



Socia media, increased screen time and its deleterious effect on physical health

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Abstract

Social media has immensely changed every aspect of human life, whether social, physical economic, political, and so on. This paper, based on secondary data, is an attempt to discuss the prevalence of social media in human life, increased screen time, and its tremendous effect on physical health. Review of studies carried out in this area suggests a direct association between social media and health; this may lead to numerous health problems if not controlled.

Keywords: social media, physical health, myopia, digital eye syndrome

Introduction

Half of the world now uses social media platforms. 4.57 billion people all over the world are now on the internet. Setting a new record within the last 12 months 346 million new users have come online. (Digital Global Snapshot report, 2020) Social media users have grown by more than 10 percent over the past years. Amid lockdown only there is 87% increase in social media usage. (Global Web Index, 2020) 21% of 8-11-year-olds have a social media profile, swiftly increasing to 71% of 12-15-year-olds. Overall 40 percent of online users aged 18 to 22 years reported feeling addicted to social media. (Of Com UK report, 2020) Above mentioned data witnesses how much the world is indulged in this virtual social media platform. It has immensely impacted physical health, giving birth to numerous health issues like neck pain, tension, the strain on eyes, fatigue, sleep disturbance, neglect of personal hygiene. The habit of smoking, alcohol, and tobacco, consumption of junk food, having ringxiety and selfitis were found some other consequences. (Masthi *et al.*, 2018, & Hou Y *et al.*, 2019) ^[27, 19] Problems like Myopia, Digital Vision Syndrome, sleep disturbance, increases in sedentary time causing obesity are the most significant risk factors found in numerous studies leaving no age untouched. The negative impact of social media on physical health emerged as a crucial challenge to researchers, policymakers, and the government.

Social media

Social media, the most spoken word in the present scenario, is a form of electronic communication (such as websites for social networking and microblogging) through which users create online communities to share ideas, information, personal messages, and other content (such as videos). It is a virtual platform to create profiles, make explicit and traverse relationships". M D Byod & Ellison NB, 2007 ^[26] also define social media as "virtual communities where users are free to create individual, public profiles, interact with real-life friends

and meet other people all over the world based on shared interests. (Griffiths M, 2009) ^[15] Instagram, Telegram, Facebook, Twitter, Skype, and What's App are among the most popular and commonly used virtual social networking sites. In past few years there is tremendous increment in screen time due to these platforms which has immensely impacted physical health in a negative way. Let us know first what is physical health?

Physical health

We can define physical health as the proper functioning of all the external and internal parts and organs of the person's body, which allows the person to perform daily tasks normally with no limitation (World Health Organization, WHO 1948). It consists of the ability to perform physical activities and carry out social roles that are not hindered by physical limitations and experiences of bodily pain and biological health indicators. While physical health consists of many components, here is a brief list of the key areas that may be addressed:

- Physical activity- include strength, flexibility, and endurance
- Nutrition and diet- include nutrient intake, fluid intake, and healthy digestion
- Alcohol and drugs- includes the abstinence from or reduce consumption
- Medical and drugs- includes addressing minor ailments or injuries
- Rest and Sleep- includes periods of rest and relaxation, along with high- quality sleep

Physical Health Problems Associated with High Social Media Use

Vision related problem

World Health Organization 2019 report on vision disclosed that globally 2.2 billion people have a vision impairment. (World report on Vision, 2019) A survey conducted by Jarma Wellness,

a leading organization working in the areas of Preventive Healthcare and Education Services across India to develop a Healthier student population and inculcate positive Health behaviour and attitudes covering over 40+ schools from kindergarten to 12th standard schools and 300 pre-primary centres belonging to different socio-economic backgrounds spread across 20 plus cities in India for over 1,76,240 children ranging from 2 to 17 years of age. The report is based on findings and observations from their School Health Screening Programme revealed that One in every two children in India may need glasses. Approximately 25.5 percent of school children between 2 to 17 years of age have been found to have an abnormal vision, One in every three children wear glasses but still face vision difficulties. (Jarma Wellness report, 2020) [38] The major eye problems caused by excess digital media uses are:

