



Oral health among young people in Scotland

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Introduction

In Scotland the rate of dental disease among children is high compared with the rest of the UK and many countries in Western Europe (National Dental Inspection Programme of Scotland, 2008). This is largely due to a diet high in sugar content and low levels of oral care including infrequent tooth brushing (Scottish Executive, 2002). At least twice daily tooth brushing is recommended to reduce levels of tooth decay and gum disease (Loe, 2000; Scottish Executive, 2002).

Dental health in young people has improved in Scotland in recent years (National Dental Inspection Programme of Scotland, 2008). However, it remains a public health concern (Scottish Executive, 2002). The national target is for 60% of 11 year olds to be free of 'obvious caries experience' by 2010.

Oral hygiene habits are established early in life (Blinkhorn, 1981) and the importance of this is highlighted in studies showing that adolescents who brush their teeth at least twice daily by the age of 12 tend to continue to do so throughout their teenage years (Kuusela et al, 1996). It is important therefore, to promote tooth brushing from a young age in Scotland.

Gender differences in oral hygiene are evident world wide, with girls brushing their teeth more frequently than boys (Maes et al, 2006). In addition, it is well known that a disproportionately large amount of dental disease is found in a small proportion of children, namely those with a lower socioeconomic status (SES) (Bratthall, 2000; Marthaler, 2004). These children are more likely to start tooth brushing later in life and to brush their teeth less frequently (Gregory and Lowe, 2000; Maes et al, 2006; Silver, 1992). The importance of the influence of childhood SES on oral health has been shown in a recent Scottish study (Levin et al, 2009). Furthermore, low childhood social status is associated with high levels of dental caries in adulthood with no oral health benefits evident with increasing SES over time (Poulton et al, 2002). Family structure also appears to have some influence on the likelihood of some children being twice daily tooth brushers (Levin & Currie, 2009). Eleven and 13 year old boys living in a single mother family and 13 year old girls living in a stepfamily are less likely to brush their teeth twice daily compared with their counterparts living with both parents. Apart from frequent toothbrushing, family influences and socio-economic status, the main reason cited for the high levels

of dental disease among children in Scotland is a high sugar diet (Scottish Executive, 2002).

This sixteenth Briefing Paper in the HBSC series aims to examine oral health among young people in Scotland; specifically prevalence of at least twice daily tooth brushing and its association with age and gender, family factors, including family affluence, family structure and communication with parents, and healthy and unhealthy food habits. Trends in tooth brushing between 1990 and 2006 are presented. The survey methodology is described in the Technical Appendix.

Summary of main findings

- In each age group, girls were more likely than boys to report brushing their teeth at least twice a day
- Between 1990 and 2006 there was a steady increase in the proportion of children brushing their teeth at least twice daily
- Young people who live in high affluence families have a higher frequency of twice daily tooth brushing than those living in low affluence families
- Living with both parents was associated with a higher frequency of twice daily tooth brushing for boys, however family structure does not appear to impact on girls' tooth brushing frequency
- For both boys and girls, increased ease of communicating with their mother and father was associated with higher frequency of twice daily tooth brushing
- Among both boys and girls, lower frequency of sugary drink consumption was associated with higher frequency of twice daily tooth brushing
- For both boys and girls, higher frequency of fruit and vegetable consumption was associated with higher frequency of twice daily tooth brushing

Tooth Brushing

Age, gender and trends

Almost three-quarters (72%) of young people surveyed in Scotland reported brushing their teeth at least twice a day. Girls were more likely than boys to brush their teeth this often; 80% compared with 65% respectively. Gender differences existed in every age group

(Figure 1). Between the ages of 11 and 15 there was little change in the prevalence of tooth brushing for either girls or boys.

There has been a steady increase from 1990 to 2006 in the proportion of boys and girls that brush their teeth two or more times a day. Among boys, the proportion rose from 48% in 1990 to 65% in 2006. Among girls, the proportion increased from 70% in 1990 to 80% in 2006 (Figure 2).

Family Factors

In this section, the relationships between twice daily tooth brushing and various family factors are described. These include family affluence, family structure and ease of communication with mother and father.

