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The Relationship Between Electronic Gaming and Health, Social Relationships, and Physical Activity Among Males in Saudi Arabia

Abdullah Ghurm Alshehri[1] and Ahmed Mohamed Abdel Salam Mohamed[1]

Abstract

Physical and psychological effects of playing computer games cannot be ignored. Electronic games are considered to be an influential factor in growth, personality development, and positive sociability of children, and game duration has been associated with increased aggression, reduced mental health, and higher BMI. The aim of the present study was to explore the relationship between electronic gaming and health, social relationships, and physical activity among males aged 16–18 years in Saudi Arabia. An online survey designed by the authors containing 60 items and divided into 5 sections was used during one school semester. The sample was selected randomly from 30 high schools; 90 students were selected from each school, with 30 chosen from each of grades 9, 10, and 11. Respondents were 194 male students, aged 17.23 ± 1.52 years. The questionnaire was presented to six experts to assess validity, with Cronbach's α established at 0.87. Results showed that playing electronic games had a negative relation with health, social relationships, and physical activity among males. The most negative significant was the correlation between electronic games and physical activity ($r = -.49$), followed by that with social relationships ($r = -.42$) and BMI ($r = -.31$) . The lowest result was for health ($r = .20$). More empirical investigations are needed to explore deeper effects of electronic gaming on various groups in Saudi society, including the general population, employees, and different categories of school and university students.

Keywords

electronic gaming, health, physical activity, social relationships, males

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Computer games have become one of the most popular and attractive media among adolescents (Doran, Azad, Fathi, & Poorhossain, 2012). Playing computer games for a short time under parental supervision can have positive effects on quality of life in adolescents. However, spending long hours playing computer games may have negative long-term effects (Kasiri, Eslami, Mostafavi, Hassanzade, & Moradi, 2011). Participation in these games for extended periods of time can lead to stress, restlessness, and physical tension. Real physical stimulation is experienced throughout the game via sympathetic nervous system stimulation, which can gradually make this system more reactive to stimuli (Zamani, Chashmi, & Hedayati, 2009).

Some case studies indicate that excessive players display many signs of addiction, suggesting that electronic games are used to counteract other deficiencies and underlying problems in the person's life (e.g., problematic relationships, lack of friends, physical appearance, disability, or coping; Hussain & Griffiths, 2009).

Several studies have shown that anxiety and depression are common among those who are addicted to video games, for example, the study conducted by Andreassen et al. (2016) showed that addictive social networking had moderately high correlations with measures of

[1]Faculty of Sport Science and Physical Activity, King Saud University, Riyadh, Saudi Arabia

Corresponding Author:
Abdullah Ghurm Alshehri, Faculty of Sport Science and Physical Activity, King Saud University, Riyadh 11451, Saudi Arabia.
Email: aalsheeri@ksu.edu.sa

attention-deficit hyperactivity disorder (ADHD; $r = .41$), anxiety ($r = .34$), and obsessive–compulsive disorder (OCD; $r = .33$), respectively. In another study, Wei, Chen, Huang, and Bai (2012) showed that the multivariate linear regression model ($F=44.766$, $R2=0.305$, $p<.001$) showed higher Social Phobia Inventory (SPIN) scores ($\beta=0.310$, $p<.001$), higher Chen Internet Addiction Scale (CIAS) scores ($\beta=0.308$, $p<.001$), longer weekly online gaming hours ($\beta=0.091$, $p=.013$), and female gender ($\beta=0.063$, $p=.026$) as significant predictors of high Depression and Somatic Symptoms Scale (DSSS) scores.

In addition, other research has suggested that there are cognitive and neurological correlations with Internet gaming disorder (Marino & Spada, 2017; Meng, Deng, Wang, Guo, & Li, 2015; Weinstein & Lejoyeux, 2015). There are strong cognitive reinforcements such as social acceptance, self-esteem, and goal achievement that perpetuate video game use (King & Delfabbro, 2014; Rasmussen et al., 2015). Brain imaging studies reported significant changes in the areas of the brain that regulate impulse control and decision-making among individuals with Internet gaming disorder (Meng et al., 2015). Addicted video gamers who have poor self-control or poor social skills are more likely to exhibit aggressive behavior (Anderson et al., 2010; Liau et al., 2015). Such behavior is shaped by various psychological responses such as anger, cruelty, or hostility that video games—especially the violent types—typically invoke (Greitemeyer & Mügge, 2014). Furthermore, studies have shown that once an adolescent becomes "addicted," the symptoms usually persist over time (Strittmatter et al., 2016). One longitudinal study showed that 84% of adolescents addicted to video games at the baseline remained addicted 2 years later. Longitudinal follow-up data suggested that these comorbid conditions do not merely correlate but also that they are a direct consequence of this addiction (Gentile et al., 2011).

