

A content analysis of health-related advertisements in Islamic Republic of Iran broadcasting (IRIB)

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Received: 8 September 2015

Accepted: 23 January 2016

Published: 11 April 2016

Abstract

Background: Media advertisements especially radio and TV are one of the most important and effective ways for health promotion and consumption of healthy productions worldwide. Ministry of Health and some other ministries in Iran agreed to control and restrict the advertising of unhealthy products and services. Therefore, adequate supervision and monitoring should be done in this field. A content analysis of Health-related Advertisements was done in Islamic Republic of Iran Broadcasting (IRIB)

Methods: This study was a cross-sectional research and collecting of data was carried out in 2012. Ten selected TV and radio channels were recorded from 6 a.m. to 12 p.m. for two successive months in the special week-days. Broadcasted advertisements data were extracted by the trained observers according to a checklist and analyzed using SPSS 18 software and described with descriptive statistics.

Results: The percentage of different types of advertising were including 73.9% unrelated to health, 21.9% harmless health related, 2.9% less healthy, 1.3% harmful or harmful with a probability of abuse. Non-harmful to health advertisements included 95.86% of total advertisements out of ten TV and radio channels; and the remained advertisements (4.14%) were related to the harmful, less healthy foodstuff and detrimental services and products. Also, 0.8% of the advertisements were shown during children programs.

Conclusion: The main findings of the current study revealed that majority of the advertisements of Islamic Republic Broadcasting were unrelated to health. It seems advertising of harmful for health in IRIB was less than 5%, and the levels of these type ads were less than the other countries. Even so, the policymakers need to pass and enforce some executive and governing law for the prevention of broadcasting unhealthy advertisements to increase the society health level and prevent the diseases resulted from unhealthy products causing the considerable damages in a long time.

Keywords: Advertisements, Health, Television, Radio.

Cite this article as: Etemad K, Ebrahimi P, Azimi H, Lotfi M, Nojomi M. A content analysis of health-related advertisements in Islamic Republic of Iran broadcasting (IRIB). *Med J Islam Repub Iran* 2016 (11 April). Vol. 30:353.

Introduction

Nowadays, overweight and obesity are global problems, as the marketing of the energetic and junk food is one of the principal reasons (1). Different studies have confirmed that many commercial advertisements are contrary to the healthy nutrition (2). The consumption of the advertised

foods is more than the non-advertised foods (3). Despite the growing power of social media, TV advertising is still the most influential medium in buying decisions of people (4).

Advertising of unhealthy food means that television advertisements encourage consumption of the products with high fat,

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sugar, and/ or sodium. According to previous studies, most of the television food advertisements promote unhealthy food products or reveal unhealthy nutritional information that causes more preferences for and buying unhealthy food products. Also, some studies have shown that food advertising affects consumption of foods with high total calorie (5).

Various studies have shown that exposure to television food advertisements is one of the main factors influencing the diet and eating behaviors and preferences of people, which finally affects the outcomes such as obesity and overweight (4,6).

According to a study in the USA, the American children watch 20000-40000 advertisements per year (7). A similar study in Australia showed that watching more ads increases interest and intention to harmful foods such as sweet, meat, fast food and sweet drinks (8,9). In other research on adults, similar findings were reported (10).

For analysis of commercial advertisements in Swiss media, six prominent Swiss TV channels, one German and an Italian channel were studied. All TV programs were recorded and analyzed for six months. The findings showed that 55% of advertisements concern candy and fast food. They mainly advertised the consumption of sweet and fatty foods, without any healthy advertisements for fruit and vegetables (11).

In an identical research in Canada, four Canadian TV and three famous British channels were monitored for one week in 2006. After analysis of advertisements according to the scientific criteria of healthy/unhealthy foodstuff, it was concluded that 52-61% of the advertisements were related to the unhealthy foodstuff (12). According to the findings of an Iranian study in 2008, television's food advertisements were identified as the factors influencing healthy lifestyle among the senior citizens (13). A study in 2009 showed that children exposed to food advertising consumed 45% more food. Adults also had more consumption of both healthy and unhealthy snack foods in

similar condition (14).

