

Excessive use of electronic gadgets: health effects

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Mobile phones, internet, social networking sites, and texting have changed the way we see the world. There are ~6.9 billion mobile users, almost as many as people on earth. People who excessively use electronic gadgets develop musculoskeletal disorders. Repetitive strain injury is a chronic condition that develops because of repetitive, forceful, or awkward hand movements for prolonged periods leading to damage to muscles, tendons, and nerves of the neck, shoulder, forearm, and hand, which can cause pain, weakness, numbness, or impairment of motor control. Eyes, neck muscles, arm, and wrist are affected with prolonged use of electronic gadgets. People who use smartphones excessively, because of their reduced amounts of face-to-face interaction, are likely to have a feeling that their social relationships are not supportive and rewarding and that they are not actively contributing to the happiness and well-being of others. The aim of this review article is to study literature and list the problems associated with prolonged use of electronic gadgets and ways to minimize the symptoms owing to increased 'screen time'. Smartphone overuse may lead to development of repetitive stress injury or overuse syndrome thereby affecting hand function resulting in pain in the thumb. Prolonged use of electronic gadgets may affect the human body adversely. There is a critical need to promote healthy ways of smartphone use, as well as the importance of friendship and family connectedness as a way of promoting the psychological well-being. Physicians should get themselves updated of these new disorders and younger generation needs to be educated adequately about the ergonomic practices and health safety of gadget usage.

Keywords:

de Quervain', s tenosynovitis, electronic gadgets, repetitive strain injury, smartphone, WhattsAppitis

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Introduction

Mobile phones, internet, social networking sites, and texting have changed the way we see the world. Mobile phones have made the world as one. It has influenced relationships and behaviour pattern. A mobile phone that was primarily made for calling is now being increasingly used for texting, gaming, social networking, and listening to music. As per a report by Yoram Wumser, US adults will spend an average of 3 h, 35 min/day on mobile devices in 2018, an annual increase of more than 11 min. By 2019, mobile will surpass TV as the medium attracting the most minutes in the US.

There are ~6.9 billion mobile users, almost as many as people on earth. Such a wide base of mobile phone users has resulted in higher access to the Internet. They have become personal devices that indicate social identity and status and provide numerous gratifications in the form of entertainment, information finding, time management, coping strategies, and social identity maintenance [1]. Research has shown that certain people become so attached to their device that they experience separation anxiety when it is not with them [2].

The aim of this review article is to study literature and list the problems associated with prolonged use of electronic gadgets and ways to minimize the symptoms owing to increased 'screen time'.

Repetitive strain injury

People who excessively use electronic gadgets develop musculoskeletal disorders. Repetitive strain injury (RSI) is a chronic condition that develops because of repetitive, forceful, or awkward hand movements for prolonged periods leading to damage to muscles, tendons, and nerves of the neck, shoulder, forearm, and hand, which can cause pain, weakness, numbness, or impairment of motor control.

The thumb is the least dexterous of all the fingers and is not suited for the repetitive movements required to type on a mobile keypad. A smartphone that relies on the thumbs for repetitive activities like typing can cause injury. WhattsAppitis, a new disorder with the name

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coined by Fernandez-Guerrero [3], was first reported in a 34-year-old pregnant woman presented with bilateral wrist pain. It resulted from an overuse of the mobile text messaging, for more than 6h, exerting 'continuous movements with both thumbs to send messages'. The woman was diagnosed with 'WhatsAppitis', which involves bilateral extensor pollicis longus tendinitis of the thumb or injuries relating to overuse of the popular social messaging application.

'PlayStation thumb' and 'cell phone thumb' are a form of RSI and were reported in 2009 among teenagers who used PlayStation for video-gaming and mobile phone texting for longer duration [4]. Acute Wiiiitis was described in 2007 and was named after Nintendo Wii tennis video game, characterized by intense pain in the right shoulder which was reported in a 24-year-old male who had a history of playing several hours of tennis video game where the player made repetitive same arm movements affecting his infraspinatus muscle [5].

Today in this era of computers and mobile phones, there is an epidemic of upper limb pain. Patients report to the general surgery and orthopedic outpatient departments with symptoms of vague pains involving the arm, forearm, wrist, or fingers and/or thumb. These symptoms which were earlier found in musicians have been increasingly observed in young adults owing to prolonged use of computers, video-games, and mobile phones. These symptoms are generally labelled as tenosynovitis as no pathology has been found in tendon sheaths at surgery in such patients. 'Repetitive strain injury' or 'overuse syndrome' are better terms that can be used to describe these symptoms because they are caused owing to overuse phenomenon of muscle, joints, and ligaments and respond well to rest.