Electronic games have spread across all markets and entered all households, taking over much of children's, adolescents', and adults' time, thinking, and interests. They have spread very quickly among Arab communities in general, and Gulf communities in particular. In addition to playing these games at home, children carry it with them wherever they go, leading to addiction to such games during summer vacations (Saquib et al., 2017).

Considering the neglect of physical activity and addiction to electronic games, it is crucial to investigate electronic gaming to identify to what extent it is dangerous, how it affects health and social relationships, and how to avoid the dangers of giving up physical activity. Relevant theoretical approaches, application experiences, and, above all, empirical evidence are essential to explore this issue. Nevertheless, to the best of the authors' knowledge, no scientific study of this type has been conducted on the Saudi student community. Therefore, the aim of the present study was to explore the relationship between electronic gaming and health, social relationships, and physical activity among males aged 16–18 years in Saudi Arabia.

Methods

Design

We conducted a descriptive, cross-sectional survey study. All data were collected using an Arabic questionnaire designed by the authors, which was made available to all students, in the form of a Google survey, by the authors and assistant supervisor teachers. The questionnaire contained 60 items divided into 5 sections: information (11), social relationships (11), practice of electronic gaming (11), health (13), and physical activity (14). The questionnaire included anthropometric measurements. Height (to the nearest 0.5 cm) and weight (to the nearest 0.1 kg) were noted, and body mass index (BMI) was calculated using the formula $BMI = W\ (kg)/H^2\ (m^2)$.

Setting

Data were collected during one school semester (September to December) of the 2018/2019 academic year from 30 high schools representing approximately 25% of all high schools in Riyadh. The authors obtained the approval of the department of education in Riyadh to conduct the study in high schools with a small sample. In total, 90 students were chosen from each school: 30 from grade 9, 30 from grade 10, and 30 from grade 11. The sample size was determined to be 2,700 students; however, unfortunately, responses to all questions were obtained from only 194 male students. The number of public high schools in Riyadh for boys is 112, with 38,844 students.

Participants

Participants were randomly recruited from male high schools in Riyadh, Saudi Arabia. Genders are separated in the Saudi education system and children attend single-gender schools. The authors determined the criteria for inclusion in the study to be the absence of mental or physical disability, freedom from chronic diseases, and lack of psychological illnesses. The authors met with school principals and vice principals to view the school records of selected students to ensure they met selection criteria. Replacements were recruited in cases where students did not meet the inclusion criteria. The questionnaire was filled out by the students themselves.

Instruments

The authors reviewed and analyzed similar previous studies to develop the questionnaire, which ultimately comprised 7 sections and 74 sentences. The authors presented the sections and sentences to six expert university professors with experience in the field of electronic games, who were asked to comment on the clarity of the terms used in the questionnaire and its suitability for this study. After reviewing their comments, the researchers reviewed the questionnaire and made several amendments and additions proposed by the experts. Specifically, two sections were excluded: "Electronic games have affected the power of your focus and understanding" and "I am addicted to playing electronic games." In its final form, the questionnaire consisted of 5 sections and 60 sentences; participants' responses were recorded using a 5-point Likert scale. The authors conducted a pilot survey with a sample of 10 students to evaluate cost, adverse events, understanding of the questionnaire, and time to finish. The pilot study showed that the questionnaire was easy to understand and took 45 min on average to complete. Cronbach's α coefficient was calculated to confirm reliability and assess internal consistency. The reliability of the physical activity section was reported as 0.90, social relationships as 0.87, BMI as 0.98, and health as 0.89. The average value was 0.87, indicating that the model was reliable and consistent.

Procedure

Authors visited all schools and met students to explain the procedures of the study and answer any questions. In addition, all students participating in this study were provided with an information sheet explaining the purpose of the study. A comprehensive explanation of the study procedures was also given, and all the students' questions about their participation were fully answered. Authors obtained written agreement from students and their families and then gave the link to the survey to the school. Subsequently, the students completed the questionnaire online while in their classrooms.

