

Evaluation Report

Oral Health Fluoride Toothbrushing Project with Batley Sure Start

Client: Batley Sure Start

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Executive Summary

The purpose of this report is to set out the findings of an evaluation of toothbrushing in nursery schools in the Batley Sure Start area delivered by North Kirklees PCT / Calderdale & Kirklees Community Dental Care.

Background and rationale

The epidemiological studies of five year olds for local primary schools in the area indicate that children attending schools in the North Kirklees Area, which includes the Batley Sure Start area, suffer from disproportionately high levels of dental decay.¹ Dental decay experience in deciduous teeth is measured by the dmft index. This measures the total number of teeth that are decayed, missing, due to decay or are filled. For North Kirklees the value of the index in 2001-2 was 2.87 per child, and had shown no overall improvement since 1987 and compares to a national target that has been set by the Department of Health of 1 by the year 2003. The figures for 2003-4 suggest the problem is worsening, as the value of the index for North Kirklees is now 3.69 and is the worst district in England. There is a clear need within the area to address this particular problem. Not least because of the cost to the NHS of treating children with tooth decay, but also because of the effects that it has on the children concerned.²

A number of factors have been identified as responsible for tooth decay including care of teeth, diet, feeding habits and application of fluoride³. North Kirklees does not have a fluoridated water supply. Given the reduced access that children in the Batley area have to fluoride generally compared to other areas of the country, consideration was given as to how this particular factor could be addressed.

Evidence base for approach

The oral health project was based on the evidence base arising out of a study conducted in Tayside in Scotland⁴. As part of the evaluation this evidence was critically appraised and a broader literature search was made in order to assess whether the project was being developed from a reliable evidence base initially. The appraisal found that the randomized control trial (RCT) it was based on was sound and the results of this have been used to make estimates as to the cost effectiveness of the approach.

Focus and scope of evaluation

The focus of the evaluation is about assessing whether this particular approach of delivering oral health messages and practice within a nursery setting has value in improving access to fluoride. The evaluation also considers the resources that are required to deliver this and whether this is cost effective against the benefits that may be

¹ BASCD biannual dental survey.

² Ottley C. Baby tooth care a forgotten priority? Nursing Standard 2002; 16 January; 18 40-44

³ Fuller SS; Oral Health Promotion, a practical guide for health visitors and school nurses. London: Health Education Authority, 1988

⁴ Curnow M; Pine CM; Burnside G; Nicholson JA; Chesters RK; Huntington E. A randomized control trial of the efficacy of supervised tooth brushing in high caries-risk children. Caries Research 2002; 36:294-300

expected longer term based on the available research evidence. Improvements in dental health will happen over long period of time. In the short run we need to identify if there is any indicative qualitative evidence to suggest that the project is contributing to the attitude and behaviour changes needed within the target population that will be born out in quantitative surveys longer term. In order to indicate whether this change is taking place we set some measures of success that the evaluation would seek to compare the evidence collected against. These were:

1. Nurseries understand the role they have to play in encouraging good oral health and include it in their day to day activities and policies
2. Children view tooth brushing positively and engage in this in nursery and at home
3. Parents understand the importance of tooth brushing for children
4. Parents actively promote good oral health habits to their children and understand that they can influence their child's oral health

Methodology

This included analysis of the number of children taking up nursery places. Qualitative research was conducted with both heads and class teachers to explore the operational aspects of the project and how it was influencing schools thinking at a more strategic level. Qualitative research was also undertaken with parents and children around their understanding of oral health issues and of the project.

Findings

Project Reach

The principal purpose of the tooth brushing project is to improve the access that 3 and 4 year old children in the Batley area have to fluoride. However in order to assess the value of this method of targeting children, we needed to consider how many three and four year olds attend LEA (school based) nurseries in Batley. Estimates showed that only 30% of 3 year olds take up their nursery place, rising to 62% of four year olds. This suggests that this means of reaching children is limited and that either alternative means need to be identified and or an increase in nursery place take up is needed. Children's Centres may present an opportunity to reach more children through greater take up of daycare and access to children through other services.

Cost effectiveness

The cost of running the project is estimated at £50 per child per year for materials, rising to £133 per child per year, if the nursery has to be supported by Sure Start health workers. This needs to be off set against the estimated saving of treating all incidences of dental decay for a cohort of children of around 122 at age 5 of £142 per child. However not all incidences of dental decay are treated and taking account of current treatment rates this saving falls to £31 per child, using the estimates from one RCT that have been applied to the children taking part in the BASCD survey in Batley in 2004.

On balance it would seem that where schools are able to run the toothbrushing themselves without support, then it is cost effective, particularly if children were to have all of their decayed teeth treated. Given that many of these teeth are going untreated, whether treatment is required or not, it would seem sensible to offer a preventative

measure to avoid the decay in the first place. However to ensure that children receive the preventative measure, there is a need for the intervention to reach a greater number of children as suggested by the reach analysis. Targeted support at those nurseries that require additional support is barely cost effective, but alternative means of delivery through the use of volunteers could improve the cost effectiveness of this support.

In making a judgement around cost effectiveness we should also take account of the non monetary costs to children of having poor teeth. In addition to the pain and suffering caused by decayed teeth, dental decay in children too young to cope with extensive dental treatment often results in general anaesthesia for multiple tooth extraction. Dental decay can also have effect on children's self esteem and confidence as they grow up, contribute to impaired speech development and lead to time away from school to attend dental appointments. These are all factors which can contribute to costs elsewhere in the NHS and Education System.

The value of Sure Start support

There is a value of having dedicated staff, such as the Sure Start Health workers. Targeting this support at schools where there are difficulties in operationalising the tooth brushing due to staffing is a critical factor in its success. However this is an expensive resource and needs to be set against the cost effectiveness of the project. Schools find it difficult to engage parents to help. However an alternative to using Sure Start staff may be use Sure Start connections with employment initiatives to offer training to parents to help with the tooth brushing and thus later enable parents to access the labour market. This would mean that schools could have a dedicated group of people to rely on locally rather than Sure Start staff who may cover a number of schools.

Continuing the activity

There does appear to be support from schools for continuing the activity. The tooth brushing project needs to be seen in the context of the extended schools agenda. In encouraging schools to participate in the tooth brushing there is a need to link its value to the broader role of schools through the extended schools agenda. This advises: *'Schools will want to work closely with parents to shape these activities around the needs of their community and may choose to provide extra services in response to parental demand'*.⁵ This project enables schools to demonstrate their integration with a local area plan to improve quality of life by addressing a key health need.

It was clear that some head teachers were keen to see the project as a means of embracing partnership working and as part of their broader role in promoting all aspects of a child's wellbeing. There are concerns however that there are competing demands for curriculum and staff time. Some schools are more adept at seeing the value of this activity. A number of conditions for success were identified that may help encourage involvement by schools These include schools recognizing:

- the poor dental health of their pupils and its effects on attendance
- their role as an agent of change in improving children's health

⁵ Extended Schools, Access to services and opportunities for all, Extended Schools Prospectus DFES, 2005

- toothbrushing as an educational activity and a means of delivering the curriculum
- the importance of partnership working to engage in the broader agenda related to Every Child Matters.

In addition staffing ratios need to be sufficient to make it practical. In large nurseries where there are few support staff then schools may struggle and additional help may be necessary to turn willingness into a practical reality. If measures are taken to increase take up of nursery places, then this need would increase. The cost of this support is roughly £2,000 per class, per year. An alternative is to use volunteer support. Schools have found this difficult, but again there may be scope for partnership work with Sure Start to identify volunteers wishing to access the first rungs of the labour market.

From the perspective of children there were few issues arising from the evaluation and it appears relatively easy for schools to get children to engage in the activity. This of course may contribute to the school's willingness to participate. Schools have had no difficulty in gaining parent's consent for their children to take part and from this respect it would suggest that parents do see tooth brushing as important. The evidence of whether tooth brushing has changed attitudes to oral health however is weak, given we have only been able to speak to a self selecting group of concerned parents. It was clear that for these parents dental health is an important issue. However it is also clear that even parents who make efforts to inform themselves about how to keep their children's teeth healthy are subject to conflicting information sources, some such as the media can be beyond the role of health agencies. Even following the best advice the children of concerned parents are still suffering dental decay.

From the parents' perspective the tooth brushing in nursery is valued as a means of reinforcing what is done at home. Parents wish to be kept informed of what is happening and to have the opportunity for greater involvement. The nursery seems to offer a useful route to getting messages across to parents. The brushing itself offers opportunity for practical demonstration and welcome advice. This route also offers an opportunity to ensure that inconsistencies in messages parents may have received can be addressed and consideration needs to be given as to whether this should be beyond tooth brushing into diet.

Involving parents in nursery is something that nurseries have expressed they are keen to do. Teachers spoke of doing shared activities with parents and children. Some nurseries have also expressed the role they have to play in 'helping parents develop their parenting skills'. There may be scope then for using tooth brushing in this capacity.

A number of operational issues were raised and in response to this it is recommended that schools may benefit from some joint training that addresses these concerns, particularly around inconsistencies in information and cross infection. Such training may also present an opportunity for schools to share ideas around the practicalities of implementing the brushing in their schools, so they do not feel isolated. It may be possible to seek advice on how best to deliver such training through consultation with the School Effectiveness Service in Kirklees Council. It has been suggested that oral health messages need to be targeted at parents of children before they reach the age of three. The Brushing For Life

project suggests that this may start at the weaning age, but also can be reinforced through baby and toddler groups. The project should be seen perhaps as one of a number of means of targeting families with good oral health practice and information as their child grows up. In this respect a family will pass through a series of messages and practices that are mutually reinforcing and age appropriate.

