

Unhealthy food marketing to New Zealand children and adolescents through the internet

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ABSTRACT

AIM: To assess the extent and nature of unhealthy food marketing to New Zealand children and adolescents through the internet.

METHODS: Internet traffic data for January 2014 was purchased from AC Nielsen to identify the most popular websites (n=110) among children and adolescents aged 6–17 years. In addition, websites (n=70) of food and beverage brands most frequently marketed to children through television, sports, magazines and Facebook were included. Marketing techniques and features on those websites were analysed.

RESULTS: The extent of food marketing on popular non-food websites was low. A wide range of marketing techniques and features was, however, identified on food brand websites, including advercation (87%), viral marketing (64%), cookies (54%), free downloadable items (43%), promotional characters (39%), designated children's sections (19%) and advergaming (13%). Most techniques appeared more frequently on websites specifically targeting children and adolescents, than on other websites targeting the general public.

CONCLUSION: Compared to traditional media, the internet allows food marketers to use engaging techniques to directly interact with children. While the range of marketing techniques and features identified on food brand websites was extensive, the most popular websites among children and adolescents were non-food related, and the extent of food marketing on those websites was found to be low. Additional assessment of food marketing to children through social and other digital media is recommended.

The prevalence of childhood obesity has increased dramatically worldwide since the 1980s, and is considered as one of the most serious public health issues of the 21st century.^{1,2} The most recent New Zealand Health Survey (2015/2016)³ showed that one in three children are overweight or obese; a two percentage-point increase since 2006/2007.⁴

Unhealthy food marketing to children is one risk factor for childhood obesity.^{5,6} Marketing messages reach children through a variety of media, such as television, magazines, radio, sports and increasingly the internet and new media.⁷ Unhealthy food products, such as sugary drinks, savoury snacks, confectionary and sweetened breakfast cereals, are the products most frequently marketed to children on television.⁵ A recent review revealed a variety

of persuasive marketing techniques used by advertisers to promote food products to children on television,⁸ including free gifts, toys, coupons, celebrity endorsements, discounts and competitions. These forms of marketing techniques have been found to increase children's preferences for the advertised foods.⁸ The latest New Zealand study on television food marketing in 2006 found that the majority of unhealthy food advertisements occurred during children's peak television viewing times.⁹ In addition, some major food brands sponsor sports^{10,11} and pay for advertising in children's magazines¹² in New Zealand, which may further accumulate exposure of children to certain brands.

Unlike in several other developed countries (Sweden, Norway, Ireland, UK, Chile),¹³ there are currently no regulations in place by the New Zealand Government to reduce

exposure of children to unhealthy food marketing through any type of medium. The Advertising Standards Authority, an industry body, established the Children's Code for Advertising Food in 2010.¹⁴ This Code defines the age of a child as less than 14 years, and states that '*Food advertisements should not undermine the food and nutrition policies of the Government, the Ministry of Health Food and Nutrition Guidelines nor the health and wellbeing of children*', and '*advertisements should not encourage over-consumption of any food*'.¹⁴ In addition, free-to-air television in New Zealand supplements this Code by voluntary rules concerning advertising during children's programmes as outlined in the document 'Getting it right for children', last updated in 2008.¹⁵ However, research in New Zealand^{9–12,16} and internationally¹⁷ has consistently shown that self-regulation of food marketing by the food industry does not lead to measurable reductions in children's exposure to unhealthy food marketing.

With the emergence of the internet and new media over the past decade, there has been a shift in some of children's screen time from television to the internet. The World Internet Project Survey reported a steady increase in internet users from 82% in 2007 to 92% in 2013 in New Zealand.¹⁸ In addition, the percentage of households with an internet connection has continued to increase from 37.4% in 2001 and 60.5% in 2006 to 76.8% in 2013. In 2014 about half of the children 6–14 years old used the internet at home every day.¹⁹ In 2006 it was found that around 65% of Australian children aged between 5 to 14 years were using the internet, and 79% of children aged between 5 to 8 years went online at home.²⁰

It has been found previously in Australia that food companies attract the attention of children and extend their exposure time on the internet through interesting games, website-featured competitions, promotional characters, email greeting cards and free downloadable items.²¹

In addition, advergames (where the product is an essential part of the game) engages the player through entertainment and competitions,²² and has been shown to increase children's preferences for advertised food products.^{23,24} Monitoring the extent and nature of unhealthy food marketing to children through a wide range

of media is necessary to increase accountability of governments and the food industry to reduce childhood obesity.²⁵ This study specifically focuses on assessing, for the first time, the extent and nature of unhealthy food and non-alcoholic beverage promotion to New Zealand children and adolescents through the internet. Previously, other studies in New Zealand have investigated food marketing to children through television, sport sponsorship (through analysis of websites from national and regional New Zealand sporting organisations), food product packaging and magazines.^{9–12,16}

Methods

The study was approved by the University of Auckland Human Participants Ethics Committee.