Advertising plays a significant role in habits and preferences of people. Mass media, especially TV, has a major effect on adopting a healthy lifestyle by people. This mass media associated with social support of friends, family members, and health professionals and other organizations can be effective while concentrating their programs on the promotion of healthy lifestyles. Messages provided in this area should be attractive, clear, proportionate, understandable and in accordance with people culture. It is clear that making the messages consistent with age and change stage of people is one of the duties of health professionals (13).

Advertisements of harmful services and products have been declared forbidden for all media which could be followed by fine according to Iranian 5-year development program law passed by Islamic legislative assembly in schedule 2011. Since there may be differences between the law and execution, so the executive organizations shall enforce and control the regulation to influence on their performance.

In any cases, there is a close relationship between consuming high-quality healthy foodstuff and the standard matters with public health, and if it is ignored, it may cause serious danger to public health of society in the future. All health authorities have to notice the role of advertising programs on health goals in order to prevent the related diseases.

Hence, studies should pay more attention to this issue. Moreover, the majority of studies on the status of health-related television and radio advertising have been conducted in Europe and the USA. In Iran an extensive study has not been done yet to compare the advertisements of hazardous or healthy products and to determine their congruence with current health recommendations provided by the Ministry of Health.

Therefore, this research was conducted to study the health-related advertisements in Islamic Republic of Iran Broadcasting (IR-

IB), and specifying the kind of the advertisements was not healthy. So the findings may also help policymakers and authorities to plan and make reasonable and constructive decisions on health-related program of advertisements broadcasting to promote public health.

Methods

This study was a cross-sectional research conducted to explore the status of health-related advertisements in 2012. Different channels of IRIB were considered as the research population, and the list of which was prepared by internet websites. Because of a variety of IRIB channels, the researchers decided to monitor TV and radio programs using a sampling method. The sample channels were chosen for monitoring according to the list of all local networks and based on the priority of advertisements and geographical distribution on the map. Among 16 Nationwide TV networks, 17 Provincial TV networks and 14 Radio networks, the following channels were selected to study:

Nationwide networks: Channel 1, Channel 2, Channel 3;

Provincial networks: A) Tehran, B) Gilan, C) Khouzestan, D) Isfahan;

Radio networks: 1) Nationwide Radio, 2) Payam Radio, and 3) Youth Radio.

To have different audiences of TV and radio channels, recording the advertising information was on a rotating basis throughout the week. Since some popular programs include movies, serials, entertainments, and sport programs such as football leagues were broadcasted in special week days, mid-week days were selected in rotation to cover all programs and their audience. Also, because the audience may have much more time for watching IRIB programs at weekends, TV and radio programs were recorded in Thursdays and Fridays for all the weeks.

The selected weekdays of the first week were included in: Saturday, Sunday, Thursday, and Friday, and the second week were also involved: Monday, Tuesday,

Thursday and Friday, and the third week took in: Wednesday, Thursday and Friday, which was repeated the same from the fourth weeks as explained.

The programs were recorded from 6 a.m. to 12 p.m. for two successive months. All of the advertisements broadcasted in IRIB (such as commercial, educational, etc.) except two types of TV advertisements (blipverts: A blipvert is a very brief television advertisement that lasts just one or several seconds) and subtitle advertising) were included in this study.

The study data was collected using the observational method and a researcher-made checklist which its validity was attested using an expert panel method and carrying out a pilot study. The basic items of the data collection checklist were extracted based on the literature review, and the checklist draft was reviewed by nine experts who were specialists in community medicine, nutrition, health education, media, health economics and health care management. Then according to the experts' feedbacks, the corrections were made to the initial draft, and the final checklist was composed and approved. The checklist items were included: number, date, broadcasting time, product type, advertisements duration and channel name/ code.

For the pilot study, all observers completed some checklists according to a sample of recorded TV and radio advertisements, and then their forms were compared with each other, and some minor revisions were made in the final checklist.

