

A REVIEW OF FOOD ADVERTISEMENTS AND CHILDHOOD OBESITY
AND AN EXPLORATION OF THE IMPACT OF FOOD POLICIES

By

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Abstract of Thesis

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Health, Human Performance, and Recreation

A Review of Food Advertisements and Childhood Obesity
and an Exploration of the Impact of Food Policies

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A Review of Food Advertisements and Childhood Obesity
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Objective: The purpose of this study was to review food television advertisement policies that currently exist in multiple countries and to review the published literature on children's television viewing behaviors, the relationship of children's television viewing and childhood obesity, and the relationship of food television advertisements directed toward children and childhood obesity. Three research questions investigated in this current study follow:

1. What policies exist for marketing food products through television advertisements directed toward children?
2. Who is responsible for children watching food advertisements?
3. Are food television advertisements different between multiple countries?

Methods: The EBSCOhost database platform was accessed in order to search multiple databases with multiple layers of search terms. Professional and academic articles were selected for review using predefined inclusion and exclusion criteria.

Results: Many factors affect children's decision making as a result of television advertisements. Some factors that are found to influence their choices include the use of toys, repeat advertisements, advertisement duration, environment, and parental education. Current policy states that rules do not only come from government. Parents are also responsible for creating rules to restrict television watching at home. The role of

government is to restrict the length of advertisements while also monitoring the types of food that is advertised.

Conclusions: Most research recommends strict parental guidance of children and adolescents. Schools are also responsible for helping children make healthy food choices. Government, on the other hand, is responsible for limiting the number of television advertisements shown.

CHAPTER 1

INTRODUCTION

According to the World Health Organization (WHO), the increase in the rate of obesity across the world is known as “globesity” (Wills, Fehin, & Callen, 2011). When compared with countries across the world, the United States is among the highest in prevalence of obese adults (Wills et al., 2011). According to studies from the Centers for Disease Control (CDC), the rate of obesity among children in the United States (US) increased from 13.05% in 1998 to 15.21% in 2003 (Childhood Obesity Facts, 2011). In the United States, body mass index (BMI) rates adjusted for age and gender place children between the 85th and 95th percentiles, with 30% of US children predicted to become overweight or obese adults (Sterrett et al., 2013). In a study of 28 states, over 10% of children aged two to four were considered overweight (Palmer & Carpenter, 2006). Recent research indicates that obese children often grow to become obese adults (Ludington-Hoe, Gittner, & Haller, 2013). According to CDC statistics, about 35.7% of US adults are obese (Adult Obesity Facts, 2011), and these numbers are continuing to increase each year by 0.5% (Lobstein & Dobb, 2005). It is estimated that the yearly cost of overweight and obese people in the United States totals \$270 billion (Sterrett et al.).

Obesity and overweight in childhood is often linked to health consequences in adulthood (Sterrett et al., 2013). Obesity and overweight levels reduce heart rate variability (Dietrich et al., 2008) and also increase the risk of heart disease, high blood pressure, stroke, type 2 diabetes, gallbladder disease, osteoarthritis, respiratory problems,

and cancer (Gantt, Neely, Villafana, Chun, & Gharabaghli, 2008; Anderson & Caswell, 2009). In 2008, 80% of adults who were obese or overweight had at least one of these chronic diseases (Wills et al., 2011); moreover, forty percent of these had more than two chronic diseases (Wills et al.). Obese and overweight people have a high risk of developing several types of cancer, including postmenopausal breast, colon, rectum, endometrium, kidney, pancreas, and esophagus adenocarcinoma cancers (Anderson & Caswell, 2009). Of those adults who are obese or overweight in the United States, cancer kills one out of every seven men and one out of every five women (Flanders & Augestad, 2011). In addition, obesity and overweight levels lead to mental health problems (Flanders & Augestad, 2011), and are also related to a higher risk of morbidity (Anderson & Caswell, 2009).

A sedentary lifestyle is one of the factors that increases the risk of obesity (Fuglestad, Jeffery, & Sherwood, 2012; Raynor, Bond, Freedson, & Sisson, 2012). Sedentary lifestyles are described as insufficient activity and the lowest level of energy expenditure (Raynor et al., 2012), combined with an increase in consumption (Grieken, Ezendam, Paulis, van der Wouden, & Raat, 2012). The amount of energy consumed through food is more than the amount of energy used by physical activity, therefore increasing body weight (Milanović, 2012). More movement and less sedentary activity are some strategies used to avoid obesity (Stubbs, Pallister, Avery, Allan, & Lavin, 2012). Causes of obesity among youth include a decrease in physical activity and an increase in time spent watching television (Rey-López, Ruiz et al., 2012).

