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Original Article

Effect of Using of Xbox and Kinecte consoles on Cognitive and Weight Changes of Children and Teenager with Autism on Esfahan City

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ABSTRACT

Autism is a developmental disorder that is characterized by abnormal communicative behaviors, along with restricted interests and repetitive behaviors. Symptoms of this disorder appear before the age of three and its main reason has not been known yet. Prevalence of this disorder is triple among men compare to women, it has a long course, and poor prognosis. This study aims to investigate the impact of Xbox and Kinect game consoles on weight changes and cognitive changes in autistic children. It was a semi-experimental research and was done with pre-test and post-test in two experimental and control groups. Subjects included 30 autistic children chosen randomly and by convenience sampling. Tools for data collection were measurement scales and CPT test. In order to analyze the data, the Wilcoxon test and analysis of covariance and t-test were used. The results showed that the Xbox and Kinect game console effect on weight loss and increased attention of autistic children. Xbox and Kinect game consoles effect on reducing the reaction time of autistic children.

Keywords: Computer games, Cognitive changes, Weight changes, Autism.

Introduction

Retardation or autism is a developmental disorder associated with abnormal behavior such as verbal communication is characterized by repetitive behaviors and limited interests. Autism characteristic is a severe and fundamental limitation in several areas: Interaction, communication and social interaction and lack the ability to take advantage of the imagination (Saeidi, 1385).

These patients except in special cases, such as normal individuals who don't have the power to control weight also drugs used for the treatment of these patients can cause side effects such as the weight gain is time. Children who suffer from this

disease in adulthood because of their weight gain will be stricken by obesity-related diseases such as diabetes, hypertension, high cholesterol etc. Weight loss in these patients in childhood is much easier than during adulthood because of increased fat mass and lack of activity weight loss in these patients seems to be impossible (Meto, 2010).

Xbox and Kinect, is a type of computer entertainment which in terms of content has an impact on intelligence and behavior of children and adolescents. Computer games in an unrealistic space have same structure as virtual space. In these games, users enter as real actors in cyberspace. In these virtual space a variety of roles and rules that are mainly based on real space are simulated (Jesse, 2011).

Changing conditions, incorporating the various changes in the environment of these games have increase teens, and children's tend to play more these games, more than thirty years, researchers have investigated the use of computer technology and virtual environments are increasingly effective in treating autism and patients with autism often interact with the computer and use it for creative and exploratory behaviors and intentions. Computer use in the treatment of autistic patients compared to traditional methods of teaching one to one and group advantages like learning easier; reduce distraction and use of visual ability in training (Tanka and Kouynj, 2010).

The use of computers in teaching people with autism can enhance their social and emotional skills. In fact, they showed that the use of computers in autistic patients compared to traditional methods of teaching one to one and group advantages like learning easier; reduce distraction and use of visual ability in training compared to traditional methods of teaching one to one and group has more advantages like learning easier; reduce distraction and use of visual ability in training and also these games take child's attention to the environment and many repetitions of the same factors can be generalized to the environment and to improve children's attention (Romdoos *et al*., 2012).

Weigh-enhancing drugs, including antipsychotics such as risperidone, etc in these children and Wrong food habits of autistic children (Evans *et al*., 2011) discussed capabilities of the Xbox and Kinect game console for weight loss (due to too many users' activity of the console during game play) and a lot of children's cognitive changes and too much interest among children such as Autistic Children (song researchers have investigated this issue in advance) further scientific study for the use of these devices, is needed.

Given the pressing need to teach autistic children in this study we intend to improve these children's cognitive changes by using computer games and we resolve their educational needs through the game and by use of these computer games help autistic patients to lose weight through exercise.

Methodology

According to the research topic Xbox and Kinect game console effect on weight and cognitive changes of autistic children and adolescents in Isfahan, the method is quasi-experimental study using pre-and post-test in experimental and control groups, The population of the study consisted of Isfahan autistic children, both girls and boys enrolled at three centers in the city and are known nearly 100 people, among them the sample is selected. To select a sample of 30 autistic children, boys and girls randomly and equally divided into control and experimental groups. Subjects in this study were randomly selected from three autism

center. It should be noted that the number of autistic children in Isfahan is nearly 100 students, 30 girls and boys less than 18 years, randomly selected available samples.

Measuring Tools and Instruments

Balance

A precise digital scale was used to measure the weight changes before and after intervention.

CPT test

This test is reliable tool for objective measuring reaction time and attention in children with autism and attention deficit - hyperactivity. Today these tools are one of the most widely used instruments for measuring direct attention and reaction time in this disorder has become a test before and after the sample is taken. In order to objectively assess of attention, impulsivity and speed of reaction conser `s continuous performance test were taken from cognitive science research center. The main method is to target stimuli is displayed randomly among the different stimuli on the screen and the subject is taught while appearing to aim to press tuberculation (2 min test).

Variables include the commission error count is a marker for impulsivity and self-examination on the number of responses to non-target stimuli frequency of deletion, which is feature of attention check-in occurs when participant loses the target and reaction time is the time between the presentation of objective and the participant answer. Autistic children's play area was in the autism center's hall located on Sheikh Mofid Avenue. This lasted from 17 khordad to 17 mordad in the year 92. The run time was on odd days and lasted 45 minutes for each child.

Research Variables

Independent variable

Xbox and Kinect console that plays games, children will get to exercise that lasted for each individual three-week session in two months.