Introduction

The purpose of this report is to set out the findings of an evaluation of toothbrushing in nursery schools in the Batley area. This is part of a response to the very poor dental health of children within the area.

The report begins by setting out the background to the project and the extent of the dental health problem in Batley. The objectives and nature of the approach undertaken to address the problem are described and the evidence for the approach is also considered.

The scope and focus of the evaluation is very much around how a researched and evidenced based practice of toothbrushing within nursery settings works. In particular we have been interested to consider the operational aspects of a project that works across public agencies to achieve a common goal, with support from an external programme, charged with the remit of joining up services – Sure Start. For this reason the evaluation concentrated on gaining insight about the workings of the project from four groups, school staff, Sure Start Staff, parents, and children. The methodology section sets out how this was done.

The evaluation has also considered the extent to which the project reached its intended groups through analysis of the take up of nursery places. The costs of running the project have been considered in relation to the potential savings to the Batley area based on published research findings.

Finally conclusions are drawn as to the value of the project and recommendations made as to where improvements can be made at both the operational and the more strategic level.

Background and rationale to the project

The oral health project is being delivered by North Kirklees PCT / Calderdale & Kirklees Community Dental Care within the Batley Sure Start area. The epidemiological studies of five year olds for local primary schools in the area indicate that five year olds attending schools in the North Kirklees Area which includes the Batley Sure Start area suffer from disproportionately high levels of dental decay.⁶ Dental decay experience in deciduous teeth is measured by the dmft index. This measures the total number of teeth that are decayed, missing, due to decay or are filled. For North Kirklees the value of the index was 2.87 per child, in 2001-2 and had shown no overall improvement since 1987. This compares to a national target that has been set by the Department of Health of 1 by the year 2003. (DoH an Oral Health Strategy for England, July 2004).

At the same time the proportion of restored teeth (filled) as measured by the Care Index, had declined from 21% in 1987 to only 7% 2001-2. Fourteen percent are treated through extraction.

The figures for 2004 suggest the problem is worsening, as the value of the index for North Kirklees is now 3.69 and is the worst district in England. The Care Index has fallen further to only 3%, and 14% of the decayed teeth are still treated by extraction.

There is a clear need within the area to address this particular problem. Not least because of the cost to the NHS of treating children with tooth decay, but also because of the effects that it has on the children concerned.⁷

A number of factors have been identified as responsible for tooth decay including care of teeth, diet, feeding habits and application of fluoride⁸. North Kirklees does not have a fluoridated water supply and in this respect it differs from other parts of the country. Given the reduced access that children in the Batley area have to fluoride generally compared to other areas of the country, consideration was given as to how this particular factor could be addressed.

An earlier study undertaken in Scotland investigated the effects of twice daily tooth brushing on dental health.⁹ The Scottish study was undertaken in an area where there is no fluoridation of the water supply and in this respect is similar to the Batley situation. There are differences in the ethnic make up of the Scottish study and the Batley Sure Start population, however it is acknowledged that the key determinants of dental caries risk are poverty and poor education. Both of which are applicable to the Batley situation.

⁶ BASCD biannual dental survey. The methodology for the survey follows that recommended by the British Association of Community Dentistry, who recommends sample size. However care needs to be exercised in interpreting its results as it may not be representative at small geographical level. For this reason we have only discussed the results in relation to the whole of North Kirklees

⁷ Ottley C. Baby tooth care a forgotten priority? *Nursing Standard* 2002; 16 January; **18** 40-44

⁸ Fuller SS; *Oral Health Promotion, a practical guide for health visitors and school nurses*. London: Health Education Authority, 1988

⁹ Curnow M; Pine CM; Burnside G; Nicholson JA; Chesters RK; Huntington E. A randomized control trial of the efficacy of supervised tooth brushing in high caries-risk children. *Caries Research* 2002; **36**:294-300

For this reason the project is working with a number of school based nursery settings within the Batley Sure Start boundary to address the accessibility to applications of fluoride, as a factor that contributes to lower incidences of tooth decay.

Scope of the project evaluation

The evaluation is not about testing a hypothesis that applying fluoride to children's teeth results in less dental caries. The above quoted research study has confirmed that over a two year period that this is the case. Rather it is about assessing whether this particular approach of delivering oral health messages and practice within a nursery setting has value. The evaluation also considers the resources that are required to deliver this and whether this is cost effective against the benefits that may be expected longer term based on the available research evidence.

The project does have subsidiary aims around improving dental care habits amongst parents and children, so that when the project ends learning is sustained amongst participants. The Batley project is focussing primarily on increasing the access that children have to fluoride whilst in nursery; however consideration also needs to be given as to whether the habit once established in nursery will continue with the child into school. For this purpose we need to also understand through the evaluation the extent to which the message is reaching parents.

The principal objective of the project is to ensure that all children participating receive an application of fluoride onto their teeth at least once a day during term time, as this is considered to be an effective way of preventing tooth decay.¹⁰ Dental packs are also provided to families to encourage the continuation of the practice during the school holidays. It is possible that there may be additional benefits to participants and their families in terms of awareness of the factors that impact on children's oral health.

The evaluation was limited to the six nurseries involved plus one nursery that initially piloted the project. It included both head teachers, staff, parents and children. Sure Start staff who have been involved in supporting nurseries have also been included. Although the project is about the oral health of children, we are limiting our evaluation to the understanding of tooth brushing activity amongst the target group. It is not intended to explore the effect of the project on other aspects of the oral health such as diet related factors. However if significant information on this subject arises spontaneously from those participating, this will be included in the final report.

Evaluation Purpose

Although it is possible over time to monitor what is happening to the oral health of children in the area through the dental survey undertaken every two years, this in itself does not tell us if this particular project has caused any changes. It is possible that any improvement in dental health may be in part due to this project, but many other factors

¹⁰ Ditto

may also have had an impact. We also cannot wait for a long period of time to see if there are improvements in oral health. For this reason we need to identify if there is any indicative qualitative evidence to suggest that the project is contributing to the attitude and behaviour changes needed within the target population that will in the longer run be born out in quantitative surveys.

In order to indicate whether this change is taking place we set some measures of success that the evaluation would seek to compare the evidence collected against. These were:

1. Nurseries understand the role they have to play in encouraging good oral health and include it in their day to day activities and policies
2. Children view tooth brushing positively and engage in this in nursery and at home
3. Parents understand the importance of tooth brushing in general and for children in particular.
4. Parents actively promote good oral health habits to their children and understand that they can influence their child's oral health

In addition to these measures, it was also anticipated that during the course of the evaluation information would come to light that related to the process of delivering the project, for example, where things that have been very easy to do or difficulties that were encountered. The evaluation findings present what is working well about the process and where there are areas for improvement.

Evaluation Objectives

On the basis of the indicators that we set out at the start of the evaluation a number of objectives were agreed. These are set out in relation to the three groups of people whose behaviour the project is aiming to have an impact on, nursery staff, parents and children. In addition it was agreed that we should also seek to understand the role that the Sure Start staff had played in delivering the project.

Nurseries

1. To understand why the nurseries participated in the project and what their initial expectation was.
2. To understand what the nurseries see as their role in ensuring children's health and how this translates into a health policy.
3. To explore any changes in the snacking policies related to oral health (e.g. use of sugar as a reward) in nurseries during the time the project has been running.
4. To explore with the nurseries what they feel the benefits of participating have been.
5. To explore with the nurseries what barriers / difficulties they have encountered in participating and how these may be overcome.
6. To identify from the perspective of the nurseries what changes they have noticed, if any, in child and parental behaviour around tooth brushing.

Sure Start health start workers

1. To understand what their perception of their role is
2. To explore their perception of the value of the project in relation to the time spent on it.
3. To explore any areas of good practice they have identified during the project
4. To identify any barriers they have encountered in delivering the project

Parents

1. To understand parent's beliefs about oral health through exploration of domestic habits in relation to tooth brushing and any barriers there may be to this.
2. To explore what parent's understanding of the project is and why it is taking place
3. To explore the interpretation and use of the materials / tooth brushing pack provided.
4. To explore whether there have been any changes in their homes in relation to oral health since the project began
5. To explore the causes of these changes if any.

Children

1. To understand what children's tooth brushing habits are in nursery
2. To understand the extent to which they enjoy participating in tooth brushing in nursery and what makes it enjoyable / unenjoyable.
3. To understand what children's tooth brushing habits are at home.
4. To explore the extent to which they are encouraged / given help with brushing their teeth at home

Target group

The Fluoride Delivery Project has been delivered in the following nurseries since September 2004.

St Mary's

Warwick Road

Park Road (only until Christmas 2005)

Carlton Road

Purwell

Batley Parish

An additional nursery - Field Lane Nursery took part in a pilot, however it was unable to sustain its participation due to staffing issues.

All children who turned four during the academic year 2004/5 were invited to participate subject to parental consent. All nurseries were included in the evaluation. However not all participated in all aspects of it. This is described in the methodology section.

Project Delivery

The project was delivered by nursery staff, supported by North Kirklees staff of Calderdale and Huddersfield Community Dental Care. In two of the nurseries support was required from Sure Start Health Start workers, without this support it would have been difficult for these two nurseries to run the project. The process involved taking a group of children at a time, providing them with toothpaste, brush and plastic beaker and assisting them in selecting their toothbrush, applying toothpaste to it and brushing their teeth at the table. Children were supervised during this process. The process and materials used were designed to keep mess and inconvenience for nursery staff to a minimum. This addresses concerns that have been raised by nurseries around time pressures to deliver the Early Year's curriculum. Nurseries have been provided with guidelines, training and materials to address any concerns around exposure to bodily fluids.

Related projects running in the area.