Television Viewing, Advertisements, and Childhood Obesity

Television viewing is one behavior that leads to sedentary lifestyles among children (Lobstein & Dobb, 2005). Not only is television viewing related to children's levels of sedentary behavior, there has been a documented relationship between children's television viewing and children's consumption of unhealthy foods, preference for higher-density foods, and participation in low levels of physical activity; all of which contribute to obesity (Caroli, Argentieri, Cardone, & Masi, 2004; Henderson & Kelly, 2005). Previous studies show an association between obesity and the amount of time spent watching television (Lewis & Hill, 1998; Magnus, Haby, Carter, & Swinburn, 2009; Livingstone, 2006; Arnas, 2006). Children who are obese spend more time watching television compared to children who are not obese (Caroli et al., 2004). Research shows watching television for more than one hour increases the risk of being obese by 5.3 times (Lewis & Hill, 1998) and increases the level of obesity by 2% (Lewis & Hill, 1998).

The relationships of television viewing can be observed between generations. For instance, parents who spend a long time watching television have children who are heavier and also spend a long time watching television (Caroli et al., 2004). On the other hand, a reduction in hours spent watching television by children and families contributes to reduced body weight (Raynor et al., 2012), BMI, waist-hip ratio, waist circumference, and triceps skin fold thickness (Lobstein & Dobb, 2005; Caroli et al., 2004).

There are three reasons for the link between television viewing and childhood obesity. As long as children are watching television, they, generally, (1) are sedentary,

(2) consume more snacks, and (3) tend to prefer the advertised foods (Lobstein & Dobb, 2005; Henderson & Kelly, 2005).

More food advertisements per hour leads to more overweight children (Magnus et al., 2009). Most of the foods advertised on television are processed and are not considered healthy (Lobstein & Dobb, 2005; Henderson & Kelly, 2005; Kent, Dubois, & Wanless, 2011; Warren, Wicks, Wicks, Fosu, & Donghung, 2007). Foods that are high in fat, sugar, and salt (HFSS) are the largest food group advertised (Caroli et al., 2004). In the US, the top products advertised on children's television channels include sweets, snacks, junk food, cereal, and dine-in or delivery restaurants (Kent et al., 2011). One-third of all food advertisements are for high sugar cereals, and 10% of all food advertisements are for soda (Warren et al., 2007). According to the WHO, excessive fast food advertisements aimed at children is a known contributor to weight gain (Ip, Mehta, & Coveney, 2007). While it has been documented that food television advertisements are related to risk factors for childhood obesity, there currently is minimal research related to the effects of policies that aim to address the characteristics of food television advertisements that are directed toward children.

The Role of Food Television Advertisements

Advertisements have an effect on food companies' profits (Magnus et al., 2009). Therefore, marketers target children who watch television (Caroli et al., 2004). It is easy to attract the attention of children by using colors, songs, cartoon characters, and other children (Kent et al., 2011). Because they are children, they cannot always understand the difference between the advertisements and the regular programs (Magnus et al.,

2009). In other words, marketers aim to affect children's knowledge and attitudes (King, Hebden, Grunseit, Kelly, Chapman, & Venugopal, 2011). Also, marketers want to earn children's loyalty, and if they are successful, children will influence their parents' choices. Studies show that food advertisements not only affect the children's preferences; they also affect the mothers' choices (Caroli et al., 2004). Children's preferences and choices regarding consumption will change going into adulthood (Palmer & Carpenter, 2006). Experimental studies found that children who were exposed to food advertisements tend to prefer an advertised food brand over a non-advertised one (Henderson & Kelly, 2005). In 2006, a review of 155 studies by the Institute of Medicine (IOM) concluded that television advertisements have an impact on children's eating, food favorites, and purchases (Desrochers & Holt, 2007).

Food Television Advertisement Policies

As a solution to address the documented relationships of food television advertisements directed toward children and risk factors for childhood obesity, policies and recommendations for policies regarding food advertisements have been changing across the globe (Chung et al., 2012). In the United States, The Center for Science in the Public Interest provided a proposal to reduce the advertisements of high energy and nutrient poor foods and beverages on television (Wilde, 2009). In 2004, the American Psychological Association (APA) provided suggestions that would limit television advertising directed at children under the age of seven (Wilde, 2009). In 2005, the IOM asked the US Secretary of Health and Human Services to designate a federal agency to change, evaluate, and improve advertisement policies (Wilde, 2009).

In 2005, children's television channels in the United Kingdom (UK) were required to reduce advertisements of foods high in fat, sugar, and salt to no more than 50% of all advertisements (Boyland et al., 2011). According to Boyland and colleagues (2011), the Office of Communications (the UK broadcast regulator, Ofcom) introduced additional policies in 2007 aimed to reduce the number of food television advertisements that are for items that are high in fat, sugar, and salt and that are directed at all viewers, including items directed at children (Boyland, Harrold, Kirkham, & Halford, 2011). Then, in 2008, a new policy was added for UK television advertisements for foods high in fat, sugar, and salt, strictly prohibiting these advertisements to air during, before, or after children's programs with an audience between the ages of 4 and 15 (Boyland et al., 2011).

