Appetite 166 (2021) 105431

Contents lists available at ScienceDirect

Appetite

journal homepage: www.elsevier.com/locate/appet

Food and drink marketing on social media and dietary intake in Australian adolescents: Findings from a cross-sectional survey

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ARTICLE INFO

Keywords:
Social media
Adolescents
Diet
Food marketing
Digital marketing
Advertising

ABSTRACT

Unhealthy food and drink marketing is prominent on social media and use of such platforms is widespread among adolescents. This study aims to examine the association between exposure to and engagement with food or drink advertisements on social media and unhealthy food and drink intake in Australian adolescents. In 2018, a representative sample of secondary school students aged 12–17 years (N = 8708) self-reported how frequently they saw food or drink advertisements on social media (exposure), 'liked' or 'shared' food or drink posts (engagement), and consumption of various unhealthy food and drinks. Multilevel logistic regression assessed the association between exposure to and engagement with food marketing on social media and high intake of unhealthy food and drinks. Fifty-five percent of students reported seeing a food or drink advertisement on social media at least weekly, while engagement was less frequent. Exposure to a food or drink advertisement on social media at least once in the last week was associated with a high intake of unhealthy drinks, while liking or sharing a food or drink post at least once in the last month was associated with a high intake of unhealthy food and drinks (all $p < 0.01$). As frequency of engagement with this type of marketing increased, so too did the likelihood of a high intake of unhealthy food and drinks. The association between exposure to and engagement with food or drink marketing and high unhealthy drink intake was driven by males, while all associations persisted irrespective of age. Holding manufacturers to higher standards in their digital marketing of unhealthy food and drink products through improved policy design and enforcement capability may be crucial in enabling young individuals to maintain a healthy diet.

1. Introduction

Maintaining a healthy diet during adolescence promotes mental and physical health throughout the life course. Early diet quality has been associated with a reduced risk of depression (Jacka, Kremer, & Leslie, 2010, Jacka, Kremer, & Berk, 2011), cancer (Farvid, Eliassen, & Cho, 2016; Mahabir, 2013; Ruder, Thiébaut, & Thompson, 2011), type 2 diabetes (Malik, Sun, & van Dam, 2011) and weight gain (Hu, Jacobs, & Larson, 2016). However, for many young Australians, the persistent and ubiquitous promotion of energy-dense, nutrient-poor (unhealthy) food and drinks provides a barrier to consuming a nutritious, high quality diet essential for development and the prevention of non-communicable diseases (Smith, Kelly, & Yeatman, 2019; World Health Organization, 2010). Young people are typically exposed to unhealthy food and drink marketing (herein referred to as unhealthy food marketing) multiple times each day (Kelly et al., 2019; Signal, Stanley, & Smith, 2017) and are disproportionately targeted (Boelsen-Robinson, Backholer, & Peeters, 2015; Cairns et al., 2013). Creating an environment free from unhealthy food marketing has been endorsed by the World Health Organization (WHO) as a vital strategy in improving diet quality in young people (World Health Organization, 2010). Consequently, many countries have begun to restrict unhealthy food marketing on television and in other traditional advertising settings such as radio and magazines (World Cancer Research Fund International, 2019).

The advent of smart phones, tablets and increased online connectivity (Australian Communications Media Authority, 2013) has led to a notable increase in food and drink companies using digital platforms, which are not subject to the same level of regulation by government and industry codes as traditional advertising modes, to market their products (Hickey et al., 2018; Kelly, Vandevijvere, & Freeman, 2015). Digital

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https://doi.org/10.1016/j.appet.2021.105431
Received 18 June 2020; Received in revised form 21 May 2021; Accepted 25 May 2021
Available online 29 May 2021

