

Obese Children: the Effect of Television Production on their Eating Behavior

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Abstract

Objective: Researches have shown that obesity in children can cause many body and mind problems. Watching some TV advertisement and programs that indirectly encourage children eating can cause children overeating and obesity. Despite the importance, little research has been done in this subject. This study is trying to evaluate the effect of TV productions on eating behavior in obese children.

Method: This research was the experimental study with pretest-posttest with control group in statistical population of 40 high school students that selected through simple random sampling. All subjects completed DEBQ-C scale before and after the training. This questionnaire was designed by Van Strien (2007) for the study of eating behavior in children with 7 to 12 years old.

Results: Data analysis and significance analysis of covariance in $p < 0.05$ showed that the TV products have the effect on children's eating behavior and this effect was more on the girls than boys.

Conclusion: Since watching TV advertisement and some TV programs has a positive relationship with eating behavior, it is recommended that TV and education authorities plan to teach appropriate training to parents and children to create a proper act of eating behavior.

Keywords: TV productions, eating behavior, obese children.

Introduction

Nowadays, obesity and overweight have increased in developed and developing countries and cause many problems to the public health. Ogden, Carroll, Kit, and Flegal (2012) reported that the prevalence of overweight among school-age children (6-11 years old) in the US has increased from 7% in 1980 to 18% in 2010. In Iran, Shahgholian (2001) reported that prevalence of obesity among children aged 6-12 is equal to 9.9% (According to Akbari *et al.*, 2006). Obesity can cause several health risks and problems in

childhood and adulthood. Moderate to severe obesity can cause early puberty, respiratory diseases, eating and sleep disorders, insulin resistance, type 2 diabetes, orthopedics and bone problems, cardiovascular diseases, hypertension, and some cancers (Freedman *et al.*, 2007; Kushi *et al.*, 2006). In addition to physical problems, studies have shown that obesity can be followed by adverse psychological consequences. Williams, Wake, Hesketh, mabers & Waters (2005) stated that overweight and obesity in children negatively affect their quality of life. Psychological-social problems include a negative self-image, lower education, limited friends, looking older, decrees in self-esteem, social isolation and depression (Anderson, Cohen, Naumova & Must, 2007). Obese children are often mocked by their peers and this can cause anxiety or depression. Based on the results of researches, obesity is a risk factor for depression (Herva *et.al*, 2006). Yang hayman and *et al* (2003)

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believe that increase in body mass predicts some behavioral problems (Cited by Aliakbari Dehkordi & Mohtashami, Hasanzadeh, Tadriz Tabrizi (2015).

Studies have also shown that childhood obesity is associated with low self-confidence, emotional disorders, anxiety, depression, and behavioral problems (Anderson & et al, 2007; Mamun *et al.*, 2009; Farhat, Iannotti, and Simons-Morton, 2012; Pott, Albayrak, Hinney, Hebebrand, and Pauli-Pott, 2013).

Other researches have been done in Iran on the same issue, including Aliakbari Dehkordi (2015, 2013) & Aliakbari Dehkordi & et al (2015). Aliakbari Dehkordi (2015) showed that behavioral problems have significant difference in overweighting and normal children and this difference was observed in conduct and oppositional defiant problems. Also, Aliakbari Dehkordi (2013) has done other research on Tehran elementary sixth grade female. Participants divided to two groups (70 individuals with overweight and 70 individuals with normal weight) based on Body Mass Index (BMI). The results of research showed that anxiety had significant difference between children with overweight and normal weight.

Therefore obesity has a lot of public health consequences which are appeared as psychological-social and immediate problems in children (Dietz, 2004, Anderson & et al, 2007); since childhood obesity is directly associated with adulthood obesity and obese children grow up to be obese adults (Mulvaney, Kaemingk, Goodwin, Quan, 2006; Cited by Aliakbari Dehkordi, 2013).

Obesity and being overweight is described as a multi factor disease that is influenced by physiological, biochemical, metabolic, anatomic and psychological- social factors. Especially, obesity in childhood can be caused by several factors such as poor eating habits and inappropriate patterns of activity. Bandura (2002) according to observational learning theory, states that individuals learn and use the behavioral patterns by observing the behaviors of others. One factor that has a major impact on the formation of an eating pattern is watching the TV

programs. The role of television and food advertising in social learning has been proven and it is clear that the media has a major role on the way people eat and think about foods (Alipour, 2010). Great attention has been paid to this issue in various countries of the world and several studies have been conducted on the impact of watching TV on weight gain in children. In one of the first studies carried out by Lewis and Hill (1998) on the psychological consequences of overweight and obesity, it was reported that children have a great desire for consuming the foods advertised on TV. Robison (1999) also showed that children who are exposed to a variety of video shows with the commercials have a significantly greater desire for selecting and consuming the advertised foods than children who have watched these video shows without these commercials.