Sampling of websites

The most popular websites among New Zealand children and adolescents aged 6–17 years for January 2014 were selected by purchasing internet traffic data from AC Nielsen, a market research company. All websites that attracted an audience greater than 1.5% of the target population ($\geq 10,365$ New Zealand children and adolescents 6–17 years) were included.

This list included mainly non-food websites, such as search engines, websites related to games, news, television, magazines, movies, cartoons, online shopping, banks, and encyclopaedia. One super-market food brand website was included (countdown.co.nz).

Additional food brand websites were selected based on the frequency of marketing of food brands through other media, such as television, sport sponsorship and magazines, as derived from previous New Zealand studies^{10,12,26}, and from Social-bakers, an online social media monitoring company.²⁷ The Australian website of the selected food brands was considered for inclusion where there was no existing New Zealand website (as a few brands use one website for both Australia and New Zealand).

Coding of websites

Two coding tools, one for the popular, non-food websites, and one for the food brand websites, were adapted from an Australian study,²¹ and used to measure the extent and nature of unhealthy food

promotion through the internet in New Zealand. Marketing techniques and related features used on food brand websites (eg advercation, advergaming, viral marketing, promotional characters (see Table 1)) were recorded. The coding tools were pilot tested for a small sample of websites (n=4), prior to the actual data collection. The coding for these four websites by KM was checked by one of the lead researchers (SV), and no discrepancies were found. The data collection took place during May–June 2014.

A small sample of food brand websites (n=18), mainly fast food restaurant websites and websites specifically targeting children and adolescents, were re-coded by KM during the month of September 2014 to identify any changes in the frequency of food marketing techniques and features used by internet food marketers over time.

All food and beverage products marketed on websites were classified as “Everyday” (healthy), “Sometimes” or “Occasional” (unhealthy) foods, according to the New Zealand Ministry of Health Food and Beverage Classification System.²⁸ Foods were categorised into seven groups: 1) non-alcoholic beverages, 2) vegetables and fruit, 3) breads and cereals, 4) milk and milk products, 5) meat, fish, poultry and meat alternatives, 6) mixed meal dishes and 7) snack items.²⁸

Coding of food brand websites

Characteristics of websites assessed included the target audience (children 6–12 years, adolescents 13–17 years and general population) and a range of marketing techniques, such as brand identifiers, gaming and children’s sections, promotional characters, promotions, opportunities for extending website experience, marketing partnerships and tie-ins, brand benefit claims, nutrition and health claims, protection for children, registration and accounts and educational material.

Details on the features assessed within each marketing technique are given in Table 1. All the games on the food brand websites were played once by KM to identify the presence of food products, brand logos, spokes characters, music, sound effects and animation during the games.

Websites were classified as targeting children when they included fun, fantasy and adventure themes or games, and were classified as targeting adolescents when they included fashion, image and sexuality themes. The promotional characters were categorised into six types, adapted from Hebden et al:²⁹ cartoon/company-owned character, licensed character, amateur sportsperson, famous sportsperson, celebrity and movie tie-in. Premium offers (downloads, buy one, get one free, etc.) were also captured.²⁹ An internationally standardised system was used to categorise health-related labelling components on food products (eg health and nutrition claims).³⁰

For specific brand or standalone websites (eg weetbix.co.nz), the entire site was coded. For the food brand websites which were just a page/link on the company’s website, the entire page, including the information located within two mouse clicks away from the brand page, was coded. For the food company websites, the home page and all the pages two mouse clicks away from the home page were coded.

Coding of popular non-food websites

Both branded and non-branded food references were captured and coded. Unlike for the food brand websites, for which the unit of analysis was the website, for popular non-food websites, the unit of analysis was the food referenced. Every pictorial or written reference to food on the websites was included.