The recorded programs were reviewed by the selected observers who completed the checklists. The observers were chosen among volunteer experts working at Iran University of Medical Sciences. Because all observers were trained to complete the checklists and all advertising information were extracted from the recorded advertisements, the study checklist was fully completed with no missing data in this study.

After checking and analysis of checklists, data processing was started using Excel

software.

The encoding method was used to separate and classify the advertised products according to the criteria based on the guidelines of Iran Ministry of Health. To control and restrict the advertising of unhealthy products and services, Ministry of Health in collaboration with other departments (Industry and Mines, Welfare and Social Security, Trade and Economic Affairs and Finance Ministries) enacted the regulations concerning health-related advertisements broadcasting. Therefore, adequate supervision and monitoring should be done in this area, and television networks and radio stations have to pay fines in the cases of the rules violation.

According to Ministry of Health guidelines, the classifications of unhealthy products and services are listed below:

1) Less healthy: bulked cereals (puff paste, crunchy, etc.), beverages (such as cola, energized drinks), Chips, etc.

2) Harmful to Health:

- Cosmetic services (such as solarium tanning, tattoos, hair and nail implant, etc.)

- Spraying poison services without supervision of Ministry of Health

- Nutritional counseling and medications for weight loss and obesity, the intervention measures to increase the height, and bodybuilding clubs without supervision of Ministry of Health

- Pools and recreation water centers(water parks) without supervision of Ministry of Health

- Environment and water decontamination services without supervision of Ministry of Health

3) Harmful to health and probability of abuse drugs:

- All kinds of medicines without the authorization of Ministry of Health

- Products or actions representative of high-risk behaviors (such as consuming fast food and industrial food products, tobacco use including cigarette and hookah, etc).

Statistical analysis of the study was performed using SPSS 18. Data was analyzed

in the descriptive method, and statistical diagrams and tables specify the status of IRIB advertisements generally regarding average time in “seconds”, and healthy products in “percentage” among which the harmful products and services were determined and classified according to the related criteria.

Results

The classification of unhealthy advertisements categorized by Ministry of Health was mentioned above. However the advertisements broadcasted by IRIB and monitored during this study in 2012 was as follows:

a) Advertisements unrelated to health (such as civil, communication services, banking, education, private institutes, culture, trading, home appliances, cars, insurance, industry, etc);

b) Harmless advertisements (e.g., detergent, health products, dairy, groceries, rice, spaghetti, fish can, foodstuff, restaurants, swimming pools, sports equipment, etc);

c) Less healthy advertisements (such as beverage, types of chips, puff paste, crunchy, etc);

d) Harmful advertisements (just hair implant was broadcasted);

e) Harmful advertisements with a probability of abuse include (just the fast food was broadcasted).

The results of analyzing TV and radio advertisements are shown in the statistical diagrams and tables. The overall time in seconds spent for all the advertisements in ten TV and radio channels were as follows:

- ✓ Total recorded time: 638811 seconds (100%)

- ✓ Non-harmful to health advertisements: 612339 seconds (95.86%)

- ✓ Harmful to health ads: 2334 seconds (0.37%)

- ✓ Harmful to health with the probability of abuse: 5495seconds (0.86%)

- ✓ Less healthy: 18643seconds (2.91%) (Table 1).

Because of lack of scientific criteria, it is impossible to determine harmfulness of

Table 1. Time (seconds) spent for Advertisements Related and Unrelated to Health in Ten TV and Radio Channels

Total		Non-harmful to health		Non-food, Harmful to health ads		Food Ads				Channel
						Harmful to health and with the probability of abuse		Less Healthy		
%	Seconds	Percent	Seconds	Percent	Seconds	Percent	Seconds	Percent	Seconds	
18.57	118603	18.12	115747	0.12	754	0	0	0.33	2102	TV 1
14.93	95383	14.52	92724	0.04	271	0	0	0.37	2388	TV 2
19.58	125065	18.93	120922	0.12	774	0	0	0.53	3369	TV 3
13.72	87672	13.20	84332	0.08	535	0	0	0.44	2805	Tehran TV
8.96	57226	8.45	53995	0.00	0	0.38	2430	0.13	801	Gilan TV
9.08	58006	9.03	57712	0.00	0	0	0	0.05	294	Khuzestan TV
6.77	43220	5.74	36689	0.00	0	0.48	3065	0.54	3466	Isfahan TV
4.25	27131	3.91	24964	0.00	0	0	0	0.34	2167	Payam Radio
2.60	16584	2.46	15730	0.00	0	0	0	0.13	854	Nationwide Radio
1.55	9921	1.49	9524	0.00	0	0	0	0.06	397	Youth Radio
100	638811	95.86	612339	0.37	2334	0.86	5495	2.91	18643	Total

