

Perils of Screen Addiction

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Abstract – We are living amidst a tsunami of information and screen addiction is a modern-day predicament. There's no denying that smart-phones have become integral and even vital to our daily lives. Pandemic during last two years forced both youth and children to spend more time in front of screens. Many became addicted to technology. Unfortunately, this addiction to smartphone and laptop screens can be quite difficult to treat as compared to addiction to drugs. Enveloped in such a situation, one tends to lose will power. Such an addiction affects the very way our brains work leading to chemical imbalance resulting in tiredness, anxiety and depression. In case of children, it affects their focus and ability to learn.

Over-dependence on technology is altering how we experience life. We're facing hitherto unknown issues and difficulties. Such as new emotional triggers. We experience relating to others in new ways. Assumptions behind use of technology are that it will make our lives more comfortable; But for that to happen, we cannot be passive users. Instead we must usher mindfulness to our relationships with devices. Today, prevalent of depression is rising alarmingly. Excess screen time does represent absence of sunshine. In view of unpredictable consequences of new technologies, digital education is necessary for all stakeholders -- teachers, children and parents.

Most people don't have the option to step away from screens, as they depend on it to do jobs and communicate with others. Screen time is a useful way to maintain social connections when we can't be face-to-face with our friends and loved ones. But, one needs to use digital technology in a way that instead of detracting us, it promotes our well-being.

Keywords: Nomophobia, Phone addiction, Screen-dependency disorder, Gaming disorder, Dopamine, Immersive technologies, Digital education

I. INTRODUCTION

SMART-PHONES have become omnipresent. They serve the functions of newspapers, books, magazines, MP3 television, camera, computers and so on. While it is a productivity enhancing tool, its extended compulsive use may interfere with other daily activity, particularly relationships. Likewise, for use of tablets and laptops. Newspapers recently reported that Indians spend 5 hours daily on smart-phones. In countries like US and UK, figure is much higher -- so much so that children loath to go outside to play. In the East, Chinese Health Organization identified 'Internet Addiction Disorder' as

country's leading medical problem [1], afflicting over 2 crore youth. More than 400 technology de-addiction centres operate in South Korea. Asking them to stay away from text messages, e-mails, facebook and Twitter updates for 24 hours resulted in withdrawal symptoms.

Modern technology's dilemma is it has left with a sense of too much and, at the same time, not enough. While our overall leisure time is increasing, we are spending more of it using screen-based devices. By pervasive usage of technological devices, we are subtly being reprogrammed to feel anxious in absence of stimulation provided by them. Less emotional connection to us and others is the direct result of spending excess time in a virtual world. Instead of being proactive, technology becoming the master, we tend to become reactive.

Millennials get addicted to smart-phones that affects analytical skills. Big technology companies use algorithms to keep them engaged as long as possible. One often sees kids staring at glowing screens in playgrounds, restaurants and in friends' houses. World Health Organization [2] took note of this alarming trend and recommended steps for parents and teachers to limit screen time for children, whose ability to discriminate between good and bad is not fully developed [3].



Figure 1. Virtual, online friends become more important than real-life relationships due to constant use of social networking, dating apps, texting, and messaging.

We seem to develop habit of constantly checking devices. Often, people following strong spiritual practices find themselves powerless -- getting caught in subtle trap of these technological tools. Thus, what motivates us, the way we spend

our time, and what we desire are on unpredictable course of transformation [4]. No doubt, technology overuse could lead to a decreased capacity to focus on one thing at a time besides inability to resist distractions. It makes it difficult to return to a calm state-of-mind.

Screen addiction is similar to addiction to drugs, gambling and alcoholism. It doesn't injure health like alcohol, nevertheless its 'toxicity' affects sub-consciousness and relationship with the world.

WHO is including "gaming disorder", the inability to stop gaming, into the International Classification of Diseases. It is recognition of the serious but growing problem of digital addiction. Companies like Google recognize the issue and recently announced that it will begin focus on "Digital Well-being". Such unpredictable consequences of new technologies make digital education imperative for Teachers, parents and children.

Phone addiction is real: It is similar to gambling addiction and earnestly needs our attention.. Today experts all over the world talk about nomophobia. It is the irrational -- yet real fear of being without smart-phone, or unable to use it when one wants. In case, one is addicted to phone it's not just about wastefully spend time but a risk of different physical problems such as:

- Eye strain/ pain and discomfort in the eyes
- Neck problems.
- Illnesses caused by germs on the phone.
- Distraction from normal routine.

While COVID-19 compelled one to communicate online, research shows a correlation between depression and excessive screen time. Pandemic invented the term Zoom fatigue, which refers to feeling tired, stressed, or burnt out after a video chat. Such an addiction affects the very way our brains work, leading to chemical imbalance resulting in tiredness, anxiety and depression. In case of children, it affects their focus and ability to learn. It's imperative for parents to fight with kids' cell phone addiction



Figure 2. Usage of smartphones by youngsters.

