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Effect of Addiction to Computer Games on Physical and Mental Health of Female and Male Students of Guidance School in City of IsfahanEshrat Zamani PhD^{*}, Maliheh Chashmi MSc^{**},
Nasim Hedayati DDS^{***}^{*} Assistant Professor, School of Education, University of Isfahan, Isfahan, Iran.^{**} School of Education, University of Isfahan, Isfahan, Iran.^{***} Dentist, Kerman University of Medical Sciences, Kerman, Iran.**Abstract****Background:**

This study aimed to investigate the effects of addiction to computer games on physical and mental health of students.

Methods:

The study population includes all students in the second year of public guidance schools in the city of Isfahan in the educational year of 2009-2010. The sample size includes 564 students selected by multiple steps stratified sampling. Dependent variables include general health in dimensions of physical health, anxiety and sleeplessness and impaired social functioning. Data were collected using General Health Questionnaire (GHQ-28) scale and a questionnaire on addiction to computer games. Pearson's correlation coefficient and structural model were used for data analysis.

Findings:

There was a significant positive correlation between students' computer games addiction and their physical and mental health in dimensions of physical health, anxiety and sleeplessness. There was a significant negative relationship between addictions to computer games and impaired social functioning.

Conclusion:

The results of this study are in agreement with the findings of other studies around the world. As the results show, addiction to computer games affects various dimensions of health and increases physical problems, anxiety and depression, while decreases social functioning disorder.

Key words:**Addiction to computer games, Physical and mental health, Students of guidance school.****Page count:**

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Introduction

Computer games are the most popular entertainments in modern societies and they target a variety of people in different ages. The addiction to the rivalry and excitements of the games make them the most common recreational programs for today's teenagers, so that they do anything to reach a higher level of the game, they immerse in the game so much that they completely separate from their surroundings. Challenging with the obstacles and reaching a higher level in the game, make the players excited and losing the game make them anxious.¹

Computer games started in 1972 with Pang, a computer tennis game, and then developed in hardware and software systems. Improvement of quality and variety of games increasingly spread it in the society especially adolescences.² It is believed that computer games like watching TV provides opportunities for visual learning. Especially because these games are more active compared to watching TV, they are considered more effective.³ Since these games are known as the second entertainment after TV, opponents of these games emphasize on their negative effects such as stimulating anger and violence, costing a lot of money and having negative effects of physical and mental health, which are much higher than the positive effects of the games such as increasing the coordination of eyes and hands.⁴ As Klein and Keepers mentioned in their research reports in 1990, students who prefer computer games to other entertainments have more behavioral problems than other students (cited from Patton).⁵

Currently in Iran, a great part of students' leisure time out of school is spent on computer games.⁶ The reasons for adolescents' attraction to these games include being excited and easily accessible while authorities and families do not have any proper plan for students' leisure time and there is not many options for their entertainments. Playing computer games to some extent can be useful, but long-term playing leads to various physical and mental complications.⁷ Long term involvement with these games means the players long term tension, restlessness and worrisome and during the game, physical tensions and real physical stimulations are experiences. By sympathetic nervous system stimulation, this can gradually make this system sensitive and ready for response to limited stimulants, while causes anxiety symptoms in the player. A study by Sherry et al (2001) investigat-

ing the reasons for playing video and computer games by adolescents and their game priorities on 535 adolescents in age 15-20 in the West USA found that 68% of adolescents had these games as their weekly entertainment. The reasons for playing these games among boys were excitements and challenges and they insisted to win. Moreover, sport and violent games were more attractive for boys.⁸

Development of electronic and computer games are a great threat for youth and adolescents and can lead to psychological disorders and depression in these groups. In previous times, kids were involved playing with other children, but children of today spend most of their time on computer games as soon as they understand and acquainted with them, while these games cannot create any emotional and human relationship.⁹

Children's and adolescents attractions to the computer games cause many mental, physical and social problems for them. These effects are stimulating anger and violence, obesity, epilepsy due to games, social isolation, and other physical and mental damages. Many psychologists and mental health professionals have paid attention to the effects of these games.¹⁰

The increasing prevalence of computer games among children and adolescents have made many researchers to determine the effects of these games on players. In Iran, there are few and limited studies on the effects of addiction to computer games on players. Considering the increasing rate of addiction to computer games among Iranian adolescents and youth, the present study was conducted to investigate the effects of addiction to computer games on physical and mental health including physical health, anxiety, and depression and impaired social functioning.

