

# The relationship between computer games and quality of life in adolescents

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## ABSTRACT

**Background:** Term of doing computer games among teenagers is growing rapidly. This popular phenomenon can cause physical and psychosocial issues in them. Therefore, this study examined the relationship between computer games and quality of life domains in adolescents aging 12-15 years. **Materials and Methods:** In a cross-sectional study using the 2-stage stratified cluster sampling method, 444 male and female students in Borkhar were selected. The data collection tool consisted of 1) World Health Organization Quality Of Life – BREF questionnaire and 2) personal information questionnaire. The data were analyzed by Pearson correlation, Spearman correlation, chi-square, independent *t*-tests and analysis of covariance. **Findings:** The total mean score of quality of life in students was  $67.11 \pm 13.34$ . The results showed a significant relationship between the age of starting to play games and the overall quality of life score and its four domains (range  $r = -0.13$  to  $-0.18$ ). The mean of overall quality of life score in computer game users was  $68.27 \pm 13.03$  while it was  $64.81 \pm 13.69$  among those who did not play computer games and the difference was significant ( $P = 0.01$ ). There were significant differences in environmental and mental health domains between the two groups ( $P < 0.05$ ). However, there was no significant relationship between BMI with the time spent and the type of computer games. **Conclusion:** Playing computer games for a short time under parental supervision can have positive effects on quality of life in adolescents. However, spending long hours for playing computer games may have negative long-term effects. **Conclusion:** Doing computer games for a short time under parental supervision can have positive effects on quality of life in adolescents. However, spending long hours for playing computer games may have negative long-term effects.

**Key Words:** Adolescent, computer games, quality of life.

## INTRODUCTION

Physical and psychological effects of applying computers

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cannot be ignored. Sometimes, the youngsters are more engaged with and affected by computers than the older ones. Some researchers have referred to the developments in modern technology as “computer revolution” and computer video games are a manifestation of them.<sup>[1]</sup> Computer games are a kind of entertainment, which are done by devices equipped with an electronic processor.<sup>[2]</sup> The history of video games goes back to the early 1980s. Quality improvement, variety of the games and development of electronic and computer sciences have led to the increasing expansion of this entertainment among different groups, especially adolescents. On the other hand, the production rate of game software is such that one can find a list of about 38000 different computer games in almost more than 100 websites.<sup>[3]</sup> On average, 70-90% of American adolescents and young adults, 60-90% of Finnish adolescents and young adults and similar ratios

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of adolescents in other studies have entertained themselves with computer games.<sup>[4-7]</sup> The time spent on these games is also remarkable. Roberts' study in America revealed that, on average, the age groups of 8-10, 10-14 and 15-18 years old spent 65 min, 52 min and 33 min on computer games per day, respectively.<sup>[8]</sup> Boys play computer games more than girls.<sup>[9-11]</sup> Games, especially electronic ones, due to their capabilities and functions, can help to maintain mental health. They are also considered as one of the influential factors in the growth, personality and sociability of children.<sup>[12]</sup> However, studies have indicated that game duration is associated with gaining higher aggression scores.<sup>[13,14]</sup> In addition, students who spend more than 5 h at each time on computer games have less mental health.<sup>[15]</sup> Sedentary behaviors like using media are a risk factor for obesity in all age groups.<sup>[16,17]</sup> Also, studies have shown a positively significant relationship between body mass index and the time spent on computer games.<sup>[18-20]</sup> Several studies have considered the relationship between computer games and socialization process and there are contradictory results in this regard. One study shows that computer games have no effect on socialization.<sup>[21]</sup> The results of another study demonstrates a reverse relationship between game experiences and social skills but this relationship is not significant and depends on the playing location and presence of other people in that location and not on the experience of game itself. In Amini *et al.*'s study, social class (affluent, semi-affluent and deprived) was studied and the results revealed no significant relationship between social class (affluent, semi-affluent and deprived) and playing computer games.<sup>[10]</sup>

The progress in changing games and the intensity of their development require many concerns with regard to the lifestyle of adolescents. Today, merely maintaining the conventional life is not favorable, but improving the quality of life in different fields is considered a fundamental goal. Quality of life is considered a key indicator and has special importance since it includes different domains like physiological domains, performance and entity of the person.<sup>[23]</sup> Measuring quality of life helps to identify the needs of society, adjust programs and budgets and, generally, improve quality of life. Therefore, this study sought to identify the relationship between computer games and quality of life. After specifying the role of some effective variables in this relationship, the effect of these games on the adolescents' life was determined. According to the results of this study, some training programs were designed for the target group and their parents hoping for taking a small step towards improving the quality of life of this group.

