## IN BRIEF

- This study has found strong relationships between parental socio-demographic characteristics and levels of dental knowledge and attitude.
- Lack of further education, living in a deprived area and being Asian meant that parents had less chance of scoring highly for levels of dental knowledge and having a positive dental attitude.
- Multiple logistic regression analysis revealed that the ethnicity of parents was the factor of most significance above deprivation.
- This knowledge may allow oral health promotion interventions to be targeted at those communities who have the greatest need.

# The relationship between socio-demographic characteristics and dental health knowledge and attitudes of parents with young children

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**Objective** To determine if parental socio-demographic characteristics are associated with dental knowledge and attitude.

**Design** A questionnaire survey of 500 consecutive parents with children aged approximately 8-months, attending clinics in 1999/2000, in Burnley, Pendle and Rossendale, for health visitor distraction-hearing tests. **Outcome measures** Scores were obtained for dental knowledge and attitudes. The socio-demographic variables of parental ethnicity, age, education and area of residence were used to determine any associations.

**Results** Parental age ranged between 16–46 years. Child age ranged between 7–11 months. Significant differences were detected for parental dental knowledge according to ethnicity (P = 0.003), educational status (P = 0.000), and area of residence (P = 0.016). Significant differences were also found in dental attitudes; ethnicity (P = 0.000), educational status (P = 0.004) and area of residence (P = 0.005). Parental age was not significant for either knowledge or attitude.

**Conclusions** Lack of further education, being Asian and living in a deprived area means parents have less chances of high dental knowledge and positive dental attitudes.

Although levels of dental disease have been decreasing over the past five decades, dental caries is still a major drain on NHS resources. Its treatment by the placement of a simple filling costs over £173 million per year in England and Wales.<sup>1</sup> The fall in the measured rates of decayed, missing and filled teeth in 5-year-old children has slowed, and perhaps stopped, over the past two decades.<sup>2</sup> The national survey of children's dental health in 1995/6 found that the mean number of primary teeth affected by dental caries had fallen from 3.3 to 1.6 between 1973 and 1983 but there was no change between 1983 and 1993.<sup>3</sup> The distribution of caries has altered quite considerably over time. It has changed from being a disease that affected most children, to being one that affects only certain groups of the population,

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concentrated in relatively small numbers of children. Consequently these children have quite high levels of disease.<sup>4–5</sup> Oral health promotion interventions need to address this changing pattern to be able to resume the downward trend of dental disease.

An analysis of the factors associated with oral health and oral health-related quality of life in the United States,<sup>6</sup> unsurprisingly discovered that no one single factor could be said to represent oral health. Although ethnicity, education, age, dental attendance and socio-demographic and economic variables were all relevant, it was only when multi-dimensional measures were used that oral health could be conceptualised.

## Ethnicity

Ethnicity has been demonstrated to be associated with dental health status.<sup>7–20</sup> A snapshot survey of the health of ethnic minority populations in England<sup>15</sup> found that children from all ethnic minority groups, but especially Pakistani and Bangladeshi children, were less likely to have ever visited the dentist. Of those who had attended, this was more likely to have been a visit for dental problems rather than preventive practices. Epidemiological studies have suggested that Asians living in Britain, particularly children, have poor oral health.<sup>9</sup>

#### Deprivation

Deprivation has also been associated with dental status.<sup>4-11,21-25</sup> Lower socio-economic groups in the United States have been found to have high levels of dental caries.<sup>10</sup> Children living in deprived wards (Jarman score 2.5 or greater) in Sheffield, England were one-and-a-half times more likely to have experienced decay than those from non-deprived wards.<sup>21</sup> Of those with decay, more teeth were affected and were more likely to be untreated, than those of children from less deprived wards. Children in the North West of England had similar experiences,<sup>22</sup> where children from families with poor socioeconomic status had more dental disease experience than those from less deprived backgrounds. A study in Leeds, England<sup>11</sup> to investigate the relationship between material deprivation, ethnicity, dental health and related behaviour in 2,677 5-year-old children, found that although caries experience increased significantly with deprivation, differences in caries experience between ethnic groups were independent of deprivation score.

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# METHODS

The null hypothesis to be tested was that parental dental knowledge and attitudes would be independent of socio-demographic characteristics. The data set that was used for this study was the pre-intervention data from an ongoing 3-year study being undertaken in East Lancashire. The larger study: Collaboration by primary care professionals to improve dental health is a randomised control trial to evaluate the effectiveness of oral health promotion provided by a health visitor with the families of 500 pre-school children. Hearing test sessions were chosen for recruitment as all the children attending would be aged 8 months. All children attending local health authority clinics for distraction hearing tests were invited to take part in the study until 500 participants were achieved (16 families declined to take part before the 500 were achieved). Pre- and post-intervention measurement of dental knowledge and attitudes is one of four outcome measures used in the evaluation of the larger study. The natural nashers<sup>26</sup> questionnaire was used to collect the data. The form was adapted to also collect information about the educational status, ethnicity, age and area of residence of the parents.

