

# The Relationship Between Food E-Advertising and Children's Obesity in Bahrain: Role of Rules



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## 1 Introduction

Obesity rates in the Kingdom of Bahrain have skyrocketed in recent years, making it one of the country's most significant threats to public health. National estimates for overweight and obesity in Bahrain have reported that among Bahraini children, one out of every three boys is overweight (36%) and about the same percentage for girls (34%). Figures from the 2019 school screening program show that obesity and overweight may be as high as 45.5% in girls and 40.4% in boys aged 10–12 years. Obesity's increasing prevalence is especially concerning as the major risk factor for chronic illnesses, and various types of cancer can eventually lead to mortality.

On top of that, a statement by the Centers for Disease Control and Prevention (CDC) asserted that obesity affects children's behavior, making them lean toward more sedentary activities and affecting their sleep routine and medication use (CDC, 2021). Overweight or obese adults appear to be more likely to become overweight or obese, increasing their risk of at least 12 distinct forms of cancer (Government, 2020). Based on the high percentage of obesity in Bahraini children, it is crucial to investigate further the impact of food E-advertisement on children in Bahrain and the existing rules and regulations that help monitor these advertising activities, along with suggesting new rules and limitations that must be implemented to diminish, and hopefully eliminate, the link between E-advertising and obesity.

It is important to identify the relationship between food E-advertising and children's obesity as the number of children struggling with obesity in the Kingdom of

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Bahrain is increasing. After further research, it was clear that even though the number of children suffering from obesity has increased in the past few years in Bahrain, there is not much research on the reasons behind this increase. Also, with children's screen time increasing and advertisements targeting children popping up all over social media platforms and gaming apps, it is important to assess how relevant this is to children's obesity.

## 2 Literature Review

People's increasing desire to communicate and technological advancement has led to social media's evolution. Cambridge dictionary defines social media as websites and programs on the internet accessed by people using computers or mobile phones to communicate and share information. Some forms of social media are blogs, podcasts, and applications like Instagram, Snapchat, and Facebook (Cambridge, *n.d.*). Social media platforms created an interaction opportunity with the target audience and increased sales and brand familiarity. Advertising is a method used for raising awareness among customers regarding a product's applications and benefits, making products accessible for users seeking them; this fulfills the advertiser's goal and boosts their profits. In brief, advertising serves three goals: improving businesses and increasing company sales, providing quality service to consumers, and ensuring the economic and social well-being of society (Mwakasege, 2015).

Obesity is a complicated condition caused by genetics, emotional and intellectual qualities, and the environment. A variety of personal, behavioral, and lifestyle habits influence weight. Obesity, which builds gradually with time, is usually the result of unhealthy dietary and lifestyle decisions, many of which are acquired in childhood (Harvard, 2009).

Obesity has reached epidemic proportions in GCC countries. The region's and, more specifically, Bahrain's increased numbers of overweight and obesity are among the most extreme reported globally. Regarding the Eastern Mediterranean region, the World Health Organization has classified Bahrain, Egypt, Jordan, Saudi Arabia, Kuwait, and the UAE as the countries with the highest obesity rate (WHO, Obesity, 2020). The 2018 Bahrain National Health Survey found that one among three Bahraini adults over the age of 18 is overweight and 42.8% are obese. These two categories were pooled, and for all people surveyed, it was found that one-third of which were non-Bahraini nationalities, and Bahraini nationals had greater levels of overweight and obesity, rating 76% versus non-Bahraini citizens rating 65.5%. Over the last 40 years, obesity rates have increased in Bahrain among girls and boys aged 5–19 years. According to statistics, one in three boys (36%) is overweight, which in comparison with the rates in 1975 it is almost double, and approximately the same percentage of girls are overweight (Sabt et al., 2019).

## ***2.1 Food E-Advertising and Its Relation to Obesity***

According to American Psychological Association (APA), children nowadays use various forms of media and spend up to 44.5 h per week in front of computers, TV, and gaming panels instead of doing any other activity in their daily lives besides sleeping. Arguably, as mentioned earlier, the rise of advertising of non-nutritious food has been associated with higher rates of childhood obesity (APA, 2010). Usually, children under the age of 6 cannot differentiate between programs and advertisements, and notably, they do not grasp the manipulative intent of the advertisements. Therefore advertising targeting children under 8 years old is considered exploitation. Product preference influences children's purchase demands, influencing parents' buying decisions (APA, 2010). Only a limited number of advertisers provide reminders to differentiate content from pure advertising (APA, 2010).