In addition another oral health project 'Brushing for Life' has been running in the area. This has been implemented by health visitors and involves the distribution of tooth brushing packs and information for babies from 7 months onwards. Depending upon when this project started it is possible that some of the target group and their families may have come into contact with the oral health messages delivered through this project too. We will not be able to separate out the effects of each.

Review of Evidence base

The oral health project was based on the evidence base arising out of a study conducted in Tayside in Scotland. As part of the evaluation this evidence was critically appraised and a broader literature search was made in order to assess whether the project was being developed from a reliable evidence base initially.

Search process

The following databases were searched through Dialog DataStar:

- Medline (1996 to date)
- Embase (1996 to date)

The key words used were:

(dental caries) and (child-preschool) and (school-dentistry)

The following databases were searched through the National electronic Library for Health:

- The Cochrane library
- NICE (Public Health Excellence)

Studies found

The above search yielded 14 references, only two of which were applicable to the project currently being evaluated.^{11, 12} Both of the papers were by the same authors and relate to the same randomised controlled trial (RCT). The description of the study provided below and the critical appraisal of the trial was taken from Curnow et al² as this provided a more detailed description of the methodology used and results obtained.

Description of the study

In the RCT, a total of 534 5-year-old children in 12 schools in deprived areas of Tayside were recruited into a two-year study. Each school had two parallel classes, one randomly selected to be the brushing class and the other the control. Children in the intervention group participated in supervised toothbrushing on school days with a toothpaste containing 1,000-ppm fluoride (as sodium monofluorophosphate) and 0.13% calcium glycerophosphate, combined with recommended daily home use, compared to a control group involving no intervention other than 6 monthly clinical examinations. Local mothers were recruited as trained brushing supervisors. Children brushed on school days and received home supplies. A single examiner undertook 6-monthly examinations recording plaque, caries (D₁ level), and used FOTI (fibreoptic transillumination) to supplement the visual caries examination.

¹¹ Pine CM; McGoldrick PM; Burnside G; Curnow MM; Chesters RK; Nicholson J; Huntington E. An intervention programme to establish regular tooth brushing: understanding parents' beliefs and motivating children. *International dental journal* 2000; **50**:312-323.

¹² Curnow MM; Pine CM; Burnside G; Nicholson JA; Chesters RK; Huntington E. A randomised controlled trial of the efficacy of supervised tooth brushing in high-caries-risk children. *Caries Research* 2002; **36**:294-300.

For children in the intervention classes, the two year mean caries increment on first permanent molars was 0.81 at D₁ and 0.21 at D₃ compared to 1.19 and 0.48 for children in the control classes (significant reductions of 32% at D₁ and 56% at D₃). The authors concluded that high-caries-risk children have been shown to have significantly less caries after participating in a supervised toothbrushing programme with a fluoridated toothpaste.

Methodological quality of the study

Overall, the quality of the RCT was good. Due to the nature of the intervention, double blinding of assessment was not possible. The sample size was large. This was determined by a power calculation, (80 % power at significance level of 0.05), which was undertaken to detect a 25% difference in 2 year caries increment. There was no loss to follow-up. However, the study did not specify the method of randomisation or whether intention to treat analysis was performed.

Analysis of 3 and 4 year olds attending nurseries

The purpose of the tooth brushing project is to improve the access that 3 and 4 year old children in the Batley area have to fluoride. However in order to assess the value of this method of targeting children, we need to know how many three and four year olds attend LEA (school based) nurseries in Batley.

Matching of LEA Nursery data base against Child Health Records.

The LEA nursery database keeps a record of all children who attend any form of nursery provision that qualifies for a nursery grant. The nursery grant is a universal entitlement for all children to 12.5 hours of provision per week in term time. It is claimed by the provider and so records of children attending nurseries tend to be a good indicator of the numbers of children receiving their entitlement.

The Child Health database is the most widely acknowledged source of records of children living in an area. It is not possible to match the nursery database against the child health database at an individual level because of the resource implications of manual matching where there is no common identifier in each data set. In order to overcome this issue the matching has been done using GIS to map each set of children by address to a postcode rather than match by name. Aggregations have then been made at the Batley Sure Start geography level to show number of children in the area and the percentage attending different types of provision or not attending any nursery provision.

Looking at the academic year 1/9/03 – 31/8/05 there were 99 children who had their third birthday between 1/9/01 and 31/3/02 and appeared in either the child health data base or the LEA nursery database. These are children who became entitled to a nursery place in the term after their third birthday. However according to the nursery base, only 30 took up their place (33%). This suggests that even allowing for only rough matching of nursery children against Child Health data, around two thirds of three year olds did not take up their entitlement to nursery in this academic year.

Using the same analysis for four year olds, this rises to 62 % for the full academic year. Again this is only an estimate as we are unable to match children like for like across the two databases.

This suggests that although we may be able to target a substantial number of four year olds through nursery schools, we may not reach as many three year old children as we might expect and a significant proportion of four year olds are not reached.

Evaluation Methodology

In order to address the evaluation objectives set out above, small pieces of qualitative primary research with each of the four groups of interest, nurseries, Sure Start staff, parents and children were undertaken. It must be acknowledged that the information to be collected is largely qualitative and in this respect is not necessarily representative in the case of parents and children.

Nurseries

The views of two groups were needed here, the head teacher and the staff working in the 7 nurseries delivering the project. It was proposed to interview the head teachers from each of the seven nurseries and the staff involved in delivering the project. Five interviews were achieved with head teachers and four with nursery staff. These included a mix of nursery teachers and a nursery nurse. These took place between 28th June and 21st July 2005.

The purpose of the head teacher interview was to understand how the project fitted within the broader remit of the school in delivering health as well as any management concerns they may have had. The interviews with nursery staff were to understand operationally how the project worked and concerns there may have been about this.

In addition observation of the tooth brushing was also made in four of the nurseries, where schools were agreeable. This was to see if the project was being delivered as envisaged and also to give an opportunity to see how the children engaged with it. It is not easy to elicit the views of children as young as three years old and observation of their behaviour was seen as an appropriate means of identifying the extent to which the children appeared to be enjoying the activity.

In addition it was proposed to ask a small number of children in each nursery about the tooth brushing, their enjoyment of it and also if possible about their tooth brushing routine at home. This depended very much on the co-operation of the children and their willingness to talk and it needs to be borne in mind that the intake of some nurseries includes children who have poor language skills. It also depended upon parent consent forms being returned to the nursery. Despite these limitations, over the four observations 14 children were interviewed. These interviews took place in the classroom immediately after the tooth brushing. For some children a bilingual worker assisted in translating the questions.

A number of the nurseries had received support from Sure Start staff and it was important to gain an understanding of their view of their role and also the process by which they had become engaged with the nurseries. This is so that we could identify how this role may contribute to the successful implementation and operational delivery of the project. One Sure Start staff member who had been responsible for co-ordinating all the Sure Start workers involvement in the project was interviewed.

In order to gain the views of parents it was agreed to run a number of focus groups depending upon the numbers of parents from the nurseries in question who were willing to attend.

Letters were sent out through the nurseries explaining about the evaluation of the tooth brushing project. The letters asked parents to send back a reply slip to give permission to observe and interview their child. They also gave parents the opportunity to take part in a focus group and indicate what times of day were most convenient for them and also their preferred language.

Two mini focus groups were run one for English speakers and one for Punjabi/ Urdu speakers. The discussion guide and stimulus materials are included in the appendix.

A summary of achieved interviews and observations in nurseries is provided in the table below.

Schools	Head teacher	Nursery teacher	Nursery Nurse	No of children observed	Children interviewed
Purwell	X				
Park Road	X				
St Marys	X	X	X	2 x 2	2
Field Lane	X				
Batley Parish		X		14 in groups of 3-4	8
Warwick Road	X	X		15	1
Carlton Road	X	X		20	3

Evaluation Findings

The findings from the evaluation have been set out in three sections, according to the perspectives of three stakeholder groups, nurseries, parents and Sure Start staff. The findings have not included any survey of children's dental health before and after taking part in the project as this was not possible. Instead of this we have used the results from the Pine et al study and applied it to the dental health of five year old children in Batley. This understanding of dental health is based on the BASCD survey of 2004. Any conclusions then as to the effectiveness of toothbrushing in nurseries are based on this study rather than on a specific dental assessment of children in Batley schools who have participated in the toothbrushing.

The nurseries' perspective

The interviews with head teachers explored the following:

- background to the pupils attending the nursery
- understanding, expectations and motivation to take part in the project
- implementing and running the tooth brushing activity
- external support and training received
- policies on health and snacking
- the advantages and disadvantages of taking part
- changes noticed in the children and comments from parents

The discussion and analysis section draws together the findings from these 3 sources. Where the term nurseries is used, this means either head teachers or staff directly involved in delivering the nursery curriculum. Although they may at times be separated out. Analysis of the observation of children is also included in this section.

Analysis and discussion

Background to the pupils and parents

The majority of the nurseries perceived their children as coming from relatively disadvantaged backgrounds, or that they were recruiting children from increasingly disadvantaged backgrounds. Only one of the nurseries described itself as having an intake that included more affluent families. Most, but not all of the nurseries, had significant numbers of children of Asian heritage and for some of the nurseries their intake was predominantly from this group. The intake for some nurseries comprised significant numbers of children for whom English was not spoken as the main language at home. Some nurseries highlighted the limited language skills of some of their pupils on arrival, whether from Asian heritage or White British families. Comments were also made about the need for nurseries to support parents in their role. A fuller statistical picture of the intake of the schools the nurseries were attached to is in the appendix.

Nurseries were asked about how much involvement parents had with the nursery. This was asked for two reasons, one to understand if there was scope for involving parents in the tooth brushing activity as a support resource and secondly to understand what communication channels may be available to nurseries to get the message about tooth brushing into homes.