Table 2. Frequency and Time Spent for advertisements of Ten TV and Radio Channels according to Types of Health Products

No.	Product Type	n	%	Time (Seconds)	Time %
1	Sports equipment & weight loss programs	88	0.5	3168	0.5
2	Sauce, Ketchup, etc.	550	3.0	14724	2.3
3	Prunes, Dried black curds, etc.	33	0.2	544	0.1
4	Milk ice cream	77	0.4	5093	0.8
5	Puff paste, Chips, Crunchy, etc.	708	3.9	15822	2.5
6	Hair implant	129	0.7	2334	0.4
7	Cake	208	1.2	4461	0.7
8	Oil	62	0.3	2035	0.3
9	Pizza cheese	23	0.1	537	0.1
10	Jam, Palm sugar, Date	104	0.6	3136	0.5
11	Popsicle	7	0.0	105	0.0
12	Pool, Water park	17	0.1	1277	0.2
13	Fast food restaurant	203	1.1	5495	0.9
14	Beverage	127	0.7	2821	0.4
15	Others	15728	87.2	577259	90.3
	The total advertising	18064	100	638811	100

health services advertised by IRIB in national and local levels in 2012. This matter can be considered as one of the study limitations. Nevertheless, advertisement of health services includes the following items: clinicians' complex, clinics, swimming pools and water parks, etc.

Table 2 indicates the frequency and time spent (in seconds) for total advertisements of the ten TV and radio channels according to types of health products (Table 2).

Furthermore, 26.1% of the time spent (in seconds) for total advertisements out of ten TV and radio channels of concerned to health. The time percentage of advertisements of harmful products and services compared to total IRIB advertisements in national and local levels during the period of study in 2012 are as follows: Less

healthy advertisements (2.9%), harmful advertisements (0.4%), harmful advertisements with a probability of abuse (0.9%) (Table 3, Diagram 1).

According to the findings, 80.9% of advertisements were broadcasted between different programs, 0.8% of total advertisements during children programs, 1.38% ad during sport programs, 13.66% ad during entertainment programs, 0.3% ad during educational programs, 2.5% ad during family programs, and 0.49% ad during documentary programs, interviews, and scientific meetings (Diagram 2).

The main findings of this study revealed that the majority of advertisements of Islamic Republic of Iran Broadcasting in 2012 were unrelated to health, and a tiny number of advertisements were harmful to

Table 3. Classification of Time Spent for Advertisements of ten TV and Radio Channels in terms of Health Harmfulness

No.	Product Type	Time (Seconds)	%
1	Advertisements Unrelated to Health	472298	73.9
2	Harmless Health-related Advertisements	140041	21.9
3	Less Healthy Advertisements (Beverage, Puff paste, Crunchy, etc.)	18643	2.9
4	Harmful Advertisements (Hair Implant)	2334	0.4
5	Harmful Advertisements with Probability of Abuse (Fast Food)	5495	0.9
	The total advertising	638811	100

health. It showed that 4.14% of the advertisements were related to the harmful, less healthy foodstuff and harmful services and products, such as beverage, types of chips, puff paste, crunchy, hair implant, and fast food, etc.