marketing (i.e. "promotional activity, delivered through a digital medium, that seeks to maximise impact through creative and/or analytical methods" (World Cancer Research Fund International, 2020)) potentially has a greater influence on consumer behaviour than marketing on television and in other traditional advertising settings for a number of reasons. Firstly, digital media is pervasive and not confined to designated settings, providing an attractive opportunity for advertising agencies to reach large audiences (Appel et al., 2020). Furthermore, it is often targeted at the individual level and can reinforce marketing campaigns via other media avenues to increase the salience (Kelly, Vandevijvere, & Freeman, 2015) and persuasive effects (Norman, Kelly, & McMahon, 2018) of such campaigns. Advertising on digital platforms has also facilitated the proliferation of novel forms of marketing, such as seeded marketing that utilises word-of-mouth to promote products (Chae, Stephen, & Bart, 2017), which is commonly embedded into entertainment content (Calvert, 2008), masking the persuasive intent (Wright, Friestad, & Boush, 2005) of the message. In such instances, the lower (automatic) cognitive processing of the integrated marketing material promotes the formation of implicit brand attitudes, which in turn has a strong effect on impulsive consumer behaviour according to the Processing of Commercialized Media Content (PCMC) model (Buijzen, Van Reijmersdal, & Owen, 2010). By clouding the distinction between marketing and entertainment, such content is more likely to be shared among peers (a phenomenon known as consumer-generated media (Mangold & Faulds, 2009)), thus creating descriptive norms and promoting normative behaviour (Lapinski & Rimal, 2005). It is also well established that entertaining content can condition positive brand attitudes through affect transfer (Kim, Allen, & Kardes, 1996) and that positive brand attitudes and purchase intention is promoted with increasing entertainment value (Jung, Min, & Kellaris, 2011). Lastly, digital marketing has greater agility than advertising on television or in other traditional settings in that it can be created, distributed and modified in a timely manner so as to be responsive to social trends and popular social narratives. The appeal of digital platforms for advertising agencies has prompted proposed restrictions on online junk food marketing in the United Kingdom (Department of Health and Social Care, 2020) and Europe (Joint Research Centre (20, 2020), as recommended by the WHO (Tatlow-Golden, Boyland, & Jewell, 2016).

The majority of Australian adolescents are active users of at least one social media platform, such as Facebook, YouTube or Instagram, and many have profiles on multiple platforms (Office of the eSafety Commissioner, 2018) and report daily use (Australian Communications Media Authority, 2013). Despite the prominence of unhealthy food marketing on social media and evidence of high levels of adolescent engagement with such brands online (Fleming-Milici & Harris, 2020), knowledge of the influence of digital food marketing on young people's dietary behaviours is still evolving (Smith, Kelly, & Yeatman, 2019). Previous research has focused on exposure to digital marketing via email or text message (Scully, Wakefield, & Niven, 2012), food brand videos (Baldwin, Freeman, & Kelly, 2018) and video blogs that employ product endorsement by social media 'influencers' (Smit et al., 2020), with all showing convincing associations with consumption of unhealthy food or drinks. However, to our knowledge, no studies have investigated the link between unhealthy food and drink intake among adolescents and their frequency of exposure to and engagement with food or drink advertising on social media more broadly. Further, previous studies have not addressed potential differences in these effects by demographic characteristics.

The aim of the present study is to extend upon current knowledge by examining the association between exposure to food or drink advertisements on social media and unhealthy food and drink intake in a large, representative sample of Australian secondary school students. We also aim to explore the association between engagement with food or drink posts on social media and unhealthy food and drink intake, as well as whether these associations differ by demographic characteristics. We hypothesise that adolescents with greater exposure to food or drink advertisements on social media and more frequent engagement with food or drink posts in the last month will be more likely to report high intake of unhealthy food and drinks.

2. Methods

2.1. Sample and procedure

Australian adolescents aged 12–17 years were recruited as part of a large school-based cross-sectional study, the National Secondary Students' Diet and Activity (NaSSDA) survey. The NaSSDA study was approved by the Human Research Ethics Committee of Cancer Council Victoria (HREC 1117) and conducted in accordance with the Declaration of Helsinki. Approval was also obtained from the education authority for each sector in each state and territory, as well as the principal at each selected school. A stratified two-stage probability design was employed, first randomly selecting schools stratified by school type (government, Catholic and independent) to ensure the sample reflected education sector distributions, and then randomly selecting classes within each school. Surveys were administered in classrooms across each Australian state and territory between May and December 2018. Students were eligible if they were in year levels 8 to 11 and attending school on the day of the survey. Student participation in the survey required either passive (opt-out) or active written parent/carer consent as mandated by each individual state and territory education department. Prior to commencement of the survey, students were provided with information on the nature of the questionnaire and were instructed they could opt-out of the research. Written assent was provided by all participating students.

