

ARE THERE DIFFERENCES IN FOOD CHOICES BETWEEN GIRLS AND BOYS IN A UK SECONDARY SCHOOL?

By

C. Foster

Supervisor Professor S.C. Langley-Evans



Introduction

The aim of this study was to explore whether there were any differences in the food choices made between girls and boys attending a secondary school based in the East Midlands. 119 students (52 girls and 67 boys) were recruited from Harry Carlton Secondary School in East Leake. The students were aged between 11-17 years old and were required to complete questionnaires regarding their daily eating habits over the course of one school week (five days). The study suggested that there are differences in the food choices of boys and girls which may impact upon healthy growth and development during this critical stage of life.

Background

The prevalence of childhood obesity is increasing, and with that comes the increased risk of non-communicable diseases such as type 2 diabetes and cardiovascular disease later on in life (Gibney *et al.*, 2002). With evidence to suggest that obesity can track through from adolescence to adulthood, interventions in young people may be critical for preventing major diseases associated with obesity in the adult population. Tracking refers to body fatness at one stage of the lifecycle correlating strongly with a later stage of development (Langley-Evans, 2009a).

During adolescence, individuals undergo many physical and psychosocial changes. They go through a transition from a child-like way of thinking to a mature and adult level of interaction

and function (Story *et al.*, 2002). Individuals experience high rates of growth and development where their bodies undergo a change in shape and body composition. Nutritional requirements increase to a level greater than those required in adulthood, when expressed as per body weight and in absolute terms (Langley-Evans, 2009b).

The Department of Health (2011) published The National Diet and Nutrition Survey (NDNS) to assess the nutritional status and dietary behaviour of the UK population. Findings from this survey showed that fruit and vegetable consumption was below the recommended 5 portions a day in both males and females aged 11-18 years. Fruits and vegetables provide good sources of the vitamins required by these individuals as well as being high in fibre. The survey also highlighted that across all age groups, mean intakes of total fat met the recommendations outlined by the Dietary Reference Value (DRV), but the mean intake of saturated fat exceeded its DRV. Soft drinks were the largest contributor to overconsumption of non-milk-extrinsic sugars (Department of Health, 2011). Many studies have found a relationship between their consumption and a greater and more rapid weight gain in individuals leading to an increased risk of obesity (Malik *et al.*, 2006).

Many factors have been found to influence food choices made by children and adolescents. Major factors include peer pressure, parental influence and media/advertising. This study aimed to determine whether there are differences in food

choices between girls and boys in a UK secondary school. The following hypotheses were explored:

- Female adolescent students are more likely to choose a lower fat meal option than males.
- Female adolescent students are more likely than males to consume the recommended five portions of fruits and vegetables during the day.
- As male and female adolescent students get older, they are more likely to choose lower fat meals and consume more fruit and vegetables.
- Female adolescent students are more likely to eat breakfast every day before school.

Methods

This study aimed to assess the differences in daily food choices made by male and female adolescents in the setting of a UK secondary school (Harry Carlton). In order to carry out the investigation and test the hypotheses, Harry Carlton School was approached. Harry Carlton is a local mixed secondary school situated in the village of East Leake and has a student population of 1030 students in Years 7 to 13, including approximately 200 pupils in the Sixth Form.

266 students aged 11-17 years from certain form groups across all years were invited to partake in the study. Students under the age of 16 years were required to have written consent from parents. The study had a response rate of approximately 45% with 119 participants successfully completing the study. 52 were female and 67 were male. Due to the uneven distribution of participants across different years, data was grouped into two age groups: 11-13 years and 14-17 years.

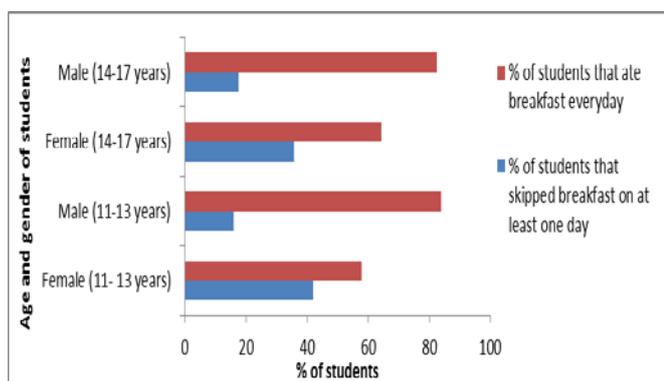


Figure 1. The percentage (%) of students (grouped according to age and gender) that had breakfast every day of the week or skipped breakfast on at least one day.

