

Effects of Sedentary Lifestyle and Physical Activity in Gaming Disorder

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Abstract: Due to the development of the video game industry in recent years, there has been an increase in the number of video game player and the gaming time. The gaming time increase carries a risk for a behavior disorder defined as a gaming disorder. At the same time, one of the major negative effects of playing video games is increasing sedentary lifestyle. Increasing sedentary lifestyle leads to a decrease in physical activity, consequently both physical and mental health can be affected. Knowing the effects of sedentary lifestyle in individuals with gaming disorder is important in preventing irreversible health problems and protecting public health. The role of physical activity is important in preventing a sedentary lifestyle in gaming disorder. It is important to know and address the importance of physical activity in these individuals, whose physical activity is difficult to encourage. Therefore, in this review, the possible effects of sedentary lifestyle and physical activity in gaming disorder are summarized in the light of the literature.

INTRODUCTION

Gaming disorder is defined as a behavioral disorder characterized by an individual's loss of control over playing video games, continuing to play video games despite its negative consequences, and increase in video gaming time¹. In recent years, with the prevalence of video games and the growth of the video game industry, there has been an increase in video game playing times, especially among adolescents and young adults². It is emphasized that excessive video game playing affects mental and physical health and is important for public health^{3,4}. The prevalence of gaming disorders varies according to countries and assessments. It is stated that the prevalence is in the between of 0.6%-50%⁵.

Gaming disorder can be a risk factor for decreased participation in sports and exercise, as well as not doing sports and exercising regularly can cause gaming disorder⁶. It has been reported that there is negative relationship between the duration of playing video games and exercise. Likewise, negative relationship has been reported between the duration of video game playing and physical activity in children and adolescents⁷. Like other sedentary behaviors, playing video games prevents physical activity and increases the sedentary lifestyle^{8,9}.

It has been reported that individuals have increased their playing time after the COVID-19 pandemic¹⁰. For this reason, sedentary lifestyle is increasing especially during the pandemic period. With the sedentary lifestyle brought about by gaming disorder, mental health is affected as well as physical health. In addition to this, a sedentary lifestyle leads to a decrease in the quality of life^{11,12}.

It is known that physical activity and exercise are effective on many systems in the body in reducing sedentary life and reducing the negative effects of sedentary lifestyle^{13,14,15,16}. The purpose of this review is to explain the possible effects of sedentary lifestyle and physical activity on gaming disorder.

Effects of sedentary lifestyle in gaming disorder

Physical inactivity is defined as not meeting current physical activity recommendations¹⁷. It has been reported that physical inactivity and sedentary behavior have become a global problem¹⁸. Data reported from 39 countries show that only 19-23% of 11-13-year-olds achieve the recommended daily level of moderate-to-vigorous physical activity¹⁸. In line with these trends, evidence confirms that the current generation of children engages in outdoor activity less frequently and of shorter duration than their parent's generation¹⁹. It has been suggested that children's physical activities move away from outdoor play and towards activities that take place primarily indoors¹⁹. Some results show that sedentary time can cause emotional and mental health problems²⁰. The majority of the total time spent sedentary consists of sedentary behaviors spent on the screen^{21,22}. Increasing on screen time causes

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problems such as deterioration in body composition, sleep problems and musculoskeletal pain^{23,24}.

Like other sedentary behaviors, playing video games is a factor that increases physical inactivity⁹. At the same time, it has been determined that video games can prevent physical activity by shortening the time of being physically active⁸. Time spent in sedentary activities, such as playing video games, reduces daily energy expenditure, indicating a causal relationship between sedentary behaviors and obesity²⁵.

It has been observed that there is a negative relationship between the duration of online gaming and exercise and physical activity²⁶. It has been stated that gaming disorder may be a risk factor for decreased participation in sports and exercise, concurrent, not doing sports and exercise regularly can cause gaming disorder⁶.

Individuals with gaming disorder generally lead a sedentary lifestyle for a long time in a sitting position²⁷. Sedentary behavior is a risk factor for the development of chronic diseases such as cardio-metabolic diseases, diabetes, obesity, coronary artery disease, musculoskeletal disorders and some types of cancer^{28,29,30}. The results of the studies showed that two-hour increase in sedentary behavior increases the risk of obesity by 5%, diabetes by 7% and increases the risk of musculoskeletal disorders³¹.

It has been stated that the exercise capacity of those who spend on the screen time for more than 4 hours decreases significantly and is lower than the individuals who spend on the screen time for less than 2 hours³². In addition, it is reported that after the COVID-19 pandemic, there has been an increase in the time spent on the screen of individuals¹⁰. Specially dependent on the time spent on the screen, an increase in the risk of obesity and a decrease in physical health were found²⁴.

