Original Article

The effect of video games on teenagers' behavior and performance: A cross-sectional study in Tehran

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Abstract

Background: The novelty of the present study was to interpret the relation of the videogame usage in teenagers' behaviors and their performance in schools and distinctive environments.

Methods: A total of 508 male and female teenage students were randomly selected from secondary schools of Tehran, the Capital of Iran. The designed questionnaire was completed by student's parents at the end of school year. School performance and students' behavior and pattern of using videogames were asked. Descriptive statistics, Contingency coefficient and chi-squared tests were used for data analysis.

Results: According to the results, almost all the teenagers were interested in video games and 76.8% of students played video games once in a while. Female students whose mothers were older used video games more often than teenagers whose mothers were younger. Also, male students, whose mothers were housewives and had handheld devices in their rooms, were observed to spend more time playing games. The male students who spent more time playing video games showed more aggression than the others. In addition, female students who played video games quite often, showed abnormal behavior and strange mental status. Both genders showed high percentage of shouting and overeating, when they spent more time playing video games.

Conclusion: Playing videogames has a significant effect on teenagers' behaviors but not on their school performance. Social determinants of health also have significant effect on playing videogames.

Keywords: Adolescent; Educational Status; Students; Video Games

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Introduction

The gigantic video games companies have been growing quite fast in the recent years. They have many personnel who are employed to design innovative games, which attract the attention of teenagers. These companies have raised a red flag for parents and school decision makers, because of the public health hazards they have caused. In addition, they have raised public concern since video games have attraction for many people (1). In 1972 the first video game was made. It was a tennis game, which was a popular computer game at the time. Teenagers started having appetite for new software and hardware as time passed by (2). The video game companies have begun to target children and adolescents in the recent years. These companies spend remarkable time and afford to design attractive video games to draw people to spend a tremendous amount of time for reaching the final levels in the games.

There are many reasons that teenagers get attracted toward video games; the most influential ones are the addition of new communication technologies; and astonishing features and vocals, which are both amusing and fun. Unfortunately, these programs have made, students spend their leisure time playing games instead of studying, and the outcome would be lower grades and not outstanding school performance (3). Video game usage starts approximately from the age of 7 through 12, with 12 as the peak time for video game tendency (4). On the other hand, video game customers demonstrate high level of visual-spatial skills and attention in different stages of their lives. In contrast, there are reports that some video games can be useful for the treatment of many mental disorders, such as, Attention Deficit Disorder (ADD). Researchers have showed that, children who use video games are more socially active; for example, these groups have more activities among peers and family members. Even though, there are different points of view among scientists to claim if the over use of video game could be a permanent clinical disorder. However, more evidence is needed to show the possible negative impacts (5). In many cases, we have seen positive effects of video games; for example, the disabled people who played educational video games showed fewer symptoms of behavioral problems, challenges, and intrapersonal aggression. According to the recent studies in the United States and other countries, there are reports that approximately 8-14% of video game users have depicted pathological signs; however, there is no evidence to clarify these pathological signs worsen aggressive behaviors in the long term (6). Violent games, in contrast, may influence these people in how to express their conflicts in aggressive ways, instead of finding an acceptable way to solve problems (7). The use of video games would be considered pathological when users lose their normal function, social, psychological, and professional performances in school and society. According to the investigations in the United States, 8.5% video game users have been categorized in pathological groups by the psychological analysis (8).

The use of video games has been increasing all around the world. Because of this drastic change in teenager's culture, the current study has its novelty. In addition, the studies which have been done in the past were not sufficient enough to reflect the impact of video games on the behavior and school performance. The aim of the present study was to assess the relationship between using video games and school performance among students aged 12 to 14 using a school based cross sectional study. We focused on the responds of the two genders.

Methods

Participants

This cross sectional study was performed in the Center of Tehran, the capital of Iran. The majority of the population came from

middle socioeconomic class. The selected sample included 393 male and 395 female students. The age groups for male students included the following: the first grade 149, the second grade 137 and the third grade 107 students. The sample groups for female student were as followed: the first grade 146, the second grade 103, and the third grade 146 students.

Data-collection form

In the current study, the data-collecting form was prepared by researchers at Shahid Beheshti University of Medical Sciences, Tehran. The form has precise explanation about how to fill it and provides explanations on the aim of the research. The designed questionnaire was completed by the parents of students in the selected secondary schools. The mothers were the main concern in the present study since they were more involved with their children's performance in school; they also had the desire to fill out the questionnaire more than the fathers had. According to the evidences if the forms were given to the student, there could be a lower chance that students would hand in the forms to their parents. Therefore, the questionnaires were directly given to the parents by the end of school year, when they wanted to get their children transcript.