For branded food references, the type of advertisement, the size of the advertisement and the marketing techniques and features (similar as for food brand websites as explained above) were captured.

The type of advertisement was categorised into (a) direct advertisements; (b) part of editorial content (interviews, comics, stories); (c) product competition or promotion; (d) activity (games, puzzles and quizzes); (e) inclusion in a recipe; (f) association with an icon (cartoon characters, celebrities, sporting figureheads); or (g) links to other media marketing (such as food company’s internet site or their Facebook page).³¹

Statistical analysis

Since the number of websites that appeared to be specifically targeting adolescents was very low ($n=4$), they were analysed in combination with the websites targeting children. The data were analysed in SPSS version 20 for Windows (SPSS Inc., Chicago, USA). The frequency of marketing techniques and features used on websites targeting children and adolescents and websites targeted to the general population were compared using chi square tests.

Furthermore, frequency of marketing techniques used on a selected sample of food brand websites was compared between two different time periods, using chi square tests.

Due to multiple comparisons, the significance level was adjusted to 0.003 instead of 0.05 (Bonferroni correction). The proportion of healthy 'Everyday' foods versus unhealthy 'Occasional' foods was calculated for both food brand and popular, non-food websites.

Results

Food brand websites

In total, 70 food brand/company websites were included in the study, of which 40 were stand-alone websites and 30 were a page link on a food company website. The majority of the included food brands/companies ($n=66$) had a New Zealand website, which was analysed. For the other four brands, the Australian website was analysed. The majority of websites were classified as 'targeted towards the general population' ($n=46$), followed by 'targeting children' ($n=20$), and only four websites were classified as 'targeting adolescents'.

All food brand websites displayed brand logos, 93% of websites contained different brand variants (eg size or flavours), 89% of websites included product packaging graphics, and 87% of websites included images of products in the background. Many websites contained advercatation (87%), brand benefit claims for taste and quality of food products (96%) and viral marketing (such as links to Facebook and other social media pages) (64%). Overall, 33% of websites included television advertisements, and 34% of websites included competitions and/or giveaways. Rebates, such as combo meals, value packs or special

discounted items, were found on 13% of websites, predominantly on fast food restaurant websites (Table 1).

About 19% of websites contained a children's designated area, and 13% of websites contained advergames (Table 1). In total, 91 advergames were identified on food brand websites, ranging from one to 76 games per website. The games mainly included adventure games (15%), creative games (15%) and sport games (14%). The majority of advergames included features to extend the game (76%), such as leader boards—including rank, nickname, best game and total score of all games, the opportunity to post scores publicly, and play again option. Animations appeared within 60% of games, special sound effects within 59% of games and music within 41% of games. Some games (30%) created opportunities to personalise with the character/player in the game. None of the websites with advergames specified age restrictions or required parental consent to play the games.

The use of promotional characters (67% vs 24%, $p=0.001$) and tie-ins (58% vs 44%, $P>0.050$) was more concentrated on websites targeting children and adolescents, than websites targeting the general population. Websites targeting children and adolescents offered advergames (25% vs 7%, $p=0.054$) and giveaways (29% vs 11%, $p=0.054$) more frequently than websites targeting the general population. The most common giveaway item was a 'toy' with a children's product or a kid's meal. Viral marketing was more frequent on websites targeting children and adolescents (79% vs 57%, $p=0.061$) than on websites targeting the general population, and was the most common feature used on websites targeting children to increase website experience and brand exposure. More than half of the websites targeted to children and adolescents (54%) offered free downloadable items, such as branded characters (eg Ronald MacDonald), logos, menus or colouring pages.

About 50% of websites targeting children offered the opportunity to register and become a member or enter in a promotion, whereas only 2% of websites targeted to the general population offered those options ($p<0.001$). Moreover, only 4% of children's websites required parental consent, and

13% contained information for parents related to registrations and accounts.

A higher proportion of websites targeting children and adolescents than those targeting the general population (75% vs. 44%, $p=0.012$) used cookies to save passwords, to keep track of what was purchased, to estimate number of users and to determine overall traffic patterns on the website.