In Australia, food advertisements and dietary recommendations are conflicting. According to King and colleagues (2011), the Australian government established a taskforce that suggested reducing the number of advertisements for high density and "empty" food products. In 2009, the Australian Food and Grocery Council (AFGC), a national body representing food and grocery manufacturers, presented the *Responsible Children's Marketing Initiative* that proposed guidelines for food and beverage companies to help encourage Australian children to eat and live healthy (King et al., 2011). Also, the AFGC outlined obligations for food advertisers targeting children, such as the use of registered people, quality deals, product location, and marketing in schools (King et al., 2011).

Purpose of the Study

Current literature suggests that food television advertisements that are directed toward children are related to risk factors for childhood obesity, a condition that has ever-increasing prevalence in several countries across the globe. In an attempt to help slow this trend, some countries have established television advertisement policies that limit advertisement characteristics that could potentially contribute to childhood obesity. Therefore, the purpose of this study was to review current literature to investigate food television advertisements directed toward children and their contribution to childhood obesity across multiple countries. The three research questions investigated in this current study follow:

1. What policies exist for marketing food products through television advertisements directed toward children?
2. Who is responsible for children watching food advertisements?
3. Are food television advertisements different between multiple countries?

CHAPTER 2

METHODS

To begin exploring food television advertisements in relation to childhood obesity, a search was conducted to compare food television advertisement policies and childhood obesity rates in both the United States and the United Kingdom. A summary of findings is provided in Table 1.

According to the CDC, the prevalence of childhood obesity in the US was 14.94% in 2010. Many studies provide evidence that advertisements have an effect on obesity in children and provide suggestions for US policies that would restrict the time and types of advertisements (Lewis & Hill, 1998; Magnus et al., 2009; Livingstone, 2006; Arnas, 2006; Caroli et al., 2004; Kent et al., 2011). There are many literature reviews that discuss these recommendations, as well (Darwin, 2009; Mello, 2010). However, in the United States, no policies exist that specifically regard food advertisements on television that aim to address risk factors of childhood obesity.

Australia also lacks television advertisement policies, although there are many suggestions to create a policy (Handsley, Mehta, Coveney, & Nehmy, 2009; King et al., 2011; Kelly, Chapman, King, & Hebden, 2011; Mackay, 2009), and Australia has the highest number of studies that discuss the effect of food advertisements on childhood obesity (Chung et al., 2012; Roberts, Pettigrew, Chapman, Miller, & Quester, 2012). According to the Australia Institute of Health and Welfare (2013), the prevalence of obesity in Australian children was 14.5% in 2008.

Table 1

Comparison of Food Television Advertisement Policies and Childhood Obesity Rates between Countries

Country/Region	Childhood Obesity Rates, Year	Summary of Related Policies	Source
United States	14.94%, 2010	None	Darwin, 2009; Mello, 2010
United Kingdom	14%, 2010	Ofcom restricted the marketing of products high in fat, sugar, and salt during children's programs or any programs that are highly viewed by children. Marketers are not allowed to use any attractive techniques to advertise these products to children. Marketers are not allowed to make health claims for these food products.	Barclay, 2012
Australia	14.5%, 2008	None	Handsley et al., 2009; King et al., 2011

In the United Kingdom, Ofcom restricts advertisements of products high in fat, sugar, and salt during children's programs or any other programs highly watched by children (Barclay, 2012). It does not allow the use of any attractive techniques to advertise these products to children, and food marketers are not allowed to make health claims for these products (Barclay, 2012). As a result, it was estimated that children watched 37% less advertisements in 2009 than they did in 2005. On the other hand, advertisements for high-energy snack food increased in 2012 (Barclay, 2012). In 2010, obesity prevalence in the UK was 14% for children aged 2 to 10 years old and 19% for children aged 11 to 15 years old (Public Health England, 2013).

Searching

In order to investigate the effects of food television advertisements that are directed toward children, a review of current literature was conducted. The EBSCOhost database platform was accessed in order to search multiple databases with multiple layers of search terms. Academic Search Complete, Academic Search Premier, Alt HealthWatch, Business Abstracts with Full Text (H. W. Wilson), Business Source Premier, Children's Core Collection (H. W. Wilson), Communication & Mass Media Complete, Consumer Health Complete, Education Full Text (H. W. Wilson), Education Research Complete, Education Source, Educational Administration Abstracts, Health Source- Consumer Edition, Health Source: Nursing/Academic Edition, and Political Science Complete were included.

The following six layers of terms were used to search for related literature in the fields indicated in parentheses:

- television or TV (title)
- child or children or kids (all text)
- weight or overweight or obesity or obese (all text)
- BMI or “Body Mass Index” (title)
- advertisement or advertise or marketing (all text)
- trial or study or trials or studies (title)

Selection

In order to identify the relevant journal articles in the search results, the following inclusion criteria were applied (see Figure 1):

- Publication date between 2003-2013
- Academic or professional articles that were peer-reviewed
- Written in English
- Describe research studies

Also, certain exclusion criteria were used:

- Articles not related to food advertisements on television
- Articles that do not mention causes or effects of television food advertisements

CHAPTER 3

RESULTS

As illustrated in Figure 1, the results show a total of 24 articles in the initial search. Only 13 articles were retrieved after the removal of duplicate articles. Two articles were excluded because they were not related to food television advertisements, and two articles were excluded because they did not mention the causes or effects of television food advertisements.