Educational status was classified as: left school at sixteen, college of FE, university or higher degree. These classifications were recoded to produce two categories of: no post-compulsory education or some further education. This was done as the last two original categories were quite small. Ethnicity was classified as white, Asian, black, Chinese or other. Again due to very small numbers in the last three groups these were recoded to produce white, Asian and other (including black and Chinese). The area of residence of the parent was classified as deprived or non-deprived depending on whether the home address of the parent was in an area that received enhanced dental capitation payments based on Jarman scores. There has been criticism of this system as it uses dental practice postcode rather than home postcode to decide upon payments and these may not correspond with each other.<sup>21</sup> By using the home postcode of the family this criticism has been overcome.

Age of parents was classified in bands <20 years, 20–29 years, 30–39 years and 40–49 years.

The ten questions were split into two distinct sections: questions 1–6 about dental knowledge and 7–10 about attitudes. Total scores from these sections were used to categorise parents as having low/high knowledge (< 4/6 correct responses, > 3/6 correct answers) and negative/positive attitudes (< 3/4 positive responses, > 2/4 positive responses). Logistic regression analysis was undertaken for each of the variables (ethnicity, educational status, parental age and deprivation) overall and then comparing the factors within each of the variables to each other for both sections of questions.

## RESULTS

Parental age ranged from 16–46 years, the modal age being 36 years. Forty-six per cent (230/500) of the parents fell within the age range of 20–29 years. Age group of parent was not significant for either dental knowledge (P = 0.066) or dental attitude (P = 0.863).

Forty-eight point eight per cent (244/500) of parents had not had any further education. Having had some further education proved to be highly significant for predicting the chances of getting classified as having high dental knowledge (P = 0.000OR 2.249 95% CI 1.496–3.381) and for having a positive dental attitude (P = 0.004 OR 1.943 95% CI 1.243–3.035).

Two hundred and twenty three (44.6%) of the families lived in areas classified as deprived. Of these, 66.71% (149/223) had a high level of dental knowledge (Fig.1) compared with 76.53% (212/277) of the non-deprived group. These differences were statistically significant (P = 0.016 OR 0.617 95% CI 0.416–0.915) with those from deprived areas having less chance of having high levels of knowl-



Fig. 1 Bar chart demonstrating the number of correct responses for positive dental knowledge by areas of deprivation





edge. Living in a deprived area also meant that parents had less chance of having a positive dental attitude (P = 0.002 OR 0.502 95% CI 0.324–0.776) compared with those who lived in non-deprived areas (Fig. 2).

The majority of parents (80.4%) classified themselves as white, the remaining 19.6% being split between 17.2% Asian and 2.4% other. This is similar to the local population. Ethnicity of parents was significant for both knowledge (P = 0.003) and attitudes (P = 0.000). Asian parents had considerably less chance (OR 0.433 95% CI 0.267-0.702) of having high levels of knowledge compared with white parents (Fig. 3). Having a positive dental attitude was similarly associated with ethnicity (Fig. 4) with Asian parents having only 18% of the chances of white parents in being classified as having a positive attitude (OR 0.180 95% CI 0.109-0.299). Parents from the 'other' group had no significant differences compared with the reference group. Multiple logistic regression analysis of the three factors found to be of significance in predicting high dental knowledge excluded deprivation from the equation and placed educational status as most significant (P = 0.000 OR 2.256 95% CI 1.494–3.406) followed by ethnicity (P = 0.002 OR 0.471 95%) CI 0.294-0.755). The same methods of analysis, using positive dental attitude as the dependent variable, similarly excluded deprivation from the final equation. Ethnicity was the factor of

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most significance (P = 0.000 OR 0.190 95% CI 0.117–0.311) and educational status was second (P = 0.003 OR 2.017 95% CI 1.260 – 3.231).