Most of the nurseries do at least one home visit before a child starts attending to help with their induction. Parents are encouraged to stay with their child when they initially start and some nurseries try to engage parents in a shared activity with the child. Two of the nurseries commented that developing parents' skills was a priority.

Most nurseries offered trips and fun days that parents attended, however most did not have volunteer parents who helped out with classes. In some cases this was because parents worked. Comments were made that some parents did not have a clear understanding as to what nursery was all about. Some nurseries commented that mothers did not speak English as a first language.

The nursery settings where the tooth brushing takes place vary in both their size and the age of children. For example, some nurseries mix reception and nursery children in the same class, with only the nursery children taking part in the tooth brushing. Class size varied from 20 children at a time to up to 40 children to one qualified teacher. All nurseries had at least one support assistant / nursery nurse and some had two where the class size approached 40. Some nurseries also had additional staff such as a bilingual support worker or a communications assistant where a nursery had children with hearing impairments. Although these additional staff are provided for a particular purpose their presence is likely to facilitate the tooth brushing activity, just because there are more hands to help. For example a nursery with small numbers, that has a bilingual support worker as well as the usual nursery teacher and nursery nurse, will overall have a lower child to adult ratio.

Understanding, expectations and motivation to take part in the project

Five of the nurseries had taken part in the project for a full academic year; two had stopped the project part way through. There were some discrepancies in how long some head teachers thought the project had been running compared to how long it actually had been happening. This may be due to most head teachers handing the project over to their nursery staff and having only arms length involvement.

The general consensus amongst nurseries was that the tooth brushing project would educate children about why they needed to brush their teeth, it would establish good habits and get the children interested in brushing. Some nurseries also thought that it would encourage parents to promote care of teeth. Two nurseries had been involved in related projects in the past either through commercial organizations or through students on placements and so had some familiarity with a potentially similar experience. At least one of the nurseries seemed to be aware of the very poor dental health in the area.

There was an expectation that the children would enjoy brushing their teeth in nursery. Most staff made reference to expecting the children to get used to it. They talked about establishing routines, good habits and even encouraging responsibility amongst the children for taking care of their teeth. There was some expectation that the project would teach children how to brush their teeth correctly. Some nurseries linked the project with expectations about longer term benefits such as citizenship. There was an expectation that it would improve their dental health, causing better oral hygiene and fewer cavities.

Nurseries were asked if they expected to encounter any difficulties in doing the tooth brushing. Only two head teachers mentioned that they expected any difficulties or

problems. Their concerns centered on whether it would detract from other routines that had been established.

Head teachers had a number of motivations for taking part in the project. These have been grouped into the following themes:

- Involvement with Sure Start and partnership working
- Healthy schools award
- The pack and explanation of how it would work allayed fears and gave confidence
- Poor dental health record in the area
- Opportunity to raise awareness amongst parents
- School attendance could be improved
- Potential to improve dental health

It is clear that a number of head teachers are looking to the bigger picture as regards the role of schools. Some heads were very clear as to how this fitted with a broader role of preparing children for life and linked the oral health project to the need to improve children's diet. They saw it very much as fitting with the Healthy Schools Award. However this was not the case for all schools that had this award. Some heads were also looking for opportunities for partnership working in order to help them deliver this broader role and saw the oral health project as an opportunity to engage with this agenda.

These themes can be broadly grouped into push and pull factors. Some schools are being pushed into acknowledging the poor dental health in their area and seeking ways of addressing it. Others are also being pulled into the project because of the opportunity it presents to engage with the bigger Children's Services picture of partnership working and the expanding roles of schools.

Implementing and managing the tooth brushing

Both head and nursery staff were asked about the practical aspect of delivering the project, what they had found easy and difficult. Respondents also discussed the tooth brushing kit they had been provided with. Observation was also made of the activity in four of the nurseries.

The delivery of tooth brushing varied across each of the nurseries and the following two models were observed.

Model 1 – Whole class together

Where this model was observed all the children (15) sat together at one table. In one of the nurseries they had a snack of fruit and milk and then began the brushing.

Model 2 – Small groups

Children were called to a designated area of the nursery in small groups of 3 or 4 at a time over the period that the nursery class ran until all the children had brushed. They are supervised whilst brushing.

There were variations to this second model. In two of the nurseries where this model was observed the children stood up whilst brushing. In the nursery where the activity was delivered and supervised by a Sure Start health worker the children were observed sitting down while brushing. It is understood from health professionals that the children should be seated whilst brushing.

Timing of tooth brushing

The timing for tooth brushing varied across nurseries. However there did seem to be an association with brushing after children had eaten. In model one for example the tooth brushing began whilst some children were still finishing their snack. For some this seemed to be because it allowed the fluoride to stay on the children's teeth, for others it was because of the association with the need to remove food particles. One nursery staff respondent did question whether this was appropriate as it conflicted with advice they had received from their dentist. One of the nurseries that had stopped the tooth brushing commented that it had led to changes in practice around snacking, as previously the children had been able to snack when they wanted, but this had to be changed to a set time to accommodate the tooth brushing.

Administering the tooth brushing

In some nurseries children were helped to identify their own tooth brush, but in other nurseries this was done for the child because of concerns about cross infection if the child picked up the wrong brush. Nursery staff commented that the toothbrush bus did not always help the children identify their toothbrush. This was because the cartoon characters used to distinguish each brush and its place in the bus were not distinct enough for a 3 year old child to distinguish between.

'An American footballer and an astronaut look very similar to a three year old'. (Nursery staff).

Some nurseries had overcome this by putting name labels on the brushes; these have to be reapplied from time to time. Toothpaste was applied by staff to children's cups. There was some checking by staff that children did pick up the toothpaste from the cup before they began brushing. Staff generally wore the plastic gloves provided, only one instance was observed where this was not the case.

Encouragement

In all the nurseries where the children were observed, encouragement was given to the children, although there was variation in the degree of advice given to children on tooth brushing technique and the level of checking as to how clean children's teeth were. Again where staff only had 3-4 children to supervise at a time, this was easier than if the whole

class was brushing and particularly so where a dedicated health worker was supervising the children. One nursery had put up a mirror to encourage the children to check their teeth after brushing. This also served the purpose of ensuring the children had wiped their mouth afterwards rather than staff having to do this.

Concerns about cross infection

Concerns were raised about the potential for cross infection, because of the close proximity of the toothbrushes in the bus. Suggestions were made around having guidelines around cleaning the brushes. For example, when cleaning brushes, staff rub the brush with their thumb possibly passing infection from one brush to another.

Difficulties and barriers to administering the tooth brushing project

Nearly all of the nurseries commented that they had encountered difficulties with storage of all the materials needed for the tooth brushing project. For example a year's supply of plastic cups took up a great deal of space and not all nurseries particularly the new build ones had space to accommodate this. Suggestions were made about termly delivery.

The principal difficulty encountered was staffing. The tooth brushing took staff away from delivering the curriculum and ate into children's entitlement.

'If I am in this area doing teeth with children ... then while I am supervising that ... I would usually be on the sticky table or in the sand and talking to them and (if) things were not taken up by tooth brushing. (Nursery staff)

For nurseries with small numbers of staff it was particularly difficult around admission time, when children were settling in, in which case it could only continue with support from outside. Staffing ratios and nursery organization appear to be critical factors in whether the activity can be sustained. For example whether there is a suitable area to do the brushing and provision of sinks for hygiene.

There did seem to be a difference in the views of staff as to whether the tooth brushing could be incorporated in to the curriculum and seen as a learning activity in itself. For example there was a view that it was an educational activity in itself and could be used to encourage conversation with children. This was particularly important where children were perceived as having poor language skills. However the opposing view was also found in a nursery where children were perceived as having poor language skills, in that it distracted from the curriculum, it was too time consuming and hence it was stopped.

External Support and Training received.

Support provided by the PCT

Nurseries recalled that somebody had visited from the PCT to explain about how the project had worked, and one nursery recalled that the PCT had helped to get a Sure Start

worker in to help. Staff did not recall receiving any training, but had received an information pack with instructions and some recalled a visit from PCT staff to discuss how they may site the activity suitably. It appeared that some of the nurseries were undertaking the project in isolation.

'I don't know anybody else who is doing it'. (Nursery staff)

Some nursery staff also had more questions, particularly in relation to when the brushing should be done and cross infection. This may suggest the need for more comprehensive information or opportunity for nursery staff doing this project to share their practice and hear about how things work elsewhere.

Support provided by Batley Sure Start

Only three nurseries stated that they received support from the Sure Start programmes. Two of these nurseries had dropped out. However comments were made that the help may not always have been consistent, for example last minute phone calls to say support couldn't be provided when the children were ready to brush their teeth, and also personnel changes. One nursery has only been able to continue because of the Sure Start support. This nursery had a high child / adult staffing ratio in one its sessions and could only do the brushing in the session with a smaller number of children.

The nurseries that did not receive support seemed to be unclear as to whether support was available, or it had not occurred to them to ask. This included one nursery who had abandoned the project early on, as they saw it as unworkable. It was felt that insufficient information had not been provided early on as to what to expect.

Policies on health and snacking

Most nurseries were covered by the whole school policy on health. Some nurseries saw the oral health project as fitting very well with their policy on encouraging healthy lifestyles and made the link between oral health and nutrition and some linked it to improved attendance and better education standards. Some schools had adopted the Kirklees policy which has a health promotion aspect.