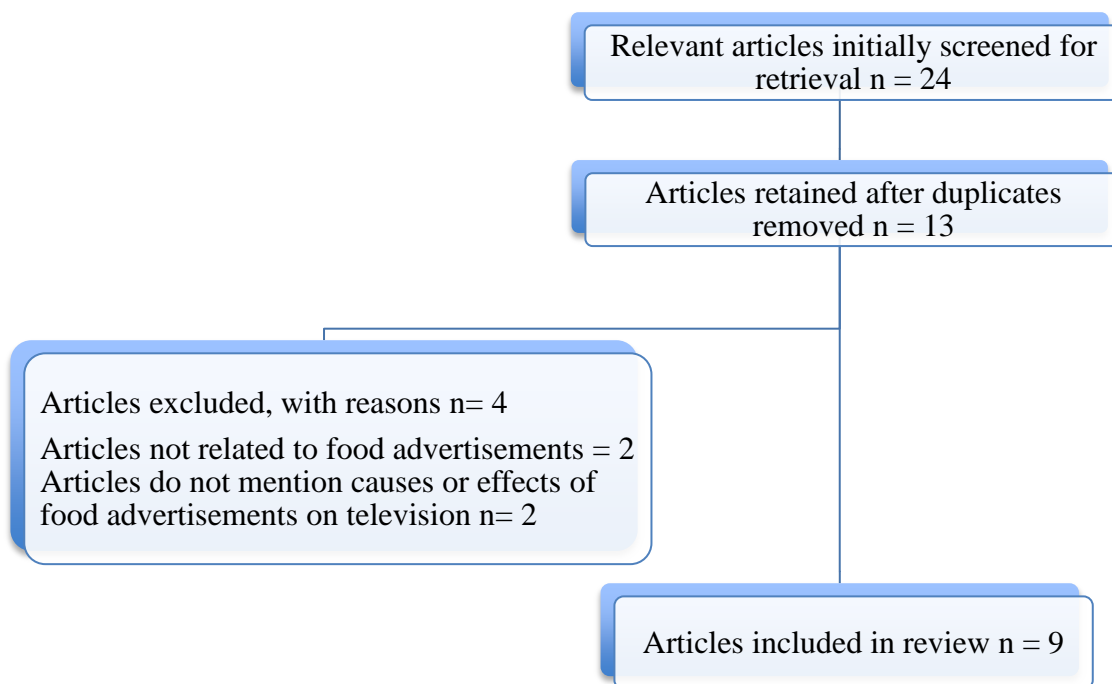


Figure 1. Selection of review articles.

Nine articles met the search criteria and were carefully reviewed and analyzed for this report (see Table 2). Each of the studies utilized unique quantitative measures in their methodologies; therefore, a meta-analysis or any other form of comparative statistical analysis was not possible. A qualitative exploration and discussion of research findings is prudent and effectively aids in the consideration of the research questions in this current study:

1. What policies exist for marketing food products through television advertisements directed toward children?
2. Who is responsible for children watching food advertisements?
3. Are food television advertisements different between multiple countries?

Characteristics of Food Advertisements on Television

One Australian study by Ip et al. (2007) used a two-study method to research 32 parents of primary school-age children. In South Australia, a database was used to select parental participants meeting these criteria: both genders, age 18 years or older, cross-section of all

Table 2

Summary of Articles Included in Review

Study	Year	Region	Findings
Ip et al.	2007	Australia	Toys, repeat advertisements, and advertisement duration are factors that affect children.
Gorin et al.	2006	United States	Families with fewer children and those who have children older than 8 years are more likely to reduce their television viewing time. Also, less time spent watching television leads to more active children.
Hare-Bruun et al.	2011	Denmark	More time spent watching television leads to more unhealthy food preferences in children. Also, watching television while eating resulted in unhealthy food habits in children.
Manios et al.	2009	Greece	Watching television for more than two hours increased children's energy consumption. Educated parents tend to have children with healthy habits. Moreover, living in urban regions leads children to watch television.
Adams et al.	2012	United Kingdom	Type of foods advertised on television differed from foods recommended, when comparing each respective country's food advertisement policies. Foods advertised are low in fiber and protein and high in fat, even though total energy is within the recommended percentage.
Haroon et al.	2011	Pakistan	35.11% of food advertisements are for snacks, and there were no advertisements for fruits.
Vik et al.	2013	Europe	Less television time leads to healthier habits. Also, educated parents tend to have children with healthy habits.
Harrison	2005	United States	Children who were more exposed to television food ads have less nutritional knowledge.

socioeconomic backgrounds, and parents of primary school-age children. In Adelaide, two primary schools made newsletter announcements and messages on notice boards in order to create focus groups with parents. The focus groups allowed for the collection of information from the parents selected in order to understand their opinions on the effects of television food marketing and food choices in children.