Discussion

This study aimed to evaluate health-related advertising in IRIB. The advertisements of the ten Iranian TV and radio channels in the special days for two successive months were monitored. The results showed non-harmful to health advertise-

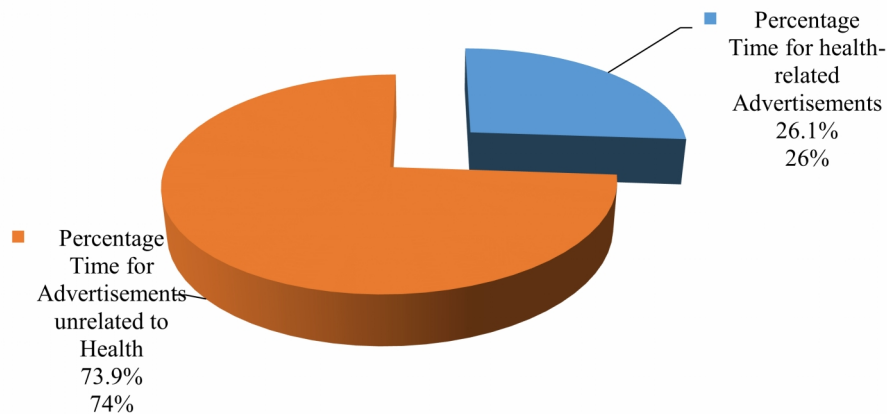


Diagram 1. Percentage of Time spent for Advertisements Related and Unrelated to Health in Ten TV and Radio Channels

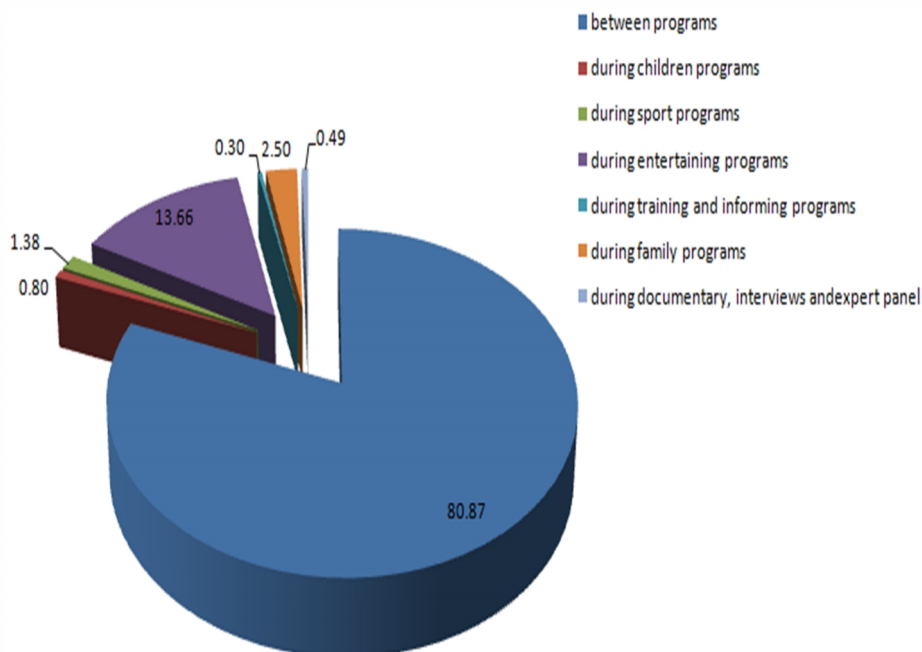


Diagram 2. The Status of Advertisements of Ten TV and Radio Channels in terms of advertising within or between the programs

ments involved more than 95% of total advertisements of the ten TV and radio channels in the study; and the remained advertisements were related to the harmful, less healthy foodstuff and detrimental services and products. Also, near one percent of the advertisements were shown during children programs.

In 2014, in a similar study which was performed in Ireland, 322 TV advertisements of foodstuff and drinks were recorded, of which 66.3% were related to the food, and the more recorded advertisements concerned fast foods (27.3%). The findings also indicated that new laws shall be passed for controlling advertisements of unhealthy foodstuff broadcasted during children programs (15). It seems that the levels of fast foods advertising in IRIB broadcasting are less than the other country.