## MATERIALS AND METHODS

A Cross sectional study was carried out among 5652 students (2925 girls and 2727 boys) in the age group of 12-15 years. The total number of girls was 215 (from 18 mid-schools and 14 high schools) and that of boys was 229 (from 18 mid-schools and 12 high schools). The sampling method of the study was two-stage stratified cluster sampling in proportion with the sample size. In the first stage, sixgirls' and sixboys' mid-schools were randomly selected out of 36 schools and

fourgirls' and threeboys' high schools were selected out of 26 high schools according to the sample size. After random selection of schools, the first, second and third grades in mid-school and the first grade in high school were selected as the units of study. Sample size was determined 395 people, but considering the 25% probability of loss due to lack of response to all the questions, 493 people were selected. Data collection tools consisted of two questionnaires for personal information and WHOQOL-BREF.

A) Personal information questionnaire: included 27 questions on personal characteristics, the way of spending leisure time, duration, place and rate of interest in computer games which was filled out by students. B) The brief form of quality of life of World Health Organization (WHOQOL-BREF): This brief form included four domains of physical health questions with sevenitems (for example, how much do you move around?), mental health domain, with sixitems (for example, how much do you enjoy your life?) social relationship domain with threeitems (for example, how much are you satisfied with your private relationships?) and environmental health domain with eightitems (for example, how much are you satisfied with the condition of your living place?). The first two questions did not belong to any of the domains and evaluated general health and quality of life. The questions were evaluated through five-level Likert scale. The raw score for each domain was converted to the range of 0-100 using the conversion method manual of WHOQOL.<sup>[24]</sup> This questionnaire was filled out by students themselves. The validity and reliability of the questionnaire were examined by Nejat *et al.*; its reliability in physical health domain was reported as 0.77, in mental health 0.77, in social relationships 0.75 and in environmental health 0.84.<sup>[25]</sup> According to the results of the above mentioned study, the validity of the distinction of this questionnaire was measured by the difference between the scores of healthy and unhealthy participants in different domains, which was confirmed by the significance of group coefficient after controlling potential confounding factors using linear regression.

The question number 21 of WHOQOL-BREF questionnaire was about the individual's satisfaction with sexual relations, which was omitted because of cultural concerns. Then, the height and weight of students were measured to obtain body mass index (BMI). From among the completed questionnaires, 444 questionnaires were qualified to be included in the study and were analyzed. For data analysis, Pearson and Spearman correlation tests, chi-square, independent *t*-test and covariance analysis were used.

## RESULTS

The present study aimed to investigate the relationship between computer games and quality of life of adolescents aged 12-15 years old in city of Borkhar in 2011. The age mean of participants was 13.33 years with the standard deviation of 1.1. From among 444 participants of the study, 215 (48.4%) people were girls and 229(51.6%) were boys.

55.3% of girls and 76.9% of boys played computer games. The results of Chi-square tests revealed a significant relationship between gender and playing computer games ( $P < 0.001$ ). 291 (65.5%) of the participants had computers at home. The majority of studied population (46.6%) reported the level of their family income as average and most of them (32.2%) reported the level of family facilities as average, too. The results of Spearman correlation test revealed a significant direct relationship between income, facility level, quality of life and its four domains ( $P < 0.001$ ).

The results of BMI showed that 304 students (68.5%) were in the normal range (below the fifth percentile rank, thin). Also, the results demonstrated no significant relationship between BMI, type of computer games and duration of playing per day. The majority of participants (66.4%) stated that they spent their leisure time playing computer games. The mean age of starting to play computer games was 9.85 with the standard deviation of 2.03 years ( $9.42 \pm 2.1$  and  $8.86 \pm 2.0$  years in girls and boys, respectively). The independent *t*-test revealed that there was a significant relationship between the starting age and gender ( $P < 0.02$ ). The average hours spent on playing computer games was 1.84 with the standard deviation of 1.36 h per day. The results of Pearson correlation test indicated a direct relationship between the number of playing hours and the variables of overall quality of life ( $P = 0.01$ ,  $r = 0.11$ ), domains of social relations ( $P = 0.07$ ,  $r = 0.12$ ), mental health ( $P = 0.01$ ,  $r = 0.11$ ) and environmental health ( $P = 0.005$ ,  $r = 0.13$ ).