## DISCUSSION

The significant differences between the study groups led to the rejection of the null hypothesis. The results are similar to those found by other studies<sup>5-8,10,13,16,19,27,33</sup> in that socio-demographic characteristics have been found to affect dental health knowledge and attitudes. The findings confirm that parents from Asian families, those living in deprived areas and parents who have had no further education all have less chance of having high levels of dental knowledge and positive dental attitudes. Health promotion theory has discredited the efforts of improving knowledge as being ineffective in changing behaviour.<sup>28</sup> However recent dental studies<sup>5,29</sup> have demonstrated that increased dental knowledge had positive effects on oral health status. Other studies<sup>7,34</sup> have similarly concluded that increasing knowledge still has an important role in today's dental arena. This study has proven that specific groups within society have lower levels of knowledge and less positive attitudes. Membership of these groups is also likely to be related to higher levels of dental disease in children.







Fig.4 Bar chart demonstrating the number of correct responses for positive dental attitude broken down by ethnic groupings



Fig.5 Venn diagram showing overlap between the three factors that have been demonstrated to affect dental health knowledge and attitudes

### Deprivation

As with most diseases dental caries has been found to be worst for those living in deprived areas.<sup>3,4,6–12,23–25,31,33</sup> This study has found evidence that parents who live in deprived areas have statistically less chance of answering questions correctly about dental knowledge and giving positive answers to questions to determine dental attitude. The evidence provided by this paper that those from deprived areas have lower dental knowledge levels and less positive dental attitudes indicates that these factors may be associated with the behaviours that are involved in caries aetiology. Improving the knowledge levels of those from deprived communities may be one strand in the empowerment process that allows these individuals 'to increase control over, and improve their health.' Deprivation was excluded from the equation when multiple regression analysis was undertaken leaving ethnicity and educational status as the factors of most significance. This may indicate the lack of independence of deprivation and ethnicity as factors.

Social class has been demonstrated repeatedly to affect child dental health status.<sup>6,22,23,31,33</sup> It may be that increased levels of education bring about increases in social placing due to increased prospects in the job market. Educational achievement is directly related to the attainment of professional status, one of the classification criteria for determining social class.

## **Educational status**

The improved dental knowledge and more positive dental attitudes held by those who had attended any form of further education must have been obtained from some source. It is unlikely that the educational content of the course was responsible for the apparent differences. A general improved level of education may mean that parents are more able to access appropriate sources of information and understand that information more fully.

The main messages about dental health do not seem to be understood by those most in need of information. Most people are aware that sugars cause dental caries but not that it is the frequency of the sugar intakes rather than the amount of sugars consumed that are of importance. Complicated messages and an over-emphasis on toothbrushing methods in the past have confused oral healtheducation and instruction. Simple, clear and consistent messages are needed to ensure that the information given is in a form that is readily understood and can be related to everyday practices.

## Ethnicity

A study in Glasgow<sup>13</sup> found that, although Asian families had low levels of dental knowledge, they held positive dental attitudes. The

present study does not support these findings because among those who had poor dental knowledge, 75% (74/99) of white parents were classified as having a positive dental attitude compared with only 43% (16/37) of Asian parents. The differences between the groups was found to be highly significant (P = 0.000). It may be that the classification systems of the two studies may be responsible for these differences but it was found that overall those who had scored well in the knowledge section also scored well in the attitude section. A more recent study<sup>14</sup> found that Bangladeshi mothers were the least likely to have received the Health Education Authority publication Birth to Five, that has been cited by some parents in the course of this research as a valuable source of dental information. Parent-held-records are also currently unavailable in any of the Asian languages used in the local area but this may not be relevant because many Asians are unable to read their own language. A national survey of ethnic minority groups use of health services<sup>15</sup> found that the children of Pakistani and Bangladeshi families were the least likely to have attended a dentist. The benefits of dental attendance may need extra emphasis with these families as regular dental attendance has been demonstrated to predict good oral health in later life.<sup>35</sup> Another study<sup>9</sup> found that regular attendance could positively affect the disease experiences of young children.

The three factors affecting the levels of dental knowledge and attitudes: ethnicity, deprivation and low educational status are all associated with each other (Fig. 5). The lack of independence of each of these factors makes it difficult to determine which factors are of most importance. Acheson (1998)<sup>34</sup> has said that to focus on groups such as minority ethnic groups may be counterproductive as it is the more major factors such as social deprivation that are of importance. A previous study<sup>11</sup> found that differences in dental status between ethnic groups were independent of deprivation scores. It seems from the present study that having high levels of dental knowledge and a positive dental attitude follows similar patterns.

Dental health does not stand in isolation from other aspects of general health. Good nutritional advice also incorporates oral health advice and vice versa. Many of the factors found to cause dental caries in children also have an effect upon general wellbeing. New initiatives such as *Sure start* aimed at improving the life chances of children from the most deprived areas of the country may be one vehicle upon which oral health promoters can hang their strategies.

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