II. UNDERSTANDING THE CAUSE

Frontal cortex in adults is fully developed, hence as compared to kids, they are better equipped neuro-physiologically to handle screen exposure. Nevertheless, they can certainly become addicted to screens. Physical symptoms are the same for adults as they are for kids:

- negatively impacting job, health and relationships;
- Being unable to control how long one is on a screen;
- Getting irritable when one is without the device;
- Being sleep-deprived because of phone usage.

Causative factors identify dopamine -- a neurotransmitter discovered in 1957 that helps to control brain's reward and pleasure centers [5]. It carries crucial messages from neurons to other cells in the body. For example, it is due to dopamine that we know to go for a glass of water when we feel thirsty.

In the 1980's, neuroscientist at Cambridge University, Wolfram Schultz, demonstrated that dopamine levels impact ambition, desire, addiction and sex drive [6]. Further, he showed that, inside the midbrain, dopamine relates to the reward we receive for an action. This dopamine process anticipates a reward to an action, and if the reward is met, it boosts the behaviour to transform to a habit. Technology dependency affects certain specific points of our brain. The released dopamine leads us to repeat our actions.



Figure 3. Based on physiological role of dopamine, technology-giants like Apple and Google spent years commercializing one's attention and advancing addictive design.

Dopamine levels rise when we're just about to find reward and diminish after we receive it. Resultantly, to get us to do anything, evolution uses this chemical process to induce anticipation, motivation, and pain alleviation. Based on this phenomenon, Technology-giants like Apple and Google spent decades commercializing our attention and advancing addictive design.

When one is favoured by luck, dopamine gets released. For example, look at the randomness of the Facebook feed. All social media apps today use "digital confetti" to give you what you want at random intervals.

Power of dopamine system is experienced by drug addicts and smokers. Habit-forming drugs affect the dopamine system by dispersing it more and more than usual. Overusage is end result of wanting more and more pleasure to feel normal.

According to Prof. Schultz, such unnatural rewards are not filtered in the brain but go directly into the brain and overstimulate, which causes addiction. Result is we lose our willpower. Evolution didn't prepare human brains for such an eventuality.

III. LURE OF VR, AR AND METAVERSE

We are amidst a major revolution from mobile to immersive computing. Numerous fields use Virtual reality (VR) and augmented reality (AR) for professional applications: training for aircraft pilots, or in the military sphere besides health and therapeutic care, Interestingly, such technologies are used by real estate developers to offer visits to flats without leaving home. Visits to faraway museums become possible.

Equipment that can be used include headsets, glasses and smart-phones integrated into units which are placed in front of eyes. Items like suits are being developed to enable users to better interact with the virtual environment.

Exposure to virtual reality could disrupt one's sensory system, causing symptoms like dizziness, nausea, sweating, loss of balance, etc., known as, 'virtual reality sickness'. In some individuals, such symptoms appear within the first few minutes of use.

Virtual reality game users have reported a host of troubling effects, like disorientation, damage to vision, and even seizures. Additionally, using VR could be a real risk of injury. Players have reportedly suffered from broken bones and torn ligaments. Using VR for extended period of time could cause eye strain: It is advisable to take regular breaks. Results of exposure to VR have been extensively researched and indicate increase in dissociative experience such as depersonalization and

de-realization. A lessened sense of presence in objective reality is experienced. Big Tech companies try to get users more involved and engaged in their VR apps with new tactics and feedback loops.

AR/VR devices use LED screens. They normally have a high blue light content, disrupting biological rhythms when viewed at night or evenings. Such LED screens expose one to the temporal modulation of the light emitted by— flashing light that may sometimes be imperceptible to eyes. In extreme cases, they trigger epileptic seizures in susceptible people.

Commercial benefits of technology called metaverse are manifold. For instance, it could redefine virtual interviews and the dynamics of a company. Metaverse would greatly aid medical research and treatment. Apart from transcending geographical limitations, VR has proven to be an effective tool to deal with PTSD and various phobias. The metaverse could provide an effective platform to treat such mental disorders and give millions of people access to realistic virtual therapy. The term metaverse was coined by author, Neal Stephenson in his 1992 science fiction novel Snow Crash. With 5G ready to roll out, one will get opportunity to experience metaverse seamlessly. As compared to the two-dimensional internet *i.e.* text and images on flat screens, metaverse is a virtual reality world characterized by a three-dimensional, multi-sensory experience.

Education is another sector that would immensely benefit from metaverse. Imagine being able to take a virtual tour of the International Space Station, or explore planets from the confines of your home.