## ***2.2 Rules and Regulations***

As part of integrated marketing communications (IMC), food and beverage producers, supermarket merchants, and quick-service restaurants employ a variety of tactics and channels to advertise their products and brands (Kraak et al., 2019). Marketing on social media has risen in recent years to become among the most popular marketing platforms in various industrial sectors, including the food sector (Kraak et al., 2019). Increased usage of social media advertising has made reaching a larger audience, including children and teenagers, much easier (WHO, 2018; Kemp, 2020). Researchers who study food brand websites revealed that child-targeting websites frequently use entertaining, dynamic, and compelling methods to advertise unhealthy products. The British Heart Foundation (BHF) investigated more than 100 websites for food and drink goods commonly purchased or sought by children, such as treats and cereals, which makes 80% of goods that have not been permitted to be marketed to children on television based on UK broadcast constraints that were advertised online using animations, cartoons, competitions, brand characters, games, links, and available for download materials (e.g., mobile phone ringtones).

## ***2.3 Advertising Regulations of Major Social Media Platforms***

A large proportion of social media platforms' revenue is typically generated from advertising (Zenith, 2020). Social media advertising is mainly self-regulatory, with businesses marketing themselves on social media platforms held responsible for material validity and compliance with city codes and regulations (ACCC, 2020). Despite the strong international recommendations for action to limit children's

exposure to unhealthy food advertising, almost none of the major and most commonly used social media platforms have implemented a full prohibition on unhealthy food advertising. Even though YouTube Kids, a platform that is designed specifically for children under the age of 13, has an advertising rule in which it prohibits marketing food products on its platform, there is proof that children using this platform may be subjected to unhealthy food products through sponsored content and promotional material on the platform (Greenberg, 2015). Sacks and Looi (2020) conducted a study and identified that almost all platforms restricted and, in some cases, banned the advertising of tobacco goods and alcohol. Still, regarding safeguarding children, social media platforms lack comprehensive policies to limit the marketing of unhealthy foods on their platforms.

### **3 Research Methodology**

A quantitative method was used to conduct and assess the research to obtain the objectives of the present study. The primary data for this study was obtained from the Bahraini community to assess the impact of food E-advertising on children's obesity and the effect of rules and regulations in mitigating this impact. A distributed online survey was used to collect data (questionnaire). The sampling number is calculated by considering several factors, such as the volume of the questioned population, the error margin, and the confidence level. As a result, the sample size calculated for this study is 398 samples. Furthermore, the frequency and percentage that determine the questionnaire's key demographics are provided in Table 1.

### **4 Data Analysis**

The survey included statements to test the two factors influencing children's obesity. This section will explore the independent variables of food E-advertising and rules and regulations, as well as the dependent variable represented by children's obesity.

### **5 Children's Obesity**

According to Table 2, most participants believe that children's obesity is primarily caused by a lack of physical activity and poor eating habits, with 67.3% strongly agreeing and 27.9% agreeing with statement S1, accounting for 95.2% of all respondents. This could imply that most participants are unaware of the impact of advertisements and other factors on children's obesity or that they simply consider it a part of the unhealthy eating habits and lack of activity caused by long hours spent online.

**Table 1** Participants' responses to demographic questions

Question	Answer choices	Freq.	%
Gender	Male	58	14.6
	Female	340	85.4
	<i>Total</i>	398	100
Age	Less than 25 years	26	6.5
	25–35 years	163	41
	36–45 years	123	30.9
	Above 45 years	86	21.6
	<i>Total</i>	398	100
Marital status	Single	71	17.8
	Married	310	77.9
	Divorced	10	2.5
	Widow	7	1.8
	<i>Total</i>	398	100
Level of education	Secondary or below	34	8.5
	Diploma	46	11.6
	BSc	248	62.3
	Masters	63	15.8
	PhD	7	1.8
	<i>Total</i>	398	100
Number of children under 14 years	1-Dec	149	37.4
	2-Jan	157	39.4
	5-Mar	82	20.6
	More than 5	10	2.5
	<i>Total</i>	398	100

**Table 2** Children's obesity

Statements	% Degree of agreement					Mean	SD	General %
	SD	D	N	A	SA			
Children's obesity is caused by a lack of activity and unhealthy eating habits.	0.3	0.8	3.8	27.9	67.3	4.613	0.624	92.30
Genetics is the only driver of obesity or thinness in children as they are born this way.	10.6	42.7	27.4	16.8	2.5	2.58	0.972	51.60
Childhood obesity affects the risk of developing some diseases such as cancer and heart disease in the future.	0.5	1	14.3	48.2	35.9	4.181	0.746	83.60
Most obese children lack self-control.	1	11.1	22.4	48.2	17.3	3.698	0.917	74
I don't have a constant control on what my child eats during the day.	4.5	28.1	31.7	28.6	7	3.055	1.015	61.10
Obese children will not lose weight as part of their natural growth alone without diet and exercise.	0	0.5	0.8	27.1	71.6	4.698	0.506	94
Children's obesity is a public health issue that society needs to help solve.	1.3	12.3	17.3	48.7	20.4	3.746	0.959	74.90
Children's right to health must be protected at all costs.	0.3	1.3	2	32.4	64.1	4.588	0.624	91.80

