

# **Knowledge of and attitudes to sports drinks of adolescents living in South Wales, UK**

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Key words: oral health, children, sports drinks

Word count including abstract 2,399

Abstract – 270

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## **ABSTRACT**

**Background:** The UK sports drinks market has a turnover in excess of £200M. Adolescents consume 15.6% of total energy as free sugars, much higher than the recommended 5%. Sugar sweetened beverages, including sports drinks, account for 30% of total free sugar intake for those aged 11-18 years.

**Objective:** To investigate children's knowledge and attitudes surrounding sports drinks.

**Method:** 183 self-complete questionnaires were distributed to four schools in South Wales. Children aged 12 - 14 were recruited to take part. Questions focussed on knowledge of who sports drinks are aimed at; the role of sports drinks in physical activity and the possible detrimental effects to oral health. Recognition of brand logo and sports ambassadors and the relationship of knowledge to respondent's consumption of sports drinks were assessed.

**Results:** There was an 87% (160) response rate. 89.4% (143) claimed to drink sports drinks. 45.9% thought that sports drinks were aimed at everyone; approximately a third (50) viewed teenagers as the target group. Over 2/3rds recognised the brand logos, yet less than a 1/3rd could identify brand ambassadors.

About half were aware that dental erosion may result from consumption and approximately 2/3rds knew that they were linked to dental caries and energy provision. Despite this the majority claimed to drink them. As previously reported most of those drinking sports drinks did so because of the taste.

**Conclusion:** Whilst most of the respondents had some understanding of the detrimental effects on health the majority of them were drinking them regularly despite this knowledge. Work is therefore needed at a macro level, with soft drink manufacturers, to consider marketing and reformulation of products for adolescent consumers who appear to enjoy them.

## INTRODUCTION

According to the British Soft Drinks Association<sup>1</sup>, sports drinks are functional drinks specifically designed to help athletes and other active people hydrate before, during and after exercise. The composition of these beverages is quite similar in terms of osmolality, sodium and carbohydrate concentration given that the common aim is to aid performance during prolonged exercise, especially in a hot environment<sup>2</sup>.

The sports drinks market in the UK is considerable with a turnover of £218M in 2014. The market is dominated by consumers aged 15-24 years<sup>3</sup>.

Adolescents are currently consuming 15.6% of total energy as free sugars<sup>4</sup>, much higher than recommended 5% of total energy<sup>5</sup>. One of the main sources of free sugars in adolescents' diets are sugary sweetened beverages (SSBs). SSBs account for 30% of total free sugar intake for adolescents aged between 11-18 years.

Consuming excess free sugar in food and drink is detrimental to people's health, increasing their risk of obesity, which is associated with greater risks of developing, type 2 diabetes, hypertension, coronary artery disease and cancer. It is also a well-established risk factor for tooth decay<sup>6</sup>.

A large prospective study in the United States found a clear association between consumption of sports drinks and weight gain amongst 11-16 year olds over a 2-3 year period<sup>7</sup>.

The sports drinks market is dominated by relatively few brands<sup>3</sup> and these are regularly marketed via sports ambassadors. Brands align themselves with sport because of the positive and healthy image it portrays, and the opportunity for brands to endorse their company and products to a global market. Evidence indicates that food and drink products endorsed by athletes are perceived to be healthier and that sponsorship influences product preferences and choices<sup>8</sup>.

The aim of this study was to investigate the relationship between knowledge and use of sports drinks amongst 12-14-year-old school children in South Wales, UK.

## **METHOD**

The detailed method for this study has been previously reported in a paper focussing on children's consumption of sports drinks<sup>9</sup>. Briefly, this study consisted of a cross-sectional questionnaire survey of 12-14-year-old school children. The children were recruited from a convenience sample of four secondary schools in South Wales; selected to reflect the range of deprivation experienced within the area. Ethical approval was gained from the Dental School Ethical Committee at Cardiff University. A combination of school consent, parental passive consent and child assent was used to recruit participants<sup>9</sup>.