In total, 74.6% food brand websites advertised food products, which were of low nutritional value, and were classified as unhealthy “Occasional” foods according to the Ministry of Health food and beverage classification system. The highest frequency of marketing was for sweet snacks (including ice cream) (23%), followed by mixed meal dishes (13%) and breakfast cereals (10%). The prevalence of marketing for “occasional” foods was found to be higher on websites targeting children and adolescents (88%) than on websites targeting the general population (57%).

There were no significant differences ($p>0.05$) in the frequency of use of any of the marketing techniques on food brand websites between two different time periods. However, it has to be noted that the sample size of websites, which were re-analysed, was small.

Popular non-food websites

Out of 110 popular non-food websites analysed, only 15 websites included branded or non-branded food references ($n=65$ in total, of which only $n=5$ were branded). The majority of food references were found on game websites. The food categories referenced most frequently were mixed meal dishes (38%), followed by sweet snacks (28%). The majority of foods referenced (63%) were classified as unhealthy “occasional” foods, and 12% were classified as healthy “everyday” foods. Since only five branded food references were found on non-food websites, further details on marketing techniques are not reported here.

Discussion

This is the first study to comprehensively assess the extent and nature of food marketing to New Zealand children and adolescents through the internet, including through both food brand and popular non-food websites.

While the extent of food marketing on popular, non-food websites was low, a wide range of marketing techniques and features were identified on food brand websites. In general, marketing techniques appeared more frequently on websites specifically targeting children and adolescents, than on other websites targeting the general population.

Surprisingly, the frequency of food references on non-food websites (2014) was very low in our study, compared to Australia (2006), where about 11 food references per website were found.²¹ Also in the US, food advertising on third-party websites was found to be much more common than in New Zealand.³⁷ One of the potential explanations might be that companies increasingly focus their marketing efforts on social and other digital media (eg Facebook), which have become much more popular since the Australian study was conducted ten years ago. A few recent Australian studies,^{43,44} and a recently published report from the World Health Organization Europe⁴⁵ show that unhealthy food advertising through Facebook and other digital media is concerning, since it amplifies advertising in traditional media and is very poorly regulated and monitored.⁷

The dynamic and sophisticated nature of digital media enables food marketers to directly connect and engage with their target audiences in new ways, which are beyond those delivered by the traditional media, such as television.^{7,45}

Viral marketing, for example, encourages children to send marketing messages to their friends, without understanding the blurring line between advertising and content. Furthermore, the use of ‘cookies’ (small files that track user’s online activities and collect user information to facilitate targeted marketing) allows marketer’s direct, inconspicuous insight into children’s behaviour in ways not available in the past.³⁸ Food marketers also encourage children to register and open an account, by providing benefits to members, such as access to special games, free downloadable items, etc. In addition, advergames on some food company websites engage children with branded characters and branded food items. One study in the US found a significantly higher proportion of children visitors on

branded food company websites with advergames than those without advergames.²⁴

Similar to traditional media platforms,^{9,10,12} internet marketing was found to predominantly promote unhealthy foods to New Zealand children and teenagers. Consequently, there is a need for regulations to protect children from unhealthy food and beverage marketing messages. Presently there are no regulations on any marketing activities in New Zealand. According to the World Health Organization, government regulations have the highest potential to decrease the extent of exposure of children to unhealthy food and beverage marketing.⁴⁶ In this study, the majority of the food brand websites were New Zealand specific, which is important for policy implementation within New Zealand. While a new draft self-regulatory Code for advertising to children and adolescents has recently been proposed,⁴⁷ this is very unlikely to have any impact to reduce unhealthy food marketing to children through digital media.

Restriction of the use of cookies as a violation of children's privacy could be introduced, such as in the US, where digital tracking of children younger than 13 years is limited.⁴⁸ Verifiable parental consent is needed to collect personal information from children younger than 13 years old, and tracking across platforms with geo-location or behavioural advertising is not allowed.⁴⁵ Verifiable parental consent should be required for membership or registration on websites, especially for those featuring advergames. Hardly any of the food brand websites investigated in this study contained regulated age restrictions and parental consent.

