Warwick Obesity Network

Rapid Review of the Evidence For and Against Restrictions on Food Advertising to Fight Obesity

Summary

The interdisciplinary Warwick Obesity Network conducted a rapid review of medical research published over the past 15 years on the links between advertising and obesity. A summary of key points that emerged:

- Based on the evidence presented in this review, the Warwick Obesity Network urges the government to further restrict children’s (online and television) exposure to advertisements promoting high fat, sugar and salt (HFSS) foods. We support the implementation of a total ban for the online advertisement of HFSS products and further restrictions introduced for advertising HFSS products on TV.
- The relationship between obesity and exposure to food advertising meets all criteria commonly used to demonstrate the presence of a causal relationship in epidemiology.
- Younger children (<8 years of age) are more susceptible to the impacts of food marketing, in terms of quantity and quality of calories consumed, than older children and adults.
- Children from socio-economically disadvantaged and ethnic minority backgrounds are disproportionately exposed to unhealthy food advertisements.
- “Advergames” that contain food cues can increase short-term food consumption. Though the primary purpose of most advergames is the promotion of unhealthy foods, parents and children are often unaware that advergames are advertising tools.
- The use of a familiar cartoon character wields more powerful influence on children’s preference for less healthy foods than for fruits or vegetables.
- The introduction of further statutory regulations is widely supported by both the general public and health care professionals.
- Regulating the advertising of unhealthy foods likely represents a cost-effective intervention.
- Advertising restrictions must be accompanied by community-based interventions that address other causes of poor diet and sedentary behaviour; this is because online and TV advertisements represent one small dimension in the wider obesogenic environment.
- Voluntary bans are ineffective. Exposure to unhealthy food advertising is similar before and after the introduction of voluntary food advertisements.

Method

The team conducted a rapid review of published evidence based on an electronic search in Medline. The review covers English-language studies published from 2006 to 2020. The search included all systematic reviews that contained an advertisement element.
(intervention/exposure) and captured obesity-related outcomes. Studies were screened using a pre-defined form to extract key data, such as design of included studies, sample size, analysis, population, intervention/exposure and outcomes (see Appendix 1). This review synthesises evidence from 18 systematic reviews, incorporating results of some 400 peer-reviewed studies involving more than 9,000 individuals.

Results

Relationship between advertising and food consumption. Four systematic reviews conclude that exposure to screen advertising significantly increases children’s short-term consumption of unhealthy food (e.g., Boyland et al., 2016; Sadeghirad et al., 2016; Folkvord & Riet 2018; Russell et al., 2019). One systematic review and meta-analysis, collating evidence from 39 published studies, found that playing an advergame that contains food cues (e.g., placing food in a character’s mouth to earn points) for 5 minutes increased short-term food consumption by 53.4 kcal compared to advergames without food cues (Russell et al., 2019). The same review found that exposure to 4.4 minutes of TV food advertisements increased short-term food consumption by 60.0 kcal compared to children exposed to non-food advertisements (Russell et al., 2019).

Food advertisements seem to have a greater impact in promoting consumption of unhealthy food compared to healthy food (Kraak & Story, 2015). For example, the use of a familiar cartoon media character has a more powerful influence on children’s preference for less healthy foods than the use of the same character to on children’s preference for fruit or vegetables (Kraak & Story, 2015).

Due to a lack of longitudinal evidence, it is less clear whether an acute increase in food consumption, in response to food advertising, is associated with long-term health outcomes such as obesity. However, a 2016 systematic review found that the relationship between obesity and exposure to food advertising meets all criteria commonly used to determine the presence of a causal relationships in epidemiology (Normal et al., 2016). This research was undertaken using the ‘Bradford Hill Criteria’, a recognised public health framework (Bradford Hill, 1965). The evidence base was particularly strong for children aged 3-12 years, with exposure to marketing across all media platforms consistently demonstrating significant, negative effects on food preferences and food consumption (Normal et al., 2016).

Vulnerability and exposure of certain children. Younger children (≤8 years of age) are more susceptible to the impacts of food marketing, in terms of quantity and quality of calories consumed, than older children and adults (Boyland et al., 2016; Sadeghirad et al., 2016).