Association between twice daily tooth brushing and family affluence (FAS)

The association between twice daily tooth brushing and family affluence was examined separately by gender. Among both boys and girls, higher family affluence was associated with a higher frequency of twice daily tooth brushing. Among boys, frequency of twice daily tooth brushing increased significantly in a stepwise fashion from low (54.4%) through medium (63.4%) to high (69.0%) FAS. Among girls this increase was only seen between low (70.0%) and medium (80.4%)/ high (82.7%) FAS (Figure 3).

Association between twice daily tooth brushing and family structure

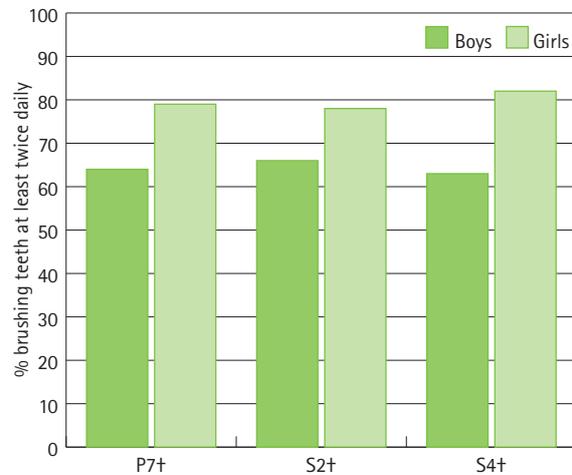
Young people were asked who they live with in their main or only home¹. Categories included both parent families, single and step families. Family structure was associated with twice daily tooth brushing among boys but not girls. For boys 66.7% who lived in both parent families reported brushing teeth at least twice daily compared with 58.9% of those living in single parent families (Figure 4).

Association between twice daily tooth brushing and communication with mother and father

Ease of communication with mother and father has previously been identified as one aspect of a supportive parental relationship which may have a protective effect on the lives of young people (Pedersen *et al.* 2004). Previous research suggests that positive relationships with parents are associated with positive health outcomes (Garnefski and Diekstra, 1997; Swarr and Richards, 1996).

Young people were asked to say whether they found it easy or difficult to talk to their mother or father². For both boys and girls, ease of communication with parents (finding it easy to talk to their mother and father) was associated with higher frequency of tooth brushing. Among boys, 66.7% and 68.7% who found it easy to talk to their mother and father respectively reported brushing their teeth at least twice daily compared with 57.2% and 58.1% who found it difficult to talk to their mother and father. A similar pattern emerged

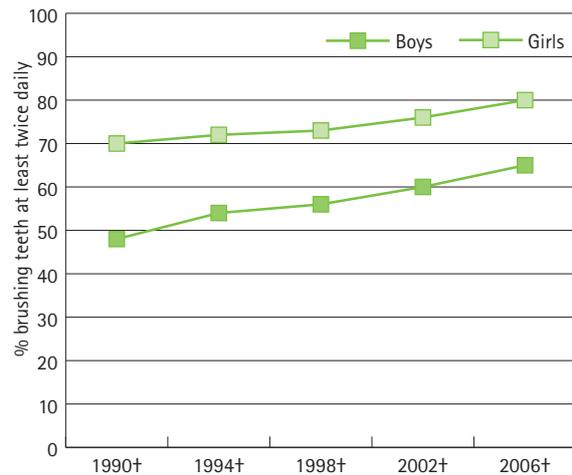
Figure 1: Pupils who reported brushing their teeth at least twice a day



† Significant gender difference (p<0.01)

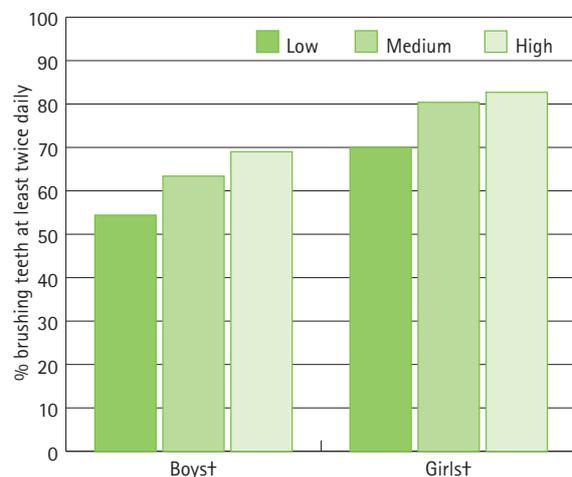
Trends

Figure 2: Pupils who reported tooth brushing at least twice a day 1990–2006



† Significant gender difference (p<0.01)