Ethical Approval

This study was approved by the research ethics committee at the authors' institution. Students and their families signed a consent form to take part in present study, including the right to withdraw from the study at any time without giving a reason.

Statistical Analysis

Data were analyzed using the Statistical Package for the Social Sciences 19.0 (SPSS, Chicago, IL). Data were summarized as mean ± *SD*. Statistical significance was set at $p < .05$.

A Pearson correlation coefficient was calculated to assess the relationship between electronic gaming and health, social relationships, and physical activity, and Cronbach's α to confirm reliability.

Table 1. Physical Characteristics of Participants ($N = 194$).

Physical characteristics	Mean	*SD*
Age (years)	17.23	1.52
Weight (kg)	72.6	7.28
Height (cm)	166.81	8.12
Body mass index (BMI) (kg/m^2)	26.09	4.08
BMI percentile for age (boys)	≥98th*	

Note. *BMI percentile was calculated from the U.K. 1990 reference chart for children and adolescents (boy chart; Cole et al., 1995).

Results

The physical characteristics of the participants are presented in Table 1. A total of 194 male high school students who played electronic games participated in the study. The mean and standard deviation for age, weight, height, and BMI were 17.23 ± 1.52 (years), 72.6 ± 7.28 (kg/m^2), 166.81 ± 8.12 (cm), and 26.09 ± 4.08 (kg/m^2), respectively (Table 1). The proportion of students per grade was 64 in Grade 9, 64 in Grade 10, and 66 in Grade 11. Although students in the present study were apparently healthy, the main BMI percentile for their age group showed that they were classified as obese (Cole, Freeman, & Preece, 1955). Table 2 shows the mean and standard deviation for electronic gaming and BMI to be 2.00 ± 0.46 and 26.09 ± 4.08, respectively.

Additionally, the results demonstrated a significant relationship between BMI and electronic gaming ($r > -0.31$). Table 3 shows that the mean and standard deviation for electronic gaming and health were 2.00 ± 0.46 and 1.67 ± 0.45, respectively. The results of Pearson correlation tests revealed significant relationships between electronic gaming and health ($r > -0.32$). Table 4 shows that the mean and standard deviation for electronic gaming and social relationships were 2.00 ± 0.46 and 1.73 ± 0.31, respectively. The results showed a significant relationship between electronic gaming and social relationships ($r > -0.42$). Table 5 shows that the mean and standard deviation for electronic gaming and physical activity were 2.00 ± 0.46 and 1.85 ± 0.34, respectively. The results showed a significant relationship between electronic gaming and physical activity ($r > -0.49$). Statistical significance was set at $p < .01$.

Table 2. The Relationship Between Electronic Gaming and Body Mass Index ($N = 194$).

Variable	Mean	*SD*	*r*	*p*
Electronic gaming	2.00	0.46	−0.31	<.01
BMI	26.09	4.08		

Table 3. The Relationship Between Electronic Gaming and Health ($N = 194$).

Variable	Mean	*SD*	*r*	*p*
Electronic gaming	2.00	0.46	−0.20	<.01
Health	1.67	0.45		

Table 4. The Relationship Between Electronic Gaming and Social Relationships ($N = 194$).

Variable	Mean	*SD*	*r*	*p*
Electronic gaming	2.00	0.46	−0.42	<.01
Health	1.73	0.31		

Table 5. The Relationship Between Electronic Gaming and Physical Activity ($N = 194$).

Variable	Mean	*SD*	*r*	*p*
Electronic gaming	2.00	0.46	−0.49	<.01
Health	1.85	0.34		

Discussion

The aim of the present study was to explore the relationship between electronic gaming and health, social relationships, and physical activity among males aged 16–18 years in Saudi Arabia, in the 2018/2019 academic year. Our results showed a negative significant correlation between electronic gaming and health, social relationships, and physical activity. Similar findings were observed in previous research, which found a significant negative correlation between health, physical activity, and electronic gaming, as well as between electronic gaming and various mental and physical health risks. Among the reported negative consequences of electronic gaming on young people's health are provocation of seizures, tendon injuries, and social introversion in cases of excessive playing, and promotion of aggressive behavior because of playing violent video games (Dorman, 1997; Gentile, Lynch, Linder, & Walsh, 2004).