Aggressive games ranked first among the studied people (61.9%). The majority of students in this study (38.9%) evaluated their current life status as good and also 38.9% were satisfied with their current health status. Table 1 shows the mean and standard deviation of the overall quality of life score and its four domains and playing or not playing computer games. As shown in the table, the mean of overall quality of life score in the first group (those who played computer games) was  $68.27 \pm 13.03$  and the mean of the second group (those who did not play computer games) was  $64.81 \pm 13.69$ .

The means of physical health, social relations, mental health and environmental health in two groups are mentioned in Table 1. The results of independent *t*-test showed a significant relationship between the mean of overall quality of life score

( $P < 0.05$ ,  $t$ -test = 2.59), mental health domain ( $P = 0.02$ ,  $t$ -test = 2.27) and environmental health domain ( $P < 0.05$ ,  $t$ -test = 3.28) in two groups of the students who played computer games and those who did not play. However, the mean of social relation domain and physical health domain showed no significant difference between the students who played and those who did not play computer games. It should be mentioned that those who did not play games gained a lower score in physical health domain, but the difference of their scores with those of students who did not play was not significant. By controlling the economy status index (income, facilities, and father's job), no significant relationship was found between playing computer games and overall quality of life score and its four domains.

The lowest mean of overall quality of life score was among those who played mind games and the highest score was related to those who played action games. The means of other domains (physical health, social relations, mental health and environmental health) are given in Table 2. The ANOVA test revealed no significant relationship between type of computer games and overall quality of life score and its four domains. However, those who played action games gained higher overall quality of life, physical health, social relations and environmental health scores. Table 3 shows the relationship between the starting age of playing computer games and the overall quality of life score and its four domains. The Pearson correlation test revealed a significant reverse relationship between the starting age and the overall quality of life score and its four domains. Moreover, according to this test, there was a significant relationship between overall quality of life score and quality of life status and health status ( $P < 0.001$ ).

## DISCUSSION

It is important to identify the relationship between playing computer games and quality of life and the extent to which these games affect the life of adolescents. Accordingly, some educational programs can be designed for this group and their parents in order to take a step in improving their quality of life.

The results of this study clearly showed that boys play computer games more than girls. This finding was in line with that of Marny and Gentile and Amini et al.<sup>[10,13]</sup> It can be said

**Table 1: Mean of overall quality of life score and its four domains and playing computer games**

Domains	Playing computer games	Mean	Standard deviation	t-test		p (controlling economic status index*)
				t	P	
Overall quality of life score	Yes	68.27	13.03	2.59	0.01	0.96
	No	64.81	13.69			
Physical health score	Yes	72.32	14.12	0.56	0.57	0.19
	No	71.50	15.01			
Social relations score	Yes	65.29	24.23	1.74	0.08	0.71
	No	61.07	23.90			
Mental health score	Yes	64.37	16.08	2.27	0.02	0.68
	No	60.76	15.33			
Environmental health score	Yes	68.41	15.78	3.28	0.001	0.48

\*Economic status index included father's education, family income and facilities

**Table 2: The mean of overall quality of life score and its four domains in terms of the type of computer**

Domains		Mean	Standard deviation	ANOVA	
				F	P
Overall quality of life score	Mind games	65.51	18.60	0.68	0.50
	Entertaining	67.47	13.17		
	Action	68.96	12.57		
Physical health score	Mind games	63.96	22.61	2.36	0.09
	Entertaining	71.88	13.79		
	Action	73.23	13.60		
Social relations score	Mind games	57.95	23.89	0.89	0.40
	Entertaining	63.98	24.89		
	Action	66.55	23.86		
Mental health score	Mind games	68.18	18.47	0.59	0.55
	Entertaining	63.24	16.42		
	Action	64.72	15.86		
Environmental health score	Mind games	66.76	22.41	0.30	0.73
	Entertaining	67.66	16.33		
	Action	69	14.94		

that the reason for higher tendency of boys toward computer games in comparison with girls is in the skills required for playing computer games and different feedbacks of the two genders to these games.