Most nurseries did not allow children to bring their own food into nursery, however, this was allowed in some for school age children. Schools were keen to point out their involvement in the school fruit scheme. Some acknowledged that tuck shops selling sweets and sugary drinks had gone and that water was available for children to drink. However schools acknowledged that they had no control over what children brought in their lunchboxes. Although this is not applicable to nursery children, nursery staff acknowledged this was the case when the children went on trips and brought packed lunches. Some head teachers did express concern at the poor nutritional value of the food that some children brought from home. These nurseries also considered developing parenting skills to be a priority.

Only one nursery commented that changes had been brought about to practices regarding food in the nursery, in that cookery and baking activities were now sugar free.

The advantages and disadvantages of taking part

Both Head teachers and nursery staff commented that the project would encourage healthy lifestyles and establish habits. In the longer term children would have healthier teeth. Children know how to brush their teeth and the reasons for brushing. It was seen as 'a good educational activity in the best sense' in that it also presented a topic of conversation to stimulate language development. It also led into talking to children about what they ate.

The take home packs were viewed positively by nurseries as a way of sustaining brushing in the holidays and a means of taking the message into homes and effecting parents. Children had even asked for extra packs for their siblings.

Some nurseries saw no disadvantages in taking part. For those that did, the main issue was how time consuming it was and that it detracted from the curriculum.

'It became a dominant part of the curriculum' (Head teacher).

Solutions to this were seen in having additional support workers to help, however this is not always feasible. Where the commitment of the nursery and or head teacher was strong however it seems that ways were found to overcome this. One such case involved negotiating support from Sure Start. Where there was a belief that tooth brushing was not really the role of the school, and that it was considered to be something that 'should be done in the home' (*head teacher*) then the school seemed more likely to withdraw.

Changes noticed in the children

Nurseries commented that the children were very enthusiastic about brushing their teeth; only one or two cases were reported of children not wanting to take part or of parents withholding consent. Children did not have to take part if they did not want to, as the foundation stage curriculum is about encouraging free play and choice. One or two of the nurseries commented on how brushing techniques had improved, and that they had observed some children who at the beginning did not seem to know what to do with a toothbrush. This had now changed. Teachers commented that children now had 'teeth' in their vocabulary and could talk about what they were doing. They talked about how the children saw it as part of their routine.

Children's views

The observations conducted seemed to confirm that the children were eager to participate and did seem to know what the routine was. A small number of children 2-8 in each of the four settings (14 children in total) were asked about the tooth brushing. However caution must be used here, as the results are not representative of all the children

participating and we cannot be certain that the children were always confident about the answers they gave. It is also likely that the more articulate children who will have given their opinion to the observers.

Children commented that they liked brushing their teeth, they liked the toothbrush and they liked their teeth being clean and shiny,

'It was nice the toothbrush', 'they (teeth) go shiny'

Children commented about brushing up and down and back and forward. In one of the nurseries children commented about the song that was used by the Sure Start Health worker to encourage the children.

Children were asked when they brushed their teeth at home. Of the 14 children asked, seven were able to indicate twice a day brushing – usually morning and at bed or night time. The other seven indicated that they either brushed once a day or didn't know when they brushed at home.

Children were asked who helped them to brush their teeth. Eight of the children questioned said that no one helped them or they did it themselves. Five indicated an adult helped usually their mother and two children didn't respond. However we need to take care here as many of the children who have said they brush themselves, may be trying to stress their independence and not that an adult does not check.

The observation and discussion with the samples of children, suggests that they see the tooth brushing positively and are learning about the importance of brushing. However we do not know from this, the extent to which this is being carried on into the home, or if anything has changed at home while they have been participating in the brushing.

Comments from parents

Nurseries did not appear to have received any negative comments from parents, nor did they seem to have had difficulty obtaining consent from parents. There appeared to be some variation in parent's interest in the tooth brushing across nurseries. Some parents possibly forgetting about it until the toothbrush packs were sent home, whilst other nurseries reported greater levels of interest, including seeking advice about dentists in the area from nursery staff. The next section explores in more detail the views of parents from two of the nursery schools.

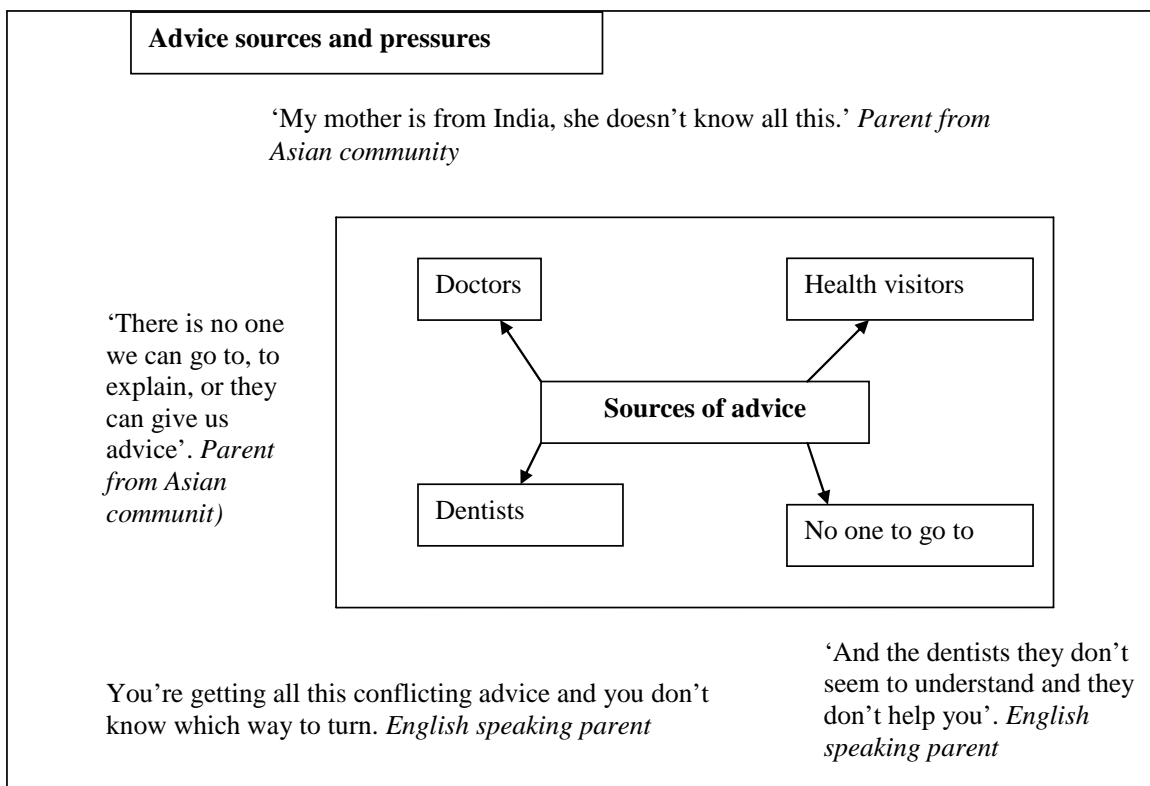
The Parent's Perspective

Two mini focus groups were held with parents, recruited through the nursery schools. One was held in English and the other in Punjabi / Urdu. Both were held in August 2005. Both were transcribed and the Punjabi / Urdu recording was translated into English for analysis. Children were present in both groups and were at times encouraged by their parents to contribute. The majority of the children were in a crèche during the focus groups.

The discussion began with general issues and concerns about children's health and went onto to dental health, the importance of tooth brushing and finally tooth brushing within the nursery setting. The approach was used to gain an understanding of the context that the tooth brushing is taking place in. The results presented here show the key findings from across the two groups.

Health information

Both groups when asked about what concerns they had for their children's health were able to raise the issue of dental health spontaneously, indicating it is important to them. The chart below indicates the sources of advice parents were using to help them with this, but also the pressures they faced in trying to do the right thing.



The responses here may represent the type of parent who was attracted to attend the group, i.e. those who were sufficiently interested in their child's dental health to come along to a group to talk about it. Parents in both groups indicated that they understood some of the factors that contribute to tooth decay.

'They should not eat junk before they go to sleep' Parent from Asian Community.

'I am sure that if you asked most parents, they would think coke, sweets and fizzy drinks would be the main problem.' English speaking parent

However they were keen to point out that despite their efforts the children still needed fillings.

'I try my best. I give them sugar free drinks and everything....I feel a bit guilty because I am stopping everything, but still the teeth are getting bad' English speaking parent

Parents expressed concerns about the conflicting advice they were receiving, particularly in relation to fruit.

'They are saying one minute eat five portions of fruit and veg a day, but avoid this type of fruit because it is going to rot your children's teeth... The information is coming from health visitors, their GP's, their dentists'. English speaking parent

But also from other media

'I heard it on television this morning about avoiding certain fruit. They were talking about strawberries, apples and pears. Also bananas have high-sugar in them, but kids love bananas'. English speaking parent

However for some parents there did seem to be some consistency in messages, comments were made that the instructions given in the toothbrush pack were the same as those given by the health visitor

'They did enforce like when you go for the 4 month check and then you go for the 7 month check. They enforced it anyway.' Parent from Asian Community

Parents were keen to point out that they could not always stop their children from having sweets and sugary drinks.

'What happens it is sometimes not the parents, it's the grandparents, the aunties or somebody else that's the problem? They go round their house and they have it (Coke) and they (the children) have the coke and they don't know they are not supposed to. You have to educate other people'. English speaking parent

Health Professionals

Parents were keen to point out the difficulty they had in registering with an NHS dentist.

'For me to actually get my two children registered at our dentist, I had to take out a private plan... That costs me £20 a month. The only way I could actually get my children seen was being on that plan, so I had no choice'. English speaking parent

Once registered with a dentist parents were keen to point out their experiences...