The respondents also showed that they disagree with the statement that genetics is the only factor behind obesity in children with 53.3% strongly disagreeing and disagreeing collectively 27.4 neutral answers, and 19.3 strongly agreeing and agreeing collectively, with a mean of 2.580 and a standard deviation of 0.972, which is barely  $<1$  in statement S2, indicates that there are conflicts in the participants' answers. S4 was about children's lack of self-control, in which 65.5% strongly agreed and agreed with the statement, 12.1% strongly disagreed and disagreed, and 22.9% were neutral; this led to a  $\mu = 3.698$  and a standard deviation of 0.917. On the other hand, S5, which stated that parents do not have a constant control on what their child eats during the day, resulted in a 35.6% collective strong agreement and agreement, 31.7% neutral answers, and 32.6% collectively disagreeing and strongly disagreeing. Moving to S6, majority of participants agreed (27.1%) and strongly agreed (71.6%) that obese children will not lose weight as part of their natural growth alone without diet and exercise where the mean was 4.698 and standard deviation was 0.506. When asked about children's obesity being a public health issue that society needs to help solve in S7, 69.1% of participants strongly agreed and agreed with the statement, 13.6% strongly disagreed and disagreed with the statement, and 17.3% were neutral resulting in a mean of 3.746 and standard deviation of 0.959. The vast majority of participants showed their agreement and strong agreement with the statement S8 with a percentage of 96.5%; this led to a mean of 4.588 and standard deviation of 0.624.

## 5.1 Food E-Advertising

The results of Table 3 will be used to describe the E-advertising aspect.

Looking at the result in statement S1 that measures participants' concern about the E-advertising of unhealthy food products at times when children are on the internet/social media platforms, it was clear that most participants agreed and strongly agreed with the statement with a collective 82.2% agreement, while only 0.8% strongly disagreed and 4.8% disagreed and 12.3% were neutral. As shown in Table 3, in statement S2 the responses resulted in  $\mu = 4.407$  and standard deviation = 0.745; results showed that 53.5% of the participants strongly agreed that use of popular personalities or characters in food E-advertisements targeting children increases the influence of unhealthy food promotions and 36.2% agreed with the statement to, only 2.3% collectively disagreed and strongly disagreed which is a very small percentage. Moreover, the results were similar for statement S3 where 52.5% strongly agreed that food E-advertising that promotes free toys or gifts with products attracts children to unhealthy food, 38.7 agreed, and only 3% strongly disagreed and disagreed collectively resulting in a mean of 4.397 and standard deviation of 0.773. Another statement that majority of participants agreed on was that food E-advertising does not provide accurate information about nutritional quality of the product being advertised, 53.8% strongly agreed with the statement, 37.7% agreed, 6.5% were neutral, 1.5% disagreed, and 0.5% strongly disagreed. The mean and standard deviation values were 4.427 and 0.726 confirming the agreement of the participants. The statement S5 regarding

**Table 3** Food E-advertising

Statements	% Degree of agreement					Mean	SD	General %
	SD	D	N	A	SA			
I am concerned about the E-advertising of unhealthy food products at times when children are on the internet/social media platforms.	0.8	4.8	12.3	37.2	45	4.209	0.889	84.20
The use of popular personalities or characters in food E-advertisements targeting children increases the influence of unhealthy food promotions.	0.3	2	8	36.2	53.5	4.407	0.745	88.10
Food E-advertising that promotes free toys or gifts with products attracts children to unhealthy food.	1	2	5.8	38.7	52.5	4.397	0.773	87.90
Food E-advertising does not provide accurate information about nutritional quality of the product being advertised.	0.5	1.5	6.5	37.7	53.8	4.427	0.726	88.50
I monitor what my child watches on the internet and social media platforms.	0.8	4.5	30.4	39.9	24.4	3.827	0.877	76.50
I observe the effect of E-advertising of unhealthy foods on my child’s choice of foods.	0.5	9.3	25.4	41.2	23.6	3.781	0.928	75.60
Food E-advertising affects children’s obesity.	0.5	3.8	11.8	48	35.9	4.151	0.808	83