Other results of this investigation showed that boys were more interested in aggressive games than girls, which was in parallel with the results of some other studies.<sup>[26,27]</sup>

In this study, 65.5% of students had computers at home while in the study by Doran *et al.*, 81.8% had computers.<sup>[22]</sup> This difference can be due to the differences in economic status in the two studied samples.

The findings showed that the prevalence of playing computer games was 66.4% in students while in Amini *et al.*, it was 53.4%<sup>[10]</sup> and, in another study, it was 45.7%.<sup>[22]</sup> This difference can be attributed to the growth of playing computer games and increase of their accessibility in the recent years.

In the present study, mean of overall quality of life score was  $67.11 \pm 13.34$ , in which the highest score belonged to the physical health domain ( $72.04 \pm 14.4$ ). There was a significant difference between the overall quality of life score in those who played computer games with those who did not ( $P=0.01$ ). The mean of mental health and environmental health scores in those who played computer games were significantly higher than those who did not play games. It should be noted that, after controlling the confounding variables, no significant relationship was found between these variables. In physical health domain and social relations domain, there was no significant difference between the two groups; in fact, those who played computer games had more physical health. The results of Mohtasham *et al.*'s study<sup>[28]</sup> was in line with those of ours, but Najmi *et al.*<sup>[29]</sup> found different results and indicated a significant difference between the variables of the two groups.

**Table 3: Correlation coefficients of starting age for playing computer games with overall quality of life score and its four domains**

Domains	Game starting age	Pearson coefficient	
		r	l
Overall quality of life score		-0.18	0.001
Physical health score		-0.14	0.01
Social relations score		-0.13	0.02
Mental health score		-0.15	0.01
Environmental health score		-0.15	0.007

In this study, there was a significant direct relationship between the hours spent on playing per day and the score of social relations ( $P=0.007$ ) while the results of the study by Doran *et al.*, showed a reverse relationship between the experience of playing computer games and social relations.<sup>[22]</sup> Of course, different studies have reported different results. For example, a study shows that playing computer games has no effect on social skills which is not in line with the findings of this study.<sup>[21]</sup> In some other studies, playing computer games has been known to have positive influence on social skills.<sup>[28-30]</sup> They have reported that those who play more do not necessarily face reduction in social relations with others and they seem to have proper and reasonable relations with others.

Also, in this study, there was a significant direct relationship between the hours spent on playing per day and mental health ( $P=0.01$ ) while the results of Allahverdipoor *et al.*'s study showed that the students who spend more than 5 h on playing had less mental health.<sup>[15]</sup> These differences in the results can be explained this way that those who spend some hours of day on computer games are successful in their social relations. Since the role of social relations in mental health is clear for the experts, these people will gain a higher score in mental health. The reason for this is their more interaction with others since they compete with their friends in having newer games. In this study, there was a significant reverse relationship between the starting age and mental health but in Allahverdipoor *et al.*'s study, those who started playing computer games at early ages had less mental health.<sup>[14]</sup> Starting to play games at early ages can be due to the family's good financial status which affects their quality of life. It should be noted that, in this study, with the control in the level of income and facilities, this relationship was not significant.

In the present study, those who played action games had a higher overall quality of life score and environmental health score. Those who played mind games gained higher mental score and those who did not play at all had lower physical health score.

It is deduced from the results of this study that playing computer games for a short time not only does not affect the adolescents' life negatively but also has some positive effects

if parental control over type of games and duration of playing is present.

This study was the result of a M.Sc. thesis entitled “Studying the Relationship between Computer Games and Quality of life of Adolescents Aged 12-15 Years Old in City of Borkhar” which was among the first studies about the effect of computer games on quality of life. In previous researches, the effectiveness of one domain of quality of life on other domains was investigated; however, this study examined the four domains together and along with overall quality of life score. This study indicated the field for doing intervention in other studies. It focused on the age group of 12-15 years old. It is recommended that further studies be done on other age groups, among children and adolescents. The results of this study were based on a self-report tool and future studies can be based on more accurate methods of study. The present study was a cross-sectional one, so others can conduct longitudinal studies.

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