The negative relation between electronic games and male health is one of the results of this study, shown in Table 3, consistent with those of numerous previous studies, such as the study conducted by Wang and Perry (2006) that examined the metabolic and physiologic responses to video game playing in 21 boys between the ages of 7 and 10 years. In that study, participants played a video game for 15 min. Blood pressure was monitored before and during the game; blood glucose and lactate levels were measured before and immediately after the game. The results showed significant increases for several metabolic and physiologic factors. There were noticeable increases in heart rate, systolic and diastolic blood pressure, ventilation, respiratory rate, oxygen consumption, and energy expenditure.

Other results of our investigation, shown in Table 4, included a negative relation between electronic gaming and social relationships. This is in keeping with the findings of Griffiths and Hunt (1998) that children addicted to computer games tended to only play games and avoided social relations. Similar findings were observed in another study where individuals who were addicted to these games had lower social skills than those who were not addicted (Zamani, Kheradmand, Cheshmi, Abedi, & Hedayati, 2010). Another study showed a significant correlation

between playing games and withdrawal, depression, rule-breaking behaviors, aggression, and social problems among adolescents (Shokouhi-Moqhaddam et al., 2013). This could be explained by multiple factors, for instance, the need for social interaction. Students may experience anxiety and distress when facing real-world social situations and may thus prefer social interactions and relations occurring in the virtual environment; playing electronic games may satisfy the need for stabilizing their social situation and provide a sense of belonging through interaction with other players in the game (Charlton & Danforth, 2007).

The results contained in Table 5 indicate a significant and negative relationship between electronic games and participation in physical activity, a correlation that can be derived from the increase in the body mass rate in the sample. This is also consistent with the findings of a number of previous studies (Riviere, 2004; Sothern, 2004) that considered electronic gaming to be a sedentary activity and argued that in the past few decades, such activities—combined with poor nutritional choices—have been important factors contributing to the decrease in physical activity and the alarming rise of obesity among the youth, with detrimental consequences for their health. Certain empirical studies investigating the relationships between obesity, participation in physical activities, and electronic gaming in large samples of children and adolescents (Carvalhal, Padez, Moreira, & Rosado, 2007; Wilson 2004) seem to corroborate this assertion by reporting that lower levels of physical activity and higher body mass were associated with more time dedicated to electronic gaming.

However, we cannot deny the findings of previous studies indicating that electronic games can be used to improve health and engage individuals in healthy behaviors. Gaming is not always harmful, and gaming technologies can be used as alternative and positive means to promote health. Saab et al. (2018) showed that a virtual reality intervention succeeded in promoting knowledge, testicular awareness, implementation intentions, help-seeking intentions, and behaviors among participants. In another study (Saab, Landers, Cooke, Murphy, & Hegarty, 2019) participants also agreed that such an intervention was suited for men from different sociodemographic backgrounds, and they felt confident using a virtual reality setting. It is also possible that outcomes would vary if measured over a 10- or 15-year period. Further studies are warranted to consider other populations, including females, children and adolescents, and participants from other age groups

Conclusion

In the present study, we explored the relationship between electronic gaming and health, social relationships, and physical activity among males aged 16–18 years in Saudi Arabia. After collecting data from 194 male participants during one school semester, our statistical analysis concluded that electronic gaming has a negative relation with the health, social relationships, and physical activity of high school males in Saudi Arabia.

Recommendations

The policy regulating physical activity in schools should be changed to allow more time, classes, support, and encouragement for physical activities. More research is needed in elementary and middle schools. Empirical investigations are needed to more fully explore the effects on various groups in Saudi society, including the general population, employees, and university students.

The results of this study were based on a self-report questionnaire, with the implication that future studies should use more accurate methods of data collection. Finally, the present study was cross-sectional; longitudinal studies are needed to explore causal relationships between variables such as family income, family education level, gender, standard of living, quality of life, and time spent playing.

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Ethical Approval

This study was approved by the research ethics committee at the College of Sport Sciences and Physical Activity, King Saud University (SSP NO.3-6-485680).

Ethics, Consent, and Permission

Participants signed a consent form to take part in present study, including the right to withdraw from the study at any time without giving a reason.

ORCID iD

Abdullah Ghurm Alshehri https://orcid.org/0000-0003-2358-4777

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