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Mobile phone: A journey from necessity to addiction

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Abstract

Mobile phones have become an indispensable part of our daily lives. The benefits and portability of mobile phones have made them increasingly popular and gradually becoming necessary among the world population. Excessive use of mobile phone could lead to breakdown of relationships, ruining your mental and physical health. All of this pertains to addiction - because technology can be beneficial or harmful, depending on how we use it. Checking or scrolling through the mobile phone for updates constantly, is a universal habit among those who carry their e-device along like an extension of their body. A numerous studies have documented that mobile phone addiction would bring about negative impacts on physical and mental health as well as social adaption such as interpersonal problems, health issues and even suicidal ideation.

Addressing the relationship between mobile phone addiction and mental and physical health, the literature search from PubMed, Web of Science and Google Scholar has been done.

This research paper aims to investigate the side effects associated with mobile phone addiction, highlighting the physical, psychological, and social implications.

By examining the current literatures, we delve into the various aspects of this phenomenon and provide insights into potential strategies to mitigate its adverse effects.

Keywords: Mobile phone addiction, mental health, and physical health

Introduction

The modern world we live in is one of incredible technical advancement. The abundance of devices and applications that have emerged at an astounding rate has driven, overwhelmed, and completely changed the political, economic, social, and psychological fabric of our daily lives, affecting every part of our lives irrespective of where we turn or what we look at. There is hardly an aspect of our lives and environment that technology has not touched and transformed and in this technological world.

This pocket-sized device is an innovative invention in that it combines the functions of conventional phone and computer in a single smaller device. It allows access not only to sophisticated communication networks, but also to a wide range of entertainment such as games, multimedia players, photo albums, and electronic books. Smart phones also provide essential tools including Global Positioning System (GPS), camera, recorders, translator, clock, radio, remote control of electrical appliances, torchlight, calculator, e-wallet, and even health trackers. Owing to the convenience and multiple functions of smart phones, users tend to become over attached and preoccupied with their devices.

It is considered as double-edged sword for young adults. On the one hand, using a mobile phone helps young people connect with others more frequently, build stronger bonds with them, and make connections with new people. On the other hand, improper use of mobile phone influences young people negatively, specifically, improper mobile phone use can reduce individual's concentration and the amount of information received during a typical class, block face to face communication, and even lead to physical or mental stress. It is estimated that prevalence of mobile phone addicts ranges from 0% to 38% of mobile phone users across cultures and societies, suggesting at least 62% of mobile phone users are with possible addiction. A number of research and study to understand the effects of Mobile phone addiction (MPA) on young adults has been done.

(A report showed that the population of smartphone users was 3.2billion worldwide in 2019 and was grown to millions in 2021.

Austin suggested that technology could be the cause of perceptual disruption. By separating the youngsters from their families and weakening family relationships and interactivities,

mobile phone has been effective in forming the new identity of young generation ^[1]. In comparison to face-to-face communication the reduction of security and superficiality of social relationships are considered as consequences of mobile phone use ^[2].

Mobile phone Addiction

Mobile phones have several benefits including easy access to internet as they are easy to carry around. But Constant dependency on one's mobile phone, to cater to psychological needs and extraneous necessities, causing a constant attachment to one's gadget, leading to loss of productivity and developing the side effects such as loneliness, depression, lack of social behavior, loss of sound sleep and various physical and mental health issues. MPA, the terms such as mobile phone addiction ^[3, 4], "Mobile phone addiction" ^[5, 6] "mobile phone dependence" ^[6, 7] and "mobile phone overuse" ^[8] have all been used to describe more or less the same phenomenon, that is, individuals engrossed in their Mobile phone use to the extent that they neglect other areas of life.

A literature review done by Sedyono, *et al.* (2017), showed that maintaining social media relationships, positive attitudes towards mobile phones and continuously using mobile phones to perform daily activities lead to mobile phone addiction ^[9].

Mobile phones are hailed as one of the greatest inventions of the 20th century. But with technological advancement, human dependency increased and led to an irreplaceable position of a phone in our daily life.

Some psychiatrists proclaim that in the 21st century mobile phone addiction is no different from any other type of addiction (e.g., drug, the Internet) and that mobile phone addiction has become one of the most prevalent non-drug addictions and is widely seen among people of different age groups ^[9]. According to a report by New York Times (2017) ^[10], both adults and teens check their mobile phones 150 times a day, that is every 6 minutes and send an average of 110 texts per day.