Figure 3: Twice daily tooth brushing among 11–15 year olds by Family Affluence and gender

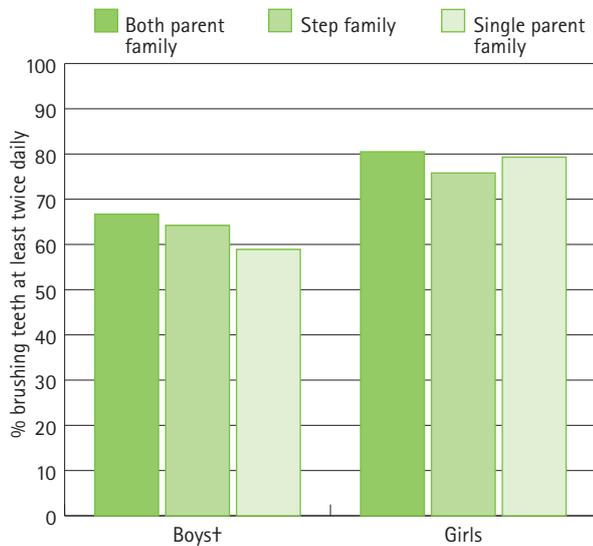


† Significant difference between FAS groups (p<0.01)

1 Children were asked about where they live all or most of the time (their main home) and, if applicable, a second home (where they lived some of the time). See Technical Appendix for details.

2 Those who reported that they did not have or see their mother/father were excluded from the analysis

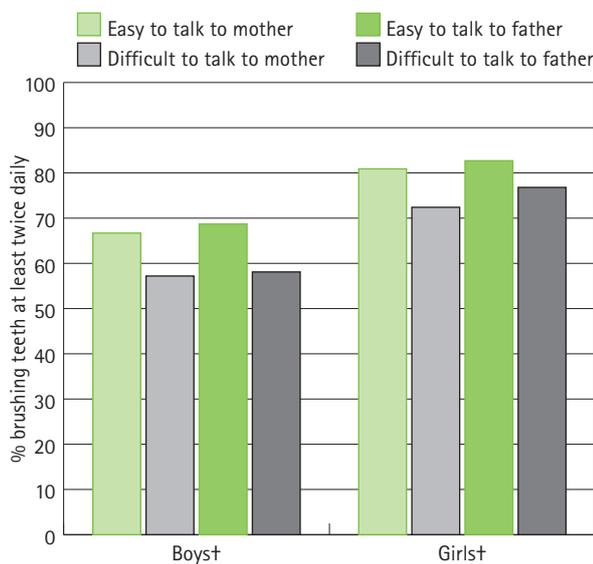
Figure 4: Twice daily tooth brushing among 11–15 year olds by family structure and gender



† Significant difference between family structure groups ($p < 0.01$)

for girls: 80.9% and 82.7% who found it easy to talk to their mother and father respectively reported at least twice daily tooth brushing compared with 72.4% and 76.8% who found it difficult to talk to their mother and father (Figure 5).