A preliminary focus group of eight adolescents (aged 12 – 16) was undertaken prior to the cross-sectional survey to inform the questionnaire design. Participants were informally asked whether they drank sports drinks and why? With information gained from the focus group, a self-complete anonymous questionnaire was designed containing mainly closed questions, allowing categories to be analysed efficiently and with minimum bias.

Questions reported in this paper were designed to assess:

1. knowledge of who sports drinks are aimed at,
2. recognition of brand logo and sports ambassadors,
3. knowledge of the role of sports drinks in physical activity,
4. knowledge of the possible detrimental effects to oral health,
5. relationship of knowledge to their own consumption of sports drinks.

One researcher (DB) was present at each school to distribute and collect the questionnaires and also to answer any questions about the project.

The data were analysed using appropriate descriptive and inferential statistics, such as frequency distributions and chi-squared test for categorical variations (with an alpha value of 0.05 accepted as significant). Statistical analysis was performed with IBM SPSS Statistics (Version 20) software.

## RESULTS

As reported previously<sup>9</sup> out of the 183 questionnaires distributed, 160 were returned and 143 children claimed to drink sports drinks. For the knowledge and attitudes section of the questionnaire reported in this paper, there were a small number of respondents (n=1-2) who did not answer all the questions, therefore denominators in this results section vary slightly but are annotated.

Most of the children surveyed thought that sports drinks were aimed at everyone, including all age groups irrespective of activity levels (45.9%, 73/159). Approximately a third of respondents considered that teenagers were the target group (50/159); 12.6% (20) responded “teenagers” whilst a further 18.9% (30) specifically stated “teenagers who participate in sport and exercise”. Fewer respondents indicated that adults in general were the target market (3.1%, 5) as opposed to adults who participate in sport and exercise (19.5%, 31).

### Figure 1

#### Brand logo and sports ambassador recognition

The majority of all 158 respondents 71.5% (n=113), 72.8% (n=115) and 63.3% (n=100) recognised the Lucozade Sports, Powerade and Gatorade brand logos respectively. Similar percentages were observed for the 143 children who reported drinking sports drinks. Children who recognised the logos were much more likely to drink them (Figure 1, Lucozade sport  $\chi^2$  3.228, df=1, P=0.072; Powerade  $\chi^2$  6.365, df=1, p=0.012; Gatorade  $\chi^2$  12.963, df=1, p=0.01). In addition, over a fifth of children who did not identify the brand logo still drank the products (Figure 1).

Whilst the majority of children recognised the logos (Figure 1), fewer could identify the sports brand ambassadors, although this was significantly influenced by gender (Table 1). Overall, the males were more familiar with the sports ambassadors. However, there were no significant associations between recognition of any of the sports brand ambassadors and consumption of the drinks.

### Table 1

## **Knowledge surrounding sports drinks**

The majority of respondents were aware that water (73.1%, 117/159) was the “best” drink to be consumed during physical activity, followed by sports drinks (16.9%, 27) and milk (9.4%, 15). Most of the children without prompting were aware that sports drinks provided energy (68.8%, 110) but less were able to cite hydration (8.1%, 13) as a reason for their use.

Many of the children were aware of the dental health implications of sports drinks, 65% acknowledged they could lead to tooth decay, 49% that they may “grind teeth down” (erode), 48% that they may stain teeth and only 5% incorrectly stated they could strengthen teeth. Despite this knowledge of the detrimental effects of sports drinks, 89% of those who responded consumed them<sup>9</sup>.

### **Figure 2**

There was a significant relationship between claiming to read the product label and frequency of consumption. Under half (41%, 58/141) of those who reported drinking sports drinks said they read the product labels. Those claiming to read the label reported drinking sports drinks less often than those who said that they did not read the label (Figure 2,  $\chi^2$  103.9 ,  $df=6$ ,  $p<0.001$ ).

Respondents were asked to rate sports drinks on a scale of 1 (“bad”) to 10 (“good”) in terms of how “good” or “bad” they thought they were for their teeth. It was apparent that the infrequent or non-drinkers considered sports drinks to be “bad” for you; with 73% (19/26) rating them between 1-4 on the scale. However, the attitude that they were “bad for you” did not prevent the children from consuming them; for example, 58% (38/66) of those consuming them 1-3 times a week also held this belief (Figure 3).