Neck-shoulder and low back pain are common in adolescents who constantly use computers to play video games³². It has been reported that there is a relationship between musculoskeletal symptoms and computer use in adolescents. Headache, neck pain, shoulder pain and low back pain were more common in computer users^{33,34}. The findings of various studies show that computer use causes pain not only in the neck-shoulder and back regions, but also in the hands, fingers, wrists, eyes and head^{35,36}. It has been indicated that 16% of young individuals using computers have pain in the neck or back region. In addition, it has been stated that children have impaired functionality in daily life due to musculoskeletal pain³⁷. Musculoskeletal pain, especially headache, neck pain and shoulder pain, is another factor that reduces the quality of life in gaming disorder³⁷.

Physical activity in gaming disorder

Physical activity and exercise are recommended as a prevention strategy in gaming disorder. In particular, it has been indicated that individuals should be encouraged to increase outdoor activities and to engage in sports activities fit for the person^{11,13}.

The level of participation in exercise and sports affects the level of gaming disorder. In parallel, individuals with low levels of physical activity were reported to have more game disorder symptoms than individuals with high levels of physical activity⁶. In addition, a long duration of sedentary lifestyle reduces the benefits of physical activity³⁸.

Many studies have indicated that positive relationship between physical activity and the physical, emotional, mental and social health of children and adolescents³⁹. Exercise and physical activity provide physiological benefits in the whole body, especially in the cardiovascular system and peripheral muscles⁴⁰. In addition, it is known that exercise and physical activity improve cognitive and mental health, reduce anxiety and depression and provide behavioral changes in individuals^{41,42}. In particular, sedentary life causes

individuals to lack self-confidence and to be self-enclosed while exercise and physical activity increase the internal motivation of individuals and improve their physical behaviors⁴³. Considering these effects of exercise, Its benefits have also been proven in anxiety, stress and emotional disorder accompanied by negative thoughts affecting the inner world of individuals⁴⁴. In order to reduce these mental health effects, moderate or high-intensity aerobic exercises have been recommended and have been shown to reduce major depression in young individuals⁴⁵.

In the World Health Organization (WHO) physical activity guide; recommended at least 60 min/day of moderate to vigorous mostly aerobic physical activity, for children and adolescents. For adults to do at least 150-300 minutes of moderate-vigorous exercise or at least 75-150 minutes of vigorous aerobic physical activity per week¹⁷. In its simplest form, there are studies suggesting moderate physical activity to reduce the negative effects of sedentary lifestyle^{13,46}.

Some alternative exercise has been reported, especially in individuals who have difficult sports and exercise habits. Some of these studies have suggested active video game exercise (exergame) approaches^{47,48}. Active video game or video-based exercise (Exergame) are video games that encourage the physical movement of players, involving the transfer of body movements to game commands⁴⁹. Exergame shows similar effects to traditional exercises because they can expend energy⁵⁰. In general, it is thought that exergame can be an effective exercise used to increase energy consumption equivalent to light and moderate physical activity⁵⁰.

In the literature, it has been found that Exergame improves cardiovascular endurance and increases muscle strength in sedentary individuals^{51,52}. It has also been stated that exergame can be used as aerobic physical activity⁵³. By providing new alternatives for exercises, exergame can help people lead a healthier lifestyle. Exergame can be advantageous especially by increasing internal motivation in young individuals, increasing the individual's participation in exercise training by feeling themselves in the game, providing pleasure from physical activity, providing visual feedback, performing balance training, being applied in the home environment, and increasing the harmony that cannot be achieved with traditional exercises⁵².

Conclusion

As the playing video game time increases, the level of gaming disorder and sedentary life increases. Increasing the sedentary lifestyle accompanies many health problems. Encouraging physical activity in gaming disorder can prevent occur problems. At the same time, physical activity is needed to increase the quality of life of these individuals. In gaming disorder, which it is difficult to increase physical activity, different exercise approaches such as exergame can be used as an exercise approach. In this way, it can be used to encourage individuals to engage in regular physical activity and can support the development of regular exercise habits. Further studies on physical activity and different exercise approaches in gaming disorder will help to reduce the effects of sedentary lifestyle in these individuals.

Authors note

This review is based on the general information section of the doctoral thesis entitled "Investigating the Effects of Video-Based and Aerobic Exercise Trainings on Functional Capacity, Physical Fitness and Level of Gaming Disorders". None of the authors has conflict of interest

Conflict of interest

The authors declare that there are no conflict of interests.

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