

Original Paper

Junk Food Consumption Among High School Students in Iran: The Role of Food Advertising



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ABSTRACT

Introduction: Adolescence is one of the most important periods of human development. Nutrition plays an important role in health and prevention of disease during this period. Food advertising influences food purchase and food consumption among children and adolescents. Most of these advertisements are about the foods high in fat, salt and sugar. High exposure to these kinds of advertisements increases the tendency towards consuming junk foods in adolescents.

Objective: This study aimed to determine the junk food consumption by the exposure to junk food advertisements among high school students.

Materials and Methods: this analytical study with cross-sectional design, 341 students from public high schools in Rasht, north of Iran were selected by cluster random sampling method. Data were collected by a valid and reliable researcher-made questionnaire. The questionnaire was a self-report designed by the researcher which had two parts adapted from similar studies. The first part records demographic characteristics of students, and the second part assess the source and frequency of exposure to fast food/junk food advertisement and the frequency of fast food/junk food Consumption Data Analysis was performed using Kruskal-Wallis test at a significance level of 0.05.

Results: Most of the subjects (52.2%) were female and in the 11th grade (37.2%). In terms of the frequency of exposure to junk food advertisement, 37.2%, 33.4% and 15.3% of subjects reported "from time to time", "quite often" and "very often", respectively. Regarding the source of exposure to junk food advertisement, 51.9% were exposed to more than one advertising source. The Kruskal-Wallis test results showed a significant difference in junk food consumption frequency based on the frequency of exposure to food advertisement ($P=0.0001$).

Conclusion: High exposure to junk food advertisement can be associated with high consumption of junk foods and subsequently having chronic diseases in adulthood. Therefore, it is necessary to control the food advertising and provide a legal framework for supervising it.

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Highlights

- Consumption of sweet snacks had the highest frequency (5-7 times a week) among studied adolescents.
- Nearly half of studied adolescents had been exposed to junk food advertisement “quite often” and “very often”, and the majority of them had exposure to several source of junk food advertisement.
- The higher exposure to junk food advertisement can be associated with higher consumption of junk foods.

Plain Language Summary

Adolescence as an important period of human development should receive more attention, because physical, psychological and social maturity happens in this period. Health-threatening behaviors such as high consumption of fast food and junk food are common in adolescents. Such eating habits are strongly influenced by family members, peers and media. Junk foods are high in sugar, salt, and calories and often poor in minerals, vitamins and fibers. They can increase the incidence of diseases such as obesity, diabetes, cardiovascular diseases and hypertension in adulthood. On the other hand, there is strong evidence that food advertising influences children’s food preferences, food purchase and food consumption. Since food companies target children and adolescents directly by using several marketing techniques such as advertising, there is an urgent need for identifying the factors associated with eating habits in adolescents. Therefore, this study aimed to compare the difference in the frequency of junk food consumption among high school students in Rasht, Iran based on the source and frequency of exposure to food advertisement. The results indicated that the students with exposure to digital sources of food advertisement had higher consumption of fast food/junk food. Also, there was a significant difference in junk food consumption frequency based on the frequency of exposure to food advertisement.

Introduction

Adolescence is referred to the age group of 10-19 years, and it is one of the most important periods of human development, since physical, psychological and social maturity happens in this period [1, 2]. Adolescents are at risk of many health-threatening behaviors, such as excess food intake and decrease in physical activity, which could be a threat to their future health [3]. Nutrition as an essential factor for growth and reproduction [4], plays a key role in children’s and adolescents’ health and directly affects their physical, mental, and cognitive development [5-7].

Nutritional issues in adolescents are mainly characterized by increased need for energy and nutrient intake and the changes in eating habits, which could induce different types of nutrition-related disorders in adulthood [8]. The unhealthy eating habits such as skipping breakfast, low intake of fruits, and high consumption of fast food/junk food are common in adolescents. These habits were strongly influenced by family members, peers and social media [9, 10]. Junk food and fast food are all definitions that have been used to describe the quick,

unhealthy, hunger satisfying foods, which are easy to make and easy to consume. Junk foods are high in sugar or salt and calories and often poor in minerals, vitamins and fibers which can increase the incidence of diseases such as obesity, diabetes, cardiovascular diseases, and hypertension in adulthood [11-13].