2.2. Measures

2.2.1. Food marketing exposure and engagement on social media

Students were asked to report how often in the last month they had (i) seen an advertisement for a food or drink product on social media (e.g. Facebook, Instagram) and (ii) 'liked' or 'shared' posts related to a food or drink product or brand (e.g. soft drink, fast food) to measure food marketing exposure and engagement, respectively. Response options included *not in the last month, 1–3 times a month, 1–3 times a week* and *daily or almost daily*.

2.2.2. Unhealthy food and drink intake

Students were asked how often they eat a variety of unhealthy food types including (i) sweet foods (e.g. sweet biscuits, cakes, muffins), (ii) meals or snacks from take away food places (e.g. burgers, pizza, chicken, chips), (iii) confectionery (e.g. lollies and chocolates), (iv) ice cream, icy poles or ice blocks, (v) potato crisps/chips or other salty snacks (e.g. corn chips), and (vi) hot chips, French fries, wedges or fried potatoes. Response options for all food items included *never*, *less than once a week*, *about 1-2 times a week*, *about 3-4 times a week*, *about 5-6 times a week* and *every day*. Students were also asked how much of a variety of unhealthy drinks they consume including (i) fruit juice, (ii) soft drinks (e.g. cola, lemonade), cordials or sports drinks, (iii) diet drinks (i.e. all diet varieties of soft drinks, flavoured mineral waters, energy drinks, sports drinks and cordial), and (iv) non-alcoholic energy drinks. Response options for all drink items included *I don't drink this product*, *less than 1 cup a month*, *about 1-3 cups a month, about 1-3 cups a week, about 4-6 cups a week, about 1-2 cups a day, about 3-4 cups a day* and *5 cups or more a day*. Each food and drink item was subsequently recoded to reflect average number of times/cups per week; for example, *1–2 times a week* was assigned a score of 1.5 times a week, and *1–3 cups a month* was assigned a score of 0.5 cups a week. The sum of the weekly scores for the six food items (range: 0–84) and the four drink items (range: 0–140) generated a continuous measure of students' unhealthy food and drink intakes, respectively, which was then dichotomised into low-mid (quartiles 1–3) and high (quartile 4) intake, corresponding to unhealthy food consumed

Table 1
Demographic characteristics of the study sample (N = 8708) and the Australian population.

	Study sample		Australian population[a]
	n	%	%
Sex			
Male	4125	47.4	50.8
Female	4583	52.6	49.2
Socio-economic area			
Low (1–40%)	2498	28.7	34.0
Mid (41–80%)	4000	45.9	41.2
High (81–100%)	2210	25.4	24.8
Age group			
12–13 years	1330	15.3	20.8
14–17 years	7378	84.7	79.2
Geographic location			
Metropolitan	5697	65.4	71.3
Regional/remote	3011	34.6	28.7
Seen food/drink ad on social media			
Not in the last month	1853	21.3	–
1–3 times per month	2099	24.1	–
1–3 times per week	2563	29.4	–
Daily or almost daily	2193	25.2	–
'Liked'/'Shared' posts on social media			
Not in the last month	6866	78.8	–
1–3 times per month	1107	12.7	–
1–3 times per week	492	5.6	–
Daily or almost daily	243	2.8	–

Note: Percentages are rounded so may not sum to 100%.
[a] Australian population distributions were calculated using data from the Australian Bureau of Statistics among the general population for socio-economic area (Australian Bureau of Statistics, 2018a) and geographic location (Australian Bureau of Statistics, 2018c), and among students aged 12–17 years for sex and age group (Australian Bureau of Statistics, 2019). Based on unweighted data.

≥14 times per week and ≥7.5 cups of unhealthy drink consumed per week.

