Final Report to Funder- Parent's experiences of receiving oral health advice from dental health professionals for their children and factors influencing oral health practices: Focus groups with parents of children aged 0-11 years.

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Lay Summary

Dental decay in children is a chronic yet preventable public health problem. Effective prevention for children requires the adoption of protective home-based toothbrushing and dietary behaviours from an early age. Dental teams have the opportunity to support parents and children to adopt these behaviours when they visit the dentist. These conversations are a three-way interaction between the child, their parents or caregiver and the dental team member. This is the final report of three looking at parents' perceptions of these preventive conversations and how they can support home-based toothbrushing and dietary behaviours.

We aimed to explore parent's experience of receiving oral health advice (e.g., toothbrushing and diet) from dental health professionals and the factors affecting the oral health practices of their child. We asked parents of children aged 0-11 years to discuss their experiences and then summarised these conversations into different themes.

- The first theme identified was Instruction and Execution in which parents suggested that they often received only minimal advice from the dentist, but that when they did, this motivated them to care for their child's oral health. Parents also expressed frustration that other family members (e.g., fathers) that had not received advice from a dentist continued with inappropriate behaviours (e.g., giving the child sugary snacks, not

enforcing toothbrushing). This suggests a need for communication of oral health messages to all caregivers of child, as only one parent is likely to be present at dental visits.

- Within the theme of Instruction and Execution parents also suggested that other environments that their child spends time (e.g., school) also need to enforce good dietary behaviours (e.g., not provide sweet snacks after lunch). As the child gets older, the child is likely to spend more time away from the parent, and so it becomes more difficult for parents to control the child's diet.
- The second theme identified was Direct communication with child, in which parents discussed the need for the dentist to involve the child when communicating oral health advice, and to use methods like disclosing tablets, which are more likely to engage the child and emphasise the consequences of poor oral health. Parents also suggested the use of technology to deliver advice (e.g., TV screens), as these would also be more likely to engage the child compared to just verbal or written advice.
- The third theme identified was Awareness from other sources. Parents were often exposed to other sources of oral health advice such as advice leaflets or sessions at children's centres. Parents who are particularly motivated to care for their child's oral health also actively seek out information through their own research.
- Within the theme Awareness from other sources, parents also suggested that school would be a good environment for children to receive oral health advice, and that the child can then pass on the information to the parent, giving the child a sense of responsibility for their oral health care.
- In addition, within the theme Awareness from other sources parents also reported receiving more oral health advice from the health visitor than from the dentist, suggesting a need for regular, consistent and structured advice from dental teams.
- The final theme identified was Product preferences, in which parents discussed the oral health products they use for their child. Parents agreed that fictional characters on products were motivating to children, as children were more likely to consider the product a personal possession if it had characters on. Added features (e.g., inbuilt timers) are also appealing but there is some concern over the price of such products and children become less motivated by the appeal of the characters as they get older.

- Also with the theme Product preferences, parents reported that attractive packaging (e.g., with fictional characters) was not seen as important on toothpaste. Some parents reported looking at the fluoride content (parts of fluoride per million parts) when choosing toothpaste, and other parents reported choosing toothpaste based on the age label. Some parents also reported the difficulty in transitioning their children from flavoured children's toothpaste to an adult toothpaste due to the strong flavour, suggesting the need for milder mint flavoured toothpastes for children in order to make this transition easier.
- Within the theme Product preferences, some parents also mentioned using timers to help the children brush for the required time, and sugar apps (in which barcodes of products can be scanned to reveal the sugar content of products) to help them determine the sugar content of certain foods.