Figure 5: Twice daily tooth brushing among 11–15 year olds by ease of communicating with mother and father



† Significant difference by family communication ($p < 0.01$)

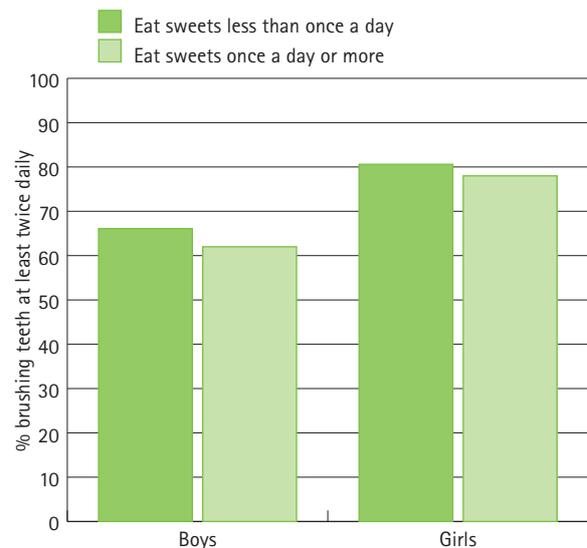
Food Habits

In this section, the relationships between twice daily tooth brushing and various food habits are described. These include the daily consumption of sweets and sugary drinks and the daily consumption of fruit and vegetables.

Association between twice daily tooth brushing and daily sweet consumption

Young people were asked how often they consumed sweets. There was no significant difference between sweet consumption and tooth brushing frequency for either boys or girls (Figure 6).

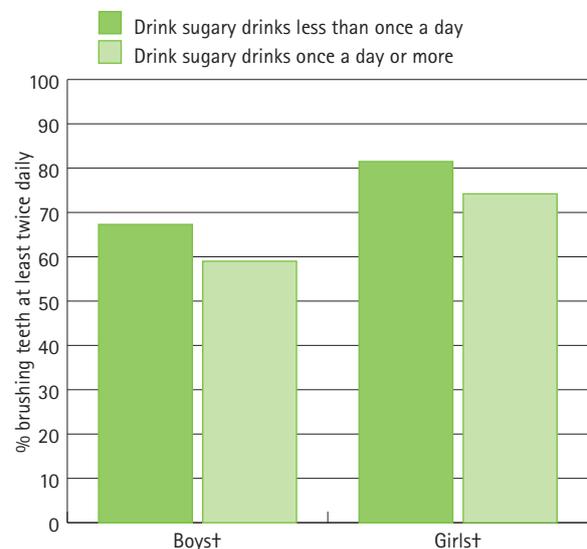
Figure 6: Twice daily tooth brushing among 11–15 year olds by sweet consumption



Association between twice daily tooth brushing and daily consumption of sugary drinks

Young people were asked how often they consumed sugary drinks (e.g. Coke or other soft drinks that contain sugar). For both boys and girls, those who reported drinking sugary drinks less than once a day were more likely to report twice daily tooth brushing (67.3% and 81.5% respectively) than those who reported drinking sugary drinks once a day or more (59.0% of boys and 74.2% of girls) (Figure 7).

Figure 7: Twice daily tooth brushing among 11–15 year olds by sugary drink consumption

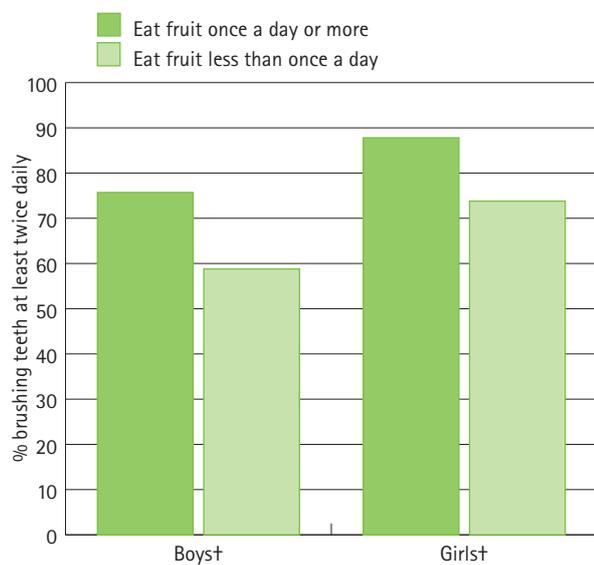


† Significant difference between sugary drink consumption groups ($p < 0.01$)

Association between twice daily tooth brushing and daily consumption of fruit and vegetables

Young people were also asked about healthy eating habits, namely, how often they consumed fruit and vegetables. For both boys and girls higher consumption of fruit and vegetables (once a day or more) was associated with higher frequency of tooth brushing. Among boys for example, 75.7% and 73.4% who ate fruit and vegetables respectively, reported brushing their teeth twice daily, compared to 58.8% and 60.4% of those who reported eating fruit and vegetables less than once a day respectively (Figures 8 and 9).