A recent Huffington post article reported the following statistics ^[11]:

- 92 percent of adolescents go online daily, and 24 percent say they are online "almost constantly."
- 76 percent of adolescents use social media (81 percent of older teens, 68 percent of teens ages 13 and 14).
- 71 percent of adolescents use Facebook, 52 percent use Instagram, 41 percent use Snap chat, 33 percent use Twitter.
- 77 percent of parents say their children get distracted by their e-devices and don't pay attention when they're together.
- 59 percent of parents say they feel their teen is addicted to their mobile device.
- 50 percent of adolescents say they feel addicted to their mobile phone.

These statistics show the urgent need to understand and address MPA related issues before it reaches a stage of Digital Detox.

Symptoms of Mobile Phone Addiction (MPA)

Excessive use of mobile phone leads to behavioral disorders. This reflects in the everyday behavioral pattern of the patients. In one of the earliest relevant studies has done

by Bianchi and Phillips (2005) ^[12] argued that the problem of mobile phone use may be a symptom of an impulse control deficit or depression. Smartphone addiction, even while the device it is off, may cause anxiety, sleep disorders, confusion, abnormal insomnia and digestive problems ^[13].

A symptom of smartphones addiction is the fear of being without a smartphone, using applications (apps) on smart phone uncontrollably and spending more time interacting with smartphones than interacting with real people ^[14].

A study done by James and Drennan (2005) on Australian university students' mobile phone use and discovered a large use rate of 1.5-5 hours a day. Their results showed a range of characteristics associated with addictive use ^[15]. These were: impulsiveness, mounting tension prior to using the device, failure of control strategies and withdrawal symptoms.

Ross (2011) found that three characteristics of mobile phone addiction, the first is that people who are addicted to mobile phone always keep their mobile phones on. The second is that they tend to use their mobile phones even when they have a land-line phone at home. Finally, they normally are confronted with financial and social difficulties due to their excessive mobile phone use ^[16]. Apart from the amount of communication or time spent on the mobile phone, the various mobile phone addiction symptoms are summarized from various journal papers pertaining to the aforesaid issue ^[17].

Delay in arrival to committed tasks, due to prolonged usage of phone in unnecessary situations.

- Prefer social and personal connect using a phone as a medium thus eliminating real world contact.
- Lack of sound sleep due to prolonged phone usage.
- Seeking to a mobile phone as a source of comfort during times of emotional distress and loneliness.
- Ignoring face to face conversations and looking into digital displays when conversing to Someone Constant urge to use mobile phone when driving, riding, crossing road etc.
- Respond to texts, calls even if the environment is unfavorable to receive/text a reply.
- Dedicating large amounts of time to activities related to using the phone (phone calls, text messages, games, consultations, use of the camera for photos and videos, etcetera) carried out exclusively or in combination with other activities;
- The victim experiences a sense of dizziness, headache, vertigo eye or ear ache or other physical symptoms that can be related to abusing the mobile phone;
- Extreme affection shown towards the mobile phone which is mainly seen through not wanting to be far away from the phone, even for small amounts of time;
- The victim tends to get anxious, panics or experiences unpleasant emotions in general when the telephone's battery is dead or if the phone does not work;
- The victim is inclined to use the mobile phone as instrument of control in sentimental and affectionate relationships;
- Tendency to use the mobile phone to keep fears and insecurities under control (fear of solitude, particular phobias, anxiety attacks);
- The victim spends more money on accessories than the phone costs.

A wide range of other negative consequences from mobile phone addiction among consumers included financial issues, damaged relationships, emotional stress and falling literacy. According to the researches, if anyone possess the following traits, they can be considered to be addicted to Mobile Phones in some way or another.

Negative Impact of Mobile phone Addiction Consequences of excessive Mobile phone use

There are multitudinous negative consequences associated with excessive Mobile phone use. Excessive Mobile phone use can lead to neurological changes where the brain of the affected individual has been found to have significantly higher levels of gamma-amino butyric acid (GABA), which results in poorer attention and control as well as being more easily distracted^[18]. The connectivity in parts of the brain that regulate emotions, inhibition, decision-making, and impulsive control may also be affected by excessive Mobile phone use^[19].

One of the most serious consequences of uncontrolled Mobile phone use is the occurrence of accidents. Unintentional injuries, such as road traffic injuries, pedestrian collisions, and falls have increased with the incidence of Mobile phone users talking, texting, or listening to music while on the road^[20]. According to an article published in Times of India on 2nd Jan 2023, Ministry of Road Transport and Highways (MoRTH) reported that, A total of 1,997 road accidents occurred in 2021 due to the use of mobile phones while driving and as many as 1,040 people lost their lives^[21].

Excessive Mobile phone use as a behavioral disorder

The context of such behavioral disorders is conceptualized based on the classic addiction symptomology that was included in Diagnostic and Statistical Manual of Mental Disorders (DSM-5) criteria for compulsive gambling and substance abuse as a guideline^[22].