monitoring what children watches on the internet and social media platforms resulted in a mean of 3.827 and a standard deviation of 0.877, and participants collectively agreed and strongly agreed with the statement with a percentage of 64.3; on the other hand 30.4% were neutral, 4.5% disagreed, and 0.8% strongly disagreed. The findings of S6 resulted in 64.8% of the participants collectively agreeing and strongly agreeing, 25.4% were neutral, 9.3% disagreeing and 0.5% strongly disagreeing, and the results of the mean and standard deviation were 3.781 and 0.928, respectively. Meanwhile, statement S7 also resulted in the majority of participants agreeing and strongly agreeing with the statement where 35.9% strongly agreed and 48% agreed. The disagreement percentage of S7 was very low, where 3.8% disagreed and 0.5% strongly disagreed, and the mean value was 4.151 and the standard deviation was 0.808. The results of the last two statements clearly indicate that there is an issue with food E-advertisements that targets children and that many parents have noticed the impact that these advertisements have on their children’s food choices.

### 5.2 Rules and Regulation

Table 4 will measure the role of rules and regulations in protecting children from unhealthy food E-advertisements to reduce and hopefully eliminate children’s obesity.

**Table 4** Rules and regulations

Statements	% Degree of agreement					Mean	SD	General %
	SD	D	N	A	SA			
There are laws in the Kingdom of Bahrain regulating food E-advertisements directed at children.	7.8	20.1	57.5	11.3	3.3	2.822	0.852	56.40
If any, the current regulations of food E-advertising in the Kingdom of Bahrain are not effective in protecting children from targeted advertisements.	0.5	2.8	36.7	42.2	17.8	3.741	0.797	74.80
If any, rules that are implemented by social media platforms are not enough to protect children from E-advertisements of unhealthy food products.	0.5	1.8	9.8	41.7	46.2	4.314	0.761	86.30
The government should introduce stronger restrictions on food E-advertising.	2.3	8.5	19.3	30.9	38.9	3.957	1.063	79.10
Unhealthy food E-advertisements should be totally banned.	0.3	1	24.4	47.7	26.6	3.995	0.758	79.90
Major social media platforms should voluntarily restrict the exposure of children to E-advertisements of unhealthy foods.	0.5	2.3	10.3	43	44	4.276	0.777	85.50

As shown in Table 4, participants responded to the statement S1 that indicates that there are laws in the Kingdom of Bahrain regulating food E-advertisements directed at children with 7.8% strongly disagreeing, 20.1% disagreeing, 11.3% agreeing, and 3.3% strongly agreeing, and there were also 57.5% neutral responses that resulted in a mean of 2.822 and standard deviation of 0.852. S2 was related to how effective are Kingdom of Bahrain’s regulations where the results indicated a cumulative agreement and strong agreement equaling 60%, a cumulative disagreement and strong disagreement equaling 3.3%, and a neutral value of 36.7%; as mentioned before the percentage of neutral responses indicates that participants are unaware of the existence of rules and regulations implemented by the Kingdom of Bahrain let alone their effectiveness. The mean and standard deviation values were respectively, 3.741 and 0.797. On the other hand, S3 stated that rules that implemented by social media platforms are not enough to protect children from E-advertisements of unhealthy food products, the responses were mostly in agreement with the statement where 41.7% of participants agreed and 46.2% of participants strongly agreed, and there were some disagreement (1.8%) and strong disagreement (0.5%), but they were minimal in comparison to the agreement, and the responses resulted in a  $\mu = 4.314$  and standard deviation = 0.761. The findings of S4 resulted in 69.8% of the participants collectively agreeing and strongly agreeing, 19.3% participants were neutral, 8.5% disagreeing and 0.3% strongly disagreeing, and the results of the mean and standard deviation were 3.957 and 1.063, respectively. Unhealthy food E-advertisements should be totally banned; this statement was to measure the participants’ view of the negative effect that unhealthy



food E-advertisements have on children; a total of 74.3% agreed and strongly agreed with the statement, while 24.4% were neutral and 1.3% disagreed and strongly disagreed. The responses resulted in a  $\mu = 3.995$  and standard deviation = 0.758. The findings of S6 resulted in 87% of the participants collectively agreeing and strongly agreeing, 10.3% of participants were neutral, 2.3% disagreeing and 0.5% strongly disagreeing, and the results of the mean and standard deviation were 4.276 and 0.777, respectively.

### 5.3 Path Analysis

Table 5 represents the *T*-test results of participants’ perspectives on the factors influencing children’s obesity in terms of whether the participants are males or females; all the variables revealed no significant difference because the *T*-test results were higher than (0.05 sig.).