### **Figure 3**

Respondents who claimed to drink sports drinks were asked how long they usually took to consume them. The majority of respondents said that they drank sports drinks within 20 minutes, (60.1%, 86/143). How “bad” children thought they were was not necessarily reflected in shorter

duration of consumption, with 57.5% (46/80), 30% (24/80) and 12.5% (10/80) taking less than 20 minutes, or 20 minutes up to an hour, or over an hour to consume, respectively (Figure 4).

Of the total who reported drinking sports drinks around one third (32.2%) thought they were both “bad for teeth” and reported drinking them within 20 minutes. A further 16.8% thought they were “bad for teeth” and drank them within an hour, whilst only 7% thought they were both “bad for teeth” and took an hour or more to consume them (Figure 4).

#### **Figure 4**

Furthermore, there was a gender split for this characteristic, significantly more girls reported taking longer to consume the drinks than males (Table 2,  $\chi^2$  12.6,  $df=2$ ,  $p=0.002$ ).

#### **Table 2**

## **DISCUSSION**

This was a small exploratory study of four secondary schools in South Wales, UK and the findings should therefore be interpreted in this context. However responses from 160 adolescents do provide an indication of their knowledge and attitudes to sports drinks. Most respondents thought that sports drinks were aimed at everyone: all age groups including teenagers who do/do not participate in sport. However, the evidence indicates that sports drinks are only effective for adults who participate at elite levels, for durations of greater than one hour<sup>10</sup>. They are not intended for adolescents irrespective of their activity levels<sup>11</sup>. This indicates a lack of awareness of these consumers as to the target market of the products and their role in hydration and energy provision in elite sports.

Brand marketing is known to be effective for sports drinks and other sugar sweetened beverages (SSBs) amongst adolescents and other age groups<sup>3</sup>. Unhealthy food and drink promoted through sport encourages the formation of positive attitudes towards unhealthy consumption<sup>8</sup>. This research reflects these findings in that there was good awareness of the three main brands, Lucozade sports, PowerAde and Gatorade. Furthermore, children that recognised the brand logos were significantly more likely to drink them. Children recognise brands at an early age<sup>12</sup> and this is known to influence both purchase and consumption<sup>13</sup>.

However, not everyone recognised the brand ambassadors despite the survey being conducted shortly after the 2012 London Olympics. Significantly more boys recognised the male brand ambassadors, but there was no gender difference in recognition for the female PowerAde ambassador. In this research brand logos had greater recognition and influence upon consumption when compared with the sports celebrity ambassadors. The children do not seem to be emulating the celebrities, they are drinking them for different reasons.

There was good basic knowledge about the role of sports drinks amongst those surveyed in this research. Less than a fifth correctly thought sports drinks were the best option for drinking during physical activity, however there was a good awareness of the detrimental effects on oral health. About half were aware that dental erosion may result from consumption and approximately two thirds knew that they were linked to dental caries and energy provision. Despite this the majority still claimed to drink them. As we previously reported most of those drinking sports drinks did so because of the taste and drank them socially rather than during sport<sup>9</sup>. Visram et al (2016)<sup>14</sup> in



their review of energy, (rather than sports) drink consumption amongst 11-18 year olds in the USA and Europe, also found that taste was a primary driver for consumption and drinking socially with friends was a common context for drinking, although awareness of possible negative effects of energy drinks was low.

In the present study girls reported taking longer to consume sports drinks than boys and may reflect the fact that more girls drank them in social situations<sup>9</sup>. Duration of consumption is of utmost importance due to the acidic and high sugar content of these beverages which could lead to increased risk of dental erosion and dental caries (DBOH, Section 4)<sup>15</sup>. Because girls are mainly drinking them outside of sport and therefore not expending energy, this puts them at greater risk of weight gain<sup>7</sup>.