The study received ethical approval from The University of Nottingham Medical Research Ethics Committee.

Participants were required to complete a short answer/tick-the-box style questionnaire about their eating habits each day for a 5 day period (one school week). The questionnaires were co-ordinated with the Harry Carlton catering team so that school-lunch menu options for the week of the study could be included. Questionnaires were completed during form-time and were collected after every entry completion to ensure a 100% response rate.

Data collected included each food item that was consumed by participants mapped against the Eatwell plate food groups. Data was analysed using chi-squared and two way analyses of variance tests, across each of the individual days of the study and across the entire week.

Results & Discussion

Figure 1 shows breakfast consumption of the subjects. The majority of students consumed breakfast every day before school, with the greater percentage being boys (84% of the male population). Of the students that did skip breakfast, the majority were females ($P < 0.05$) aged 11-13 years (42% of this age group). A similar study by Kirby and Currie (2010) also found that boys are more likely to eat breakfast every day before school compared with girls. However, in their study they also found that there was a gradual decline in breakfast consumption with age. Contrary to these findings, a study by Tin *et al.* (2001) found that boys were more likely to skip breakfast compared with girls. It could be suggested that breakfast skipping may be a behaviour adopted by adolescents to control body weight. However, there is little evidence to suggest concrete reasons for this behaviour, and further research is needed (Tin *et al.*, 2011). Dubois *et al.* (2008) conducted a study that outlined the consequences of breakfast skipping. They concluded that children who skipped breakfast on at least one day of the week tended to have different dietary patterns from those who consumed breakfast every day. They deduced that this led to children consuming over 700 kcal at lunchtime, which was a predictor for overweight, suggesting that meal frequency could impact on appetite regulation and energy balance.

Across the week of the study the consumption of starchy foods was greater in males than in females ($P < 0.05$, Figure 2).

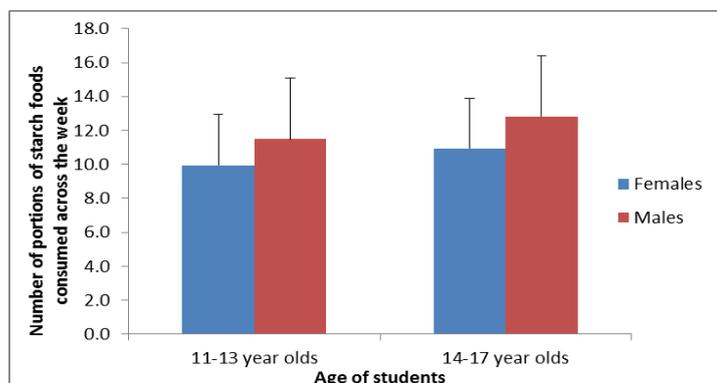


Figure 2. The number of portions of starch foods consumed by male and female students (according to their age) across one school week ($n=119$). Two-way-ANOVA showed there was a statistically significant effect seen between groups in terms of gender ($P < 0.02$). Females aged 11-13 years: $n=38$; Males aged 11-13 years: $n=50$; Females aged 14-17 years: $n=14$; Males aged 14-17 years: $n=17$.

The Food Standards Agency recommends that starchy based foods should contribute 33% of dietary intake and so on average students should be consuming 3 portions of starch/day (up to 15 portions across the study week (FSA, 2011)). However, results of our study revealed that on average across each of the days of the week, students consumed less than the recommended quantity. Across the week, 14-17 year old males consumed the greatest number of portions of starchy foods (12.8). However, this was below the recommended 15 portions per week.

With respect to milk and dairy consumption, only on one day of the study week (Friday) was there a statistically significant result in terms of gender and age group. Older males and younger females had greater intakes compared with younger males and older females. Older males consumed on average over double the number of portions consumed by older females who consumed just 0.5 portions on average. However, these differences were very small and considering results across the whole week, there were no significant effects of gender or age or a relationship between the two. The Eatwell plate advises that approximately 15% of our dietary intake should come from milk and dairy foods (FSA, 2011). A publication produced on behalf of The British Dietetics Association states that children should aim to have 3 portions of dairy a day (Connor, 2007). The present study showed that across both sexes and age groups students

consumed lower than recommended amounts of dairy foods.