Myopia

The inability to see things clearly unless they are relatively close to your eyes, is called Myopia near-sightedness or short-sightedness. It is a refractive error, meaning that the eye is unable to bend or refract, light correctly. The eye does not focus the light that enters it properly, so images in the distance appear blurry and unclear. Myopia occurs when the eyeball is too long or the cornea is too curved. This means that light coming into the eye will stop in front of the retina, instead of on it. The retina uses light to form pictures that it then sends to the brain. When the light is unable to focus properly on the retina, the image it creates will appear blurry. (Morgan *et al.*, 2012) [32] By 2050, it is estimated that 5 billion people worldwide will be myopic concluded a systematic review and meta-analysis of the prevalence of myopia and high myopia and estimated temporal trends from 2000 to 2050 using data published since 1995. Data from 145 studies covering 2.1 million participants were included, It estimated 22.9% of the world population (1406 million people) and 163 million people with high myopia (2.7% of the world population). The study predicts by 2050 there will be 4758 million people with myopia (49.8% of the world population) and 938 million people with high myopia (9.8%) of the world population. (Brien A. *et al.*, 2016) [7]. Increased use of social media platforms is the major contributor to myopia. The association between digital device uses and myopia has been examined by several studies. A systematic search was conducted to determine the association between smartphone overuse and visual impairment, including myopia in children and young adults. A random-effects model for meta-analysis of the 10 cross-sectional studies (26,962 subjects) and a fixed-effects model for meta-analysis of the 4 controlled trials (148 subjects) was used. The cross-sectional studies, suggested that smartphone overuse is not significantly associated with myopia. For the 4 controlled trials, the smartphone overuse groups showed worse visual function scores compared with the reduced-use groups, moreover, longer smartphone use may increase the likelihood of ocular symptoms, including myopia, and ocular surface disease, especially in children. (Wang J *et al.*, 2020) [40]. Again a systematic review which was conducted to investigate the prevalent or incident myopia, and the risk of myopia progression in children using digital devices showed mixed evidence. Fifteen studies were included (nine cross-sectional and six cohort studies) with a total of 49 789 children aged between 3 and 19 years old. Seven studies found an association between screen time and myopia. There were several

reasons for the lack of association in the remaining studies. First, these studies used self-reported measurements of screen time. This is subject to recall bias and more objective measures of time spent on digital devices are needed. Second, the number of studies included in the meta-analysis was small. This may have affected the validity of the pooled estimates. (Lanca C *et al.*, 2020) [25] Social media platforms like you Tube, online gaming, Netflix are the reasons for excess digital use in children whereas Instagram, Facebook, Twitter was found most popular in adults in several studies, further causing myopia. With an objective to examine young children's exposure to and use of mobile media devices a Cross-sectional study child aged 6 months to 4 years was conducted, result stated that (96.6%) children used mobile devices, 44% of the children are indulged in mobile even before the age of 1 year. Parents gave children devices when doing house chores (70%), to keep them calm (65%), and at bedtime (29%). At age 2, most children used a device daily and spent comparable screen time on mobile devices. Most 3- and 4-year-olds used devices without help, and one-third engaged in media multitasking. 2-3 hours is the average time a child spends on a digital screen especially on youtube. (Kabali *et al.*, 2015) [25] Whereas an additional increase of each 30 minutes in digital devices use increases more chances of developing myopic symptom in children. Staring at screens for prolonged periods may end up wearing glasses, and if wearing glasses already, the power may increase rapidly. The combination of more screen time and less outdoor time may harm children's vision and put them at a higher risk of developing myopia or nearsightedness. An additional 40 minutes of outdoor time per day achieved a 23% reduction in the incidence of myopia concludes an experimental study. (Enthoven *et al.*, 2020) [10].

Digital eye syndrome

“Digital Eye Syndrome also known as Computer Vision Syndrome can be an outcome of staring into a screen for a long period. CVS is defined as ‘the complex of eye and vision problems related to work which are experienced during or related to computer use. It affects around 60 million people globally. Social media use is the main reason why people spend too much time on digital devices. One who exceeds two hours of computer or any other digital device use a day is at risk of computer vision syndrome according to the American Academy of Ophthalmology (the American Optometric Association (AOA), 1995) [5], Symptoms associated with DES most commonly are:

▪ Eyestrain

Eyestrain normally refers to digital users' subjective complaints about uncomfortable, painful, and/or irritable visual experiences. It is the most widely reported symptom of CVS among the top symptoms. It results from visual disorders when visual demands exceed visual capacity found long-hour work at the computer reduced important visual functions such as accommodation and convergence and could be the cause of eyestrain among digital users. (Sheedy, 2000) [36] An online electronic survey form was prepared on the Google app to check the level of digital eye strain in students attending class online during the lockdown. Children/parents were asked to indicate the total duration of digital device use before and during COVID era. The symptoms of DES, its severity, and frequency were recorded & measured with the Computer Vision Syndrome Questionnaire. Two

hundred and sixty-one parents responded to the questionnaire. One hundred and eight children (49.8%) were attending online classes for >2 h per day. The prevalence of DES in the cohort is 50.23% (109/217). Of these 26.3% were mild, 12.9% moderate, and 11.1% of severe grade. (Mohan A *et al.*, 2021)^[31].