In addition to date, the DSM-5 has admitted gambling disorder as the only behavioral addiction, while other addictive behaviors such as “Internet gaming”, “exercise addiction”, “sex addiction” or “shopping addiction” are classified as impulse disorders^[23].

James & Drennan and Anuj *et al.*, (2013) have mentioned in their research as behavioral addiction, approximately 70% of the youth changed their Mobile phones in less than 3 years, and 25% of them changed within a year. The average bill of \$140 monthly may lead to financial difficulties or Mobile phone debt^[24, 22].

Impact of Mobile phone addiction on mental health

Excessive mobile phone use also coincides with other mental disorders such as social anxiety, depression, impulsivity, and loneliness, as well as attention deficit problems^[25]. Soderqvist, *et al.* (2008) explored the excess use of wireless phones and health symptoms in 2000 Swedish adolescents and they showed that frequent mobile phone users reported health complaints, such as tiredness, stress, headache, anxiety, concentration difficulties and sleep disturbances^[26]. Regular users of wireless phones had health symptoms more often and reported poorer perceived health than less frequent users.

Headache: Acharya, (2013) examined the health effects of cell phones usage amongst students pursuing professional

courses in colleges. College students of both sexes in the age group 17-23 years from urban and rural backgrounds were selected at random (those using mobile phones)^[27]. The result showed that headache was to be the most common symptoms followed by irritability and anger^[34].

Lack of concentration: According to an article published in ‘Japan Times’ excessive use of electronic gadgets caused sleep deprivation in school children. It also led to poor academic performance due to loss in concentration^[28]. Other studies have also shown that mobile phones addiction has been found to disrupt sleep which in turn can impact memory, affect ability to think clearly and reduce cognitive and learning abilities^[21].

Sleep Deprivation: Short wavelength artificial blue light emitted by electronic devices delay circadian rhythm and suppresses release of sleep-inducing hormone^[29]. Research has showed that 76.4% of participant using electronic device for more than 3 hours a day found poor sleep quality^[30].

Stress: Excessive use of digital equipment also leads to repetitive stress injury [RSI], in which cytokines released and travelling in blood stream are toxic to the nerve cells. The need to obsessively check new messages and notifications can increase personal stress^[31].

Brain tumor: The international agency for research on cancer states that mobile phones have the potential to cause cancer due to electromagnetic fields produced by them. Research has shown that the frequency range 40 MHz to 6 GHz from electronic gadgets deeply perforates inside the tissue and produces changes in DNA shape and disrupts blood brain barrier. The rays from the mobile phone while talking can penetrate the ear as deep as 6 cm and by decreasing the activity of protein kinase C and melatonin hormone affect the pineal gland and hippocampus. The use of mobile phone for more than 1hour/day for 10 years increase the risk of brain tumor as microwave frequency produces change in micronuclei more of children than adults. Radiations from mobile phone have been found to instigate brain tumor in 40% cases^[32].

Depression: Depression is associated with elevated levels of cortisol known as the stress hormone. A correlation is seen between increased symptoms of depression and suicidal thoughts in adolescents using mobile phones and playing video games for more than 3 hours /day^[33]. The level of inhibitory neurotransmitter GABA [Gama-amino-butyric-acid] is decreased in stress ultimately leading to depression.

Anxiety: Anxiety was found to be more prevalent among adolescents due to device interference or distraction^[26, 40]. Mobile phones compel people to keep checking them and this leads to fear of missing out (FOMO) and “nomophobia” (no mobile phone phobia), which are situations that will cause distress or anxiety in young people^[34, 35].

Photo Sensitive Epileptic Seizures: Photo Sensitive Epileptic Seizures can be caused due to flickering light source, high intensity and brightness of light, sharp colors [red and blue], visual patterns [striped patterns] and close distance from the screens^[36, 37]. Researchers in Italy used

Transcranial Magnetic Stimulation [TMS] to examine the effect of radiations generating from mobile phones on the function of brain. They conclude that excessive and prolonged use of mobile phones can be harmful to brain activity [38].

Impact of Mobile phone addiction on physical health

Overuse of phone devices can also lead to physical health issues such as “text neck, pain in thumb” a kind of cramping, stabbing pain that comes after looking at a phone too long with a poor posture. This can affect the spine, respiratory functions, and even emotions [39].

Musculoskeletal syndrome: musculoskeletal pain that occur primarily in the fingers, neck, back, and shoulders can cause detrimental alterations to these muscular zones among adolescents with problematic smartphone use [40].