In addition, food companies should include privacy policy information with clear specification of age of target audience, any marketing features used on websites, such as advergames, and personal information collected from children. Viral marketing needs to be restricted to reduce the spread

and reach of unhealthy food marketing to children and adolescents. Other strategies to protect children against harmful effects of food marketing could also be used, such as mass media campaigns, including counter advertising.⁴⁹ In addition, companies could be much more transparent about their policies related to restricting unhealthy food marketing to children, including types of media and marketing techniques, and put those clearly up on their website.⁵⁰

The strengths of the study include the selection of websites based on net ratings data for the target population and food brands most frequently marketed through a range of media in New Zealand. The large sample of websites included in the study assisted to assess the potential exposure of children and adolescents to marketing messages. Furthermore, a small sample of food websites were reanalysed at a later time to identify changes in frequency of different types of promotional activities over time.

The limitations include that actual exposure of children and adolescents to food marketing through the internet (especially through food brand websites), and the extent of food marketing through social and other digital media (eg Facebook) was not assessed.

Conclusions

Compared to traditional media, the internet allows food marketers to use engaging techniques to target children and directly interact with them. While the range of marketing techniques and features identified on food brand websites was extensive, the most popular websites among children and adolescents were non-food related, and the extent of food marketing on those websites was found to be low.

Additional assessment of food marketing to children and adolescents through social and other digital media is crucial, since companies may have shifted their marketing efforts to those new media.

Competing interests:

Dr Swinburn and Dr Vandevijvere report grants from Health Research Council of New Zealand, during the conduct of the study.

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Table 1: Marketing techniques and features used on food and beverage brand and company websites.

Marketing techniques	All websites (n=70)	Websites targeting children + adolescents (n=24)	Websites targeting general population (n=46)
Marketing features	Number of websites (n) and percentage (%)	Number of websites (n) and percentage (%)	Number of websites (n) and percentage (%)
Brand identifiers	70 (100%)	24 (100%)	46 (100%)
Brand logo	70 (100%)	24 (100%)	46 (100%)
Different brand variants	65 (92.9%)	23 (95.8 %)	42 (91.3%)
Product packaging graphics	62 (88.6%)	21 (87.5%)	41 (89.1%)
Product as part of the background	61 (87.1%)	23 (95.8%)	38 (82.6%)
Product serving suggestions	43 (61.4%)	15 (62.5%)	28 (60.9%)
Image of person consuming the product	19 (27.1%)	6 (25.0%)	13 (28.3%)
Designated children's section	13 (18.6%)	6 (25.0 %)	7 (15.2%)
Advergaming	9 (12.9%)	6 (25.0%)	3 (6.5%)
General gaming	3 (4.3%)	3 (12.5 %)*	0 (0.0%)
Promotional characters	27 (38.6%)	16 (66.7%)**	11 (23.9%)
Cartoons, company owned	18 (25.7%)	12 (50.0%)**	6 (13.0%)
Licensed characters	7 (10.0 %)	5 (20.8 %)*	2 (4.4%)
Famous sports persons	4 (5.7%)	3 (12.5%)	1 (2.2%)
Famous celebrities	3 (4.3%)	0 (0.0%)	3 (6.5 %)
Amateur sport persons	1 (1.4%)	1 (4.1%)	0 (0.0%)
Movie tie-ins	0 (0.0%)	0 (0.0%)	0 (0.0%)
Premium offers	11 (15.7%)	4 (16.7%)	7 (15.2%)
Promotions	49 (70%)	16 (66.7%)	33 (71.7%)
Television adverts	23 (32.9%)	9 (37.5%)	14 (30.4%)
Giveaways	12 (17.1%)	7 (29.2%)	5 (10.9%)
Competitions	12 (17.1%)	4 (16.7%)	8 (17.4%)
Fundraising	11 (15.7%)	4 (16.7%)	7 (15.2%)
Vouchers	9 (12.9%)	2 (8.3%)	7 (15.2%)
Rebates	9 (12.9%)	3 (12.5%)	6 (13.0%)
Sample offers	2 (2.9%)	2 (8.3%)	0 (0.0%)
Other	12 (17.1%)	4 (16.7%)	8 (17.4%)
Opportunities to extend the website experience	67 (95.7%)	23 (95.8%)	44 (95.7%)
Expanding usage of the brand (recipes)	55 (78.6%)	17 (70.8%)	38 (82.6%)

Table 1: Marketing techniques and features used on food and beverage brand and company websites (Continued).