2.2.3. Potential confounders

In addition to assessing exposure to food marketing via social media, students were also asked to report how often in the last month they had seen an advertisement for a food or drink product (i) at the supermarket, convenience store and/or milkbar, (ii) at a sporting event they had attended or watched on TV, (iii) on public transport (e.g. bus, train, tram), (iv) at school (e.g. canteen, sports event), (v) on a website, and (vi) in a magazine. A proxy measure of exposure to television advertising was determined by asking students to indicate how much time they spent watching commercial television on a typical school day, Saturday and Sunday. A weighted average daily time spent watching commercial television was subsequently calculated, with values collapsed into 'none', '1 h or less/day', '>1 h to 2 h/day' and '>2 h/day' categories. Finally, all students reported their sex, year level and home postcode, which was used to compute socio-economic area (low (quintiles one and two), mid (quintiles three and four) or high (quintile five)) according to the Socio-Economic Index for Areas (SEIFA) Index of Relative Socio-Economic Disadvantage (IRSD) ranking for Australia (Australian Bureau of Statistics, 2018a), and home location (metropolitan or regional/remote) according to the Australian Statistical Geography Standard Remoteness Structure (Australian Bureau of Statistics, 2018b).

2.3. Statistical analyses

Analyses were conducted using Stata MP version 16.1 (StataCorp, 2020). The association between (i) exposure to food or drink marketing on social media and (ii) liking or sharing food or drink posts and high intake of unhealthy food and drinks was assessed using multilevel logistic regression with school as the random effect. An interaction term was added to the models to determine whether the associations varied by sex, socio-economic area and age group (12–13 years and 14–17 years). A significance level of $p < 0.20$ was accepted for interaction tests (Kirkwood & Sterne, 2003), while a conservative significance level of $p < 0.01$ was accepted for all other analyses due to multiple statistical testing. All models controlled for student sex, socio-economic area, age group, home location, school type, state/territory, time spent watching commercial television, and exposure to food or drink advertising in other settings (supermarket/convenience stores, sport events, public transport, school, websites and magazines). Exposure to food or drink marketing on social media was also included as a control variable when testing the association between liking or sharing food or drink posts and high intake of unhealthy food and drinks. Likelihood ratio tests determined that inclusion of covariates provided a superior model fit, with the adjusted model being a better predictor of sample observations.

3. Results

In 2018, 9268 students (student response rate = 67%) from 104 schools (school response rate = 8%) participated in the NaSSDA survey. Analyses are based on data from 8708 male and female students who met inclusion criteria (i.e. aged 12–17 years) and completed all measures included in the analyses. The sample comprised approximately equal proportions of male and female students, with greater representation from students aged 14 years and above as well as students residing in mid socio-economic and metropolitan areas (Table 1). Comparisons with the general Australian population (Australian Bureau of Statistics, 2018a,c), and the population of Australian students aged 12–17 years where possible (Australian Bureau of Statistics, 2019), can be found in Table 1.

Over half (55%) of students surveyed reported seeing a food or drink advertisement on social media at least weekly in the past month, with a quarter (25%) exposed daily or almost daily (Table 1). Liking or sharing food or drink posts on social media was a less frequent behaviour, with approximately one in five students (21%) reporting having done so in the last month.

Table 2
Associations between exposure to and engagement with food marketing on social media and high intake of unhealthy food and drinks among Australian secondary school students using unweighted multilevel logistic regression with school as the random effect.

	High intake of unhealthy food		High intake of unhealthy drinks	
	AOR (95% CI)	*p*-value	AOR (95% CI)	*p*-value
Seen food/drink ad on social media				
Not in the last month	1.00 (ref)	–	–	–
1-3 times per month	1.13 (0.96–1.33)	0.152	1.22 (1.02–1.44)	0.026
1-3 times per week	1.06 (0.90–1.25)	0.487	1.32 (1.11–1.57)	0.002
Daily or almost daily	1.05 (0.87–1.26)	0.601	1.57 (1.30–1.90)	<0.001
'Liked' or 'shared' food/drink post				
Not in the last month	1.00 (ref)	–	–	–
1-3 times per month	1.49 (1.29–1.73)	<0.001	1.60 (1.38–1.86)	<0.001
1-3 times per week	2.51 (2.06–3.06)	<0.001	3.00 (2.45–3.69)	<0.001
Daily or almost daily	5.26 (3.94–7.01)	<0.001	4.14 (3.09–5.55)	<0.001

Note: Bold values denote statistical significance at $p < 0.01$; AOR = adjusted odds ratio; CI = confidence interval. Odds ratios are adjusted for sex, socio-economic area, age group, home location, school type, state/territory, time spent watching commercial television and exposure to food or drink advertising in other settings (supermarket/convenience stores, sport events, public transport, school, websites and magazines).