An article published in 2013 indicated that, in spite of the reduction of TV advertisement costs by 19.4%, the children and teenagers still watch 12-16 advertisements a day which included the foods with high saturated fats, sugar or sodium (16). In a study carried out in Singapore, 33% of analyzed advertisements were related to the foodstuff, 38% of foodstuff advertisements were recognized healthy and 57% unhealthy (2). These results are not in compliant with the findings of the current study which may show IRIB more commitment to the regulations related to foodstuff advertising.

In a research carried out in Mexico, 22% of advertisements were concerned to the foodstuff and 50% of the advertisements were related to the children (17). It was confirmed in an analysis of three Australian commercial channels that 25.5% of advertisements were related to the foodstuff, and a large number of advertisements were broadcasted in the hours children were watching TV (18). In this study, the advertisements broadcasted during children programs were less than the ending hours of the night, which doesn't match to the results of two mentioned studies in this case.

The results of analyzing six national TV

commercial channels in Malaysia during a period of six months in 2008 indicated that the highest rate of advertisements was related to snack (34.5%) mostly broadcasted during the hours children were watching TV (19). Furthermore, the findings of studying foodstuff advertisements in three Australian TV channels showed that 31% of advertisements were concerned to foodstuff, and 81% focused on the unhealthy foods (1). Whereas the findings of the current study revealed that TV and radio advertisements may be more supervised by health authorities.

Commercial advertisements of six prominent Swiss TV channels, a German and an Italian channel were recorded and analyzed for six months in 2011. Findings represented that 55% of advertisements were related to fast food and candies. The most commercial messages advertised sweet and fatty foods, without any healthy advertisement of fruits and vegetables (11). In a similar research in 2009, four TV Canadian and three famous British channels were studied for one week. After advertisement analysis according to the scientific criteria of healthy and unhealthy foodstuff, it was confirmed that 52-61% of advertisements were related to unhealthy foodstuff (12). It may be due to neglecting or non-compliance with regulations and rules.

In two third of countries, the foodstuff advertisements include 40% of total advertisements. In a research, TV advertisements in 13 countries (Australia, Denmark, Finland, Belgium, France, Germany, Austria, Greece, Netherlands, Norway, Sweden, England and USA) were studied for 20 hours of children programs; the results showed that Australia, USA and England had the highest rate of foodstuff advertisements and the lowest ones were for Sweden (7). While, in this research, the health-related advertisements consist of only 27.3% of total advertisements, in this regard, the foodstuff advertisements in IRIB have a better status than the pointed countries. According to the results of this study, near to one-third of TV advertise-

ments is related to the health of which few amount is concerned to the advertisements of foodstuff without nutritional value, or unhealthy and harmful ones.

Conclusion

The findings of this research showed that healthy, anti-obesity, and mixed food advertising decreased consuming total calories, fat, sodium, and carbohydrates (5). It is found that exposure to food advertisements can change eating preferences and behaviors (20). Therefore, practitioners and decision makers should be aware of the spread of food advertising and the possibility of the impact on knowledge and behavior. They should make an effort to encourage producers to create and promote weight-friendly foods (3).

According to the results of this study, it is recommended that besides keeping the current status of TV and radio advertising, the healthier foodstuff advertisements should be presented, and Ministry of Health should impose more supervision based on the legal responsibilities, and consider the contribution of the appropriate stakeholders. Moreover, the government would be obliged to pay subsidiary to the industries owners for movement of food industries for producing healthier foods. Concerning the relation between health and food, and due to the effect of advertising on health, the media especially radio and TV should provide the necessary knowledge to the society in this case, with broadcasting healthy advertisement.

Limitations

As one of the study limitations, due to differences in the nature and type of advertisements broadcasting in Iran and its related regulations, the generalizing of the results to other countries may not be possible. It was not possible to determine harmfulness of health services in this study because there had not been performed any particular scientific study yet and the scientific criteria were not available. Also, recording TV and radio programs including advertise-

ments needed lots of time and energy, and saving and getting a backup of the recorded TV and radio programs was challenging.