There were 30 questions in the data collecting form, among them 16 were related to the demographic and basic variables. The questions in the parents section included: fathers' and mothers' age, education, and carrier. The student's section included: student's gender, age, height, weight, number of brothers and sisters, the parental marriage status, educational status, the distance their homes and the school, school performance based on the transcripts, family status and location of their occupation.

The variables related to the use of video games included 6 questions: number of rooms in the house, presence of computer set, TV, play station, or any other handheld devices beside video games; the total time video game was used and the study time in a given day.

The variables related to behavior included 6 questions: student's ability to communicate with his/her parents about his/her problems, student's behavioral and mental status, the effect of video game usage on student's behavioral and mental status, the change in the quantity of student's behavior and self-control due to the games, the effect of video games on day dreaming, changes in eating habits, and their tendency toward violence at home.

Variables related to school performance were the quantities of change in student's scholastic performance due to the time spent on video games from their parents' point of view.

In the current study, parent's participation was completely voluntarily. Questionnaires were anonymous and the parents were assured that their information remain safe and secure. The study was approved by the ethics committee of Shahid Beheshti University of Medical Sciences, Tehran.

Data was analyzed using descriptive statistics, Contingency coefficient, Kendall tau b, and Pearson´s chi-squared tests. Statistical Package for the Social Sciences (SPSS) software version 19.0 was used for data analysis.

Results:

The total response rate was 64.4% (508 out of 788 students). Table 1 shows the means for the age of students and their parents, number of brother(s) and sister(s), the entire grades, and Body Mass Index (BMI). About 80 percent of the parents had a minimum degree of diploma. More than 50% of fathers had non-governmental carriers and most of mothers were housewives. The majority of students (males: 36.3%, females: 19.6%) were the first child of the family. The entire population lived in the city of Tehran (Table 2).

Table 1. Frequency of demographic variables

Name of variable	Total		Boys		Girls		Median	Minimum	Maximum	*P*
	Mean (SD)		Mean	(SD)	Mean (SD)					
Age of student	13.1	(0.7)	13.1	(0.8)	13.0	0.7	13.0	12.0	15.0	**0.5**
Age of father	44.5	(5.4)	44.7	(5.5)	44.1	5.4	44.0	30.0	64.0	**0.2**
Age of mother	39.2	(5.3)	39.4	(5.3)	38.9	5.2	39	23.0	55.0	**0.3**
Count of sisters	0.6	(0.7)	0.5	(0.7)	0.6	0.8	0	0	5	**0.9**
Count of brothers	0.6	(0.6)	0.5	(0.6)	0.7	0.7	1	0	4	**0.01**
Total grades	19.0	(5.5)	19.1	(8.6)	18.8	1.2	18.7	12.0	20.0	**0.008**
B.M.I.	21.7	(4.7)	21.7	(4.4)	21.7	5.2	20.9	13.3	47.1	**0.4**

Table 2. Frequency of parent's demographic variables and family structure

Name of variable	Option	**Total**	**Boys**	**Girls**	
		No. (percentage)	No. (percentage)	No. (percentage)	*P*
Level of father´s education	Primary	24(5%)	9(3%)	15(8.4%)	0.1
	Secondary	90(18.6%)	60(19.7%)	30(16.8%)	
	High school	231(47.9%)	148(48.7%)	83(46.3%)	
	Technician	35(7.2%)	22(7.2%)	13(7.2%)	
	Bachelor	83(17.2%)	49(16.1%)	34(19%)	
	Master degree	16(3.3%)	13(4.3%)	3(1.7%)	
	Doctorate degree	4(0.8%)	3(1%)	1(0.6%)	
Level of mother´ education	Primary	18(3.7%)	9(2.9%)	9(5.2%)	0.07
	Secondary	87(17.5%)	45(14.2%)	42(24.4%)	
	High school	309(62.0%)	207(65.3%)	102(59.3%)	
	Technician	22(4.4%)	16(5.0%)	6(3.4%)	
	Bachelor	56(11.2%)	35(11.0%)	21(12.2%)	
	Master degree	6(1.2%)	5(1.6%)	1(0.5%)	
Father´s job	Governmental	202(42.4%)	120(40%)	82(46.6%)	0.3
	Non-governmental	254(53.4%)	168(56%)	86(48.9%)	
	Without job	20(4.2%)	12(4%)	8(4.5%)	
Mother´s job	Governmental	65(13.3%)	41(13.1%)	24(13.6%)	0.4
	Non-governmental	18(3.7%)	9(2.9%)	9(5.1%)	
	Housewife	406(83%)	263(84%)	143(81.3%)	
Family structure	Bi-parental	395(82.1%)	258(82.7%)	137(81.1%)	0.9
	Uni-parental	83(17.3%)	52(16.7%)	31(18.3%)	
	None of them	3(0.6%)	2(0.6%)	1(0.6%)	