3.1. Association between food marketing exposure on social media and unhealthy dietary intake

After controlling for potential confounders, students who reported seeing a food or drink advertisement on social media at least once in the last month were no more likely to have high intake of unhealthy food compared to students who reported not being exposed to such marketing over this period (all $p > 0.15$; Table 2; Fig. 1). However, the odds of having high intake of unhealthy drinks were significantly greater among students who reported seeing a food or drink advertisement on social media at least once a week compared to not in the last month (1–3 times per week: adjusted odds ratio (AOR) = 1.32, 95% CI = 1.11–1.57, $p = 0.002$; daily or almost daily: AOR = 1.57, 95% CI = 1.30–1.90, $p < 0.001$).

Interaction tests showed that the association between seeing a food or drink advertisement on social media and having high intake of unhealthy drink persisted regardless of socio-economic area or age group (all $p > 0.20$; Table S2 and Table S3), yet there was significant variation by sex (χ^2 (3) = 12.66, $p = 0.005$; Table S1). Stratified analyses found a similar pattern of results to the overall sample among male students (1–3 times per month: AOR = 1.42, 95% CI = 1.13–1.79, $p = 0.002$; 1–3 times per week: AOR = 1.63, 95% CI = 1.29–2.04, $p < 0.001$; daily or almost daily: AOR = 1.88, 95% CI = 1.46–2.43, $p < 0.001$), but no evidence for an association among female students (all $p > 0.20$).

3.2. Association between food marketing engagement on social media and unhealthy dietary intake

Compared with students who did not engage with food marketing on social media in the last month, students who reported liking or sharing a food or drink post at least once during this period were significantly more likely to have high intake of unhealthy food (1–3 times per month: AOR = 1.49, 95% CI = 1.29–1.73, $p < 0.001$; 1–3 times per week: AOR = 2.51, 95% CI = 2.06–3.06, $p < 0.001$; daily or almost daily: AOR = 5.26, 95% CI = 3.94–7.01; $p < 0.001$) and unhealthy drinks (1–3 times per month: AOR = 1.60, 95% CI = 1.38–1.86, $p < 0.001$; 1–3 times per week: AOR = 3.00, 95% CI = 2.45–3.67, $p < 0.001$; daily or almost daily: AOR = 4.14, 95% CI = 3.09–5.55; $p < 0.001$), respectively (Table 2). As students' level of engagement with this type of marketing increased, so too did the likelihood of them having high intake of unhealthy food and drinks.

Interaction tests found that this pattern of results did not differ as a function of students' age ($p > 0.20$; Table S3). However, the association between engagement and unhealthy food intake differed by socio-economic area (χ^2 (6) = 12.84, $p = 0.046$; Table S2), and the association between engagement and unhealthy drink intake differed by both sex (χ^2 (3) = 6.55, $p = 0.088$; Table S1) and socio-economic area (χ^2 (6) = 10.41, $p = 0.108$). Further stratified analyses found that associations persisted among both male and female students, with only slight variation by socio-economic area.

4. Discussion

As hypothesised, exposure to food and drink advertisements on social media was associated with a high intake of unhealthy drinks, while engagement with such marketing was associated with high intake of both unhealthy food and unhealthy drinks. There was also evidence of a positive relationship between greater engagement, but not exposure, and unhealthy dietary intake, with the strongest associations observed

