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Musculoskeletal Disorders among Smartphone Play to Earn Gamers: An Emerging Concern

Milad Gholami [a], **Reza Kalantari** [b *]

a. Department of Occupational Health Engineering, Faculty of Public Health, Arak University of Medical Sciences, Arak, Iran.
b. Department of Occupational Health Engineering, Faculty of Public Health, Zanjan University of Medical Sciences, Zanjan, Iran.

***Corresponding author:** Department of Occupational Health Engineering, Faculty of Public Health, Zanjan University of Medical Sciences, Zanjan, Iran. Postal Code: 4515786349. E-mail: dr.r.kalantari@zums.ac.ir

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ABSTRACT

Advancements in communication technology have led to the rise of mobile Play to Earn games (P2E), causing increased smartphone usage. As players engage more frequently in these games, they earn more in-game currency. However, excessive gaming is associated with musculoskeletal disorders, especially in the neck and upper extremities, due to poor posture and repetitive movements. We recommend that P2E platform designers warn gamers about the health risks associated with poor posture, repetitive movements, and prolonged smartphone use before they start playing these games. Moreover, health professionals, including ergonomists, should guide the public and raise awareness about the health consequences of smartphone overuse. Furthermore, public health programs should focus on educating people on ways to prevent musculoskeletal symptoms.

Advancements in communication technology have expanded smartphone usage (Kuyucu, 2017). The popularity of mobile P2E games has grown significantly worldwide. These games require users to tap on digital icons within a Telegram bot interface to earn coins. Players can also earn coins by completing various tasks and trading them on different platforms (*What Is TapSwap (TAPS)? All About the Viral Telegram Crypto Game*). The more time spent playing, the more coins are earned; however, the low value of these coins often necessitates extended playtime. Alarmingly, there is a lack of systematic education and awareness about the consequences of excessive smartphone use among users before engaging in these games.

Although a high prevalence of musculoskeletal disorders (MSDs) has been documented among industry workers (Arghami et al., 2016; Greggi et al., 2024), recent studies indicate that smartphone overuse is also associated with postural changes and an increased risk of MSDs (Yaşarer et al., 2024). Persistent musculoskeletal symptoms in the neck and upper extremities are prevalent among long-term smartphone users (Gustafsson et al., 2017). Poor posture-characterized by a flexed neck, unsupported elbows and wrists, and repetitive finger movements-can cause these symptoms (Zirek et al., 2020). Many P2E gamers are teenagers and university students who may be unaware of the potential risks of MSDs associated with smartphone use. A study revealed that over half of university students have a poor understanding of correct body and wrist posture during mobile phone usage (Chris Okafor et al., 2021). Here, we discuss possible MSDs linked to mobile phone overuse, particularly in the neck and upper extremities.

1. Upper Extremities

The predominant use of the thumb or a single finger when

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interacting with handheld devices, such as smartphones, is associated with an increased incidence of MSDs (Sharan et al., 2014). Repetitive tapping on touchscreens and fast finger movements to earn more coins in P2E games are very common, and poor hand posture can exacerbate the risk of MSDs. Tapping with the index finger is faster than using other fingers, which may lead to a higher frequency of MSDs in this part of the body. A review study found the most common symptoms associated with MSDs as pain (the most frequently reported), fatigue, stiffness, numbness, and tenderness, often resulting from conditions such as tendonitis in the hand and wrist muscles, De Quervain's syndrome, and thoracic outlet syndrome. The prevalence of MSD symptoms was reported to be as high as 53% in the thumb, 71.6% in the shoulders, 15% in the elbows, and 32% in the hands and wrists (Zirek et al., 2020). In addition, Carpal Tunnel Syndrome (CTS) is another MSD linked to prolonged smartphone use (Al Shahrani & Al Shehri, 2021). Trigger finger syndrome and 'texting thumb' are also potential problems, especially due to the frequent tapping on touchscreens.

2. Neck

Many smartphone users habitually bend their necks while using their devices. This condition, commonly referred to as "Text Neck", results from improper neck postures, such as a flexed neck, and excessive time spent in these positions (Aliberti et al., 2020). Neck pain is significantly associated with smartphone usage time (El Shunnar et al., 2024). Cervical disk degeneration is directly related to mobile phone overuse (Zhuang et al., 2021), which can cause symptoms in the upper extremities. Stiffness in the neck is one of the most prevalent symptoms reported, often occurring within just 15 to 30 minutes of smartphone use (Thorburn et al., 2021). The repetitive use of a smartphone touchscreen during P2E games promotes poor neck posture, as it is difficult to hold a neutral neck position while holding a smartphone in front of the face for extended periods.

Conclusion

P2E games can endanger gamers' musculoskeletal health. We recommend that P2E platform designers warn gamers about the health consequences of poor posture, repetitive movements, and prolonged use of mobile phones before they start playing these games. Health professionals, such as ergonomists, should guide the public and raise awareness about the health risks associated with smartphone overuse. Educational interventions have been shown to effectively improve body posture and prevent MSD (Samadi et al., 2018). Public health programs should focus on educating people on ways to prevent musculoskeletal symptoms, particularly regarding the duration of mobile use and the correction of body posture. Implementing regular screen breaks, reducing smartphone usage time, engaging in exercise, and participating in daily physical activity can help gamers prevent neck and upper extremity syndromes.

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