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HOW TO CITE:
Chetty V, Munsamy A, Cobbing S, Van Staden D, Naidoo R. The emerging public health risk of extended electronic device use during the COVID-19 pandemic. S Afr J Sci. 2020;116(7/8), Art. #8530, 2 pages. https://doi.org/10.17159/sajs.2020/8530

ARTICLE INCLUDES:
☐ Peer review
☐ Supplementary material

KEYWORDS:
musculoskeletal health, visual health, sleep impairment, digital eye syndrome, health awareness

PUBLISHED:
29 July 2020

The emerging public health risk of extended electronic device use during the COVID-19 pandemic

The experience of being in lockdown, isolated, and socially distant, even from family and friends, has become the 'new normal' during the COVID-19 pandemic. People across the world are increasingly using electronic devices (e-devices) to connect socially, for education, and for work. Anecdotally, voices have emerged that predict that COVID-19 will revolutionise how we interact beyond the pandemic, enabling people to connect over large geographical areas. However, the increased use of e-devices may have far-reaching consequences on body systems, including the musculoskeletal and visual systems. These complications are often overlooked due to the focus on the medical management of COVID-19. Attention should be paid to these complications as they have the potential to become a serious public health issue.

Musculoskeletal impairments such as back, neck, shoulder and wrist pain are associated with sustained postures during e-device use. This association has been highlighted in children, young adults and higher education students, and has the potential to become more severe as people age.[1-5] Varied postures, specifically increased head and neck flexion[6], as well as the incorrect placement of the e-device on surfaces, are of concern. The size and weight of e-devices can further cause fatigue, and negatively affect the biomechanics of users.[7] Furthermore, e-device use is associated with other negative behaviours, such as reduced time exercising and playing. Overuse of e-devices in children has been shown to be associated with obesity[8], impaired physical and cognitive development, as well as sleep problems[9]. These challenges have the potential to add a significant burden to already over-stretched primary health-care systems.[10]

Additionally, users' environments also influence musculoskeletal impairments. Many people in low- and middle-income countries live in resource-scarce home environments. They lack a suitable ergonomic set-up for the correct use of e-devices, or information on managing screen time and exercise. These users are also more likely to use a smartphone for online engagement, as opposed to a laptop, and may sit on low beds, floors or outside the home to access data coverage for online platforms. In addition, the restrictions on daily free movement are likely to result in people living more sedentary lifestyles, which can, in turn, increase the prevalence of other health challenges such as diabetes and obesity, and impair child brain development.

Prolonged screen time further leads to associated eye health concerns for people of all ages. Even before COVID-19, the rising prevalence of myopia, or short-sightedness, was acknowledged as a global public health problem, predicted to affect five billion people by 2050.[11] Central to this increasing incidence are environmental factors such as increased time indoors, increased educational demands, and increased use of e-devices. Lockdown measures, precipitating a move towards working remotely or learning online, have forced people to spend significant time indoors and in front of e-devices. This prolonged use of e-devices, particularly at close working distances, results in a condition known as digital eye syndrome (DES).[12,13] DES produces clinical symptoms such as headaches, caused by stress on the accommodative and binocular vision systems, as well as reduced blink rate and poor blink quality.[12-14] This is compounded by the blue light emission from light-emitting diode (LED) devices. Blue light also affects sleep latency and duration by reducing melatonin production, which disrupts circadian rhythms.[12] The impact of excessive e-device use may, therefore, extend beyond DES and musculoskeletal problems, to increasingly disrupted sleep patterns, which are associated with emotional distress and cognitive deficits.[12-14]

Usage of e-devices is likely to increase during the COVID-19 pandemic. This, in turn, increases the likelihood that associated visual, musculoskeletal and developmental impairments will become more prevalent and severe, thus adding a significant burden to already over-stretched primary health-care systems. We, therefore, need to develop strategies to provide better information on how to adopt preventative measures that address both eye health and the musculoskeletal impairments associated with the increased use of e-devices. These strategies should include innovative ways to use e-devices and programmes that educate communities on appropriate measures to counteract the adverse effects of screen time. Public health initiatives should involve collaboration with various sectors, including community partners, to establish and integrate contextually tailored health awareness programmes into countries across the globe. An immediate public health response for health-care advocates, employees and other COVID-19 response structures should include advice on contemporary e-device use and ensure this critical information is integrated into the package for essential protective principles used to combat the spread of the COVID-19 infection.

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