Article Commentary

Exergaming to improve physical, psychological and cognitive health among home office workers: A COVID-19 pandemic commentary

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Received 29 June 2021
Accepted 3 August 2021

Abstract.
BACKGROUND: The COVID-19 pandemic has resulted in increased sedentary behaviour and poorer health among office workers. Exergaming is a technology-driven mode of exercise that can improve health while physically distancing.
OBJECTIVE: The purpose of this commentary was to explain the benefits of exergaming on physical function, psychological health, and cognition among office workers.
RESULTS: Exergaming improves these health outcomes, reduces pain, and decreases the risk for chronic disease. It is easily accessible on smart devices and can be performed both indoors and outdoors.
CONCLUSIONS: Twenty-one minutes of exergaming per day can improve health outcomes and reduce the risk of pain and disease. Employers and policy-makers should consider promoting exergaming among office workers.

Keywords: Exercise, video games, sedentary behaviour, middle-age, COVID-19

1. Introduction

The World Health Organization (WHO) declared the COVID-19 outbreak as a pandemic in March 2020. As of 21 July 2021, there have been over 191 million confirmed cases and over 4.1 million deaths, posing an unprecedented challenge to alleviate this public health concern [1]. Physical inactivity has been reported to be 30% higher during the pandemic [2]. It is possible that the government-imposed restrictions (e.g., stay-at-home orders, travel restrictions, banning outdoor activity) [3], gym closures [4], delays in manufacturing of fitness equipment [4], financial hardship [5, 6], and the lack of social support from training partners [4] may have contributed to this increased physical inactivity. The consequences...
of the pandemic have therefore posed challenges to adhering to the recommended physical activity guidelines (i.e., 150 minutes per week of moderate-intensity physical activity or 75 minutes per week of moderate vigorous-intensity physical activity [7]). To this end, researchers have observed negative impacts on health outcomes, such as poorer quality of life [8], loneliness [9], isolation [8], boredom [9], poorer mental health [9–11], poorer sleep [2], weight gain [2], and increased use of television, computer, and social media [2, 12]. Therefore, improving health among office workers during and after the COVID-19 pandemic is important.

Exergaming improves health and can be performed at home regardless of restrictions [13–19]. Exergaming can be described as any kind of video game or multimedia application that requires physical movement for the purpose of controlling the game [20]. It combines smart technologies, exercise, and cognitive stimulation [21, 22]. It can be used on numerous platforms such as applications on smart phones [23], virtual reality systems [24], and consoles [25, 26]. Different types of exergames exist, including single player, as well as multi-player exergames with artificial and/or real players that are either collaborative or competitive [27–29]. Exergaming is feasible, safe, and shows high usability and acceptability in healthy and clinical populations across the lifespan [19]. To our knowledge, no research has summarized the benefits of socially distanced exergaming. The purpose of this commentary was to explain the benefits of exergaming on physical function, psychological health, and cognition among home office workers. A better understanding of the benefits of socially distanced exergaming is warranted for future uptake.

2. Benefits of exergaming

2.1. Exergaming improves physical function

Exergaming offers benefits to physical function, such as improvements in fitness, strength, energy expenditure, gait speed, posture, and functional mobility in middle aged adults relative to an inactive control group [13–17]. Multi-player exergaming promotes greater heart rate and energy expenditure compared to single-player exergaming, which may be a function of the games themselves or the social support provided during multi-player exergaming [30]. Exergaming also reduces cardiovascular risk, such as weight loss as well as lower blood pressure, total serum cholesterol, triglycerides, and low-density lipoprotein [13, 31, 32]. Lower-back pain is the most common occupational disease and is related to sedentary activity in office work [33]; importantly, exergaming decreases chronic neck and back pain among office workers [34]. These improvements in physical function following exergaming may stem from the games involving stepping and standing in place, head movements, performing high speed hand-eye and foot-eye coordination tasks, crouching, reaching, and jumping [16, 35]. Office-workers spend about two-thirds of their workday sitting; thus, increasing physical activity and physical function is especially important in this population [36].

2.2. Exergaming improves psychological health

Maintaining psychological health is important during the pandemic. Exergaming enhances mood [18], relieves stress [28], reduces social isolation [28], reduces loneliness [28], and improves self-esteem [37], self-confidence [37], and self-efficacy [37]. Multi-player exergaming increases emotional and social support, affords the opportunity to share in positive experiences with others, increases motivation and engagement in practice, and increases enjoyment compared to single-player exergaming [29, 38, 39]. Interestingly, collaborative games increase social presence and intention to exercise compared to competitive games [27, 28], which may be important factors during the pandemic. Qualitative reports have noted that exergaming is “fun and varied”, is “progressive”, and offers a “challenge to do better” [18]. Altogether, socializing while physically distancing and receiving the benefits of exercise may be critical to maintaining psychological health during the pandemic.

2.3. Exergaming improves cognitive function

Exergaming improves cognition among office workers [40]. Specifically, exergaming improves executive function, inhibition, visuospatial processing, attention, spatial learning, memory, and cognitive flexibility in clinical and non-clinical populations [19, 41]. Exergaming is fast paced and has high perceptual, cognitive, and motor demands [42]. Therefore, perhaps these improvements are a function of the user responding to visual feedback, planning actions, understanding spatial constraints, and creating cognitive maps of bodily movements in relation to the
game [20]. Cognitive skills are important in the workplace for tasks such as interpreting information, remember team goals, and sustained attention during meetings [43]. Thus, identifying the cognitive processes that are improved through exergaming and providing appropriate recommendations are critical for maintaining and improving cognitive function among office workers. To our knowledge, no studies have examined the effects of single vs multi-player exergaming on cognitive outcomes, which should be a future area of research.

3. Practical implications

Socially distanced physical activity has been recommended for office workers during the pandemic [36], with a diverse range of exercise types improving adherence [44]. This commentary expands upon previous recommendations for building a routine when working from home [45], and highlights that exergaming is a great mode of exercise to incorporate into an indoor or outdoor exercise regime for office workers. Exergaming is enjoyable, increases social engagement, increases productivity at work, is easily accessible, involves relatively low costs, and is a safe mode of exercise [26, 46, 47]. In order to meet the recommended physical activity guidelines of 150 minutes per week of moderate-intensity physical activity [7], only 21 minutes per day, 7 days/week of exergaming is necessary. Given that exergaming can improve physical function [13–17], psychological health [18], and cognition [43], and that these factors are important for the health and productivity of office workers, employers and policy makers should consider activity programs for office workers.

4. Limitations

While physical activity guidelines suggest 150 minutes per week of moderate-intensity physical activity [7], the minimum dose of exercise to provoke improvements in physical function, psychological health, and cognition may differ [48, 49]. Few studies have specifically examined the different types of exergames and single- vs multi-player exergames; more research is needed to better understand their influence on physical function, psychological health, and cognition.

5. Conclusion

Exergaming is safe, enjoyable, and low-cost. It can improve physical function, psychological health, and cognition, as well as reduce pain and prevent chronic disease. This is especially important for office workers during the pandemic who face greater sedentary behaviour. Incorporating exergaming activity programs for office workers should be considered by policy-makers and employers.

Conflict of interest

The authors have no conflict of interest to report.

References