Fruit and vegetable consumption was similar in all groups of children and was well below the recommended 5 a day, barely exceeding 1 portion a day. The Eatwell recommendation is that fruit and vegetable consumption should contribute approximately 33% dietary intake (FSA, 2011). This study indicates a great under-consumption of this food group. The NDNS indicated that only 13% of males and 7% of females aged 11-18 years consumed the recommended 5 portions of fruit and vegetables a day (Department of Health, 2011). Findings from the present study are therefore not atypical of other studies that have produced similar findings with much larger sample sizes. Ultimately, these findings suggest that adolescent fruit and vegetable consumption is an area where intervention is needed. Although this study did not report any statistical significance in terms of gender differences on fruit and vegetable consumption, other studies have. Rasmussen *et al.* (2006) conducted a systematic review of the literature considering determinants of fruit and vegetable intake in children and adolescents. They found that in 27 reports girls have a more frequent or higher intake of fruit and vegetables than boys. This gender difference seemed to be more prevalent amongst children and adolescents in European countries compared with children and adolescents in the US.

For foods high in fat / sugar there was no statistical significance found across any of the specific days of the week regarding gender or age. However, across the full week (Figure 3) there was a statistically significant difference between boys and girls ($P=0.04$), whereby in both age groups males consumed a greater number of portions of high fat/ high sugar foods (1.2 and 3.2 portions more, respectively). This may be accounted for by the fact that at all ages, the energy requirements of girls are lower than those of boys, and this greater consumption of energy-dense foods in boys may therefore serve as an adaptive purpose (Cooke & Wardle, 2005). However, it may also be that due to social and environmental influences, females view diet as being of greater importance and so consciously restrict their intakes of such foods (Wardle *et al.*, 2004). The Eatwell guidance shows that high fat/sugar foods should contribute to no more than 8% of dietary intake (FSA, 2011). The present study showed that on average across the days, participants consumed no more than 2 portions of high fat/sugar foods/day.

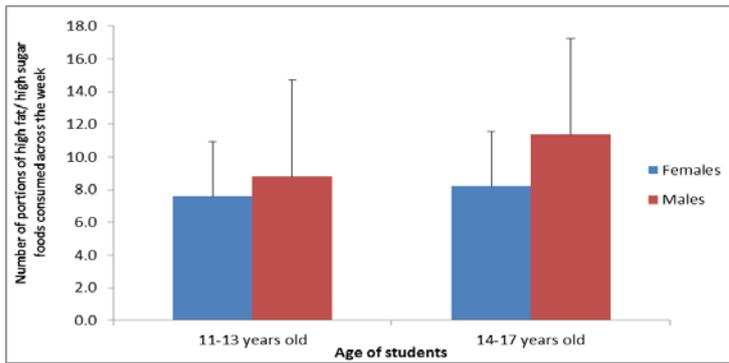


Figure 3. The number of portions of high fat/ high sugar foods consumed by male and female students (according to their age) across one school week (n=119). Males consumed more portions than females (P<0.05). Females aged 11-13 years: n= 38; Males aged 11-13 years: n= 50; Females aged 14-17 years: n=14; Males aged 14-17 years: n= 17.

The consumption of meat and alternatives, across each of the study days and across the week, was not influenced by age or gender. The Eatwell guidance recommends that foods in this group contribute towards 12% dietary intake (FSA, 2011). Across the week, male students aged 14-17 years consumed on average approximately 5 portions of these food types. This indicates a low consumption of meat and alternatives in participants.

findings by Engelhardt *et al.*, (2007) would suggest. Arguably, such a small sample is not representative. It would have been preferable to have had an even number of both boys and girls in each of the years and a larger recruitment of older children.

Arguably, the setting chosen for our study was fairly representative of the UK as a whole, because as Figure 4 shows, the East Midlands has average levels of least and most deprived areas in the region. However, recruiting more schools across the UK where levels of deprivation varied, would allow for comparisons between diets of adolescents in different regions.