Longitudinal studies also show that watching TV for a long time can bring many adverse effects. A longitudinal study conducted by Jackson *et al.* (2003) revealed that obese children pay more attention to foods items advertised on TV. This fact was also true in the case of overweight children, while children with a normal weight care the advertisements of food and non-food items the same. Obese children pay special attention to food ads compared to non-food ads, showing a significant relationship with the amount of eating foods, especially the advertised ones. In a study which was carried out again by Jackson *et al.* four years later (2008), it was reported the hours of watching TV in adolescents is closely associated with the number of unhealthy foods that they consume. Batada, Seitz, Wootan, Story (2008) reported similar results and stated that there is a significant relationship between hours of watching TV and the likelihood of obesity in adults and children. They also found that, during the three years of their study, those who watched TV for two hours or more a day were generally fatter than others. In another study, Van Strien, Bazelier (2007) studied the eating behaviors of children when watching TV in Sweden and Netherlands in a period of 5 years from 2000 to 2007 and concluded that one of the factors causing obesity in children is the uncontrolled

watching TV and the commercials on TV. Based on the findings of this study, he proposed the theory of eating behavior. In Iran, Seyyed Amini Malek, Moradi, Ebrahimi (2009) came to the conclusion that there is a significant relationship between physical complaints and the time spent on watching TV among the elementary school girls with overweight.

Van Strien (2005) believes that eating behavior is a response to the available food signs. Eating behavior involves the selection and consumption of food items that is different person to person based on their cultural, economic, and social status. Fertmans, Baeyens, Van den Bergh (2001) defines the eating behavior like any other behavior which can be acquired based on learning. He states that children learn the eating behavior from the behaviors of parents, relatives and friends, and the environment. In general, eating behavior can be defined based on the following two scientific theories of psychology:

1- Behaviorism: Eating behavior is defined as the effort to be practical for weight management.

2- Cognitivism: Focusing on the quality of thinking patterns in partnership with weight management.

Therefore, as the literature review suggests, there is a significant relationship between watching the TV commercials and formation of eating behavior in children. This means that when children are exposed to the TV commercials, they become more willing to consume them and this tendency is greater among the obese children (Harris & et al., 2009; Andreeva, Kellyb, and Harrisa, 2011). On the other hand, the growing trend of obesity and overweight in children has made the researchers interested in research on this subject. Unfortunately, studies conducted in Iran have been mostly restricted to prevalence studies and the consequences of obesity and overweight have been less taken into account. Given the special status of children as one of the most important groups for health planning, the present research aims to study the effect of TV production on eating behavior of obese children in Damghan, Semnan Province. This study seeks the answer to the question that whether the TV productions are effective in eating behavior of

children or not.

Method

Ethical statement

Informed consent forms were given to the students' mothers of sample group and all necessary information, including the aims; confidentiality, and non-disclosure of participants' information etc. were given to the mothers. It was explained that if their children are reluctant to continue, they can stop taking part in the study at any time. It was also explained that after the completion of the study, the results would be revealed to mothers. Free training sessions for the control group were planned.

Participants

The experimental design of the study was of pretest-posttest type with the control group. The statistical population included all elementary school students in Damghan with obesity, 40 of whom were selected as the sample using the cluster random sampling. For sampling, a girls' school and a boys' school were randomly selected, with help and cooperation of education department, principals, and health caregivers of schools. Using the Body Mass Index (BMI), obesity or non-obesity of students was determined and approved by the school health caregivers. In each selected school (a girls' school and a boys' school) 20 subjects were randomly divided into two groups of experimental and control. Girl and boy students separately participated in the studies in their own school. Before entering the study, the subjects were examined both physically and mentally to get prepared enough. Every student has a physical health file that is examined by a doctor every 6 months and special cases are added to it. For example, if a child is allergic to a particular substance, it is definitely mentioned in his/her health file. Their height and weight are also recorded in this file. The Subjects ranged in age from 7 to 12 years, with a mean of 10 and s standard deviation of 4.85 for girls and 4.08 for boys.

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Procedure

In this research at first both experimental and control group took a pre-test. In other words the Dutch Eating Behavior Child Questionnaire (DEBQ-C) was completed by both groups. Afterwards the experimental group underwent the intervention which was TV programs. TV product intervention package was provided in this research based on Bandura theory (2002) and Van Strien theory (2005). This 12 session intervention was implemented on the experimental group during one month, 3 half an hour sessions every week. Each session included four parts. At first there were educational animations that taught about food indirectly which took ten minutes of 30 minute intervention. Then 5 minute commercials that actually consist of healthy food such as dairy, nuts and etc were shown. Next, short films suitable for children were shown for 10 minutes in the third part, such as the programs produced for children by the Health Policymaking Council on nutrition education. In the end part, again 5 minutes TV commercials were shown to them. It should be noted that the validity and reliability of this TV products and intervention were confirmed by the group of child psychologists and specialists in nutrition and TV programs.