Carpel Tunnel Syndrome [CTS]: Compression of hand’s medical nerve due to continuous use of handheld electronic gadgets such as mobile phone causing numbness, tingling and pain in the palm and wrist is referred to as CTS. Studies shows that 92% of the intensive users find pain or discomfort in the hand or wrist, but only 25% of the less frequent users experience discomfort [41].

Hearing Loss: Ozturan, *et al.* (2002) concluded in his research that ear is the first organ dealing with the mobile phones, there is an elevated energy deposition in the ear as compared to other organs and its effect on hearing are debated [42]. Loss of hearing by high frequency electromagnetic waves occurs due to damage of inner ear hair cells [43].

Eye Strain: Moreover, high intensity flickering light source and brightness of light adolescents may also suffer digital eye strain including blurred vision, dry eyes, and itchy and burning eyes, which can cause eye fatigue [44].

Male Sterility: Male sterility can occur due to radio frequency radiations from mobile phones and WI-FI 2.4 GHz. Since the trousers pocket used to carry mobile phone is close to the groin area, radiations affect the motility of sperms and structure and function of testes. seminiferous cells, Leydig cells, and testosterone biogenesis are also affected. Studies found that 17% of the patients who are using mobile phones showed abnormal sperm motility [45, 46]. In addition, Agrawal, *et al.* (2008) reported that the mobile phones harmful radiations were able to degrade the quality of sperm with regard to quantity, viability, motility, morphology and few mutations in DNA causing severe changes in sperms [47].

Suggestions to Prevent and Overcome Mobile Phone Addictions: Self-control or Self-regulation is an essential decisive to overcome from any bad things.

Self-control refers to the ability to regulate personal desires or actions and to adapt to the environment in a way that enhances the attainment of personal goals [26]. People may be less likely to develop problematic phone device use, if they are more capable in regulating their thoughts, emotions, and impulses. In other words, they have the willpower to combat the temporary satisfaction that arises from compulsive mobile phone use [48].

In psychological interventions which have surfaced from research on combating mobile phones addiction include the use of self-control [49, 50].

Yoga not only helps blood flow and muscle relaxation. Research suggests an increase in GABA (Gamma aminobutyric acid) level in the brain by more than 25% after just one yoga session of 60-minute. GABA is a brain neurotransmitter and the lower levels indicate a higher risk for anxiety, stress, tinnitus, and depression [51]. Excessive mobile phone users feel always agitated, tensed, moody and irritated than yoga practitioner few researchers mentioned that those people who involve yoga in their lifestyle they feel healthier, happier and more sociable.

In addition, recommended exercise rehabilitation as an evidence- based intervention to address the physical and psychological issues in excessive mobile phone use. This rehabilitation helps individuals to recover from musculoskeletal conditions like carpal tunnel syndrome, stick neck, backache, poor posture, chronic pain or fatigue, and neurological or metabolic conditions [52]. Exercise rehabilitation was also proven to enhance mental resilience by feeling of confidence and happiness, which aids in recovery of anxiety and depression.

There are also various practical management strategies available [24, 61] to limit mobile phone usage such as Turning the cell phone off, or at least putting it away out of sight, when engaged in a face-to-face conversation with another person.

Setting aside specific times of the day or evening when one will use their cell phone for different purposes, rather than doing so all through the day even when one is supposed to be engaged in more important things.

- Delete unnecessary applications and the ones that tend to be addictive.
- Stop replacing phones as means of entertainment purpose.
- Explore new avenues in life; seek physical presence of friends and family.
- Turn it off whenever one goes to sleep or to not keep the mobile phone in or around the sleeping area.
- Develop productive habits to combat loneliness. Seek advice, guidance and help in difficult situations.
- By organizing counselling programs in schools, colleges and universities to observe the mobile phone addiction.
- Always prefer tasks that do not require the use of a mobile phone in any form as such, even if it may be difficult task.
- Make a rule on personal technology use could include creating phone-free zones at home, like the bedroom and dining areas. And also, phone-free times as during social visits, meal times and engaging in conversation with family and friends. In public engagements, too, rules need to be respected as when attending a concert or lecture, in restaurants and in libraries.

Conclusion

In this review article has highlighted the negative effect of mobile phone addiction on mental and physical health, while also discussing its symptoms and give them potential interventions to combat this issue. By raising awareness and implementing effective strategies participants identify the

root cause of mobile phone overuse and objectify the behavior and its consequence.

In combination with mindfulness practice, the participants were able to develop self-control and dissociate the affection connected to the mobile phone.

Human beings blessed with good intellect and common sense need to acquire right knowledge and choose wisely from the many options before them - including the how, when and why of using new technology without any worthless temptations.

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