There is also strong and consistent evidence, from a 2020 systematic review collating evidence from 25 studies, that children from socio-economically disadvantaged and ethnic minority backgrounds are disproportionately exposed to advertisements promoting high fat, sugar and salt (HFSS) foods (Backholder et al., 2020). Children in lower-income households are more exposed because they spend more time than their higher-income peers watching TV and playing online games. There are also regional differences in food access, with lower-income neighbourhoods often having worse access to healthy and nutritious food outlets and a greater prevalence of outdoor advertising of HFSS foods and drinks (Backholder et al., 2020).
Children who are overweight or obese are also more vulnerable to the influence of marketing; following exposure to food advertisements, these children consume an average of 45.6 kcal more than children of healthy weight (Russell et al., 2019).

It has been hypothesised that children are particularly vulnerable to the effects of marketing as they are unable to understand its selling or persuasive intent. In fact, a systematic review examining food promotions in Australia found that 75%-100% of 6-year-olds fail to comprehend the basic purpose of food advertisements (Carter 2006).

While the mechanisms by which food advertising affects eating behaviour is beyond the scope of this review, it appears that food advertisements activate a certain region of children’s brains: the ventromedial prefrontal cortices (vmPFC), which play a role in decision-making, reward valuation and self-control (Bruce et al., 2016). This activation results in more rapid food decisions and a tendency to favour taste over nutrition (Bruce et al., 2016).

**Prevalence of HFSS advertising.** Food advertising in the UK is dominated by foods that are high in fat, salt and sugar (Boyland & Halford, 2013; Sonntag et al., 2015; Azar et al., 2018). An examination of children’s TV advertisements broadcast in the UK found that 62.5% of broadcasts were for food items, out of which 73.4% to 95.3% were related to HFSS foods (Azar et al., 2018). Less information is available on duration of or exposure to advergames; however, Sonntag et al. (2015) found that the primary purpose of most advergames is the promotion of unhealthy foods. As advergames do not typically include age restrictions, it is likely that children are accessing advergames that are not age appropriate. Parents and children are often unaware that advergames have a marketing element; they instead mistake these advertising vehicles for generic online games (Folkvord & Riet, 2018).

Despite current regulations, children in the UK continue to be exposed to a high volume of TV and online adverts promoting HFSS food (Boyland & Halford, 2013; Folkvord & Riet, 2018). The introduction of further statutory regulations is widely supported by both the general public and health care professionals (Lobstein et al., 2020).

**Policy considerations.** Further regulation is a potentially cost-effective option. A systematic review of 30 studies, examining the cost-effectiveness of 13 different policy options to reduce HFSS food consumption in children, found restrictions of online and TV advertisements to be the most cost-effective policy option (Lobstein et al., 2020).

It must be noted that online and TV advertisements represent one small dimension in the wider obesogenic environment. The food industry targets children in multiple ways, including the use of appealing product packaging, priority positioning of HFFS products in supermarkets, and an abundance of unhealthy food options in public places (Paes et al., 2015; Elliot & Truman, 2020). A 2015 review of 36 studies found that HFSS food products are overwhelming advertised to children, using various strategies, while healthy foods high in fibre, vitamins and minerals are rarely promoted by the food industry (Sonntag et al., 2015). Food advertisement restrictions are also unlikely to be effective in reducing the rising levels of childhood obesity unless they are supported by community-based interventions that address other causes of poor diet and sedentary behaviour (Weihrauch-Blüher et al., 2018).

Finally, voluntary codes are unlikely to be sufficient in reducing the advertising of unhealthy foods. Exposure to HFSS food advertising has been shown to be similar in countries before
and after the introduction of voluntary food advertisement restrictions (Galbraith-Emami et al., 2013). Industry-sponsored reports typically overestimate the effect of voluntary bans – a striking contrast with the findings of independent reports that show no impact (Galbraith-Emami et al., 2013).

**Recommendations**

On the basis of this review of current evidence, we urge the government to implement further restrictions that would limit children’s exposure to both television and on-line advertising for HFSS foods. Specifically, we believe there is evidence to support a total ban for the online advertisement of HFSS products to children and further restrictions introduced for advertising HFSS products on TV.

**About the Warwick Obesity Network**

The Warwick Obesity Network is an interdisciplinary team of academics and clinicians at the University of Warwick who working on obesity interventions. The network aims to mobilise current academic knowledge to inform policies that can address the global obesity epidemic. The team brings together expertise in medicine, public health, economics, psychology, behavioural science, and dietetics and nutrition. Members of the team are Dr Thijs van Rens (principal investigator, Department of Economics), Dr Lena Alkhudairy (Warwick Medical School), Dr Thomas Barber (Warwick Medical School, UHCW NHS Trust), Dr Paul Coleman (Warwick Medical School), Dr Petra Hanson (Warwick Medical School, UHCW NHS Trust), Dr Redzo Mujcic (Warwick Business School), Dr Oyinlola Oyebode (Warwick Medical School), and Dr Lukasz Walasek (Department of Psychology).