Measures

Dutch Eating Behavior Child Questionnaire (DEBQ-C). The required data and information in this study were collected using the Dutch Eating Behavior Child Questionnaire (DEBQ-C). This Questionnaire was developed by a Dutch researcher named Van Strien in 2007 and its reliability and validity was confirmed

by himself. DEBQ-C questionnaire is different version of DEBQ questionnaire (1997) which was developed for children aged 7-12. This questionnaire consists of 20 items in three subscales of restrained eating, emotional eating, and external eating. Scoring in this questionnaire is based on a three-point scale (1: No, 2: sometimes, 3: Yes). The minimum and maximum score on this questionnaire are 20 and 60, respectively (Van Strien, 2002).

For confirming the validity and reliability of this questionnaire, Van Strien tested it in two stages. The questionnaire was tested on 382 boys and 387 girls in the first stage and 252 boys and 263 girls in the second stage. The obtained correlation was acceptable and Cronbach's alpha was in the range of 0.73 and 0.82. In another study that conducted by Van Strien and Francine (2007) on 596 male and female students aged 7-12, Cronbach's alpha for this questionnaire was obtained 0.85. Since it seemed that this questionnaire was being used in Iran for the first time, it was handed out among 100 mothers and the results were examined in terms of reliability. Cronbach's alpha was obtained equal to 0.83. In order confirm the validity of this questionnaire; it was given to 12 psychology professors after translation and making the necessary changes. They confirmed the face and content validity of this questionnaire and validity coefficient was obtained to be 76% for all items.

Results

Table 1 shows the descriptive statistics related to pretest and posttest of eating behavior scores in two experimental and control groups.

To test the research hypothesis, ANCOVA was used (Delavar, 2006). The results have been shown in Table 2. It should be noted that presumptions of ANCOVA were also studied and confirmed. Shapiro-Wilk test was used for examining the normality of distribution of variables and the results indicated that the distribution of variables was normal in both experimental and control groups ($P=0.819$). Also, homogeneity of regression slopes was confirmed ($P=0.4$) and it was revealed that there was a linear

Table 1. Descriptive findings related to pretest and posttest of eating behavior scores in two experimental and control groups

Statistical indices	Groups	Mean	Standard deviation	Minimum	Maximum	
Control	Boys	Pretest	51	4.85	44	58
		Posttest	51.3	4.06	44	56
	Girls	Pretest	51	4.06	44	57
		Posttest	48.4	2.76	43	52
	Total	Pretest	49.85	4.36	44	58
		Posttest	46.32	3.09	43	56
Experimental	Boys	Pretest	50	4.08	46	59
		Posttest	29.7	3.68	23	35
	Girls	Pretest	48.6	4.45	43	55
		Posttest	27.6	3.31	24	34
	Total	Pretest	49.6	4.22	43	59
		Posttest	28.86	3.57	23	35

Table 2. The results of ANCOVA of impact of TV productions on eating behavior

Statistical indices	Sum of squares	Degree of freedom	Mean squares	F value	P	Statistical power
Source of changes						
Pretest	0.491	1	0.491	0.039	0.844	0.054
Inter-group variance	4312.28	1	4312.28	345.76	0.0001	1
Gender	62.974	1	62.97	5.049	0.031	0.58
Intra-group variance	436.509	35	12.472			
Total	66618	40				

relationship between the research variables.

According to the data shown in Table 2, since the level of significance in inter-group variance is $p < 0.01$ and this is less than the criterion level of significance and also the obtained F-value (345.76) is more than the table value (7.39), the research hypothesis indicating the impact of TV productions on eating behaviors of obese children is confirmed and it can be concluded that there is a significant difference between mean scores of eating behavior of obese children in experimental and control groups. With regard to the comparison of means between two groups, the impact of TV productions on eating behavior is greater in the experimental group, because mean score of eating behavior in the experimental group (28.65) shows a

moderate value of this scale compared to the control (49.85). In terms of the effect of TV production on eating behavior by each gender, since the level of significance obtained for gender (0.031) is less than the criterion value, it can be concluded that there is a significant difference between boys and girls in this regard. Based on the comparison of mean scores in two groups of boys (29.70) and girls (27.60), it can be stated that TV productions have a greater impact on eating behavior of girls.

According to the data shown in Table 3, since the level of significance in inter-group variance is $p < 0.01$ and this is less than the criterion level of significance. It can be concluded that there is a significant difference between mean scores of abstaining from

eating, emotional eating, and eating external stimulus of obese children in experimental and control groups.