Study results showed that advertisements with toys made children want the advertised food. Participants suggested that repeat advertisements are another factor that influences children. In the same study, parents asked for a policy to change the duration of advertisements directed at children, to limit the number of repeat advertisements, and to include advertisements of healthy foods for children. However, the participants in the study indicated that there are several barriers to implementing such a policy, including limited funding and sponsorship, difficulty in distinguishing between healthy and unhealthy foods, and the probability that limiting food advertisements on television would lead to the creation of other forms of marketing toward children that the policy would not cover (Ip et al., 2007).

Three other studies presented duration of advertisements as an influential factor for children. The first study from the United States recruited six parent participants from an advertisement in a local newspaper. The criteria to select participants included parents who were at least 18 years old with at least one child between the ages of 2 and 14 years old. Families who had children older than 14 years were excluded. These parents were asked to limit their children's television viewing time over eight weeks, to offer the children other activities, and to not allow their children to watch television in their rooms

(Gorin et al., 2006). Five of the six families reduced their television viewing time. Families with fewer children reduced their television viewing time by 50% or more. Also, families with children older than 8 years reached the 50% goal. In general, the study resulted in more active children (Gorin et al., 2006).

Another research study by Hare-Bruun et al. (2011) was conducted in Odense, Denmark as part of the European Youth Heart Study (EYHS) I (1997-98) and II (2003-04). Both of these studies used randomly selected children from 25 schools between 8 and 10 years old and between 14 and 16 years old, with 505 subjects completing the first study in 1998 and 687 completing the second study in 2004. Food preference, food habits, television viewing, body mass index (BMI), physical activity, and socioeconomic status (SES) were measured. This study resulted in two important conclusions. First, it proved that more time spent watching television led to more unhealthy food preferences in children. Second, it showed that watching television while eating resulted in less healthy food habits in children (Hare-Bruun et al., 2011).

Another study by Manios et al. (2009) surveyed 2,242 Greek children between the ages of one and five years old. The survey included three parts: a television viewing assessment, anthropometric measurements, and a dietary assessment. This study linked the time spent watching television to unhealthy food choices. The result of watching television for more than two hours per day increased the total energy consumption in children. Children who watched television for more than two hours were more likely to consume higher amounts of calories, fats, monounsaturated fats, and polyunsaturated fats.

These children consumed higher quantities of bread, meat, sweets, chocolate, and soft drinks. They also ate less fruits and vegetables.

Another factor that influences children is the type of food that is advertised. Two studies from the United Kingdom evaluated the effects of restricted food advertisements on television. The first study monitored 288 channels, while the second study monitored 207 channels. Results of these studies showed that the type of food advertised on television differed from the food recommended, when comparing each respective country's food advertisement policies. Foods advertised are low in fiber and protein and high in fat; even though total energy is within the recommended percentage (Adams et al., 2012). An additional study in Pakistan by Haroon et al. (2011) reviewed children's weekend programs over a three week period. The study found that 35.11% of food advertisements were for snacks, and there were no advertisements for fruits.

Food Advertisements and Responsibility

All nine studies place the responsibility of watching food advertisements on governments, parents, schools, and environments. In terms of government, some research participants asked that policies restrict the time spent toward advertising to children and improve the types of foods that are advertised to children (Ip et al., 2007).

At the same time, studies report that parents are also responsible. At home, parents must create effective rules for children when watching television (Gorin, Raynor, Chula-Maguire, & Wing, 2006; Manios, Kondaki, Kourlaba, Grammatikaki, Birbilis, & Ioannou, 2009; Vik et al., 2013). In several studies, parents admitted trying to limit the television viewing time for their children and also did not allow children to watch

television while eating (Gorin, Raynor, Chula-Maguire, & Wing, 2006; Manios, Kondaki, Kourlaba, Grammatikaki, Birbilis, & Ioannou, 2009; Vik et al., 2013). These studies concluded that less television time leads to healthier habits. In short, these studies showed that providing other activities for children is one job of parents.

The school's responsibility is to teach children how to identify and recognize good foods for their health. According to a 2005 study by Harrison, children who are more exposed to television food advertisements have less nutritional knowledge. According to Vik et al. (2013) and Manios et al. (2009), educated parents tend to have children with healthier habits.

Finally, an environment that encourages children to sit for long periods takes blame as well. As the Manios et al. (2009) study shows, living in urban regions leads children to watch more television than average and is thought to contribute to increases in children's television viewing time to over two hours per day.

CHAPTER 4

DISCUSSION

Research Limitations

In this review of current literature, it is evident that research is limited regarding the effects of television food advertisements directed toward children. More studies that demonstrate the effects of television advertisements are warranted. Moreover, research that examines children's BMIs and obesity rates before and after implementation of food television advertisement policies in various countries would be particularly worthwhile.

It is important to note that the articles reviewed in the current study, although limited, have consistently demonstrated a correlation between television advertisements of unhealthy foods and childhood obesity risk factors. Also, other contributors to childhood obesity unrelated to food television advertisements have been established and could also be correlated with children's viewing of food television advertisements.