Delicious taste and attractive food advertisement play an important role in attracting adolescents towards consuming junk food [14-16]. Advertising is one of the most tangible and crucial components of marketing process [17]. Advertisements influence the audience’s mind through media such as TV, radio, Internet, billboards, newspapers and magazines. These communication tools for transferring advertising messages can have a major role in the effectiveness of an advertisement [18]. Advertising affects food preferences, food consumption behavior and sales of a brands’ products [19].

There is strong evidences that food advertising influences children’s food preference, purchase and consumption [6, 20]. Each child in the United States on average watches 13 food advertisement on TV daily, and 30% of all TV advertisement viewed by children and adolescents [21]. It was estimated that the children

view more than 40,000 TV food advertisement per year, 98% of which are about the foods containing high fat, sodium, and sugar levels [22, 23]. Food industries use the techniques such as animation, visual effects, storytelling, gift advertising, and music for more influence on children and adolescents [24]. TV is an integral part of children's life in the world [25] and among the various methods of advertising, TV advertisement has been recognized as the most effective method [26].

Excessive exposure to food advertisement given by media increases the probability of junk food consumption and subsequently chronic diseases in adulthood [27]. Also it increases the tendency to consume foods with high fat, sugar and salt levels especially in children and adolescents who spend more time watching TV [28]. On the other hand, the media including TV play an important role in formation of beliefs, behaviors, emotions, social personality, and social relations [29] as well as eating behaviors [30]. Obviously, it is necessary to improve nutritional behaviors and habits of adolescents [31]. Considering insufficient evidences and the negative consequences of junk food consumption [32], this study aimed to examine the relationship of junk food consumption with exposure to food advertisements in high school students.

Materials and Methods

This is an analytical study with cross-sectional design conducted in 2016. The study population consisted of all public high school students from two educational districts of Rasht city in Iran including 14 girls' schools and 8 boys' schools in the first educational district, and 12 girls' schools and 11 boys' schools in the second educational district ($n=13654$). The samples were selected by using cluster random sampling method where each classroom was considered as a cluster. The sample size was calculated 336 based on the study of Dehdari et al. [12] who reported $R^2=0.30$ for the correlation between junk food consumption and behavioral intention, and considering 95% confidence level and $P=0.05$.

Given the average number of 30 students per each classroom, 12 classrooms (4 from each grade) were selected randomly. One boys' school and one girls' school were selected randomly from both educational districts. Then, from these four selected schools, one classroom was selected randomly from each grade (a total of 3 classrooms from each school). Finally, 342 questionnaires were distributed among subjects. Only one male student refused to complete the questionnaire. Thus, data from 341 completed questionnaires were collect-

ed. Inclusion criteria were: studying in the 10th, 11th and 12th grades and having no any specific illnesses that may influence their diet based on a self report.

The self report Questionnaire designed by the researcher which had two parts adapted from similar studies. The first part records demographic characteristics of students, and the second part assess the source and frequency of exposure to fast food/junk food advertisement and the frequency of fast food/junk food consumption [33]. The validity of questionnaire was approved by a panel of faculty members of Guilan University of Medical Sciences. The frequency of junk food consumption rated on a scale from 1=Never to 9=More than once per day.

The frequency of junk food consumption based on type (sweet and carbonated drinks, energy drinks, fruit-flavored drinks, fast food meals, fried foods, sweet and salty snacks) was assessed in the range of "never" to "more than 4 times per week or every day". The frequency of junk food consumption was divided into two categories: moderate level (less than median including score zero) and high level (more than median including score 1). The median was determined with a score of 5 indicating "once a week". The frequency of exposure to food advertisement was rated as "rarely", "from time to time", "quite often", "very often". The source of exposure to food advertisement was evaluated based on the platforms of advertisement (TV, radio, school, newspaper, magazine, Internet and social networks, outdoor billboards/public places, and more than one source).