Such immersive technologies feature enhanced data tracking. It can track eye-movements, facial expressions, hand movements or haptic data, relating to the sense of touch. Personal data at risk will become more intimate, causing worries about user privacy a far more serious concern.



Figure 4. Deleterious biological effects of excessive screen time.

Ultimately, as the metaverse develops, the virtual environments will eventually get hyper-realistic. In this scenario, danger is: the real world would cease to provide the same level of mental stimulation compared to the virtual one.

IV. THE WAY FORWARD

Most people don't have the option to step away from screens entirely, as they depend on it to do jobs and effectively communicate with others. The rapid shift to remote work blurred the line between work and leisure. Nevertheless, experts aver that there are ways to use technology in healthier ways restoring balance in life.

It's suggested that first hour of the day be spent away from all devices, engaging in activities like walking in a garden, jogging or performing asanas, pranayams and so on. Similarly last hour of the day be reserved for reading a book or doing meditation etc. During the day, one can have breaks in between, say after every 90 minutes of continuous use of laptop, one gets up and moves around a few steps. Similarly, one can spend a few minutes -- counselors recommend 10 minutes of meditation every now and then to calm our minds and body.

During Meals, keep devices away -- maintaining a smiling atmosphere, talking with family members or colleagues. Screens be disallowed in the bedroom which will spare quality time to be spent with the loved ones [7].

Children be monitored and suitably counseled by taking them into confidence about pros and cons of staring at screens for long. Video Gaming, often depicting aggressive violence and revenge, over-stimulates our brains and is best avoided. Accompany children to a garden or for a stroll. Once the kids are taken outside they experience a great time and come back mentally content and refreshed, but an afternoon on devices could lead to petty arguments and grumpiness.

There is great concern over how multitasking affects our ability to concentrate; avoid distraction. Multitasking could decrease productivity as time is needed to reorient after a transition to a different activity. One could become cognitively fatigued slowing rate of work. Moreover, it makes it more difficult to create memories in the brain that are accurately retrieved later. One should take adequate rest for minimum one hour after using AR/VR devices. The body makes a certain amount of effort adapting to the virtual world it interacts with, leading to fatigue. It is therefore recommended to allow an hour or two of rest before resuming an activity that requires a high level of concentration, such as driving a car [8].

V. PROFESSIONAL HELP

Modern technology leaves us with a sense of too much and, at the same time, not enough. Engrossed in the usage of

technological devices, we get reprogrammed to feel anxious when we're without over-stimulation. Higher time we spend in a virtual world, the less emotionally connected we feel to us and others. It's quite subtle and pervasive.

Some parents experience challenges in handling their children's usage of digital media. Child may get angry if you limit their screen time, or you may simply feel helpless about how to manage the situation effectively. If screen usage is becoming a regular and troublesome issue with high levels of distress, it is helpful to talk to a professional. One must not be afraid -- seeking help in difficult situations is normal and healthy thing to do [9]. To alleviate mental abnormalities, it is recommended to ask for professional help from a counselor. Additionally for severe cases, specific programs, called Digital Detoxification are conducted.

VI. CONCLUSION

Devices or gadgets are not bad per se. They are useful and essential tools for communication, research, learning, entertainment, among other things. Screen time is indeed a useful way to maintain social connections when we can't be face-to-face with our friends and loved ones. But, one needs to use digital technology in a way that instead of detracting us, it promotes our well-being. Adopting judicious strategy of being moderate is the way out.

Our bodies release specific neuro-chemicals in the limbic portion of the brain when two people feel safe and cared about in the presence of each other. There's no digital substitute for this experience of limbic resonance that keeps us feeling regulated emotionally and physically.

We are living amidst a tsunami of information where, adults are able to select the best from flood of unnecessary information, children need care as they aren't able to eliminate irrelevant stuff. Social media can have a negative impact on self-esteem, especially in kids and teens, as it allows us to hide behind screens and present the lives we want others to think we have. We often see pictures of vacations, fun activities, and photo-shopped bodies, which can lead to unwelcome comparisons and feelings of inadequacy.

Children with unfettered access to the internet can fall victim to dangerous scammers, bullies, and people with bad intentions. Technology has improved our world in countless ways. However, moderation and maturity are needed to get the most out of what it has to offer. Stay alert and establish realistic rules to keep your teen from falling victim to screen-induced anxiety. Thus in view of unpredictable consequences of ever advancing technologies, digital education is necessary for teachers, children and parents. Simple steps like switching between different activities is good both for brain and body. This

approach makes life more versatile. And one will be not that much addicted to one device as likes and feelings will be shared between many different things.

For kids with developing brains, the dangers of technology addiction and over-reliance are real. It's entirely legitimate for parents to set limits on safe Internet use for their children, both for their physical and mental health. Make sure your children take frequent breaks from their screens, and join them for regular off-line activities.

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