De Quervain tenosynovitis: De Quervain's tenosynovitis is named after the Swiss surgeon, Fritz de Quervain, who first described it in 1895, which involves tendon entrapment affecting the first dorsal compartment of the wrist. Thickening of the tendon sheaths occurs around the abductor pollicis longus and extensor pollicis brevis where the tendons pass through the fibro-osseous tunnel located along the radial styloid at the distal wrist. Pain is exacerbated by thumb movement and radial and ulnar deviation of the wrist [6]. A classical patient of De Quervain's tenosynovitis is a mother of newborn who repeatedly lifts her child with thumbs radially abducted and wrists going from ulnar to radial deviation [7]. Bilateral

involvement is often reported in new mothers or child care providers in whom spontaneous resolution typically occurs once lifting of the child is less frequent [8]. NSAIDs, corticosteroid injections, splinting with a thumb spica [9], or a wrist brace may be offered as treatment.

Addiction

There is a difference between addiction to the internet and addiction on the internet [10]. When a person uses internet to play poker on his smartphone for prolonged periods, it is more appropriately an addiction to internet because of his addiction to playing poker rather than a smartphone addiction. In addictiveness of smartphone games by game players, the addiction is to the gaming behavior and not to the device as a whole. Hence, to use smartphone for gambling or to engage in other addictive behaviors should not be confused with a smartphone addiction [11]. The same reasoning distinguishes between an internet addiction and addictions to specific activities carried out on the network, with one of the most prevalent behaviors online being social networking [12].

Effect on eyes

Prolonged use of electronic gadgets causes 'computer vision syndrome' which manifests as eye strain, dryness, irritation, burning sensation, redness, blurred vision, and double vision [13]. National Eye Institute has recommended that computer users follow 'the 20-20-20 rule,' which implies that after continuous working on a device for 20 min, taking a break for 20 s by looking at a distant object 20 feet away along with frequent blinking of eyes which will reduce dryness and further strain to eyes [14].

Neck pain

Complaints of arm, neck, and shoulder are widely seen among gadget users and is defined as 'musculoskeletal complaints of arm, neck, and/or shoulder not caused by acute trauma or by any systemic disease'. The pain mainly results from improper posture or technique in handling computers. One of the most common causes is using computer and desk setups that are not ergonomically sound [15]. People who work on computers for prolonged periods should adopt ergonomic measures like good posture, use ergonomically fit furniture, move for ergonomic friendly innovative gadget designs and do stretch exercises to reduce strain and discomfort without affecting productivity. Moreover, they should take adequate break whenever possible. There is a significant association between the number of hours

of work on computers and overall musculoskeletal disorders [16].

Mental health

Overuse of the smartphone which is commoner in females and young adults, is associated with anxiety, depression, stress, and low self-esteem [17,18]. They have poor social relationships; thus, they think they should be in constant contact with others. Mobile phone silence can lead to irritability, sleep disturbances, insomnia, and digestive problems [19]. Results of a number of studies show that mobile phone radiation causes changes in gene regulation, auditory and visual problems, increased pressure of acid on the cornea and lens tissue, headache, heat sensation in the ears, memory loss, and fatigue [20]. Studies also showed that prolonged use of cell phones causes brain tumors [21]. Hooper and Zhou [22] in their study concluded that behavioral problems followed by the addiction to cell phone use cause stress. Some studies have shown a positive correlation between depression and anxiety and the amount of sent text messages in a day, and loss of control and social anxiety [23]. People who use smartphones excessively, because of their reduced amounts of face-to-face interaction, are likely to have a feeling that their social relationships are not supportive and rewarding and that they are not actively contributing to the happiness and well-being of others. A few studies among university students have documented high prevalence of nomophobia (abbreviated form of 'no mobile phone phobia') which describes the anxieties or feeling of discomfort of losing or being temporarily without one's mobile phones and is thought to be related to the excessive use of mobile phones [24].

Conclusion

Smartphone overuse may lead to development of RSI or overuse syndrome thereby affecting hand function resulting in pain in the thumb. Social networking sites provide a convenient and stimulating tool to facilitate the fundamental human need for communication although an excessive use of them can provoke certain negative consequences. There is a critical need to promote healthy ways of smartphone use, as well as the importance of friendship and family connectedness as a way of promoting the psychological well-being. Although everyone benefits from technology and modern gadgets, there is a simultaneous risk associated with electronic gadgets that may affect the human body adversely. Physicians should get themselves updated of these new disorders. Younger generation need to be educated adequately about the ergonomic practices and health safety of gadget usage.

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Conflicts of interest

There are no conflicts of interest.

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