This evidence review was written by: Dr Coleman and Dr Hanson, in collaboration with the Warwick Obesity Network.

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This policy brief summarises findings of a rapid evidence review conducted for the UK Government consultation on total restriction of online advertising for products high in fat, sugar and salt (HFSS).
Government Consultation: Rapid review of the academic evidence for and against restrictions on advertising to fight obesity

References


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<tr>
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<th>Title</th>
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**Study designs included:**
- Children 2-18
- No control groups
- RCT
- Systematic reviews, reports from government and intergovernmental agencies and non-governmental organizations and foundations, commercial associations and professional societies.

**Appendix 1: Data extraction**

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**Current Guidelines for Obesity Prevention in:**

**The effect of screen advertising on children's unhealthy advertising to children by socio-economic status (SEP) and/or ethnicity**: Examines the differential impact of unhealthy food and beverage advertising on children's dietary behavior and oral health. Aims to inform public health strategies to reduce the negative effects of unhealthy food and beverage advertising on children's health and well-being.

**Results from meta-analysis:**

- 38.0% (95% CI: 19.6 to 60.6) of advertisements were related to food, and 70.6% of food advertisements related to cariogenic food.

**Additional findings:**

- Advertising of foods especially targeted at pre-school children has a significant negative influence. Exposure to (not only) TV advertisements should be limited or completely avoided.

**Conclusion:**

- Unhealthy food and beverage marketing increased dietary intake among children exposed to screen advertising. Some studies asked children what food they were planning to eat or how often they ate unhealthy food, whereas others used self-reporting methods. The evidence about the content of TV programming included a variety of reports from business and professional associations. Researchers applied both random and fixed effects model. Meta-analysis included only studies that reported outcome data. Four out of five meta-analyses performed well with a mean effect size of 0.02. The most highly advertised food categories for children were confectioneries, sugared dairy products, and sugARED cereals. There are significant differences in broadcasting of harmful foods in various media in combination and over longer periods of time.

**Experimental and non-experimental studies, from business and professional associations:**

- Long-term impacts on BMI are known to be lower than short-term impacts. Children are particularly susceptible if advergames include a high number of brand identifiers, or when they can play these games without any restriction.

**Conclusion:**

- Long-run impacts of advergames on children's healthy eating behaviors are unknown. Children's exposure to advergames is not well understood. Further research is needed to evaluate the long-term effects of advergames on children's health and well-being.

**Additional findings:**

- Children exposed to food advertising on TV (11 studies) and advergames (five studies) respectively consumed an average 60.0 kcal and 42.0 kcal more than children in the control group (all studies were RCT).

**Conclusion:**

- Exposure to unhealthy food advertising is associated with increased dietary intake and risk of obesity. Public health strategies should focus on reducing exposure to unhealthy food advertising to improve children's diets and reduce inequities in dietary intake.

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- The evidence about the content of TV programming included a variety of reports from business and professional associations. Researchers applied both random and fixed effects model. Meta-analysis included only studies that reported outcome data. Four out of five meta-analyses performed well with a mean effect size of 0.02.

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<th>Population</th>
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<td>The impact of initiatives to limit the advertising of unhealthy food and non-alcoholic beverages on intake in children and exposure to unhealthy food and non-alcoholic beverages for up to 12 months</td>
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<td>Four of these studies found that the effect of character branding was stronger for a familiar character on unhealthy food versus the same character used to promote fruit or vegetables.</td>
<td>Media character branding is a more powerful influence on children's food preferences, choices and intake, especially for energy-dense and nutrient-poor foods (e.g., cookies, candy or chocolate).</td>
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| 3         | Government Consultation | 23 | 2013 | 2012 | Y | Y | Not defined | Not defined | No | No | There is a lack of longitudinal evidence and experimental studies 
| 4         | Interactions | 25    | 2013           | 2012       | N                         | Y                    | Not defined | Not defined            | No              | No               | The current evidence on exposure to food marketing and children's food behaviors, when examined together, satisfies all key criteria commonly used to evaluate causal relationships in epidemiology. | Exposure to food marketing can influence children's food behaviors, including intake and preferences, and this can be mediated through exposure to advertising. | No                | No               | No            | No                |