Executive summary

We aimed to explore the experiences of parents of receiving oral health advice from dental health practitioners and factors influencing their child's oral health using focus groups involving parents of children aged 0-11 years. We identified four key themes. These were:

Key findings:

- Instruction and Execution – Parents suggested that often, they did not receive any advice or instruction from the dentist for their child during dental visits and even when they did, this was very limited. However, these short snippets of advice emphasised the importance of appropriate oral health behaviours and motivated better oral health care practices. However, parents expressed frustration that other family members (e.g., partners) undermined their own attempts to care for their child's oral health, suggesting the need for communication of oral health messages to all caregivers of child, as only one parent is likely to be present at dental visits.
- Instruction and Execution – Parents acknowledged their gaps in knowledge on when to start taking their child to the dentist and identified the lack of information available on how to brush their child's teeth. They identified that children's responses to having their teeth brushed were variable and required wider parenting skills to enforce this behaviour. They reported that the "battle" over toothbrushing and dietary control became more difficult as the child gets older.
- Instruction and Execution – Parents suggested a need for other care environments (e.g., school) to be aware of and enforce appropriate dietary behaviours due to the fact that as children get older, they are less likely to be in care of parent at all times, and so it becomes more difficult for parent to control the child's diet.
- Direct communication with child – Parents expressed a desire for the dentist to involve the child as well as the parent when communicating oral health advice, and to use more involved practices to back up the advice like disclosing tablets, in order to emphasise consequences of poor oral practices to the child. They also suggested the use of delivery methods that would be more likely to engage children with the advice, such as the use of technology (e.g., TV screens) rather than just information leaflets.

- Awareness from other sources – If parents were not exposed to advice from a dentist, they often came across advice from other sources without actively seeking it out (e.g., leaflets or sessions at children's centres). Parents who are particularly motivated actively seek out information through their own research, often motivated by their own negative experiences.
- Awareness from other sources - Parents suggested that school was an ideal environment for children to receive oral health care, and the child can relay information to the parent. This gives the child a sense of authority and pride in knowing more than their parent.
- Awareness from other sources – Parents also suggested that they received more oral health advice from the health visitor than from the actual dentist. This suggests a need for regular, structured advice from a dentist, as other sources are not as regular (e.g., leaflets and health visitors).
- Product preferences – With regards to oral health products, there was a general consensus that fictional characters on products were motivating to children, as children were more likely to consider the product a personal possession if it had characters on. Added features (e.g., inbuilt timers) are also appealing to children but there is some concern over the price of such products and the appeal of the characters reduces as children get older.
- Product preferences – Attractive packaging (e.g., with fictional characters) was not seen as important on toothpaste. Unlike toothbrushes, parents took responsibility for choosing which toothpaste to buy. Some parents reported looking at the fluoride content when choosing toothpaste, and other parents reported choosing toothpaste based on the age label. Some parents also reported the difficulty in transitioning their children from flavoured children's toothpaste to an adult toothpaste due to the strong flavour, suggesting the need for milder mint flavoured toothpastes for children in order to make this transition easier.
- Product preferences – Some parents also mentioned using timers to help the children brush for the required time, and sugar apps to help them determine the sugar content of certain foods.

Introduction

Dental caries is a globally recognised public health problem (Kassebaum et al., 2015). In the UK, reducing caries prevalence in five year olds is a national priority and is included in the public health outcomes framework (Department of Health, 2012). Caries experience is acutely differentiated by social gradients (Wyborn et al., 2012). In England, the contrast is stark; at three-years-old, caries prevalence varied between 2% and 34% for different local authorities (Public Health England, 2013). This variation widened further by five-years-old, from 14% to 54% (Public Health England, 2016). Caries in the primary dentition is the strongest predictor for caries in the permanent dentition (Hall-Scullin et al., 2017). From a young age children with and without caries are set on very different oral health trajectories which dramatically separate across the life course (Hall-Scullin et al., 2017, Broadbent et al., 2008). Consequently, Public Health England and the National Institute for Clinical Excellence strongly advocate preventing caries in young children (Public Health England, 2014, National Institute for Health and Care Excellence, 2014).

