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Patterns of sugar-sweetened beverage consumption amongst young people aged 13–15 years during the school day in Scotland

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ABSTRACT

Background: There is currently little research regarding sugar-sweetened beverage (SSB) consumption patterns of young people though adolescents are thought to be frequent consumers of these drinks. There is no research regarding the other foods and drinks consumed alongside SSBs by young people. The aim of this paper is to explore the patterns of SSB purchase and consumption amongst young people aged 13–15 years.

Methods: A purchasing recall questionnaire (PRQ) was administered online in seven case study schools with 535 young people aged 13–15 years. Nutrient composition (kilocalories, fat, saturated fat, sodium and sugar) was also calculated for food/drink purchases. Chi-Square and Wilcoxon-Mann Whitney tests were conducted to examine patterns of SSB consumption and sugar/kilocalories consumption for SSB consumers and non-consumers.

Results: SSB consumers were significantly more likely to consume a drink at mid-morning break. Fewer consumed food at mid-morning break, ate food before school or ate food at lunchtime, but this was not statistically significant. A higher percentage of SSB consumers consumed 'unhealthy' food and drinks in comparison to young people who did not consume a SSB. Both median lunchtime sugar consumption (40.7 g vs 10.2 g) and median sugar as a percentage of Kcals (39% vs 14%) were significantly higher for SSB purchasers in comparison to non-purchasers.

Conclusion: The analysis highlights that SSB purchasers consume significantly more sugar at lunchtime than non-purchasers. However, both purchasers and non-purchasers exceeded WHO (2015) recommendations that sugar consumption be halved to form no more than 5% of daily energy intake. This study provides new insights for public health stakeholders and schools. Multifaceted and inventive strategies relevant to young people will be required to achieve the new WHO recommendations.

1. Background

There is widespread global concern about the prevalence of obesity across many developed countries. Obesity and overweight in adulthood is associated with a range of health outcomes including increased risk of heart disease, liver disease, stroke and type 2 diabetes (Kopelman, 2007). There is particular concern about obesity prevalence amongst child and adolescent populations, as many children go on to develop the conditions associated with adult obesity. Across developed countries more than a fifth of children aged 2–19 years (23.8% of boys; 22% of girls) is obese (Ng et al., 2014). The prevalence of 2–15 year olds in England who are overweight or obese is 31.2% (Health and Social Care Information Centre (HSCIC), 2015); and in Scotland 28% of children aged 2–15 years are considered at risk of overweight or obesity (The Scottish Government, 2016). Of the 34 countries within the Organisation

Abbreviations: BMA, British Medical Association; BMI, body mass index; FSA, Food Standards Agency; FSM, free school meals; FSS, Food Standards Scotland; HBSC, Health Behaviour in School-aged Children; HSCIS, Health and Social Care Information Centre; Kcals, kilocalories; NDNS, National Diet and Nutrition Survey; NICE, National Institute of Clinical Excellence; NMES, non-milk extrinsic sugars; OECD, Organisation for Economic Cooperation and Development; PRQ, purchasing recall questionnaire; RSD, regular soft drink; SACN, Scientific Advisory Committee on Nutrition; SIMD, Scottish Index of Multiple Deprivation; SSB, sugar-sweetened beverage; WHO, World Health Organisation.

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for Economic Cooperation and Development (OECD), the UK has the 9th highest prevalence of overweight (including obesity) amongst children aged 2–19 years. Prevalence of overweight and obesity for boys in the UK rank 15th highest (26.1%) and 4th highest for girls (29.2%; Public Health England, 2016).

In childhood and adolescence, concurrent psychosocial morbidities associated with obesity include lower self-esteem and quality of life (Griffiths, Parsons, & Hill, 2010) as well as an increased risk of depression (Sjöberg, Nilsso, & Leppert, 2005). Furthermore, the prevalence of type-2 diabetes, a disease usually associated with adult mid-life, is increasing amongst the adolescent population in the UK (Hsia et al., 2009). In order to help address this issue, the UK government previously released guidance regarding child weight management programmes (HM Government, 2009) and more recently a new Childhood Obesity Strategy was launched in 2016 (HM Government, 2016). However it has been met with some criticism that the proposals are not robust and do not go far enough to impact on public health (BMA, 2016; Diabetes UK, 2016). The Scottish Government (2011) has published an Obesity Route Map Action Plan, along with guidance for stakeholders regarding the improvement of the food and drink available to children and young people both inside and outside of school (The Scottish Government, 2014).

More recently, there has been a significant focus on the excessive consumption of sugar, which can lead to increased weight gain (Public Health England, 2015), with charities such as 'Action on Sugar' calling for the amount of sugar in processed foods and drinks to be reduced (MacGregor & Hashem, 2014). The World Health Organisation (WHO, 2015) and the Scientific Advisory Committee on Nutrition (SACN, 2015) have both suggested that sugar consumption be halved to form no more than 5% of daily energy intake for both adults and children (aged from 2 years upwards). The recommendations have also been supported by Food Standards Scotland (FSS, 2015), who have advised the Scottish Government to accept the recommendations.