Discussion and Conclusion

As previously mentioned, the present research aimed to study the effect of TV productions on eating behavior in obese children. The results showed that TV productions affect the eating behavior of obese children ($p < 0.05$). The study findings also showed that there is a difference between girls and boys in eating behavior and girls are more vulnerable to obesity. This is consistent with the findings of some previous studies (Batada *et al.*, 2008). These studies indicate that the more the children are in exposure to the TV commercials, more willing they are to consume the food items advertised or shown in TV commercials, films, and cartoons. According to Jackson *et al.* (2003), exposure to advertising increases food consumption. This inherently has a greater impact on children, because children assume that any food item advertised on TV is healthy and free of any problem. On the other hand, watching TV by children for a long time causes inactivity and sedentary. Much evidence demonstrates that high food consumption and inactivity have a direct and undeniable relationship with weight gain and obesity (Jackson *et al.*, 2003, 2008; Dixon *et al.*, 2007). The observed association between remembering the food advertising and eating more of the advertised food items suggests that paying attention of food advertisements promotes overeating and weight gain in children. It has been shown in several studies that younger children are influenced by the TV commercials easier and sooner than their older peers (Dixon *et al.*, 2007).

Literature review shows that children love eating sweet foods and food producers take advantage of this

characteristic of children in their advertisements to show that their products will be pleasant to children. Consumption of junk foods like chips, snacks, jelly, and chocolate in children is three times more than the consumption of fruit and vegetables (Batada *et al.*, 2008; Robinson, 1999; Jackson *et al.*, 2003). Another explanation that we can propose in this case is the packaging and presentation these advertised foods items which attract children, because vivid and cheerful colors are used for packing of these foods, while vegetables and fruits are not present to children in such packaging to make them interested in consuming these healthy foods. For instance, spinach is highly rich in organic matter and has anti-obesity property, but children do not like its rough and undecorated look (Akbari *et al.*, 2006; Jackson *et al.*, 2003; Harris *et al.*, 2009; Fertmans *et al.*, 2001).

In addition, children do not care the calorie content, vitamins, and nutrients of food items they consume and only pay attention to the taste and appearance of food. There is a wrong belief among both children and their parents that junk foods and snacks cannot cause any problem because their volume is low. Several studies have also shown that obese parent are highly likely to have obese children (Ayatollahi, Heidari, 2005; Williams *et al.*, 2005; Motlagh & Hojat, 2004; Dadkhah, Omidvar, Mehrabi, 2006; Rezaeipour, Yousefi., Mahmoudi, Shakeri, 2007). It seems that parents' eating behavior affect the eating behavior of children. If parents themselves watch TV when eating, then children learn this behavior and like to watch TV shows and commercial when having meals (Ayatollahi, *et al.*, 2005; Williams *et al.*, 2005). Generally, the impact of food advertising creates a link between perception and behavior in line to protests of eating behavior (Andreeva, 2011).

Table 3. The results of ANCOVA of impact of TV productions on subscales of eating behavior

<i>Statistical indices</i> <i>Source of changes</i>	<i>Mean squares</i>	<i>F value</i>	<i>P</i>	<i>Statistical power</i>
Restrained Eating	658.601	216.69	0.0001	1
emotional eating	634.614	223.04	0.0001	1
external eating	226.39	67.08	0.0001	1

In today's world, prevention of diseases is raised as a top priority. This also applies in the case of obesity. Since obesity is the cause of many other diseases in children, childhood obesity should be seriously prevented and children should be advised and guided in the selection of food preferences and eating behaviors by their parents, educational officials, doctors, and psychologists.

The present study was faced with two major constraints that make it difficult to generalize the results to other populations. Firstly, the results should be cautiously generalized to the students of other cities. In addition, due to the lack of necessary facilities, it was not possible to perform the study separately for different age groups. Hence, it is recommended future studies on the role of TV intervention in weight loss consider these two main constraints of the present study. Therefore According to the findings of this study, it can be stated that paying attention to the undeniable impacts of television and other communication technologies on various mental and physical aspects can bring us the required insight for using these technologies. Therefore, the relevant officials and authorities are recommended to train the whole society and especially parents on the balanced and appropriate use of these new technologies. In addition, it is recommended that researchers and especially health professionals to study the impact of TV production from different physiological, psychological, and social aspects. Increased knowledge about various aspects of the impact of television can increase health information and reduce physical problems of people in a society. In addition, it helps people to establish a balance between using the new technologies such as TV and mobile phone and other aspects of their life. We hope that further and more extensive studies lead to better results for guiding children about self-control and self-care against a variety of diseases and also help parents to create a healthy life for their children.

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