The majority of students had their own rooms at home. A large number of them had computer set, television, play station, or other handheld devices beside video games in their personal rooms. Only 0.2% did not use video games and most of them often used games. According to the statistics, the mean for using video games was 2 hours (SD=1.4) among boys and 1.8 hours (SD=1.5) among girls. The minimum and maximum hours of playing were 1.0 and 10.0 respectively. As for the alternation between video games use and study time a large number of students preferred to finish their homework first; on the other words, they preferred to finish their homework first and then played games. The motivations for students to use games were mostly because of enjoyment and amusement (Table 3).

Table 3. Variables related to the use of video games

Name of variable	Option	Total No. (percentage)	Boys No. (percentage)	Girls No. (percentage)	*P*
Possession of personal	Yes	317(62.6%)	201(62.6%)	116(62.7%)	**0.9**
room at home	No	189(37.4%)	120(37.4%)	69(37.3%)	
Presence of computer,	Yes	329(66.5%)	209(66.3%)	120(66.7%)	**0.9**
TV set, etc	No	166(33.5)	106(33.7%)	60(33.3%)	
Frequency of the use	Always	27(5.3%)	18(5.6%)	9(4.9%)	**0.3**
of video games	Often	90(17.8%)	63(19.5%)	27(14.7%)	
	Sometimes	390(76.9%)	242(74.9%)	148(80.4%)	
Alternation between	Always first doing homework	217(44.7%)	132(42.6%)	85(48.3%)	**0.1**
the use of video games	Often first doing homework	163(33.5%)	101(32.6%)	62(35.2%)	
and doing homework	Always first using games	39(8.0%)	26(8.4%)	13(7.4%)	
	Often first using games	67(13.8%)	51(16.4%)	16(9.1%)	
Motivation to use	Enjoyment & recreation	345(71.7%)	223(71.9%)	122(71.3%)	**0.4**
video games	Child´s being entertained to use video games due to parents´ lack of time	22(4.6%)	12(3.9%)	10(5.8%)	
	Compensation for lack of good emotional status in the family	11(2.3%)	5(1.6%)	6(3.5%)	
	friends´ stimulation	10(2.1%)	8(2.6%)	2(1.2%)	
	Overcoming personal stressful, emotional, etc. problems	7(1.5%)	4(1.3%)	3(1.8%)	
	Others	86(17.8)	58(18.7)	28(16.4)	

According to the analysis, 63.6% of the students had good communication skills and talked about their problems with their parents. The behavior and mental status of most of the students were in normal range. Two percent of parents agreed that video games had affected the behavior and mental status of their children in negative ways; a total of 16.3% (13.3% male and 3.0% female) believed that problems and behavioral changes appeared due to the use of video games in their homes and 8.2% of parents also mentioned that the children's behavior became too violent and they lost the ability to control their children's behavior. More than half of the students were day dreaming under the influence of video games, but few of them used to overate, shout loud or both while playing. According to the findings, the students' scholastic performance was affected by video games; 15.3% of parents contended that their children's scholastic performance decreased because of video games (Table 4). There was a close relationship between mother's age and the time that female students spent playing games. On the other hand, the older the mothers, the higher the amount of time children spent playing games. There was a noticeable correlation between mother's job and the frequency of the usage of video games in male students: The male students, whose mothers were housewives, used less amount of time playing games. Male students, who had TV, play station, or computer in their personal room, used these devices more often than those who did not have these devices. In addition, there was a correlation between the frequency of video game usage and violence in male students. The data revealed that violence and aggression increased in male by spending more time on action games.