As with most studies of this nature, compliance of participants was essential. There is a high risk of person-specific error where participants may misreport / under-report information. There is also an element of random error that will occur with these study designs. In this study, error was potentially enhanced by the fact that children had to recall their dietary intakes the next day, resulting in participants having to rely on their memory to recall what they had eaten. However, under the time constraints and to ensure that the school cooperated, these elements were beyond our control.

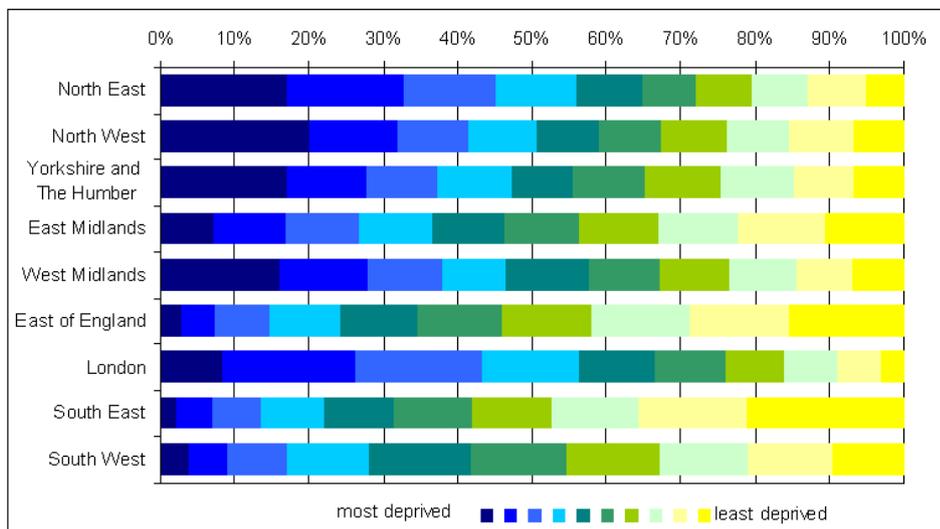


Figure 4. The regions of England according to their level of deprivation (Source: Communities and Local Governments, 2011). The levels of deprivation within specific regions of England, where deprivation has been measured according to a range of issues, not just financial ones.

There were several limitations to this study. Firstly, the sample size was low and ratio of males and females that took part was slightly skewed towards males (52 females and 67 males successfully completed the study). The overall response rate was 44.7% based upon 266 students that were invited to take part. More males participated in the study, which may be due to the fact that males may be more interested in participating in a nutrition related study, as

The duration of the study was also a limitation, as it required students to complete data entry regarding their eating habits across one school week, excluding weekends. Ideally, data would have been collected over several weeks. It would also have been preferable to establish what children ate at the weekends. However, to ensure a good response rate and to protect the data from getting lost or disclosed to another party, limiting data collection to the school week was necessary.

It also reduced the possibility of confounding factors being introduced that may arise in the home setting. The questionnaire used in this study simply asked students to record the foods that they consumed in the day. It did not require them to recall the weights or estimated portion sizes of these foods. Therefore, because the actual number of portions consumed could not be verified, and this was what the analysis was based upon, results may be subject to inaccuracy.

Conclusion

In conclusion, the results of this study showed that there were differences in food choices between girls and boys in this UK secondary school. It was found that there were gender influences on breakfast skipping, starch consumption and high fat/sugar consumption. Females were more likely to skip breakfast on at least one day of the study and males consumed more portions of starchy and high fat/sugar foods. Only in starchy food consumption was there an age-related effect, but this did not interact with the influence of gender.

However, when considering how the number of portions of the different food groups compared with recommendations outlined by the Eatwell plate, participants' actual consumption appeared far from the guidelines. Although the hypothesis that female adolescent students would be more likely than males to consume the recommended five portions of fruits and vegetables during the day, was not supported, other studies would disagree with our findings. If data provided by these subjects was accurate, their extremely low consumption of fruit and vegetables (barely 1 portion/day) and low consumption of dairy, starch, meat and alternatives, raises the question, what are these young people surviving on?

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Author Profile

Charlotte Foster graduated with a first class degree BSc (Hons) Nutrition in July 2012 from the University of Nottingham, School of Biosciences. She is due to start her MSc Dietetics at King's College London commencing September 2012. After graduating, she was selected to go to the Teso region of Uganda to collect data about the diets of pregnant women in two districts alongside health professionals from the charity The Teso Development Trust.