'I know my children have been to the dentist before to have their teeth out and they're really, really scared, so I really have to drag them in, but I keep telling them that it's a really good place, they don't necessarily take your teeth out every time you go. I want some advice on how I can train my children to go to the dentist confidently, without being scared, without crying' English speaking parent

... and also what they thought dentists should be like

'My children go to two different dentists and one's really nice and automatically gives you a sticker, the other one, when he's done doesn't give a sticker and you have to remind him. If they don't get a sticker they get really upset...' English speaking parent.

'...our dentist (has) a children's area with books and toys. It's very welcoming for children. Once you actually get in you know he lets you have a ride up and down in his chair first and he lets you have a play'. English speaking parent.

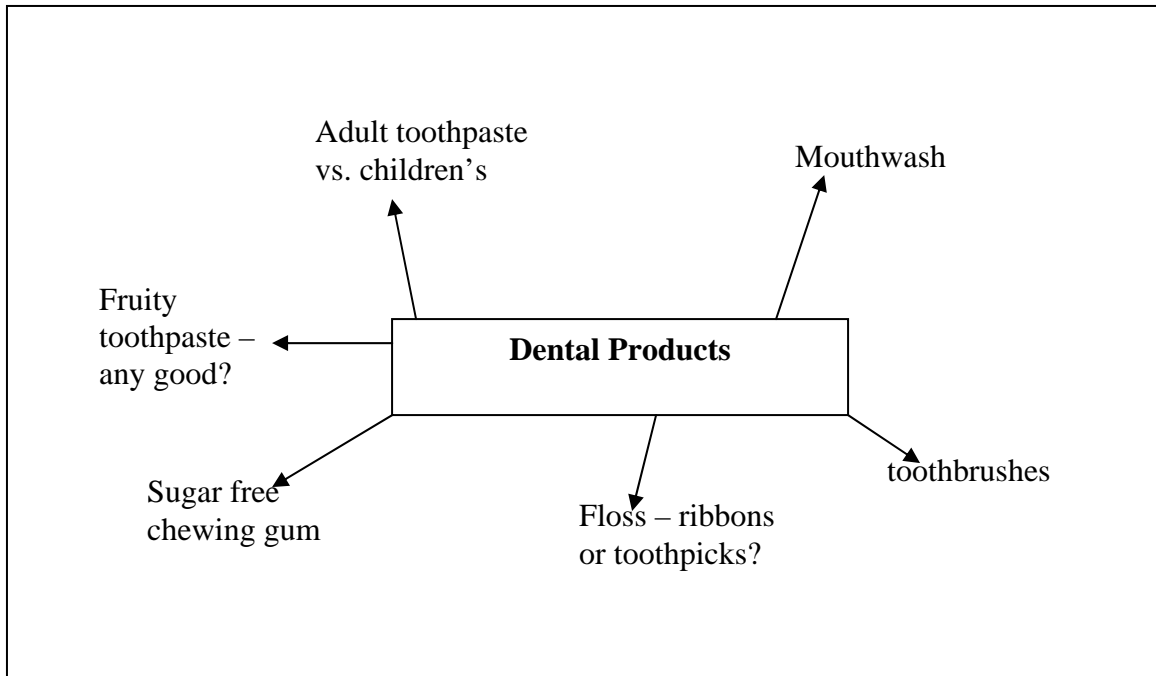
Dental routine and products

Parents were asked about their routine and the products they used to clean their children's teeth. There was an awareness of the need to brush twice a day and concern that children were in a routine.

'For my two its easy enough (to get them to brush their teeth), because it is some thing that they have always done since they were babies' English speaking parent.

However we need to remember the group is self selecting and may be made up of parents who have an understanding of the importance of routines for children.

The chart below shows the range of products that parents talked of for caring for teeth.



Again parents were not always clear about what was appropriate for children to use. Concerns were raised about whether it was more appropriate for children to use adult toothpaste because of the higher fluoride content.

'Children's toothpaste is there or thereabouts 550 parts per million fluoride and normal adults toothpaste is about 1000 parts per million. So they are not even getting enough fluoride in the toothpaste.' English speaking parent

There was some debate over whether the varieties targeted at children were of any value.

'I have stopped using those fruit flavoured toothpastes because I thought it was those that might be doing something to the tooth' English speaking parent

'I think that if I'd started him on the strawberry or bubblegum flavour that he would just never have changed... I think that putting those products on the market is also setting them a bad example for us to make our jobs a little bit more difficult especially when it comes to choosing toothpaste'. English speaking parent

'At the moment there is a new Tesco one which is sparkly and my daughter likes that. It's got bits of glitter inside it...' Parent from Asian community.

Parents mentioned other products such as mouthwashes, again there were concerns as to whether this would wash fluoride off the teeth. They were also concerned as to whether they should be encouraging children to floss and were advising children to chew sugar free gum.

'I mean flossing, should they be encouraged to floss at their age and if they are supposed to be flossing what products should we use?' English speaking parent

Toothbrushes

Parents were aware of the importance of their child having their own toothbrush. There was range of views as to how often it should be changed. This ranged from 'when it frays', 'to every 3 months', 'every 6 months'.

An emphasis was placed on the importance of novelty toothbrushes and parent's would advise others to use these.

'I mean they have always had a toothbrush as a toy'. English speaking parent

'they're using a toothbrush which is fun and I mean that obviously makes him brush his teeth, because it flashes light at you'. English speaking parent

How children learn to brush their teeth

Parents raised the issue about they themselves not knowing how to brush teeth effectively and that advice would be welcomed.

'I mean how many adults know how to brush their teeth properly... Only those of us who go to the dentist regularly know how to brush properly because the dentist would teach us... I mean are you actually teaching your children to brush your teeth properly in the first place, so actually having instruction on how to brush your teeth would be useful.' English speaking parent.

'I used to brush up and down and that's it but the Sure Start started doing it up and down and then I started doing it that way as well and I've been teaching her what Sure Start have taught her as well. So you do learn in school but you tend to forget that way.' Parent from Asian Community.

Parents did talk about the importance of supervising children and checking their children had brushed properly. There were mixed views on the age that this should be done until,

'... so I think up until they have got confidence in themselves and they've done it properly, whatever age..' Parent from Asian Community

However parents were unsure if their children's teeth were checked in school, *'I don't know if they check them at school... refers to child (you brush your teeth at school), do the teachers check when you finish brushing them, do they ask you to open your mouth?'* English speaking parent

There were concerns that teachers would not have time to check.

I mean at his school they've got 60 children they're not going to be able to check each and everyone of them ... So I wouldn't expect them at school, but obviously I check at home myself in the morning and I check at night time' English speaking parent

Parents also mentioned that children were not being taught to rinse after brushing in nursery, yet this is what they did at home. This was because *'it just didn't feel right'* Parent from Asian Community.

Tooth brushing in the nursery

Parents were asked what they knew about the tooth brushing that was taking place in nursery. Parents did not seem clear about whether it was after children had their snacks or just before home time. Some parents thought the children were brushing their teeth 'whilst in the carpets'.

One parent worked in the early year's unit and thought it was after the children had finished their snack.

Parents mentioned they had had a letter from school saying their child would be involved in the programme and had received toothpaste and a brush.

'I haven't been told when he's brushing his teeth, how he's going to be brushing his teeth, nothing. All they wanted to know was could he take part in the programme, so I said yes... but I've had nothing else about it, so obviously all I know is what he tells me.' English speaking parent

Parents mentioned the need for consistency *'you know doing the same thing in all schools'*.

Parents suggested it would be nice to be invited into school to see what the children were doing. Parents talked about having less contact with teachers as the children got older.

'We should have some sort of communication where they send letters home saying you know that is what's going to happen, perhaps write the date down when its going to start or would you like to come along on the first day to show us wht they're going to do. That would have been nice, you know show us how to do it...' English speaking parent

'Get involved in it you know' English speaking parent

The tooth brushing pack

Parents had a number of concerns and suggestions about the pack that was sent home. Some parents did not receive any information in their pack or it was not in an appropriate language. Some parents mentioned that the leaflet they received was different to the one that was shown during the discussion.

There were concerns around the toothpaste and some parents stated they did not use it.

'I won't use the toothpaste due to the fact that I have to use specific toothpaste from my dentist ... the toothbrush not a problem ... it might be worthwhile checking whether or not they wanted the pack.' English speaking parent

Some children were keen to use the pack from school.

'I got it from school, so I am going to use it, so it has influenced her more.' English speaking parent

There was a perception amongst some parents about the quality of the toothpaste provided,

'No I don't know if it's just me but I don't have any confidence in it anyway. I don't think its good enough to brush your teeth. It costs 74p anyway you see, so I don't have confidence in it.' Parent from Asian Community

'It's quite chalky as well' Parent from Asian Community

Parents did mention including disclosing tablets in the pack.

'If they had one or two in the pack it would encourage them more. It would get the parents involved more to get disclosing tablets'. English speaking parent.

And also improve the presentation of the star chart to encourage children to brush their teeth at home.

The value placed on this by parents

From the parents who have been included in the discussions there is support for tooth brushing in the nurseries. However there does seem to be more scope for communicating with and involving parents to a greater extent. There may be some evidence here around a greater awareness of the need to brush children's teeth, or at least ensure they have the right technique. We need to bear in mind however, that the parents we have spoken to may not be representative, they have chosen to attend a discussion on this topic, and many other parents did not. The parents acknowledged this themselves in one of the groups.

The tooth brushing in nurseries does present an opportunity to engage with parents and convey messages and in this respect there is a value to it.

Discussion

It is clear that for these parents dental health is an important issue. However it is also clear that even parents who make efforts to inform themselves about how to keep their children's teeth healthy are subject to conflicting information sources, some such as the

media can be beyond the role of health agencies. Even following the best advice the children of these parents are still suffering dental decay. If this is the case for some of the more concerned and informed parents, the issues highlighted here may be greater for the less proactive parent.