Table 6 represents the ANOVA test results of participant’s perspective about the variables affecting children’s obesity based on the participant’s age.

**Table 5** Participants’ perspectives based on their gender

Variable	Factor of gender	Mean	<i>T</i> -test	<i>p</i> -value
Children’s obesity	Male	3.808	-1.959	0.051
	Female	3.910		
Food E-advertising	Male	4.168	-0.580	0.954
	Female	4.172		
Rules and regulations	Male	3.756	-1.542	0.124
	Female	3.867		

**Table 6** Participants’ perspectives based on their age

Variable	Factor of age	<i>F</i> -test	<i>p</i> -value
Children’s obesity	Less than 25 years	2.633	0.05
	25–35 years		
	36–45 years		
	Above 45 years		
Food E-advertising	Less than 25 years	5.359	0.001
	25–35 years		
	36–45 years		
	Above 45 years		
Rules and regulations	Less than 25 years	4.552	0.004
	25–35 years		
	36–45 years		
	Above 45 years		

When comparing the significance level to  $\alpha = 5\%$ , it is apparent that there was a significant difference between the groups in participants' responses regarding food E-advertising variable statements ( $\text{sig.} = 0.001$ ) and rules and regulations statements ( $\text{sig.} = 0.004$ ) where both significant values were under  $5\%$ . The variance in responses was mostly between participants who were less than 25 years and the other groups.

#### 5.4 Testing the First Hypothesis

The first hypothesis stated that food E-advertising is a contributing factor to obesity in children. The results of the regression were shown in Table 7.

The data outcome reveals that the hypothesis is accepted as the  $\text{sig.} (0.000) < 0.05$ . The data also shows that  $R$  is  $32\%$ , which means that food E-advertising is a contributing factor to children's obesity, and the effect percentage of food E-advertising is shown to be  $10.3\%$ . Remarkably, the findings of the study accurately reflect the arguments mentioned in the literature review where it was stated that food E-advertising influences children's eating habits and therefore influences children's obesity.

#### 5.5 Testing the Second Hypothesis

The second hypothesis stated that rules and regulations related to monitoring food E-advertisement in Bahrain can help mitigate children's obesity. The results of the regression were shown in Table 7. The data outcome reveals that the hypothesis is accepted as the  $\text{sig.} (0.000) < 0.05$ ; the data also shows that  $R$  is  $38.5\%$ , which means that rules and regulations have a positive impact ( $14.8\%$ ) in mitigating the effect of food E-advertising on children's obesity. The reasons why rules and regulations are important in preventing the effect of food E-advertising on children's obesity were also emphasized in the literature review.

**Table 7** Regression results

Hypothesis	$R$	$R^2$	$F$ -test	Sig. ( $F$ -test)	$T$ -test	Sig.
Food E-advertising is a contributing factor to obesity in children.	0.320	0.103	45.309	0.000	6.731	0.000
Rules and regulations related to monitoring food E-advertisement in Bahrain can help mitigate children's obesity.	0.385	0.148	68.825	0.000	8.296	0.000

## 6 Conclusion, Recommendations, and Future Research

The study's main goal was to investigate the relationship between food E-advertising and children's obesity in Bahrain, as well as the impact of rules and regulations on this relationship. The study adopted a quantitative technique, which included distributing a survey to Bahraini citizens as the study's target population, which resulted in 398 responses. The testing of hypotheses acknowledged the significant impact of food E-advertising on childhood obesity, as well as the significant role that rules and regulations can play in preventing it. To summarize, this study found that food E-advertising has an impact on children's obesity in the Kingdom of Bahrain and that implementing rules and regulations to control food E-advertising will mitigate this impact. Children's obesity rates in the Kingdom of Bahrain are rising. Thus, the lack of published data and evaluation on the relationship between food E-advertising and childhood obesity in the Kingdom of Bahrain was the study's main limitation. It was also difficult to find any rules or regulations particularly related to food E-advertising targeting children, as most regulatory actions were related to children-targeted advertisements on television or in printed ads.

Children should be encouraged to participate in the digital world so that they can exercise their rights to information and participation. However, the participation of children in the digital world should not be conditional to exposing them to advertisements for unhealthy foods. Furthermore, given the tragic increase in childhood obesity in Bahrain, we have an obligation to protect children's rights to a healthy life and, as a result, establish statutory regulations for the digital marketing of unhealthy foods to children. Concerned governmental entities, in my opinion, should work together to improve existing rules and regulations controlling advertising in general, as well as construct new rules and regulations and establish a new law governing children's food advertising.

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