Methods

The aim of this descriptive correlation study was to determine the effects of computer games addiction on physical and mental health of male and female students of guidance schools in Isfahan city.

The study population includes all students in the second year of public guidance schools in Isfahan city in the educational year of 2009-2010. The sample size includes 564 students selected by multiple steps stratified sampling method. Data were collected by using General Health

Table 1. Correlation coefficient between addiction to computer games and health dimensions

Correlation coefficient	Addiction to computer games		
	R	p	N
Variables			
Physical complains	0.198	0.001	487
Anxiety symptoms	0.348	0.001	484
Social dysfunction	-0.104	0.02	478
Depression symptoms	0.250	0.001	488
Total	0.316	0.001	446

Questionnaire (GHQ-28) scale and a questionnaire on addiction to computer games. To do this research, at first 3 districts (2-4) were selected randomly among five districts of Isfahan Board of Education. From each district, one boy and one girl guidance school was chosen randomly. In total, 600 students were chosen for filling the questionnaires, after obtaining the permission from Isfahan Board of Education. The questionnaires distributed among sample. 564 students filled the questionnaires and returned to the researcher.

The data collection instrument was included the form of GHQ-28 inventory of physical and psychological health measurement. Another tool was Antwan's (2008) questionnaire for addiction to computer. The Cranbach's alpha was reported 0.92 by this researcher,¹¹ since the validity and reliability of this questionnaire was not assessed for Iran; 30 students were selected as sample for a pilot study and after data analysis, and the reliability was measured 0.76. This questionnaire was based on Lickert scale and scored from 1 to 5. 1 was for very little and 5 score was considered for very much.

The GHQ 28 inventory is created by Goldberg (1972) for diagnosing psychological disorders in various centers and environments. The questions are about the psychological condition in past month, including signs such as thought, abnormal emotions and dimensions of behavior that are observable. Therefore, questions emphasize on the situation (here and now). This questionnaire is the most known instrument for

screening in psychiatry, and has a significant effect on developing researches. This questionnaire is in forms of 30, 60, 12 and 28 questions.¹¹

The GHQ-28 which is used in this study was standardized by Palahang¹² (2005) and Yaqubi (2005)¹³ in Iran. This questionnaire was used to assess health signs including physical complain, sleep disorder, disorder of social functioning and depression.

Results

The study population included 564 students including 263 girls (46.6%) and 301 boys (53.4%). These 564 students were divided into two groups of 467 students (82.8%) as non-addicts and 97 students who played with computer games with a mean of 3 or higher (17.2%). The mean age of participants was 13 years old.

Based on the findings presented in table 1, correlation between addiction to computer games and physical complains, anxiety and sleep disorder, disorder in social functioning and depression were significant in level $P \leq 0.05$. Therefore, there was a direct relationship between addiction to computer games and physical disorders such as anxiety, sleep disorder and depression. But, there was a positive correlation between addiction to computer games and social dysfunction. In other words, based on coefficient of determination, 4% variance of addiction to computer games is common with physical disorder, 12% with anxiety and sleep disorder, 1% with disorder of social functioning and 6% with depression.

Table 2. Correlation coefficient between addiction to computer games and health dimensions in male students

Correlation coefficient	Addiction to computer games		
	R	p	N
Variables			
Physical complains	0.226	0.001	266
Anxiety symptoms	0.440	0.001	262
Social dysfunction	-0.142	0.23	259
Depression symptoms	0.331	0.001	266
Total	0.372	0.001	244

Table 3. Correlation coefficient between addiction to computer games and health dimensions of female students