Link to other food product web site or pages	54 (77.1%)	19 (79.2%)	35 (76.0%)
Viral marketing	45 (64.3%)	19 (79.2%)	26 (56.5%)
Free download items	30 (42.9%)	13 (54.2%)	17 (37.0%)
Draws	22 (31.4%)	8 (33.3%)	14 (30.4%)
Direct messages to children	9 (12.9%)	7 (29.2%)	2 (4.4%)
Link to other non- food websites	5 (7.1%)	1 (4.2%)	4 (8.7%)
Marketing partnership and tie-ins	34 (48.6%)	14 (58.3%)	20 (43.5%)
Other brands incorporated in premiums, giveaways, competition, sponsorship	24 (34.3%)	8 (34.8%)	16 (33.3%)
Television tie-ins	13 (18.6%)	5 (20.8%)	8 (17.4%)
Cartoon character tie-ins	5 (7.1%)	3 (12.5%)	2 (4.4%)
Movie tie-ins	1 (1.4%)	1 (4.2%)	0 (0.0%)
Brand benefit claims	67 (95.7%)	23 (95.8%)	44 (95.7%)
Sensory based characteristics	51 (72.8%)	20 (83.3%)	31 (67.4%)
Convenience	43 (61.4%)	17 (70.8%)	26 (56.5%)
Suggested use	37 (52.8%)	14 (58.3%)	23 (50.0%)
New brand development	27 (38.5%)	10 (41.7%)	17 (37.0%)
Suggested users	25 (35.7%)	12 (50.0%)	13 (28.3%)
Price	17 (24.2%)	5 (20.8%)	12 (26.1%)
Emotive claims	17 (24.2%)	7 (29.2%)	10 (21.7%)
Puffery	19 (27.1%)	10 (41.7%)	9 (20.0%)
Nutrition labels	53 (75.7%)	20 (83.3%)	33 (71.7%)
Basic nutrition information	50 (71.4%)	17 (70.8%)	33 (71.7%)
Specific nutrition claims	22 (31.4%)	9 (37.5%)	13 (28.3%)
Health claims	11 (15.7%)	4 (16.7%)	7 (15.2%)
Healthy eating strategies	7 (10.0%)	3 (12.5%)	4 (8.7%)
Claims	39 (55.7%)	14 (58.3%)	25 (54.3%)
Nutrient content claim	25 (35.7%)	9 (37.5%)	16 (34.8%)
Health related ingredient claim	21 (30.0%)	8 (33.3%)	13 (28.3%)
General health claim	11 (15.7%)	3 (12.5%)	8 (17.4%)
Nutrition and other function claim	8 (11.4%)	1 (4.2%)	7 (15.2%)
Reduction of disease risk claim	5 (7.1%)	0 (0.0%)	5 (10.8%)
Nutrient comparative claim	4 (5.7%)	0 (0.0%)	4 (8.7%)
Other claims (eg organic)	4 (5.7%)	2 (8.3%)	2 (4.4%)
Registration and accounts	13 (18.6%)	12 (50.0%)**	1 (2.2%)

Table 1: Marketing techniques and features used on food and beverage brand and company websites (Continued).

Website memberships	13 (18.6 %)	12 (50.0 %)**	1 (2.2%)
Benefits for members	13 (18.6 %)	12 (50.0%)**	1 (2.2 %)
Protection for children	59 (84.3%)	24 (100%)*	35 (76.1%)
Legal information available	59 (84.3%)	24 (100%)*	35 (76.1%)
Use of cookies	38 (54.3%)	18 (75%)*	20 (43.5%)
Information to parents	5 (7.1 %)	3 (12.5%)	2 (4.4%)
Age blocks	4 (5.7%)	3 (12.5%)	1 (2.2%)
Parents' consent	1 (1.4%)	1 (4.2 %)	0 (0.0%)
Time restriction	0 (0.0%)	0 (0.0%)	0 (0.0%)
Educational material (adverca- tion)	61 (87.1%)	22 (91.6%)	39 (84.7%)
<i>Type of education</i>			
Details on product ingredients	43 (61.4%)	13 (54.1%)	30 (65.2%)
Historical facts	31 (44.3%)	14 (58.3 %)	17 (37.0%)
General nutrition	17 (24.3%)	3 (12.5%)	14 (30.4%)
Sports information	4 (5.7%)	1 (4.2%)	3 (6.5%)
Other	9 (12.9%)	4 (16.7%)	5 (10.9%)

*P<0.05 (none is <0.003); ** p<0.003.