Table 4. Variables related to the effects of video games on behavior and school performance

Name of variable	Option	Total	Boys	Girls	*P*
		No. (percentage)	No. (percentage)	No. (percentage)	
Student´s ability to talk to his/her parents about his/her problems	Very much or much	323(65.5%)	216(68.8%)	107(59.8%)	0.1
	Moderate	136(27.6%)	75(23.9%)	61(34.1%)	
	Little or very little	34(6.9%)	23(8.3%)	11(6.1%)	
Student´s behavioral and mental status	Hyperactive	29(5.9%)	22(7.1%)	7(3.9%)	0.07
	Too happy	149(30.5%)	94(30.3%)	55(30.9%)	
	Normal	310(63.6%)	194(62.6%)	116(65.2%)	
The sum of effect of the use on student´s behavioral & mental status	Very much or much	53(11.2%)	42(13.5%)	11(6.7%)	0.03
	Moderate	127(26.7%)	90(29%)	37(22.6%)	
	Little or very little	240(50.5%)	151(48.5%)	89(54.3%)	
	I do not know	55(11.6%)	28(9.0%)	27(16.4%)	
The quantity of change in student´s behavior due to games	Too violent	11(2.4%)	10(3.3%)	1(0.6%)	0.001
	Moderately violent.	99(21.7%)	78(25.8%)	21(13.5%)	
	Not become violent.	347(75.9%)	214(70.9%)	133(85.9%)	
The quantity of change in student´s self-control due to games	Completely loosed	6(1.3%)	5(1.7%)	1(0.6%)	0.07
	Moderately loosed	69(15.1%)	53(17.6%)	16(10.3%)	
	Without change	381(83.6%)	243(80.7%)	138(89.1%)	
The amount of student´s dreaming due to games	Very much or much	23(4.7%)	15(4.7%)	8(4.6%)	0.01
	Moderate	67(13.8%)	52(16.6%)	15(8.7%)	
	Little or very little	161(33.1%)	113(36%)	48(28%)	
	He/she does not dream.	235(48.4%)	134(42.7%)	101(58.7%)	
Overeating and shouting during using games	Overeating	27(5.6%)	15(4.8%)	12(7%)	0.3
	Shouting	66(13.6%)	48(15.3%)	18(10.5%)	
	Both of them	27(5.6%)	20(6.4%)	7(4.1%)	
	None of them	365(75.2%)	231(73.5%)	134(78.4%)	
The quantity of change in student´s scholastic performance due to games	Better than past.	27(5.9%)	20(6.5%)	7(4.5%)	0.01
	Worse than past.	53(11.5%)	45(14.8%)	8(5.2%)	
	Not changed	380(82.6%)	240(78.7%)	140(90.3%)	

Discussion

Based on the findings of the current study, female student whose mothers were older spent more time using games and male students, whose mothers were housewives, used video games more often. Also, the majority of students could communicate with their parents about the problems and the majority of them were in the normal range from the point of behavioral and mental status.

It is quite important to mention that the present study demonstrated aggression and violence evidences increased in male students by spending more time in playing. Several researches have shown similar outcomes Anderson et al. in Japan, concluded that the over use of violent video games leads to more aggression later in the players' lives. Moreover, they realized young people used video games more than adolescence did (9, 10). According to our data the majority of video game users are in the secondary school. Furthermore, Dill et al. reported the violence in video games had more influence on the behavior compared with violent contents seen on TV (11). Other researches approved similar analysis (12-17). These studies showed that violent video games have an impact on other behavioral habits as well; for example, overeating and shouting rate increased in

male and female students during playing various games.

Moreover, the data obtained in the current study revealed that video games do not have any adverse effect on the school performance and student's grades while, other researchers found the opposite correlations. For example, Sharif et al. realized that using media caused lower performance level for kids in school (18). Hastings et al. found out video games lead to poor scholastic performance in students; furthermore, duration of using and exposure to violence in these games caused aggression and ADD. It is certainly true that males play video games more than females do, but the consequences would be the same in both sexes. The present study was conducted in the recent year in Tehran in order to show the negative and positive effects of playing video games between teenagers (19). Swing's experiment approved this hypothesis and showed that video games caused ADD in children (20). Porter reported, a correlation between the frequency of playing video game and problems such as: aggression, physical quarrel, conflict with teachers, and poor school performance (21). Durak also showed constant use of media increased the risk of psychological, somatic, social, and hyperactivity problems. There is a significant correlation between overuse of media and poor scholastic performance (22). On the other hand, Strasburger showed video games lead to a decrease in aggression and conflicts (23).

In the current survey, the focus was to show the effect of video games, and the changes in behavior and the changes in life style which occurred following using video games among young generations. It is quite important to develop more studies on the impact of video games in different age groups; this way, researchers would be able to have better analysis. For future works, we will determine what kind of games would have more negative effects on teenager's behavior and life style.

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