Adolescents in this study do not appear to be acting on the dental public health advice to limit the duration and frequency of drinking sugar sweetened acidic beverages like sports drinks. Of further concern was the lack of an association between frequency and length of consumption with beliefs about how “bad” the products are for you.

Approximately 2/5<sup>th</sup> said that they read the product label, those that read the labels tended to drink less frequently. This finding backs up the considerable evidence suggesting that label readers have healthy preferences and an intention to consume healthy foods and drinks<sup>16</sup>. Less than half of the children read the product label, those that did read labels claimed to drink sports drinks less frequently. This might be related to the fact that ingredient and nutritional labels are hidden on the back of these products. Front of pack nutrition labelling, at present a voluntary system in the UK, may help in raising awareness of the sugar content of these products<sup>17</sup>.

It was reassuring to see that the children in this survey were generally aware of the detrimental oral health effects of sports drinks. However, it was disappointing from a public health perspective that they did not realise that these drinks are intended for elite adult athletes and not children. This indicates not only a need for awareness raising amongst children and parents, but also work at a macro level, with soft and sport drink manufacturers, to consider marketing and reformulation of products for these adolescent consumers who obviously enjoy the products.

Whilst it is evident that the sports drinks manufacturers, in response to consumer demands, are reducing sugar by use of artificially sweetened lines this does not address the erosive potential of acidic beverages which children consume because of the taste. Organisations like Action on Sugar<sup>18</sup> and the British Association for the Study of Community Dentistry (BASCD)<sup>6</sup> who have policy statements on sugar are important players in the furtherance of the UK Department of Health's responsibility deal<sup>19</sup> in helping manufacturers produce "healthier" products. Some of the monies raised from the tax on SSBs<sup>20</sup>, starting in 2018, could be directed towards this.

## **CONCLUSION**

The majority of respondents in this study claimed to drink sports drinks regularly with brand logos having greater recognition and influence upon consumption compared to the sports celebrity ambassadors. Whilst most of the respondents in this study had some understanding of the detrimental effects on health the majority of them were drinking them regularly despite this knowledge. Indeed we have previously reported that taste was the main reason for their selection<sup>9</sup>. Health professionals therefore need to consider factors beyond health education, such as reformulation of products, in order to affect the consumption of these potentially harmful sports drinks.

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**Figure 1 % Recognition of sports drinks brand logo and their consumption for all respondents\***

*INSERT PICTURE HERE*

*\*n=158, 2 respondents did not answer the question on brand recognition*

**Figure 2 Claiming to read product labels and frequency of consumption**

*INSERT PICTURE HERE*

**Figure 3 Frequency of drinking compared with response to the question “how bad are sports drinks for your teeth?” \***

*INSERT PICTURE HERE*

*\*All 160 respondents, including 17 who did not drink them*

**Figure 4 Duration of drinking compared with response to the question “how bad are sports drinks for your teeth?”**

*INSERT PICTURE HERE*

**Table 1 Participants' recognition of sports brand ambassadors**

	All 159 respondents		Male* (n=75)		Female* (n=83)		X <sup>2</sup> by gender
	%	n	Yes	No	Yes	No	p<
<b>Mo Farah &amp; Lucozade Sport</b>	28.9	46	42.7	57.3	16.9	83.1	0.001
<b>Wayne Rooney &amp; Powerade</b>	29.6	47	38.7	61.3	20.5	79.5	0.01
<b>Jess Ennis &amp; Powerade</b>	24.5	39	26.7	73.3	22.9	77.1	NS, 0.357
<b>Usain Bolt &amp; Gatorade</b>	21.4	34	29.3	70.7	14.5	85.5	0.05

*\* 1 respondent did not answer the question on gender*

**Table 2 Gender and reported consumption rate of sports drinks**

Gender	Male		Female	
	%	n	%	n
<b>Time taken to drink</b>				
Less than 20 minutes	58.1	50	41.9	36
20 minutes up to 1 hour	40.0	16	60.0	24
Over an hour	12.5	2	87.5	12

*\*%s relates to the gender split within how long a child takes to drink*