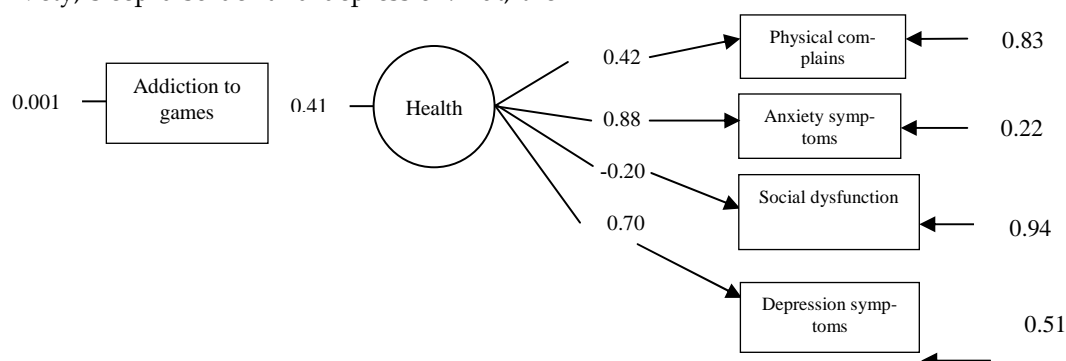
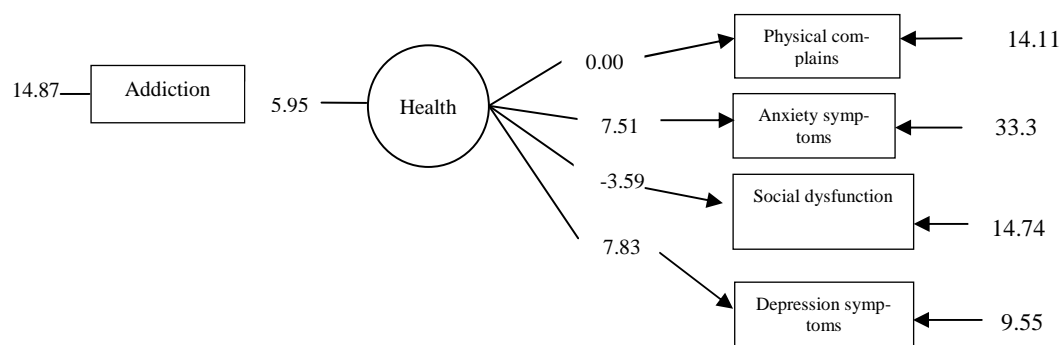
Variables	addiction to computer games		
	R	p	N
physical	0.181	0.007	221
Anxiety symptoms	0.355	0.001	484
social dysfunction	-0.097	0.02	219
Depression symptoms	0.241	0.001	222
Total	0.318	0.001	202

Table 4. Relation between addiction to computer games and health dimensions

Relation between variables	Standard coefficient	Standard error	T	Test results
Physical complains and health	0.42			
Anxiety symptoms and health	0.88	0.82	7.51	+
Social dysfunction	0.20	0.36	3.59	+
Depression symptoms	0.70	0.5	7.83	+
Health and addiction to computer games	0.38	0.41	5.95	+

Based on the findings presented in table 2, correlation between addiction to computer games and physical complains, anxiety and sleep disorder, social dysfunction and depression were significant in level $P \leq 0.05$. Therefore, there was a direct relationship between addiction to computer games and physical disorder, anxiety, sleep disorder and depression. But, the

relationship between addiction to computer games and social dysfunction is reverse. In other words, based on coefficient of determination, 5% variance of addiction to computer games is common with physical disorder, 19% with anxiety and sleep disorder, 2% with disorder of social functioning and 10% with depression.

**Figure 1.** Standard coefficient of path analysis for relationship between health components and addiction to computer games**Figure 2.** T-chart of path analysis of relationship between health components and addiction to computer games

Based on the findings presented in table 3, correlation between addiction to computer games and physical complains, anxiety and sleep disorder, social dysfunction and depression were significant in level $P \leq 0.05$. Therefore, there was a direct relationship between addiction to computer games and physical disorder, anxiety, sleep disorder and depression. But, the relationship between addiction to computer games and disorder of social functioning is reverse. In other words, based on coefficient of determination, 3% variance of addiction to computer games is common with physical disorder, 12% with anxiety and sleep disorder, 0.9% with social dysfunction and 5% with depression.

The results in the table 4 show that all relationships between variables 2×2 are significant. The effects of health with addiction to games is 0.38 which is significant in level 0.99 and shows the positive effects of addiction to games on general health of students.

Based on the results presented in table 5, all indices show the suitability of the model.

Table 5. Suitability indices of variables

Table 5. Suitability indices	Estimation
Goodness of fit index (GFI)	0.99
Adjusted Goodness-of-Fit Index (AGFI)	0.97
Root mean square deviation (RMSD)	0.054
Chi Square	11.35
Degree of Freedom	5
Level of significance	0.044

Figure 1 and figure 2 show standard coefficient of path analysis and t-chart of path analysis of relationship of health components and addiction to computer games respectively.