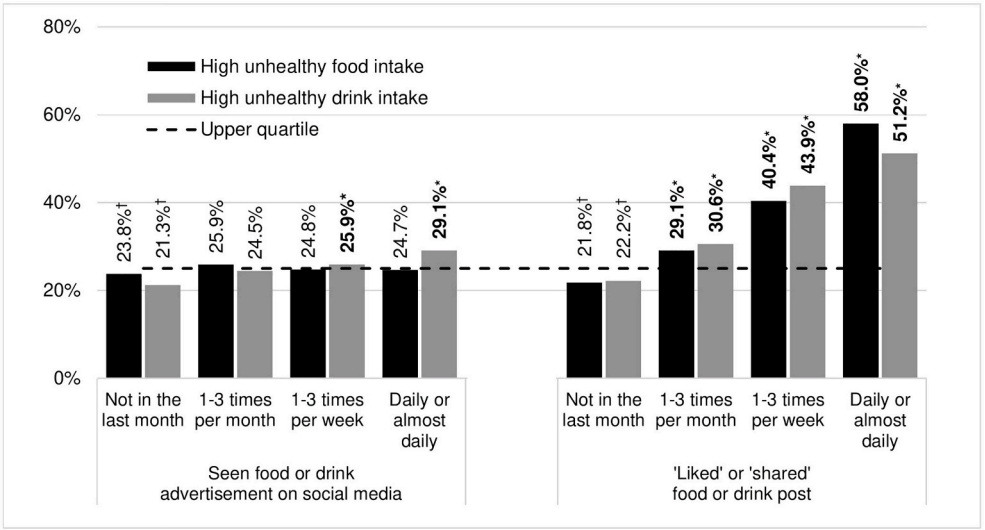

Fig. 1. Proportion of students aged 12–17 years who reported a high unhealthy food intake and high unhealthy drink intake by frequency of exposure to and engagement with food or drink advertising on social media.
* Significant difference compared to reference category (†) at $p < 0.01$. Note: All models adjusted for sex, socio-economic area, age group, home location, school type, state/territory, time spent watching commercial television and exposure to food or drink advertising in other settings (supermarket/convenience stores, sport events, public transport, school, websites and magazines).

among students who reported liking and sharing food or drink posts daily or almost daily. Findings may also have implications for digital marketing of other potentially harmful products to adolescents on social media (i.e. alcohol, gambling).

These results build upon previous research that found an association between digital marketing of food and drink products via email and text message and product purchasing behaviours in adolescents (Scully, Wakefield, & Niven, 2012), but did not consider social media and only assessed fast food, sugary drink and salty snack consumption. Most comparably to the present study, Baldwin and colleagues (Baldwin, Freeman, & Kelly, 2018) found that at least one exposure to food brand videos and food advertising on social media was associated with higher intake of unhealthy food and drinks; however, more frequent exposure was not assessed. Notably, our study shows that increasing frequency of liking or sharing food or drink posts on social media was associated with increasing odds of having high intake of unhealthy food and drinks. Evidence of a positive relationship in relation to engagement with food marketing on social media but not for exposure adds weight to the suggestion that it is the interactive component of digital marketing, above and beyond passive exposure to this type of marketing, that makes it especially persuasive and distinguishes it from advertising on television and in other traditional settings.

We observed an association between food and drink advertising on social media and unhealthy drink intake among male but not female students. This pattern of results may be related to males being more frequent consumers of sugary drinks (Scully, Morley, & Niven, 2017), which could lead to attentional bias towards these advertisements. Additionally, social media marketing of sugary drinks (particularly sports and energy drinks) is often targeted specifically towards males and employs themes of masculinity (Brownbill, Miller, & Braunack-Mayer, 2018). Further research is needed to explicate our finding that the association between engagement with food or drink advertising on social media and unhealthy food and drink intake varied somewhat based on the socio-economic area students resided in.

The present study highlights the need for better regulation of food marketing on social media, particularly promotional strategies designed to elicit youth engagement, given prevalent adolescent use of these digital platforms and the potential implications for their diet quality. The shortfalls of current guidelines for the marketing of food and drink products to children are well-documented (Ronit & Jensen, 2014; Swinburn, Kraak, & Allender, 2019; World Cancer Research Fund International, 2020), including lack of stakeholder involvement, incomplete compliance, limited measurable effects, ambiguity and the voluntary nature of such initiatives. Furthermore, guidelines are not applicable to adolescents aged 14 years and over (Australian Food and Grocery Council, 2018a, 2018b), meaning mid and older adolescents are not protected against the persuasive effects of unhealthy food marketing despite being of an impressionable age (Nairn & Fine, 2008). Our study has shown that adolescents aged 14 years and above need protection from food and drink marketing just as much as young adolescents. Increasing the age from which individuals can be targeted by advertisers, as well as the implementation of government-led, mandatory legislation and regulation that offers more solid accountability, would help to ensure that governmental duty to protect the health of young individuals is met (Mohr et al., 2019; United Nations Human Rights, 1989; World Cancer Research Fund International, 2020). The increasing effect sizes observed with increasing frequency of advertising engagement observed in the current study provides justification for restriction of interactive banners, images, games or videos in digital settings which can be distributed and promoted by adolescents throughout online social networks.