Data were collected in four days from November 27 to December 4, 2016. The questionnaires were completed within 20 minutes by the subjects. After collecting data, they were analyzed in SPSS V. 21 software using descriptive and inferential statistics. Since the level of junk food consumption was a ranked variable, Kruskal-Wallis test was used to compare the difference in junk food consumption frequency based on the frequency and source of exposure to junk food advertisement.

Results

As shown in Table 1, most of the subjects were female (52.2%) and 11th grade students (37.5%). In terms of the frequency of exposure to junk food advertisement, 37.2%, 33.4% and 15.3% of subjects reported "from time to time", "quite often" and "very often", respectively. Moreover, 51.9% of samples were exposed to more than one source of junk food advertisement. TV was reported as the most common source of exposure

Table 1. Frequency distribution of the samples based on individual, family, and social factors (qualitative variables) (N=341)

Qualitative Variables	Frequency NO.(%)	
Grade	10 th	110(32.3)
	11 th	128(37.5)
	12 th	103(30.2)
Gender	Male	163(47.8)
	Female	178(52.2)
Father's job	Employee	79(23.2)
	Worker	28(8.2)
	Farmer	9(2.6)
	Business	176(51.6)
	Retired	38(11.1)
	Unemployed	11(3.2)
Mother's job	Employee	34(10)
	Worker	2(0.6)
	Farmer	1(0.3)
	Business	24(7)
	Retired	11(3.2)
	Unemployed	269(78.9)
Father's education	Illiterate	13(3.8)
	Less than high school	101(29.6)
	Diploma	164(48.1)
	Academic	63(18.5)
Mother's education	Illiterate	12(3.5)
	Less than high school	112(32.8)
	Diploma	169(49.6)
	Academic	48(14.1)
Monthly household income (\$)	>500	48(14.1)
	400-500	81(23.7)
	250-399	123(36.1)
	<250	89(26.1)
Frequency of exposure to junk food advertisement	Rarely	48(14.1)
	From time to time	127(37.2)
	Quite often	114(33.4)
	Very often	52(15.3)
Source of exposure to junk food advertisement	TV	68(19.9)
	Radio	0(0)
	School	27(7.9)
	Newspaper	2(0.6)
	Magazine	5(1.5)
	Internet and social networks	47(13.8)
	Outdoor billboards/public places	15(4.4)
More than one source	177(51.9)	

Table 2. Comparing junk food consumption frequency based on the source/frequency of exposure to junk food advertisement

Exposure to Junk Food Advertisement.		Mean±SD	Median	Sig. *
Frequency of exposure	Rarely	3.6±2	2.5	0.0001
	From time to time	4.5±1.9	5	
	Quite often	4.9±2	5	
	Very often	5.5±2.1	6	
	Television	4.2±1.8	4	
Source of exposure	Radio	0±0	0	0.143
	School	4.8±1.8	5	
	Newspaper	2.5±0.7	2.5	
	Magazine	3.4±1.3	4	
	Internet and social networks	4.8±1.9	5	
	Outdoor billboards/public places	4.3±1.8	5	
	More than one source	4.9±2.2	5	

* Kruskal -Wallis Test

to junk food advertisement (19.9%). Regarding the frequency of junk food consumption, 0.6% reported never, 22.6% less than once a month, 8.8% once a month, 11.7% once a fortnight, 19.4% once a week, 21.7% 2-3 times per week, 5.9% 4-6 times per week, 3.8% once a day, 5.6% more than once a day. In terms of the junk food type, sweet snacks (27.3%), fried foods (11.7%), salty snacks (11.4%), sweet and carbonated drinks, energy drinks, fruit flavored drinks (5.3%), and fast food meals (4.4%) were consumed by the students more than 4 times per week or every day by subjects.

The Kruskal-Wallis test results, shown in Table 2, indicated that a significant difference between the frequency of junk food consumption and the frequency of exposure to junk food advertisement ($P=0.0001$). This means that the more frequent junk food advertisement viewing can be associated with more frequent consumption of junk foods.