The story that is coming out here seems to suggest that the tooth brushing in nursery is valued as a means of reinforcing what is done at home and at times as a stop gap when there isn't time at home. However parents do seem to wish to be kept informed of what is happening and to have the opportunity for greater involvement. The nursery seems to offer a useful route to getting messages across to parents. The brushing itself offers opportunity for practical demonstration and advice that some parents may welcome. This route also offers an opportunity to ensure that inconsistencies in messages parents may have received can be addressed. Thought may need to be given as to how information is presented to address the conflicting messages issue and whether it should go beyond tooth brushing into diet.

Involving parents in nursery is something that nurseries have expressed they are keen to do. Teachers spoke of doing shared activities with parents and children. Some nurseries have also expressed the role they have to play in 'helping parents develop their parenting skills'. There may be scope then for using tooth brushing in both these capacities with those nurseries that are receptive to it.

Parents have also mentioned how they would like to be more involved seeing the children brush their teeth and learning how to do it themselves, so they can support their children. They have also suggested including disclosing tablets in the take home pack, so parents can become more involved at home.

In this respect the evidence from this self selecting group of concerned parents supports the aims of the tooth brushing project as a means of increasing the amount of fluoride that children have on their teeth. However parent's perceptions of what the tooth brushing is for may go beyond just this and there are expectations about improving technique and providing advice.

Sure Start staff views

Sure Start health workers supported the tooth brushing activity in two nursery schools. There were two lead staff responsible for co-coordinating other Sure Start staff in the nurseries as well as delivering support themselves. One of these co-coordinating staff was interviewed.

Staff background and training

The staff member felt that their professional training equipped them for the delivering the tooth brushing, making particular reference to knowledge of hygiene. They were also aware of the poor dental health of children and were supplied with relevant research material. They were aware of the PCT priorities that the project was intended to address. Having this background was considered valuable as it 'gave an incentive' to continue with the project.

Initial training included a visit to schools for a demonstration. Training was delivered to the main leads who then cascaded to other Sure Start staff who were involved in supporting the tooth brushing.

Implementing the project in schools

The project was seen as easy to implement as the children were easy to get into a routine and getting resources was easy. Concerns were raised around the hygiene in schools, '*in one school had to sterilize (toothbrushes) in food preparation area*'.

The biggest constraint appeared to be around time. This was particularly so when there was only a limited time to get the brushing done at one school before going on to another. Any delays could make staff late for the next school. There is also a need to cover for staff sickness. Similar comments were made as to those made by teachers about the difficulty children have in recognizing their toothbrushes. This meant that brushes needed to be labeled every half term when they were changed and there was difficulty in ensuring that each child had the same colour brush with the same picture on it from one half term to the next.

Sure Start Staff recalled the cleaning procedure for the toothbrushes particularly, ensuring they did not use thumbs to clean the brush to avoid cross infection. This was a concern expressed by teaching staff in one nursery. Sure Start staff were not aware that staff in the nurseries where they worked had concerns about cross infection.

Relationships with schools

Sure Start initially became involved in the project as schools made requests to the PCT for support if the project was to be continued. The Sure Start staff have tried to accommodate the needs of schools in terms of the times that the tooth brushing runs and how it fits with the school's routine.

There was variation in the views of schools around the consistency of support received and this may reflect differences in relationships and support for the tooth brushing by the schools. Sure Start staff mentioned that it took time to build up confidence with schools and establish a routine so that schools would gradually accept the process. However Sure Start staff were keen to fit into schools routines, this meant that even with a Sure Start worker leading the brushing there were variations in the number of children supervised whilst brushing from 1:4 to 1:10. They felt that although each setting they worked in was different in its approach, each setting they worked in had an appropriate set up for their particular circumstances and pointed out how schools also tried to fit in with it.

Tooth brushing technique

The Sure Start staff did give the children instruction on how to brush correctly, demonstrations were used when there were language difficulties. For some children who were unsure what to do, they would take the brush and show the child how to do this, standing behind. This was based on the advice staff had been given. Sure Start staff were aware that the application of fluoride was more important than brushing technique; however it was believed that brushing technique did improve over the year. Sure Start staff did check the children's teeth were clean; however nursery staff in the supported nurseries did not do this as a routine.

Value of the Sure Start workers support

Sure Start Staff commented that *'if it meant the school did it rather than didn't (because there was support from Sure Start staff), then this was a big plus ... it gave a highlight to brushing teeth*

'lots of children comment on how they brush their teeth at home and brush their teeth more now than before the scheme and seeing an improvement in technique is worthwhile'.

Schools were also able to provide support back to Sure Start, for example giving them an opportunity to register older children with Sure Start. It also gave an opportunity to highlight dental health issues to parents and advise on registering with a dentist. In summing up the value of the Sure Start workers input, there was a value in doing *'special healthy teeth slots'* in schools but there was uncertainty as to the value of the day to day support for tooth brushing as there was a concern that time was taken away from other things. However it did give a focus to dental health and gave an opportunity to build up contacts with the schools.

Other health initiatives going on in schools

Staff commented that whilst the tooth brushing had been running in schools, the school fruit scheme had started up and there was a more general awareness of the children having healthy snacks.

Cost Effectiveness Analysis

The cost effectiveness analysis presented here is based on the evidence supplied by the randomized control study conducted by Pine et al (2002). The study results have been extrapolated and applied to the Batley data from the BASCD survey 2004 that measured dental caries amongst 5 year olds. This is to gauge what the likely effect of applying this study could be in terms of reductions in dental treatment costs. There were 122 five year old children who were surveyed for the BASCD study. We have assumed here that the results for these children would be the same if the study was applied to Batley. We recognize that there may be confounding factors that would not allow the study results to be applied exactly to the Batley situation.

The study suggests that to prevent one carious surface at D3 level (cavitation into dentine) you would need to have two children in the programme¹³. In other words for every two children in the programme, one carious surface at D3 could be prevented through having the children in the programme.

The study suggests that there is a 56% reduction in D3 lesions in permanent teeth after two years. However the 95% confidence interval for reduction in caries at D3 between control and intervention groups ranged between 13% and 101%.

The table below shows the results of the dental survey of 122 five year old children in Batley in 2004. The average decay figures from BASCD 2004 have been applied to the population of 122 to estimate the number of decayed, missing and filled teeth this represents.

Estimated extent of decay

Category	Average per child	No of teeth for Batley 5 year old population (122 children)
Decayed	2.95	360
Missing	0.68	82
Filled	0.16	19
Total Batley	3.79	462
Total Kirklees	3.69	

The possible absolute reductions that may be experienced if the intervention is applied are given in the table below taking account of the confidence interval given in Pine et al (2002)

¹³ Cited in www.nature.com/ebd

Estimated reductions in decay following toothbrushing (based on Pine et al)

	Lower confidence interval (13%) reduction	Observed reduction 56%	Upper confidence interval (101%) reduction
Decayed teeth	47	202	364
Missing	11	46	83
Filled	2	11	19
Decayed, missing and filled	60	258	466

Given the very large confidence interval for the study, we are suggesting that for the purposes of the cost effectiveness analysis we use only the lower confidence interval and observed reduction in calculating the savings of this programme in dental treatment. In reality the savings could be less or more than this. We also need to consider that at the moment the great majority of decayed teeth go untreated, although we do not know whether they all require treatment or not. Those at D3 levels of decay are considered to require treatment to prevent pain/abcess formation/necessity for extraction/general anaesthesia etc. For the purposes of this analysis we have counted missing and filled teeth, as having received some treatment and defined decayed teeth as untreated as these may not all be at D3 level.

The cost of paediatric dentistry for outpatients is given at £67 per treatment.¹⁴ We have used this as a proxy for treatment that covers both filling and extracting decayed teeth. At the lower estimate of potential reductions in decayed teeth, this suggests a saving of £4020 (60 x £67) if all these teeth were treated. On average £33 per child in Batley. At the moment these teeth are not all treated, some have only been identified by the survey as decayed. If this figure is applied to the missing and filled teeth only (i.e. those that have received treatment), the saving falls to £871. On average this would be £7.13 per child in Batley. This is the most conservative estimate.

If we apply the 56% reduction that the study suggests this saving rises to £3,819 (57 x £67) for the decay that is presented for treatment (£31 per child) and £17,286 (258 x £67) (£142 per child) if all decay is treated.

We need to compare this to the costs of running the toothbrushing project. This is £50 per annum per child for materials – toothbrushes, paste etc. This cost may fall in subsequent years. As the project is run in school time, there is no additional cost to the school of running the project. There is only an opportunity cost in terms of an aspect of the curriculum that may be lost.

¹⁴Department for Health Reference Costs 2004, published March 2005. Speciality code 142 available at http://www.dh.gov.uk/PublicationsAndStatistics/Publications/PublicationsPolicyAndGuidance/PublicationsPolicyAndGuidanceArticle/fs/en?CONTENT_ID=4105545&chk=znAfqu

However two of the schools would have found it difficult to run the toothbrushing without additional support. The cost of providing support to schools for one class of children who attend 5 half day sessions was approximately £2,000 per annum. To support a school for both of their sessions would cost approximately £4,000 per annum. This covers the cost of staff attendance, travel time between nurseries and a small amount of planning time. For a class of 30 children this represents a cost per child of £66 per year. Where a paid health start worker is required the cost of running the project per child per year then rises to £133.