▪ Neck and backache

CVS or DES also appears to be non-vision-related problems such as neck and backache. The major cause of neck and back pain related to CVS/DES is an improper viewing position for long hours. Most of the young adults using social media for 2 to 4 hours a day have neck and backache, with the increase of digital time the problem increases. (Blehm *et al.*, 2005)^[5].

▪ Dry eyes

Dry eyes are among the most common eye problems that cause CVS patients to consult their eye doctors. They represent one of the typical symptoms of CVS. Dry eye syndrome refers to a breakdown in the quantity or quality of tears that are used to moisten, cleanse and protect the eyes. With each blink, tears moisten the surface of the eyes and wash away dust and microorganisms. When tears dry up, the eyes may feel “gritty” as if there were sand in them. This can further cause burning or itchy eyes, increased sensitivity to light or excessive tearing, and in extreme cases, blurred vision. An experimental study was conducted to study blink frequency changes and levels of ocular discomfort during work at a video display terminal, and the effects on these parameters of augmented or reduced humidification of the ocular surface. Blink rate was measured from recordings of the electrical signal evoked by the contraction of the orbicularis oculi muscle. Blink rate and inter blink intervals were analyzed at rest and during the performance of a task with a computer (playing a card game) for 10 or 30 min in steady environmental conditions. During the performance of the visual task for 10 or 30 min, the basal blink rate decreased significantly, to about 40% of the control value. The reduction of blink frequency consecutive to computer use was associated with a sensation of ocular discomfort. (Acosta *et al.*, 1999)^[2].

▪ Headache

Headaches often accompany other CVS symptoms, based on the clinical experience of CVS experts), vision-related headaches most often occur toward the front of the head with a few exceptions, on one side of the head more than the other, and typically occur toward the middle or end of the day. Fifty healthy adolescents aged 11–13 years with normal vision and development participated in vision examination performed by an authorised optometrist. Eyestrain, headache, and musculoskeletal symptoms were measured by using an interview questionnaire. Forty-nine (98%) of the 50 children use a smartphone and 17 (34%) use a tablet. Overall, 12% to 41% experienced symptoms of headache, neck pain, tiredness and/or tired eyes while using smartphones and tablets. Nine (18%) experienced at least one symptom often or always while using their device. Musculoskeletal pain and headache were significantly associated with vision and eyestrain. Increased screen time and shorter viewing distance were associated with eyestrain and headache. (Falkenberg *et al.*, 2020)^[11].

Sleeping pattern

There has been a decline in sleep duration among young adults in the past few decades. (Giri *et al.*, 2013)^[12] American Academy of Sleep Medicine recommends the following amounts per 24 hours for sound health. (Paruthi S, *et al.*, 2016)^[34]

- Infants 4-12 months: 12- 16 hrs
- Children 1-2 years: 11-14 hrs
- Children 3-5 years: 10-13 hrs
- Children 6-12 years: 9-12 hrs
- Teenagers 13- 18 years: 8-10 hrs