Discussion

The results of this study showed that there is a direct relationship between physical health, anxiety and depression with computer games addiction. However, the relationship of addiction to computer games and social dysfunction was significance and inverse. In 1990, Yuma et al conducted an intensive study in 9 cities of Japan about the computer games played by children and adolescents and its relationship with their physical health. The results showed that obese students were more attracted to computer games. In other words, playing more computer games cause adolescents to stay home, which lead to their lack of activity and getting fat. This is considered as a biological problem.¹⁴ In psychological dimension, it seems that computer

games have a negative relationship with mental health of adolescents and have a direct effect on their violent behavior, anxiety, depression and isolation of those adolescents who play these games. The effects of computer games on psychological health of people and severity and significance of that depends on factors such as level and intensity of violence in the game, the ability of player in differentiating virtual world and real world, player's ability to inhibit their desires and motivation, the values they are brought up with or living with and also values that are in the context and content of the games.¹⁵ Anxiety was one of possible outcomes of computer games, which is studies by researchers. Studies showed that computer games increases players' heart beats to a level more than their body request.¹⁶ In the present study also, we found a direct significant relationship between addiction to computer games and anxiety.

Payne et al (2000) studied the role of computer games on social isolation, low self-esteem and violence. The results showed no relationship between playing computer games and self-esteem in girls, but there was a negative relationship between the two in boys. Also, the scores of violence had a positive correlation with amount of exposure to computer games. Other results showed that in spite of children's attraction to games, there was no evidence that computer games cause social isolation.¹⁷ Since in computer games, players conform to the characters in the game, in creating the new situations that occur in the game, the theory of participatory modeling and active conditioning can be used in explaining data on violent behaviors and possible rewards they get in response.¹⁸

Azad Fallah et al (2001) in their study investigated the relationship between games and social skills of 258 male students of first grade of high school. The results showed a significant relationship between the game-type and presence of others in the game location with social skills of adolescents. Selecting home as the place of game had a significance negative relationship with social skills and those adolescents who were mostly playing at home, had less social skill (cited from Doran).⁷ However, in the present study, there was an inverse relationship between addiction to computer games and social dysfunction. It means that as the addiction to computer games increases, social dysfunction will decrease.

Ahmadi (1998) studied the effects of computer games on adolescents of the city of Isfahan. The aim of his study was to find out if computer games have social effects. The results showed that violence and aggression in students who played these games was higher than those who did not play. Also, social participation of students who were playing computer games was low.¹⁰

The first factor noticed in most studies as well as the present study is the disorder in general health of players. Various studies show that playing too much computer games causes physical damages and increases anxiety and depression in players. Many studies show that most adolescents who are addicted to computer games have high heart beat and blood pressure due to too much excitement and stress. Most of those who involve in these games do not notice the time passing and even forget to eat. It seems that creating a cause and effect relationship between computer games and physical health or more generally speaking, cause and effect relationship between addiction to computer games and mental and physical health is simplification of the subject. There are various causes for correlation between addiction to computer games and physical health, anxiety and depression. First, addiction to computer games can cause disorder in physical health, increase anxiety and depression. Second, it is possible that disorder in physical and mental health cause people to get attracted to computer games. Third way is that both addiction to computer games and disorder in physical and mental health are created due to the effects of other factors.

Considering associations between playing computer games and physical and mental disorders, the negative effects of these games are basically related to the games and their nature. Therefore, some computer games can be constructive, while others can have damaging effects on children's body and mind. Therefore, we should accept anyway that computer games like many other phenomenon of technology age have found their way to our children's and our lives.

If we want to ignore them and deprive our children playing them, we make them more eager to access them and if they cannot play games at home, they will go to their friends, if they cannot play there, they will go to Internet cafe and places they can find computer games.

On the other hand, if we want to leave our children on their own in this field, mental, psychological and physical risks threat them. So, parents and authorities in cultural and educational fields should have appropriate plans to provide proper involvement of children in these games and in this regards, we should produce games which are based on our culture. Moreover, it is important to prevent import of damaging and harmful games to the country, which is a responsibility of authorities. Also, serious supervision on children's involvement with computer is needed at home; especially their involvement with computer games and parents should teach their children the proper culture of playing games. In fact, one of main worries about computer games, considering their wide usage among adolescents is that these games may create a more attractive environment compared to school works and interfere with school and educational performance of children. It is obvious that if children spend all their time out of school to computer games and neglects other activities which may be useful from the social viewpoint or for their thinking, it will not be favorable. In addition, the newness of this phenomenon demands lots of curiosities and researches. Investigating the negative effects of computer games on educational achievement is recommended for further studies.

In spite of more than 20 years studies on computer and video games and their outcomes and effects in the world, in Iran where a great portion of population is youth and adolescents and there is a significant prevalence of computer games, there are few studies on this topic, which suggest the need for further studies.

Conflict of interest: The Authors have no conflict of interest.

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