Discussion

In this study, nearly half of subjects were exposed to junk food advertisement “quite often” and “very often”, which is consistent with the result of Esmi et al. who reported that the most of children and adolescents viewed TV commercials “sometimes”, “always” and “very often” [34]. In the study of Hovington, majority of adolescents were exposed to junk food advertisement “quite often” and “very often” [35]. Moreover,

our results showed that more than half of subjects had been exposed to more than one source of junk food advertisement. TV was mentioned as the most common source of exposure to food advertisement. This is in agreement with the results of Joseph et al. who showed that TV was the most popular source of information about fast foods [14].

After TV, the internet/social networks and school were the most common source of junk food advertisement in our study according to the report of students, but none of them reported the radio as a source of exposure. It can be related to low usage rate of the radio by this age due to reduced popularity and also lower focus of food industries on the radio advertising due to the lack of attractive images and light/color techniques to attract children and adolescents. In the study of Hovington, TV, outdoor billboards and public places were the most common sources [35]. This indicates the focus of food industries on attracting adolescents through the visual techniques, and the important effect of the media on adolescents' eating habits.

Based on the frequency of junk food consumption, our results showed that few subjects reported “once a day” more than once a day”; while the study results of Ritchie [36] Akman et al. [37] and Jaisheeba et al. [38] were in reverse. This discrepancy may be due to difference in junk food definition, living environment, eating

habits, and data collection methods. Similar studies have shown the high intake of junk food in urban areas especially among adolescents and young people. Although the junk food consumption rate among high school students was noticeable in this study, but in comparison with other similar studies, the reported rate was lower.

Furthermore, the results showed that a significant difference in junk food consumption frequency based on the frequency of exposure to food advertisement. This indicates that the higher exposure to junk food advertisement can be associated with higher consumption of junk foods. Kuhl et al. also found a significant and positive association between exposure to advertisements and fast food consumption; those who were more exposed to advertisements, had eaten more fast food [39]. In the study of Purushothaman et al., all of adolescents reported that advertisements influenced them to eat more junk foods [40]. According to the results of current study and other similar studies, it can be stated that the media and their food advertisement have very important role in adolescents' eating habits.

In this study, the median and mean of junk food consumption frequency in adolescents exposed to more than one advertising source were more than others. The highest frequency of junk food consumption was reported by adolescents who had been exposed to only one advertising source including school, internet/social networks and TV, respectively. However, there was no statistically significant difference in the median of junk food consumption frequency and source of exposure to food advertisement.

The results of Scully et al. [20] and Yarmohammadi et al. [41] showed a significant association between the time of viewing TV commercials and fast food consumption rate. Our results also showed that, compared to students with no exposure to digital advertisement, exposed students had higher consumption of junk foods. Kuhl et al. concluded that advertisement was the most important variable effecting students' tendency towards fast food consumption [39].

Nowadays, there are numerous local and satellite TV channels that make programs especially for adolescents who are spending more time on social networks and surfing Internet. On the other hand, making highly pay-

ing advertisement is one of the best ways to survive for these programs. Therefore, the adolescents who have view these programs have higher rates of fast food consumption. So, it is necessary to control media advertising and make a framework for monitoring the food advertisement.

Some of the study limitations were using a self-report questionnaire, recall bias, and collecting data during the academic year which can influence the outcome. It is recommended that further studies be conducted using different sources of data and a larger sample size over a wider time range.

Ethical Considerations

Compliance with ethical guidelines

The participants were informed about the study objectives and an informed consent form was signed by them and one of their parents; they were also assured of the confidentiality of their information. Moreover, they were allowed to leave the study at any time and the study results would be available to them. This study obtained its ethical approval (Code: IR. GUMS. REC. 1395. 257) from Guilan University of Medical Science.

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Authors contributions

Conceptualization: Saeid Moradi Latreyi and Leila Mirhadyan; Manuscript draft preparation: Afsaneh Pasha and Leila Mirhadyan; Statistical analysis: Ehsan Kazemzad Leili; Review and editing: All authors.

Conflict of interest

The authors declared no conflicts of interest.

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