In the literature examined for the current study, there are three aspects that should be emphasized regarding the health and nutrition of children with regards to their exposure to television food advertisements and television viewing in general. Children should be educated on nutrition, parents instill further knowledge in children through discipline and proper nutrition, and national policies regarding the effects of television food advertisements on childhood obesity risk factors are lacking.

Conclusions

Current research findings indicate that the influences of television advertisements on children's eating habits are similar across multiple countries, and parents' demands for more effective policies exist in all of the studies examined. Even more, among different countries, parents' demands for specific characteristics of policies did not differ. When there are children watching television, the duration of food advertisements should be limited, and the types of foods advertised should be monitored. This is because television advertisements influence the choices people make regarding the foods they eat. More often, viewers are made to believe the claims of television advertisements.

Nearly all of the research articles recommend strict parental guidance of children and adolescents to help children make good choices about healthy food. Also, schools are responsible for teaching good dietary behaviors, and the government must regulate the number and characteristics of food advertisements shown on television.

Recommendations

Nutrition education of children must begin in the home. When children do not have the proper knowledge about nutrition and healthy food choices, their development of faulty perceptions and related over-consumption of high-energy foods could continue into adulthood.

Schools also have responsibility in teaching children the right knowledge about nutrition and healthy food choices. A class should be dedicated primarily to helping children choose the right foods for better health. Furthermore, teachers must show students how to prepare, budget, and cook healthy foods.

Parents instill discipline in their children. Parents have the primary responsibility of turning their children into young people who can make good choices about the right foods to eat. One way of doing this is to decrease the number and kinds of unhealthy foods found in the refrigerator or the kitchen. Instead, parents should stock the kitchen with fruits and vegetables, whole grain snacks, and other healthy foods, despite their children's requests for advertised foods.

Lastly, government also has responsibility for characteristics of food television advertisements. There should be limitations on the number of television advertisements that market high amounts of salt, sugar, and fat, especially when the advertisements are aired during primetime. Government agencies should carefully assess and examine the truthfulness of claims that some processed foods contain vitamins and minerals. Regulations and standards must be followed, and if a television advertisement does not conform to the governmental regulations, then it should not be shown on television.

This study has revealed that childhood obesity is not just a governmental responsibility. Parents and schools have their own work to do, and one cannot overrule the other. Policies are important for control of this issue. Government should create policies over companies and television advertisements, and parents should create family rules for the home. Also, government policy needs to be involved in publishing and educating, so parents know what is beneficial and harmful for children, what should be allowed, and what should be restricted. This information would help parents recognize what types of foods to buy for their children and what types of practices are acceptable.

To help define effective language to use in these policies, in-depth studies and experimental trials are needed.

REFERENCES

- Adams, J., Tyrrell, R., Adamson, A., & White, M. (2012). Socio-economic differences in exposure to television food advertisements in the UK: A cross-sectional study of advertisements broadcast in one television region. *Public Health Nutrition*, 15(3), 487-494. doi:10.1017/S1368980011001686
- Adams, J., Tyrrell, R., Adamson, A. J., & White, M. (2012). Effect of restrictions on television food advertising to children on exposure to advertisements for 'less healthy' foods: Repeat cross-sectional study. *Plos ONE*, 7(2), 1-6. doi:10.1371/journal.pone.0031578
- Anderson, A. S., & Caswell, S. S. (2009). Obesity management: An opportunity for cancer prevention. *Surgeon (Edinburgh University Press)*, 7(5), 282-285.
- Arnas, Y. (2006). The effects of television food advertisement on children's food purchasing requests. *Pediatrics International*, 48(2), 138-145. doi:10.1111/j.1442-200X.2006.02180.x
- Australia Institute of Health and Welfare. (2013). *Australia Institute of Health and Welfare*. Retrieved from <http://www.aihw.gov.au/overweight-and-obesity/prevalence/#children>.
- Barclay, C. (2012). Food advertising on television. *House of Common Library*.
- Boyland, E. J., Harrold, J. A., Kirkham, T. C., & Halford, J. G. (2011). The extent of food advertising to children on UK television in 2008. *International Journal of Pediatric Obesity*, 6(5/6), 455-461. doi:10.3109/17477166.2011.608801
- Caroli, M., Argentieri, L., Cardone, M., & Masi, A. (2004). Role of television in childhood obesity prevention. *International Journal of Obesity and Related Metabolic Disorders: Journal of the International Association for the Study of Obesity*, 28(3), S104-S108.
- Centers for Disease Control. (2011). Adult obesity facts. Overweight and Obesity: Data and Statistics. Retrieved from <http://www.cdc.gov/obesity/data/adult.html>
- Centers for Disease Control (CDC). (2011). Childhood obesity facts. Overweight and Obesity: Data and Statistics. Retrieved from <http://www.cdc.gov/obesity/data/childhood.html>