On balance it would seem that where schools are able to run the toothbrushing themselves without support, then it is cost effective, particularly if children were to have all of their decayed teeth treated. Given that many of these teeth are going untreated, whether treatment is required or not, it would seem sensible to offer a preventative measure to avoid the decay in the first place. However to ensure that children receive the preventative measure, there is a need for the intervention to reach a greater number of children. Targeted support at those nurseries that require additional support is barely cost effective, depending upon how many children present for treatment. However alternative means of delivery through the use of volunteers could make this targeted support effective.

In making a judgement around cost effectiveness we should also take account of the non monetary costs to children of having poor teeth. The effects of poor dental health can, for young children and their parents or carers, be devastating. In addition to the pain and suffering caused by decayed teeth, dental decay in children too young to cope with extensive dental treatment often results in general anaesthesia for multiple tooth extraction. A recent audit of child dental extractions under general anaesthesia carried out in North Kirklees from Feb 2001-Jan 2002 showed that of the 248 children undergoing treatment, 45% of the children were of Asian ethnic origin and that the dentist referring the most children (38) for general anaesthetic extractions practised in the Batley Sure Start area (Audit of out-patient children's general anaesthetic extraction service. North Kirklees CDS 2003). General anaesthetic for dental treatment carries its own risks of morbidity/mortality. Early childhood decay and extractions can lead to impaired ability to eat, resulting in nutritional problems affecting general health, and impaired speech, with consequent effects on social and educational development. These are all factors which can contribute to costs elsewhere in the NHS and Education System.

Conclusions

The tooth brushing project has been set up with the purpose of improving access to fluoride for three and four year old children. Initial research using random control trials, suggests that this approach does work in reducing D1 level decay by 32% and level D3 by 56%. Critical appraisal of this demonstrated that the research that these conclusions are based on is sound.

If as the research suggests that this is an effective means of reducing dental decay then potential cost savings are estimated as being between £3,819 and £17,286 per cohort of children depending upon whether children not receiving treatment for decayed teeth present themselves.

Factors that would contribute to the effectiveness of this approach would include the propensity for the target groups of deprived 3 and 4 years olds to attend LEA school nurseries. LEA nurseries have been chosen as they provide a more structured means of accessing children than play groups or parent and toddler groups which can be more sporadic in the frequency with which they are run.

The results of our analysis show that this is not as effective a means of targeting deprived 3 and 4 year olds in this area as we might expect, because take up of nursery places is limited particularly among 3 year olds. This suggests that toothbrushing in nurseries should not be seen as the only means of targeting children to encourage the application of fluoride. There may be other early year's settings that could provide opportunities. However the approach through nurseries would benefit considerably from measures that seek to increase the take up of nursery places. The development of Children's Centres may provide opportunities here.

The purpose of this evaluation was to consider how the delivery of the tooth brushing can be improved in nurseries from both the nurseries' perspective and also that of the parents. Success indicators were set out at the beginning to determine whether tooth brushing in nurseries is an effective means of increasing access to fluoride: These indicators were:

- Nurseries understand the role they have to play in encouraging good oral health and include it in their day to day activities and policies
- Children view tooth brushing positively and engage in this in nursery and at home
- Parents understand the importance of tooth brushing in general and for children in particular.
- Parents actively promote good oral health habits to their children and understand that they can influence their child's oral health

The qualitative evaluation has identified a number of issues as to how the nurseries can be encouraged to continue or take up the brushing and also how parents can become more involved in the project and how messages about oral health can be communicated. The qualitative research has highlighted issues that concerned parents have about their children's teeth.

Nurseries understand the role they have to play in encouraging good oral health and include it in their day to day activities and policies

From the interviews with head teachers and nursery teachers there does appear to be support for continuing the activity. The tooth brushing project needs to be seen in the context of the extended schools agenda. It was clear that some head teachers were keen to see it as a means of embracing partnership working and were keen to see the broader role that schools have in promoting all aspects of a child's wellbeing.

There are concerns however that there are competing demands for curriculum and staff time and some schools are more adept at seeing the value of this activity than others, particularly in seeing it as a means of delivering the curriculum.

Through the interviews and observations in schools a number of conditions for success were identified that may help encourage the take up by schools:

Schools recognize the poor dental health of their pupils and the effect this has on their attendance and performance.

Schools recognize their role as an agent of change in improving children's health – This requires both a head teacher to drive this change and for nursery staff to see a value in what they are doing.

Recognition that it can be turned into an educational activity and a means of delivering the curriculum, for example as a conversation generator, and linking to aspects of the curriculum related to diet and health

Commitment from the school to partnership working and the need to engage in the broader agenda related to Every Child Matters.

Staffing ratios need to be sufficient to make it practical. In large nurseries where there are few support staff, schools may struggle and additional help such as that provided through Sure Start may be necessary to turn willingness into a practical reality. If measures are taken to increase take up of nursery places, then this possibility would increase. The cost of this support is roughly £2000 per class, per year. An alternative is to use volunteer support. Schools have found this difficult, but again there may be scope for partnership working in identifying volunteers through the work of Sure Start programmes in enabling parents to access the first rungs of the labour market.

Potential for extending the project aims beyond just the application of fluoride.

There was a belief amongst both school staff and parents that the project was about improving tooth brushing technique. This may be a misconception. However it suggests that there would be support for inclusion of this in the aims of the project, although this would have implications for project delivery in relation to training of school staff.

Children view tooth brushing positively and engage in this in nursery and at home

From the perspective of children there were few issues arising from the evaluation and it appears relatively easy for schools to get children to engage in the activity. This of course may contribute to the school's willingness to participate.

Parents understand the importance of tooth brushing in general and for children in particular .They understand that they can influence their child's oral health and actively promote good oral health habits to their children.

Schools have had no difficulty in gaining parent's consent for their children to take part and from this respect it would suggest that parents do see tooth brushing as important.

The evidence of whether tooth brushing has changed attitudes to oral health however is weak, given we have only been able to speak to a self selecting group of concerned parents. Further work needs to be done at the start and end of the project to measure parental attitudes to tooth brushing. This is beyond the scope of this evaluation.

We can only conclude that there are groups of concerned parents in the area who appear to want to do the right thing, but are faced with a number of difficulties in doing this. Tooth brushing in nurseries may at least raise awareness amongst parents and present an opportunity to get consistent messages into children's homes.

The value of Sure Start support

There is a value of having dedicated staff, such as the Sure Start Health workers. Targeting this support at schools where there are difficulties in operationalising the tooth brushing due to staffing is a critical factor in its success. However this is an expensive resource and needs to be set against the cost effectiveness of the project. Schools find it difficult to engage parents to help, either because parents work or because there is no culture within the community that the school serves of being involved with the nursery.

An alternative to using Sure Start type staff may be to offer training and payment to parents to help with the tooth brushing possibly linking in with employment initiatives within the local area. This would mean that schools could have a dedicated group of people to rely on locally rather than Sure Start staff who may cover a number of schools.

Recommendations

Continuation of the project

The tooth brushing project is being continued during the academic year 2005/6. It appears that the aims of the original project are now broadening into considering the extent to which the brushing has an impact on parental attitudes and beliefs.

If the project is being seen as a vehicle for encouraging attitude change, then it is recommended that evaluation of this aspect of the project is considered and a mechanism set in place for measuring this before the new intake of children to nurseries in January 2006. This will require being clear as to exactly what attitude change is required and what standard tools are available to do this.

Few parents are engaged with the nurseries as volunteers to help in delivery of the project. The observations of nursery staff through home visits and seeing what foods families are eating suggest that dietary messages are not necessarily reaching parents. This is supported by the focus groups that suggested even the more concerned parents are unclear as to how best to promote their child's dental health. This may require an additional aspect of the project targeting messages at parents about diet.

It has been suggested that oral health messages need to be targeted at parents of children before they reach the age of three. Evidence suggests that this may start at the weaning age, but also can be reinforced through baby and toddler groups in the area. It would seem necessary to expand the delivery of the project if nursery take up at age 3 is so low.

The project should be seen perhaps as one of a number of means of targeting families with good oral health practice and information as their child grows up. This means ensuring that consistent measures are given through the range of public health initiatives that some of the families in the Batley Sure Start area may be in receipt of. In this respect a family will pass through a series of messages and practices that are mutually reinforcing and age appropriate.

Communication with schools

In encouraging schools to participate in the tooth brushing there is a need to link its value to the broader role of schools through the extended schools agenda. This advises:

'Schools will want to work closely with parents to shape these activities around the needs of their community and may choose to provide extra services in response to parental demand'.¹⁵

The tooth brushing project offers schools an opportunity to address the health needs of their local area. Given the evidence that is available on the poor dental health of children

¹⁵ Extended Schools, Access to services and opportunities for all, Extended Schools Prospectus DFES, 2005

in North Kirklees this project will enable schools to demonstrate their integration with a local area plan to improve quality of life.

Operational changes

Training and information sharing opportunities for schools

Given the concerns around issues such as hygiene and cross infection, the timing of brushing in schools and inconsistent messages around dental health, it is recommended that schools may benefit from some joint training that addresses these concerns. Such training may also present an opportunity for schools to share ideas around the practicalities of implementing the brushing in their schools and to feedback their concerns about the tooth brushing kit they are provided with. Schools are likely to welcome any changes to this that adds to convenience of use. Perhaps these views could be fed back to the manufacturer.

It may be possible to seek advice on how best to deliver such training through consultation with the School Effectiveness Service in Kirklees Council.

Delivery of supplies

It is recommended that consideration is given to termly supplies because of the limited storage space some nurseries have, or consider alternative storage facilities if it is necessary to buy supplied annually.

Sure Start Health Workers

It is likely that some schools who have previously received support from the Sure Start Health workers will find it difficult to continue without this. However it may be possible to work with Sure Start to identify parents who could be trained to deliver the tooth brushing as part of the programme's remit to facilitate parent's into employment.