Figure 8: Twice daily tooth brushing among 11–15 year olds by fruit consumption



† Significant difference between fruit consumption groups (p<0.01)

Figure 9: Twice daily tooth brushing among 11–15 year olds by vegetable consumption



† Significant difference between vegetable consumption groups (p<0.01)

Discussion

In line with previous findings, this paper highlights a significant relationship between lower family affluence and less frequent tooth brushing. Indeed, research has shown that children from lower socio-economic backgrounds in the UK are more likely to start tooth brushing later in life and to brush their teeth less frequently (Gregory and Lowe, 2000; Maes et al, 2006).

The composition of the family unit has undergone significant changes in recent decades due to wide-ranging social, cultural and historical developments (Pedersen et al, 2004). Family structure has previously been associated with several adolescent health outcomes (Todd et al, 2007). The results show that in Scotland, family structure is associated with twice-a-day tooth brushing for boys but not girls. In a previous analysis of the 2006 Scottish HBSC data, by both gender and age group, it was found that 11 and 13 year old boys living in a single mother family, and 13 year old girls living in a stepfamily were less likely to brush their teeth twice daily compared with their counterparts living with both parents (Levin and Currie, 2009). Other factors related to the family such as number of siblings and parenting style may also be related to tooth brushing frequency.

Previous studies of child health have suggested that family processes that protect children from high levels of stress result in the best health outcomes with good parent-child relations and communication providing a good foundation for this type of environment. This Briefing Paper demonstrates that good communication with both mother and father is associated with more regular tooth brushing among Scottish adolescents.

Preschool children are at high risk of dental caries when sugars are consumed at high frequency and retained in the mouth for a long time (e.g. eating sweets) (Tinanoff and Palmer, 2000). This Briefing Paper investigated the association between consuming fruit and vegetables, known to be beneficial to oral health (Moynihan and Petersen, 2004), as well as sweets and sugary drinks, known to be detrimental to oral health, and frequency of tooth brushing. Findings suggest that those young people consuming sugary drinks are less likely to clean their teeth twice a day or more, while those with a diet which includes daily fruit and vegetables are more likely to clean their teeth at least twice a day. The combined effect of not brushing teeth twice a day and consuming sugary drinks regularly is likely to result in poor oral health. Oral health initiatives should therefore target these children who are at particularly high risk of oral diseases.

Technical Appendix

Scotland, along with 40 other countries in Europe and North America participated in the 2005/2006 Health Behaviour in School-Aged Children (HBSC): WHO Collaborative Cross-National Survey (Currie, Todd & Smith, 2003: HBSC Briefing Paper 1). Previous surveys were conducted in 1989/90, 1993/94, 1997/98 and 2001/2002 and findings from these have been published in a series of international and Scottish reports and briefing papers listed at the end of this document and can be found at: www.education.ed.ac.uk/cahru/publications/. Key findings from the 2005/2006 cross-national survey have been published in the international report *Inequalities in Young People's Health* (Currie et al, 2008).

The 2006 HBSC survey in Scotland

The 2006 HBSC survey was carried out in 300 schools across Scotland. Pupils from mixed ability classes anonymously completed questionnaires in the classroom. The sample was nationally representative and included pupils from Primary 7 (11-year-olds, n=1785), Secondary 2 (13-year-olds, n=2309) and Secondary 4 (15-year-olds, n=2306) giving a total sample of 6400. On completion of fieldwork, national data files were prepared using the standard documentation procedures of the HBSC International Protocol and submitted to the HBSC International Data Bank at the University of Bergen, Norway. Data files were checked, cleaned and returned to countries for approval prior to their placement in the international file. Results from the 2005/2006 HBSC international survey represent more than 200,000 young people in 41 countries. Further details can be found in *Inequalities in Young People's Health* (Currie et al, 2008).