- Chung, A., Shill, J., Swinburn, B., Mavoa, H., Lawrence, M., Loff, B., & ... Peeters, A. (2012). An analysis of potential barriers and enablers to regulating the television marketing of unhealthy foods to children at the state government level in Australia. *BMC Public Health*, 1(2), 11-23. doi:10.1186/1471-2458-12-1123
- Darwin, D. (2009). Advertising obesity: Can the U.S. follow the lead of the UK in limiting television marketing of unhealthy foods to children? *Vanderbilt Journal of Transnational Law*, 42(1), 317-350.
- Desrochers, D., & Holt, D. (2007). Children's exposure to television advertising: Implications for childhood obesity. *Journal of Public Policy & Marketing*, 26(2), 182-201. doi:10.1509/jppm.26.2.182
- Dietrich, D., Ackermann-Liebrich, U., Schindler, C., Barthélémy, J., Brändli, O., Gold, D. R., & ... Gaspoz, J. (2008). Effect of physical activity on heart rate variability in normal weight, overweight and obese subjects: Results from the SAPALDIA study. *European Journal of Applied Physiology*, 104(3), 557-565. doi:10.1007/s00421-008-0800-0
- Flanders, W., & Augestad, L. (2011). Methodological issues in observational studies of obesity and mortality. *Norsk Epidemiologi*, 20(2), 143-148.
- Fuglestad, P. T., Jeffery, R. W., & Sherwood, N. E. (2012). Lifestyle patterns associated with diet, physical activity, body mass index and amount of recent weight loss in a sample of successful weight losers. *International Journal of Behavioral Nutrition & Physical Activity*, 9(1), 79-88. doi:10.1186/1479-5868-9-79
- Gantt, C. J., Neely, J. A., Villafana, L. A., Chun, C. S., & Gharabaghi, S. M. (2008). Analysis of weight and associated health consequences of the active duty staff at a major naval medical center. *Military Medicine*, 173(5), 434-440.
- Gorin, A., Raynor, H., Chula-Maguire, K., & Wing, R. (2006). Decreasing household television time: A pilot study of a combined behavioral and environmental intervention. *Behavioral Interventions*, 21(4), 273-280. doi:10.1002/bin.221
- Grieken, A., Ezendam, N. M., Paulis, W. D., van der Wouden, J. C., & Raat, H. (2012). Primary prevention of overweight in children and adolescents: A meta-analysis of the effectiveness of interventions aiming to decrease sedentary behaviour. *International Journal of Behavioral Nutrition & Physical Activity*, 9(1), 61-71. doi:10.1186/1479-5868-9-61
- Handsley, E., Mehta, K., Coveney, J., & Nehmy, C. (2009). Australia and New Zealand health policy. *BioMed Central*.

- Hare-Bruun, H., Nielsen, B. M., Kristensen, P. L., Møller, N. C., Togo, P., & Heitmann, B. L. (2011). Television viewing, food preferences, and food habits among children: A prospective epidemiological study. *BMC Public Health*, 11(4), 311-320. doi:10.1186/1471-2458-11-311
- Haroon, M., Qureshi, T., Zia-ur-Rehman, M., & Nisar, M. (2011). Does the food advertisement on television have the impact on children's food purchasing behavior? A study based on Pakistan food advertisement. *International Journal of Business & Management*, 6(1), 283-289.
- Harrison, K. (2005). Is "fat free" good for me? A panel study of television viewing and children's nutritional knowledge and reasoning. *Health Communication*, 17(2), 117-132. doi:10.1207/s15327027hc1702_1
- Henderson, V., & Kelly, B. (2005). Food advertising in the age of obesity: Content analysis of food advertising on general market and African American television. *Journal of Nutrition Education and Behavior*, 37(4), 191-196.
- Ip, J., Mehta, K. P., & Coveney, J. (2007). Exploring parents' perceptions of television food advertising directed at children: A South Australian study. *Nutrition & Dietetics*, 64(1), 50-58. doi:10.1111/j.1747-0080.2007.00069.x
- Kelly, B., Chapman, K., King, L., & Hebden, L. (2011). Trends in food advertising to children on free-to-air television in Australia. *Australian and New Zealand Journal of Public Health*, 35(2), 131-134. doi:10.1111/j.1753-6405.2011.00612.x
- Kent, M., Dubois, L., & Wanless, A. (2011). Food marketing on children's television in two different policy environments. *International Journal of Pediatric Obesity*, 6(2), e433-e441. doi:10.3109/17477166.2010.526222
- King, L., Hebden, L., Grunseit, A., Kelly, B., Chapman, K., & Venugopal, K. (2011). Industry self-regulation of television food advertising: Responsible or responsive? *International Journal of Pediatric Obesity*, 6(2), e390-e398. doi:10.3109/17477166.2010.517313
- Lewis, M., & Hill, A. (1998). Food advertising on British children's television: A content analysis and experimental study with nine-year olds. *International Journal of Obesity & Related Metabolic Disorders*, 22(3), 206.
- Livingstone, S. (2006). Does TV advertising make children fat? *Public Policy Research*, 13(1), 54-61. doi:10.1111/j.1070-3535.2006.00421.x
- Livingstone, S., & Helsper, E. J. (2006). Does advertising literacy mediate the effects of advertising on children? A critical examination of two linked research literatures