A number of study limitations should be noted. First, the cross-sectional design of the present study precludes causal inferences. Exposure to and engagement with food marketing on social media may promote more frequent consumption of the advertised products, and/or those who frequently consume unhealthy food or drinks may have an attentional bias towards the marketing of such products. They may also engage with such brands on social media platforms more frequently or be specifically targeted as a result of their high consumption of such products. Second, we only captured food marketing that adolescents were aware of and recalled seeing, yet exposure to marketing material arguably has a meaningful impact on brand attitudes and product selection regardless of conscious awareness of the material (Buijzen, Van Reijmersdal, & Owen, 2010; Lee & Ahn, 2012; Yoo, 2008). Recent audits of food and drink brand marketing on social media (Boelsen-Robinson, Backholer, & Peeters, 2015; Bragg, Pageot, & Amico, 2019) indicate that at least half of posts generated by brand profiles do not advertise or display any actual food or drink products, suggesting these posts may be subtly promoting positive brand attitudes through entertaining content. Given that such advertising is likely to circumvent adolescents' ability to distinguish marketing content from entertainment, the prevalence of food marketing exposure via social media reported in the present study is likely an under-estimate. Where possible, future research should aim to collect more objective measures of food marketing exposure such as advertising for unhealthy food and drink in areas surrounding secondary schools or counts of exposure on adolescents' social media accounts. Third, our measure did not specify exposure to *unhealthy* food and drink advertisements. However, it is well-established that the vast majority of food and drink advertisements feature energy-dense, nutrient-poor products (Cairns et al., 2013; Cancer Council NSW, 2019; Freeman, Kelly, & Baur, 2014; Obesity Policy Coalition, 2019; Signal, Stanley, & Smith, 2017). Fourth, sample sizes for the higher frequencies of food marketing engagement (1–3 times per week, daily or almost daily) were low (6% and 3% of the sample respectively), and hence results pertaining to these data should be interpreted with caution. Finally, as we collected self-report data, students' recall of their food and drink intake may have been susceptible to social desirability bias resulting in a potential under-estimation of the proportion of students with high intake of unhealthy food and drinks, given that a previous review found that adolescents tend to under-report energy intake (Forrestal, 2011). Replication of our findings using more rigorous dietary assessment tools (e.g. food frequency questionnaire, 24 h dietary recall) is therefore warranted.

5. Conclusion

Our study contributes important insights regarding the association between exposure to and engagement with food marketing on social media platforms and diet quality in Australian adolescents. While numerous influences dictate food and drink choices in this population group (Munt, Partridge, & Allman-Farinelli, 2017), the findings suggest that environmental modifications such as imposing higher standards on the digital marketing of unhealthy food and drink products may play a crucial role in enabling young individuals to maintain a healthy diet.

Author contributions

All authors have contributed to the present paper through involvement in the conception and design of the study or in analysis and interpretation of the data. All authors were involved in writing and revising the paper and have approved the final article.

Funding

The 2018 National Secondary Students' Diet and Activity (NaSSDA) survey was principally funded by state and territory Cancer Councils through Cancer Council Australia, with additional funding support received from the South Australian Health and Medical Research Institute. The funders were not involved in the study design, data collection, data analysis, data interpretation, or writing of the paper.

Declarations of interest

None.

Data statement

The data that support the findings of this study are available from the corresponding author (BM) upon reasonable request.

Ethical statement

The NaSSDA study was approved by the Human Research Ethics Committee of Cancer Council Victoria (approval number HREC 1117) and was performed in accordance with the Declaration of Helsinki. Approval was also obtained from the education authority for each sector in each State and Territory, as well as the principal at each selected school.

Acknowledgements

The authors thank Roy Morgan Research who were responsible for fieldwork coordination and school principals, teachers and students who participated in the study.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.appet.2021.105431.

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