Measures used in this briefing paper

Family Affluence Scale (FAS)

The children surveyed were assigned low, medium or high FAS classification where FAS 1 (score = 0–3) indicates low affluence; FAS 2 (score = 4, 5) indicates middle affluence; and FAS 3 (score = 6, 7) indicates high affluence. Scores were calculated using the following survey items:

Does your family own a car, van or truck? Response categories were: *No* (= 0), *Yes, one* (= 1), *Yes, two or more* (= 2). This item is a component of a Scottish deprivation index developed by Carstairs and Morris (Carstairs & Morris, 1991), which is used widely in research on health inequalities.

Do you have your own bedroom for yourself? Response categories were: *No* (= 0), *Yes* (= 1). This item is a simple proxy for overcrowding, classified by Townsend (1987) as housing deprivation; it is also a component of the Scottish deprivation index.

During the past 12 months, how many times did you travel away on holiday with your family? Response categories were: *Not at all* (= 0), *Once* (= 1), *Twice* (= 2), *More than twice* (= 2).

How many computers does your family own? Response categories were: *None* (= 0), *One* (= 1), *Two* (= 2), *More than two* (= 2). This item was added to the 2001/2002 survey questionnaire to identify families with higher socioeconomic status in affluent countries.

Family Structure

Children were asked to indicate the people who live in the home where they live all or most of the time, from the following: *Mother / Father / Stepmother (or father's partner) / Stepfather (or father's partner) / Grandmother / Grandfather / live in foster home or children's home / Someone or somewhere else*. Children were then categorised as living with both parents / single parent (mother or father) / step family / other.

Family Relationship

The quality of parent-child relations was measured using the following question about communication with parents. *How easy is it for you to talk to the following persons about things that really bother you?* Father/Mother. (*Very easy / Easy / Difficult / Very difficult*)

Consumption of foods

Children were asked about how regularly they consumed various healthy / unhealthy foods and drinks. *How many times a week do you usually eat the following things?* Fruit / Vegetables / Sweets (*Never / Less than once a month / Once a week / 2–4 days a week / 5–6 days a week / Once a day, every day / Every day, more than once*).

How many times a week do you usually drink the following things? Coke or other soft drinks that contain sugar (*Never / Less than once a week / Once a week / 2–4 times a week / 5–6 times a week / Once a day, every day / Every day, more than once*)

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HBSC publications and HBSC information

Further information on the international report from the 2005/6 survey can be obtained from the International Study website www.hbhc.org. The International Coordinating Centre for the HBSC Study is the Child and Adolescent Health Research Unit (CAHRU), The University of Edinburgh.

HBSC Briefing Papers from earlier surveys include:

- Briefing Paper 1: Introduction, background and dissemination of the 2002 HBSC survey in Scotland.
- Briefing Paper 2: Mental well-being among schoolchildren in Scotland: age and gender patterns, trends and cross-national comparisons.
- Briefing Paper 3: Gender Matters: Physical activity patterns of schoolchildren in Scotland.
- Briefing Paper 4: Mental-health and well-being in the context of school: Young people in Scotland.
- Briefing Paper 5: How are Scotland's young people doing? A cross-national perspective on physical and emotional well-being.
- Briefing Paper 6: How are Scotland's young people doing? A cross-national perspective on health-related risk.
- Briefing Paper 7: How are Scotland's young people doing? A cross-national perspective on physical activity, TV viewing, eating habits, body image and oral hygiene.
- Briefing Paper 8: Bullying and fighting among schoolchildren in Scotland: age and gender patterns, trends and cross-national comparisons.
- Briefing Paper 9: Social Context of Bullying Behaviours.
- Briefing Paper 10: Bullying: Health, Well-Being and Risk Behaviours.
- Briefing Paper 11: Family affluence and health among schoolchildren.
- Briefing Paper 12: Family structure and relationships and health among schoolchildren.
- Briefing Paper 13: Perceptions of school and health of schoolchildren.
- Briefing Paper 14: Mental well-being of young people in Scotland: 1994-2006.
- Briefing Paper 15: Key findings from the 2006 Scottish Health Behaviour in School-aged Children Study.

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