

Sugar consumption and tooth decay

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The Health Related Behaviour Questionnaire contains several questions relating to dental care. One of these asks *How many times did you brush your teeth yesterday?* and another asks *Last time you visited the dentist, what treatment did you have?* The answers to these and other questions offer the chance to seek relationships between dental care and other aspects of a pupil's life-style.

It has been stated in previous articles, both in this issue and in previous issues, that toothbrushing alone is not enough to prevent caries. Our databank has supported this, in that no link was found when comparing frequency of toothbrushing with whether children had fillings on the last visit to the dentist (*Education and Health*, November 1984). The current view is that a high consumption of sugar is the main cause of caries.

This article looks specifically at the relationship between having or not having fillings during the last visit to the dentist and the level of sugar consumption, to discover if our databanks reveal a link between the two. The Version 10 questionnaire used in 1985 collected 13,231 responses from 6,713 girls and 6,518 boys aged 11+ to 15+, and Table 1 gives an overview of the percentages of children in this sample having fillings on their last visit to the dentist. It shows that about the same number of boys and girls have fillings in Years 4 and 5, but that slightly more boys than girls in Years 1-3 had fillings on their last visit. About a quarter of all boys and girls had fillings on their last visit to the dentist.

By combining answers to two different questions it is possible to study how two different behaviours relate to each other; for example, is there any link between sugar consumption and dental caries necessitating fillings?

Purchase of sweets

This is examined by first looking at the pupils who report spending money on sweets during the previous four weeks. The sample includes some 1,433 2nd-year boys and girls, and 4,872 in the 4th year, of whom approximately 80% of boys and 82% of girls bought sweets during this period. In Table 2, sweet-purchasing is related to those who had fillings done during their last visit to the dentist.

This table shows noticeable differences between the percentages of children having fillings and buying or not buying sweets. Except for the 2nd-year boys we see that a higher percentage of those who bought sweets had fillings. In these cases the significance was found to be $< .01$, which suggests a highly significant connection between the two behaviours. In the girls' sample, almost twice as many

Year group:	Boys					Girls				
	1	2	3	4	5	1	2	3	4	5
Fillings	27	27	28	30	28	22	23	23	29	27
No Fillings	73	73	72	70	72	78	77	77	71	73
Sample Size	936	591	1491	2481	647	724	692	1532	2469	872

Table 1. The percentage of boys' and girls' responses to 'Did you have fillings on your last visit to the dentist?' (1985 sample)

Table 2. The percentage of boys and girls who had fillings on their last visit to the dentist, and who did or did not buy sweets during the past four weeks (1985 sample)

	Year 2		Year 4	
	Boys	Girls	Boys	Girls
Sweets bought	30	27	31	31
Sweets not bought	27	15	22	18
Sample Size	187	191	685	683

Table 3. The percentage of boys and girls who had fillings on their last visit to the dentist, and who did or did not buy fizzy drinks during the past four weeks (1986 sample)

	Year 2		Year 4	
	Boys	Girls	Boys	Girls
Fizzy drinks bought	33	29	32	32
Fizzy drinks not bought	21	18	22	24
Sample Size	187	191	685	683

Table 4. The percentage of boys and girls recording different levels of 'sugary' carbohydrate in the previous day's diet. (1986 sample)

	Year 2		Year 4	
	Boys	Girls	Boys	Girls
Sugar level 0	1	3	3	3
Sugar level 1-4	61	56	34	52
Sugar level 5-6	19	20	23	26
Sugar level 7+	19	21	40	19
Sample Size	95	100	428	292

'Sugary' carbohydrate index:	Year 2				Year 4			
	0-2	3-4	5-6	7+	0-2	3-4	5-6	7+
Fillings	27	30	20	23	13	20	21	46
No Fillings	29	33	20	19	22	26	25	27
Sample Size	193				714			

Table 5. The percentage of pupils in the 'fillings' and 'no fillings' groups who had different levels of 'sugary' carbohydrate in the previous day's diet. (1986 sample)

Table 6. The percentage of children in the 0-5 and 5+ 'sugary' carbohydrate index levels who had fillings when they last visited the dentist. (1986 sample)

Year group:	Boys and Girls combined:				
	1	2	3	4	5
Below 5 'sugar' units	25	15	18	19	20
5+ 'sugar' units	31	17	29	30	23
Sample Size	139	30	104	182	20

of those who had fillings bought sweets during the previous four weeks.

Consumption of fizzy drinks

Approximately 68% of boys and 58% of girls bought fizzy drinks during this period. In Table 3 we see that the differences are more marked than for sweets — of those who had fillings, a much higher percentage bought fizzy drinks. This again indicates that more of the children who had fillings bought sugary things, and that sugar may be one of the factors in dental decay.

'Sugary' carbohydrate levels

Since January 1986 in Version 10 there has been introduced a more accurate measurement of total sugar levels calculated from the diet page. This is an index of 'sugary' carbohydrate intake and includes items such as fizzy drinks, sweets, chocolate, fruit juice/squashes, puddings and baked beans. The resulting scale gives an indication of the amount of sugar consumed 'yesterday'. For example, a chocolate bar is given 2 points and a fizzy drink 1 point.

Table 4 gives an indication of 'sugary' carbohydrate levels for 2nd and 4th-year pupils. The sample is obviously smaller, since this measurement of sugar is recent, and fewer schools in 1986 completed this version of the Questionnaire. In all cases, however, the majority of pupils consumed between 1-6 units, with the exception of 4th year boys, 40% of whom consumed 7 or more.

These 'sugary' carbohydrate levels were then examined for those who had or did not have fillings on their last visit to the dentist. This sample completed the Questionnaire since January 1986. The results for the 2nd and 4th-year pupils

are shown in Table 5.

Here we see that in Year 2 there is not a striking difference between the percentages of different 'sugary' carbohydrate levels in those having fillings and those not. However, in Year 4 a difference is more apparent. The table indicates that those pupils who had fillings consumed a larger percentage of sugar above the 7+ level and a smaller percentage at the lower end of the scale compared with those who did not have any fillings. This therefore raises the questions: Does the sugar consumption rise as age increases? Do children who eat larger amounts of 'sugary' carbohydrate have more fillings?

Table 6 shows the results for all years eating 'sugary' carbohydrates below and above level 5 who had fillings at their last treatment.

This table shows that as a general rule children eating sugar at the 5+ unit level are more likely to have fillings. There is a notable difference in the 3rd and 4th year pupils: in the 3rd year, 29% who had fillings were in the 5+ unit level, compared with 18% below this level. This pattern is also reflected in the 4th-year figures (30% and 19% respectively). The data suggests, then, that higher sugar consumption results in a greater need for fillings, and that 3rd- and 4th-year pupils in particular seem to be more at risk than other year groups.

This data strengthens the view that higher levels of sugar are related to tooth decay, and it seems appropriate for health education in schools to stress this fact. Projects such as *Natural Nashers* are making more teachers and pupils aware of the need to develop a more healthy eating pattern so as to combat the rise in sugar consumption, and reduce the need for fillings.