Dependent variable

The rate of weight change in autistic children and adolescents

Method or Ways of Data Collection

A - Licensing from the head of the Autism Centre for sampling and testing
B - Visiting Autism centers and choosing statictical population to do the research

The Stages of the Test Implementation

Location of implementation of the test: Both each autistic child has a separate room. The initial registration form and test weight measurements were performed in the cubicle. Next filling out the registration form by carried out the child coach and thus the questions were: types of drug consume – time of consuming - Age - history of diseases.

It was necessary knowing parental consent for children to participate in the test; the arrangements were made with the parents. At this stage, working with participants starts. Both experimental and control group began performing testing of C, P, T as pre-testing, (it is worth mentioning autism patients, prior to the main test; two-week trial test was done with them).

Programs and Practices

After the formation of a randomized into two groups (control and experimental), experimental group in an 8-week training program, participated in three sessions each week. Due to the ability of autistic

children they were selected to play for two games of bowling and the shot on goal in soccer (football). Considering the long game, it was done until onset of fatigue. The training program lasted 8 weeks and after the post-test CPT as the last step in the analysis was the subject company.

According to table 1-1, the average weight of the Autistic Child in the experimental group in pre-test has been 55/54. After completing the game with the Xbox game console and Kinect the average kids weigh in on the post-test, dropped is equal to 54/01. In the control group, the average weight of autistic children has not changed and the average weight of children in the pre-test was 54/49 and the post-test was the 54/51.

Table (1-1) Descriptive statistical related to weight (kg) of Autistic Children and pretest and posttest for control and experimental group

Standard deviation	Mean		Group
10/4	54/49	Pre test	Control group
10/41	54/51	Post test	
10/96	54/55	Pre test	Experimental group
10/30	54/01	Post test	

Table (1-2) Analysis of covariance for weight changes of Autistic Children

Source of changes	Sum squares	ofFreedom degree	Sum squares	oftest F	P-value
y-intercept	2/49	1	2/49	4/582	0/041 .
Pre test effect	2987/80	1	2987/80	/674 5498	0/000
group	2/335	1	2/335	4/298	0/048
Error	14/671	27	0/543		
Total	91317/930	30			
0/995 R^2 =					

According to Table 1-2, the significance level for the effect of group earned 0/048 and is less than 0/05 Therefore it can be concluded that there is a significant difference in the weight of autistic children in the experimental and control groups after adjusting for children's weight before the game. So games of Xbox and Kinect creates a significant difference in weight change is Autistic Children. On other side, according to diagram 4-1 Weight of Children in the experimental group was significantly decreased after playing games of Xbox and Kinect. Also, to investigate the weight comparisons between pre-test and post-test of subjects in the control group and the experimental independent-t test was used. Table 1-3 will examine the differences between pre-test and post-test. It is expected that there will be no significant difference between pre-test and post-test of control group but there will be significant difference between the experimental group pre-test and post-test.

As it can be seen in Table 1-3, in the control group there is no significant difference between pre-test and post-test, because the significance level was calculated as 0/997 is more than0/05 but contrary to expectations, the experimental group also showed significant levels of 0/889 is calculated more than 0/ 05 Therefore it can be concluded that, contrary to weight loss of children is not significant in the post-test.

Table 1-3 independent t-tests to compare weight changes of autistic children in control and experimental groups before and after playing an Xbox and Kinect

Significance level	Freedom degree	test T	Mean	Test step	Group
0/997	28	-0/004	54/49 54/51	Pre test Post test	Control
0/889	28	0/141	54/55 54/01	Pre test Post test	Experimental

Discussion and Conclusion

The overall objective of this study was to investigate the effect of Xbox Kinect game console on weight and cognitive changes in autistic children.

According to the above table for the control group, there is no significant difference between pre-test and post-test, because the significance level is calculated more than 0/05. In the experimental group which Xbox and Kinect Games has been running for them between pre-test and post-test significance level of 0/001 is less than 0/05. So playing games of Xbox and Kinect creates a significant difference in weight change of Autistic Children. Present research can be known as consistent whit studies of (Jo *et al*., 2002), (Karteen *et al*., 2005), (Evans *et al*., 2011), (Bendiny *et al*., 2012). Joe et al also concluded that if obesity continues from childhood into adulthood it causes increase in violence in adulthood. So we suggest that the control of overweight in childhood. Kartyn *et al*.'s conclusion was that autistic children suffer from weight gain, which is due to side effects of drug and lack of exercise. The children interact less with others and avoid participating in athletic activities. Evans and colleagues in other article titled dietary patterns and body mass index in children with autism growing, was prepared in 2001 concluded that children with autism use sugary food more than normal children. And that's why autistic children are overweight special food diet of these children increases their weight. And while because these children they are isolated, less participate in group activities and because of lack of exercise they gain extra weight. Additionally Bendiny et al also found that children with autism have all the same activities at home but autism children's activity outdoors is much lower than children with disabilities. These children have a strong need to move and exercise and this cause the children to be overweight. Over thirty years, researchers have explored the use of computer technology and virtual environments are increasingly effective in treating autism Recipients with autism often have to interact with the computer and called it the creative and exploratory behavior apply (Datnhan, 2004).

Computer gaming is a form of recreation that is effective in terms of content on the intelligence and behavior of children and adolescents. Computer games that are played and the players to do it and take benefit from a computer and keyboard. Computer games in the virtual space and unrealistic space have same structure like real space. In this game users enter cyberspace are as real actors in this virtual space, a variety of roles and rules that are mainly based on realistic simulations of space there. Ability to change the terms, importing a variety of changes to different actions in this kind of space games, teens and children tend to have these games several times.

It is the researcher's interpretation of computer is useful for education programs of Autistic Children at home or at school environment. Computer even in severe autism can provide an ideal environment to improve communication, social development; creativity and playing.

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