Sugar-sweetened beverages (SSBs) are defined by the British Medical Association (BMA) in their most recent report as "all non-alcoholic water based beverages with added sugar, including sugar-sweetened soft drinks, energy drinks, fruit drinks, sports drinks and fruit juice concentrates (BMA, 2015)".[2] SSBs have gained particular notoriety with regards to contributing to overall sugar consumption. Specifically, SACN (2015) has provided a recommendation that consumption of SSBs be minimised. This is highly significant, given that SACN have never previously recommended that consumption of a specific food or drink be minimised in the general population. In addition, there have been appeals to introduce a 'sugary drinks tax' in the UK to further discourage consumers from purchasing these products (Faculty of Public Health, 2013). The government has recently announced that such a tax, or levy will come into effect in April 2018. It is expected that this will apply to drinks containing more than 5 g of sugar per 100 mL, with a higher rate of tax for drinks containing more than 8 g of sugar per 100 mL (HM Treasury, 2016).[3] The estimated impact that this levy will have on obesity rates in the UK is variable and it has been argued that this is a regressive policy (Cornelsen & Carreido, 2015). However, the revenue raised by the tax would be ring-fenced to improve the health and wellbeing of children (Faculty of Public Health, 2013) and is expected to be invested in sports, physical education and breakfast clubs in schools (HM Treasury, 2016).

Recent research has not only found a positive association between regular SSB consumption and weight gain, metabolic syndrome and obesity (Hu, 2013; Laverty, Magee, Monteiro, Saxena, & Millett, 2015; Malik et al., 2010), but it has also been suggested that SSBs are significantly associated with an increased risk of type-2 diabetes (Bhupathiraju et al., 2013; De Koning, Malik, Rimm, Willett, & Hu, 2011; Eshak et al., 2013; The InterAct Consortium, 2013; Wang, Yu, Fang, & Hu, 2015). In a recent meta-analysis and systematic review, Imamura et al. (2015) concluded that, independently of adiposity, SSBs may be contributing to the considerable number of new cases of type-2 diabetes. The latest National Diet and Nutrition Survey (NDNS; Public Health England, 2014) found that 78% of 11–18 year olds consumed 'soft drinks' such as SSBs over a four-day period. This age group also reported the highest mean consumption of soft drinks, which are considered to be "the largest single source of sugar for children aged 11–18 years" (Public Health England, 2015, p. 12).

Currently, there is little research regarding SSB consumption patterns of young people in the UK nations and there has been no specific or in-depth focus on what other food and drink young people who drink SSBs also consume throughout the school day. It is imperative that we illuminate the consumption patterns of young people in relation to SSBs, not only due to the potential for adverse health effects but also with the possibility that young people are overlooking key nutrients by replacing or forgoing food in favour of SSBs. Using data from a Food Standards Scotland commissioned study of food and drink purchasing and consumption (Wills et al., 2015), the aim of this paper is to explore the patterns of SSB consumption amongst young people aged 13–15 years, including other food and drink reportedly consumed alongside SSBs throughout the school day. In addition, sugar consumption will also be examined in relation to SSB consumption. Young people aged 13–15 years were the focus of this work as they are often allowed to leave the school premises at lunchtime whereas younger secondary school aged children (11–12 year olds) are not; having autonomy to purchase food and drink beyond the school gates was a key priority for this commissioned research.

2. Research design and methods

2.1. Recruitment of case study schools

A case study approach was adopted in order to fully describe and take account of the social complexities of food and drink purchasing by young people during the school day; this approach informed the use of a range of qualitative methods (not reported here), details of which can be found in the full report (Wills et al., 2015) and in subsequent publications (Wills, Danesi, & Kapetanaki, 2016). Local authority education departments were contacted in the North, South, East and West of Scotland[4] with the aim of including schools that varied in terms of deprivation (using the Scottish Index of Multiple Deprivation (SIMD)[5] rank and proportion of pupils registered for means-tested free school meals

[2] For the purpose of this paper, 100% fruit juices, dilutable juices and flavoured water will not be considered SSBs.

[3] This tax will not apply to milk-based products or fruit juice not from concentrate.

[4] This study was funded by Food Standards Scotland therefore the fieldwork took place in Scotland; the funder was not informed of the fieldwork sites selected.

[5] SIMD consists of geographical 'zones' across Scotland that are ranked from 1 (most deprived) to 6505 (least deprived) by identifying concentrations of relative deprivation, measured on the basis of 7 domains; income; employment; health; education, skills and training; housing; geographical access; and crime (The Scottish Government, 2012).