- in relation to obesity and food choice. *Journal of Communication*, 56(3), 560-584. doi:10.1111/j.1460-2466.2006.00301.x
- Lobstein, T. T., & Dobb, S. S. (2005). Evidence of a possible link between obesogenic food advertising and child overweight. *Obesity Reviews*, 6(3), 203-208. doi:10.1111/j.1467-789X.2005.00191.x
- Ludington-Hoe, S. M., Gittner, L. S., & Haller, H. S. (2013). A pilot study: Does obesity begin in the first year of life? *Clinical Pediatrics*, 52(6), 507-512. doi:10.1177/0009922813482750
- Mackay, S. (2009). Food advertising and obesity in Australia: To what extent can self-regulation protect the interests of children? *Monash University Law Review*, 35(1), 118-146.
- Magnus, A. A., Haby, M. M., Carter, R. R., & Swinburn, B. B. (2009). The cost-effectiveness of removing television advertising of high-fat and/or high-sugar food and beverages to Australian children. *International Journal of Obesity*, 33(10), 1094-1102. doi:10.1038/ijo.2009.156
- Manios, Y., Kondaki, K., Kourlaba, G., Grammatikaki, E., Biribilis, M., & Ioannou, E. (2009). Television viewing and food habits in toddlers and preschoolers in Greece: The GENESIS study. *European Journal of Pediatrics*, 168(7), 801-808. doi:10.1007/s00431-008-083
- Mello, M. M. (2010). Federal Trade Commission regulation of food advertising to children: Possibilities for a reinvigorated role. *Journal of Health Politics, Policy & Law*, 35(2), 227-276. doi:10.1215/03616878-2009-051
- Milanović, J. (2012). Sedentary behavior at obese children and youth. *Medicinski Glasnik / Medical Gazette*, 17(44), 101-111.
- Palmer, E. L., & Carpenter, C. F. (2006). Food and beverage marketing to children and youth: Trends and issues. *Media Psychology*, 8(2), 165-190. doi:10.1207/S1532785XMEP0802_6
- Public Health England. (2013). Trend in obesity prevalence. *Public Health England*. Retrieved from http://www.noo.org.uk/NOO_about_obesity/trends.
- Raynor, H. A., Bond, D. S., Freedson, P. S., & Sisson, S. B. (2012, January). Sedentary behaviors, weight, and health and disease risks. *Journal of Obesity*. 1-3. doi:10.1155/2012/852743

- Rey-López, J. P., Ruiz, J. R., Vicente-Rodríguez, G. G., Gracia-Marco, L. L., Manios, Y. Y., Sjöström, M. M., & ... Moreno, L. A. (2012). Physical activity does not attenuate the obesity risk of TV viewing in youth. *Pediatric Obesity*, 7(3), 240-250. doi:10.1111/j.2047-6310.2011.00021.x
- Roberts, M., Pettigrew, S., Chapman, K., Miller, C., & Quester, P. (2012). Compliance with children's television food advertising regulations in Australia. *BMC Public Health*, 12(1), 846-851. doi:10.1186/1471-2458-12-846
- Sterrett, E. M., Williams, J., Thompson, K., Johnson, K., Bright, M., Karam, E., & Jones, V. (2013). An exploratory study of two parenting styles and family health behaviors. *American Journal of Health Behavior*, 37(4), 458-468. doi:10.5993/AJHB.37.4.4
- Stubbs, J. J., Pallister, C. C., Avery, A. A., Allan, J. J., & Lavin, J. J. (2012). Weight, body mass index and behaviour change in a commercially run lifestyle programme for young people. *Journal of Human Nutrition & Dietetics*, 25(2), 161-166. doi:10.1111/j.1365-277X.2011.01224.x
- Vik, F. N., Bjørnarå, H., Øverby, N. C., Lien, N., Androutsos, O., Maes, L., & ... Bere, E. (2013). Associations between eating meals, watching TV while eating meals and weight status among children, ages 10-12 years in eight European countries: The ENERGY cross-sectional study. *International Journal of Behavioral Nutrition & Physical Activity*, 10(1), 58-67. Available from: Academic Search Complete, Ipswich, MA. Accessed June 25, 2013.
- Warren, R., Wicks, J., Wicks, R. H., Fosu, I., & Donghung, C. (2007). Food and beverage advertising to children on U.S. television: Did national food advertisers respond? *Journalism & Mass Communication Quarterly*, 84(4), 795-810.
- Wilde, P. (2009). Self-regulation and the response to concerns about food and beverage marketing to children in the United States. *Nutrition Reviews*, 67(3), 155-166. doi:10.1111/j.1753-4887.2009.00183.x
- Wills, T., Fehin, P., & Callen, B. (2011). Body mass index knowledge of older adults and motivation to change. *British Journal of Community Nursing*, 16(3), 110-115.