to cell phone radiation (Oktem et al., 2005; Agarwal et al., 2008; Roberts *et al.*, 2014; Sara Thomee *et al.*, 2011).

EAR PROBLEM

As technology develops, the smartphone with internet facilities will allow us to talk with people for a longer period without any time limitations and cost limitations. Velayutham *et al.*, (2011) reported that there was unilateral hearing loss in the frequent and prolonged use of the mobile phone. The study also revealed that correlation between the duration of usage of mobile daily and the length of years using the mobile phone to the degree of hearing loss. The ear remains closest to the mobile phone and is the direct recipient of the noise, thermal energy, and EMR waves emitted by the phone (Uloziene *et al.*, 2005). But prolonged talking through mobile phones can cause adverse conditions by causing a heating effect.

MYOPIA

Excessive use of digital smart devices, including smartphones and tablets, etc could be a risk factor for myopia. The widespread of myopia is increasing worldwide, with half of the global population expected to have myopia by 2050. Along with myopia and it also causes irreversible blindness that may occur in upcoming decades. The myopia epidemic is likely to be driven by exposure to environmental risk factors present in ever more urban and developed societies, with two major risk factors of particular concern: insufficient time spent outdoors and more time engaged in so-called near-vision. (Joshua Foreman, *et al.*, 2021)

McCrann, Loughman, and Butler (2020) have surveyed students from primary school, secondary school, and University. It is reported that students are using mobile phones at an average rate of four hours a day. 73% of people believed that digital technology adversely affects the eyes. Students also reported that over screen time causes eye strain, dry eyes, headaches, difficulty in reading, and 31 percent reported myopia. The escalating prevalence of myopia is not a recent phenomenon and certainly predates smartphones, but the current generation of children is the first to grow up in an era of smartphone dependency. During the pandemic, the whole world is dependent on mobile phones to know information, for education, to communicate with people, and to play games as no one is allowed to go out and be in a gathering. At the same time, the risk was also high in over usage of mobile phones.

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