References

1. Chapman K, Nicholas P, Supramaniam R. How much food advertising is there on Australian television?. *Health Promotion International* 2006;2:172-180.
2. Huang L, Mehta K, Wong M. Television food advertising in Singapore: the nature and extent of children's exposure. *Health Promotion International* 2011; 27:187-196.
3. Henderson VR, Kelly B. Food advertising in the age of obesity: Content analysis of food advertising on general market & African American television. *J Nutr Educ Behav* 2005;37:191-196.
4. Vijayapushpam T, Maheshwar M, Rao DR. A Comparative Analysis of Television Food Advertisements Aimed at Adults and Children in India. *Int J Innovat Res Sci Engin* 2014;2:476-83.
5. Rusmevichientong P, Streletskaia NA, Amatyakul W, Kaiser HM. The impact of food advertisements on changing eating behaviors: An experimental study. *Food Policy* 2014 Feb 28;44:59-67.
6. Pengpid S, Peltzer K. Content analysis of food advertising strategies and ethical implications on South African television. *Journal of Psychology in Africa* 2015; 25(1):73-9.
7. Story M, French S. Food Advertising and Marketing Directed at Children and Adolescents in the US. *International Journal of Behavioral Nutrition & Physical Activity* 2004;1:3-20.
8. Sixsmith R, Furnham A. A content analysis of British food advertisements aimed at children and adults. *Health Promotion International* 2009;25:24-32.
9. Dixon H, Scully M, Wakefield M, White V, Crawford D. The effects of television advertisements for junk food versus nutritious food on children's food attitudes and preferences. *Social Science & Medicine* 2007;65:1311-1323.
10. Wonderlich-Tierney AL, Wenzel KR, Vander Wal JS, Wang-Hall J. Food-related advertisements and food intake among adult men and women. *Appetite* 2013;71: 57-62.
11. Keller S, Schulz P. Distorted food pyramid in kids programmes: A content analysis of television advertising watched in Switzerland. *European Journal of Public Health* 2011;21:300-305.
12. Adams J, Hennessy-Priest K, Ingimarsdóttir S, Sheeshka J, Ostbye T, White M. Food advertising during children's television in Canada and the UK. *Disease In Childhood* 2009;94:658-662.
13. Salehi L, Eftekhari Ardabili H, Mohammad K, Taghdisi M, Jazayeri A, Shogaeizadeh D, et al.

Facilitating and impeding factors in adopting a healthy lifestyle among the elderly: A qualitative study. *sjsph*. 2008;6(2):49-57.

14. Harris JL, Bargh JA, Brownell, KD. Priming effects of television food advertising on eating behaviour. *Health Psychology* 2009;28(4):404-413.

15. Scully P, Macken A, Leddin D, Cullen W, Dunne C, Gorman CO. Food and beverage advertising during children's television programming. *Ir J Med Sci* 2015;184(1):207-12.

16. McClure AC, Tanski SE, Gilbert-Diamond D, Adachi-Mejia AM, Li Z, Li Z, Sargent JD. Receptivity to television fast-food restaurant marketing and obesity among U.S. Youth. *American Journal of Preventive Medicine* 2013;45:560- 568.

17. Ramirez-Ley K, De Lira-Garcia C, Souto-Gallardo Mde L, Tejeda-Lopez MF, Castaneda-

Gonzalez LM, Jimenez-Cruz A. Food-related advertising geared toward Mexican children. *Journal Of Public Health* 2009; 31:383-388.

18. Kelly B, Hattersley L, King L, Flood V. Persuasive food marketing to children: Use of cartoons and competitions in Australian commercial television advertisements. *Health Promotion International* 2008; 23:337-344.

19. Karupaiah T, Chinna K, Mee LH, Mei LS, Noor MI. What's on Malaysian television? A survey on food advertising targeting children. *Asia Pac J Clin Nutr* 2008; 17:483-491.

20. Bernhardt AM, Wilking C, Adachi-Mejia AM, Bergamini E, Marijnissen J, Sargent JD. How Television Fast Food Marketing Aimed at Children Compares with Adult Advertisements. *PLoS ONE* 2013;8(8):e72479.