There is an association of recommended hours of sleeping with better health outcomes, including improved attention, behaviour, learning, memory, emotional regulation, quality of life, and mental and physical health. There is a reduced in sleep durations is up to some extent due an increase in screen time and social media activities. (Matricciani *et al.*, 2012, Jessica L *et al.*, 2016)^[28, 21]. Although screen-based media devices are predictors of reduced sleep duration. Up to 72% of children, have a mobile media device (smartphones and tablets) in their sleeping environment. (Michael Gradisar *et al.*, 2011)^[30]. A recent study in America demonstrated that 90% of young adults under 30 used some technological device in the hour before bed. (Gradisar *et al.*, 2013)^[14]. The use of social media in sleeping time, or even just their presence in the bedroom has detrimental sleep outcomes such as sleep latency, inadequate sleep quantity, poor sleep quality, and excessive daytime sleepiness. This is because media devices are psychologically (social media and social networking sites) and physically stimulating. In a recent review of literature, almost 90% of studies reported delayed sleep time and decreased total sleep duration among bedtime media users. (Hale, L., & Guan, S, 2015)^[16]. Blue light of approximately 460 nm spectrum, suppresses melatonin, and affects human circadian clock/rhythm and sleep physiology and thus directly displace sleep by delaying and interrupting sleeping. (West *et al.*, 2011)^[41] Source of this blue light can be blue-enriched LED lamp, LED backlight for LCD, organic light-emitting diodes, computer screens, smartphone monitor, etc. People exposed to blue light at night can have an increased incidence of obesity, diabetes, sleep, psychiatric, and cardiovascular disorders. (Oh JH *et al.*, 2015)^[33]. Guidelines recommended by the National Sleep Foundation, also suggested that 7–9 h’ sleep every night for a young adult aged 18–25 years to lead a healthy life. (Hirshkowitz, *et al.* 2015)^[17]. Nightshift mode can be a shield to blue light-emitting from digital devices, the main purpose of using night mode is to reduce the brightness emitted from smartphones to a level below the threshold at which melatonin suppression occurs, It was lacking among 246 respondents with 52% among them having poor quality sleep. (Krishnan *et al.*, 2020)^[23]. Afandi *et al.* reported that non-users of social networking sites (SNS) had better sleep quality than users. (Afandi, O., *et al.*, 2013)^[3].

Obesity

Obesity is now acknowledged as a crucial threat to public health due to its rapidly expanding prevalence. Worldwide obesity has nearly tripled since 1975. In 2016, the World Health Organization (WHO) reported that more than 1.9 billion adults, 18 years and older, were found overweight of these above 650 million were obese. Social media statics uncovers that an average of 3 hours is spent per day per person on social networking and messaging.

(World Health Report, 2016)^[43]. With the current development of digital technologies, especially mobiles and tablets, progressively prevalent social media (e.g., Facebook, Instagram, Twitter, YouTube, We Chat) have altered many aspects of our daily lives. Consequently, the structure of lifestyle has become sedentary. A current study by Huang *et al.* proved that daily average technology use has a significant effect on children's weight. (Huang, H., *et al.* 2017)^[20]. Children who use social media more are at greater risk of sleep disturbance that leads to obesity. A 40% decrease in obesity in children whose parents limit their screen-time has been reported than in children without such limitation. (Mazur, A., *et al.* 2018)^[29]. Content that users consume on social media is another important subject. Holmberg discussed the persuasive effects of junk food marketing through social media on obesity. (Holmberg & Christopher, 2017)^[18].

Expressive Language Delay in Children

Language development and vocabulary growth in children are directly associated with the amount of time parents spend speaking to children. (Kuhl, P. K, 2004)^[24]. Speech-perception learning, speech-production learning, human-human interactions had a strong influence on a child's language development. Results from several studies support the association between excessive screen time in children under 6-years-old and language delays. (Chonchaiya, W& Pruksananonda, C, 2008)^[8] Toddlers who use mobile devices daily are more likely to experience speech delays. 22% of parents reported a range of 1.4 to 300 minutes daily use of digital devices among them 6.6% of parents reported expressive speech delays (i.e., late to begin talking). With an increase of 30 minutes mobile media device use, 2.3 times chances increased for the risk of expressive speech delay, parent-reported." (Van den Heuvel, M., *et al* 2019)^[39]. Furthermore, receptive language delays are a significant risk factor for social and emotional problems in adulthood. (Schoon *et al.*, 2010)^[35].

Enough is known is now known about the negative health impact of social media it is beyond doubt that it is spreading like an epidemic, Knowingly or unknowingly we all have been trapped in its inevitable grip. World Health Organization (WHO) also provides guidelines to restrict sedentary screen time for children under 5 years old as screen time may increase sedentary behavior with a negative impact on children's health. From 1 to 4 years old, sedentary screen time should be no more than 1 h. (World Health Organization report, 2019)^[44]. Regarding the prevention of paediatric overweight and obesity American Academy of Pediatrics, identifies limiting screen time use to no more than 2 hours per day as an important strategy for preventing obesity among children and adolescents. (American Academy of Pediatrics, 2013)^[4]. Here is a need for much awareness about its drastic health consequence.

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