In England, treatment of caries is the most common reason for young children (over 30,000 children) to have a general anaesthetic; this alone costs the NHS £36 million a year (Public Health England, 2014). The burden of caries is significant. Caries causes pain and suffering as well as changing what children eat, their speech, quality of life, self-esteem, and social confidence (Public Health England, 2014). Moreover, it has a wider societal impact on education and social participation (Public Health England, 2014). Treating caries accounts for a significant proportion of the £3.4 billion annual spend on NHS dentistry (Public Health England, 2014).

A number of behaviours are associated with the development of caries in children. The two key behavioural risk factors are poor oral hygiene and the consumption of sugars, more explicitly consumption of sweets and infrequent toothbrushing along with accumulation of plaque are associated with poor dental health (Mattila, 2005). Despite this, caries is a preventable disease, with modifiable target behaviours, recommended to reduce their prevalence and ensure good oral health, including twice daily toothbrushing with a fluoride toothpaste (Marinho et al., 2003) and reducing the amount and frequency of free sugars consumed (Moynihan, 2005).

In order to reduce caries incidence in children, both children and parents need to be aware of these behavioural risk factors, and key oral health promotion messages. One route through

which children and parents receive advice on oral health is through general dental practitioners, within a dental setting. An evidence-based toolkit for supporting dental teams to provide appropriate evidence based oral health advice has been developed by Public Health England entitled “Delivering Better Oral Health” (Public Health England, 2017).

All general dental health practitioners and their wider team deliver oral health advice to children and their parents in some way, but there has previously been little exploration of dental health professional’s experiences of delivering these messages and the barriers to engaging children and their parents and caregivers with oral health advice. These preventive conversations are a three-way interaction between the child, their parents or caregiver and the dental team member. Parents have responsibility for enforcing good oral health behaviours in their children, in order to prevent dental caries with children taking on more responsibility as they grow older.

Within this project, we aim to explore the experiences of oral health promotion within a dental setting from the perspective of dental practitioners as deliverers, and parents and children as receivers of the advice. We aim to gain understanding of dental practitioner’s experiences of delivering advice to children and parents, and the experiences of both children and parents when receiving this advice, and how the messages influence oral health behaviour. The current report explores the experiences of parents with regards to the oral health advice they receive for their child, and the factors that influence the oral health of their child. We used focus groups and individual interviews to explore these factors with parent of children aged 0-11 years.

Methods

Ethical Approval

Ethical approval was obtained by the Departmental Research Ethics Committee (DREC), University of Leeds. Ref: 300317/PD/225

Participants and Sampling

Parents were purposively selected from across Yorkshire, including those living in or on the outskirts of Bradford, Leeds and Huddersfield. We used a variety of setting in which to recruit parents including children's centres, nurseries and primary schools. Parents socio-economic backgrounds and ethnicities varied. Four focus groups and three individual interviews were undertaken, involving a total of 37 parents.

The participant information sheets were distributed to parents at least five days before the focus groups or interviews. In order to participate, each parent had to complete the consent form. The focus groups were conducted at a time and location that was convenient to them. A topic guide and oral health resources, some provided by Oral B, were used to facilitate the conversation.

Analysis

Focus groups were audio-recorded and professionally transcribed in verbatim in order to reflect accurately on the conversations and reflections after the event. Thematic analysis of the transcripts was used which involved 'careful reading and re-reading' (Rice and Ezzy, 1999: 258) of research material to identify the main themes. Alongside the pattern identification within the data (Fereday and Muir-Cochrane, 2006), individual or unique cases were noted down. The interviews were repeatedly read, aiming to find commonalities or contradictions among the unique and dominant cases. This was carried out by one researcher (RD) in collaboration with other members of the research team. Sub-themes and overarching themes were subsequently developed and refined by discussion between the research team. All key themes were then reviewed, and redundant themes explored and discounted as appropriate. Final themes were

agreed and named and the report produced as a collaborative work between members of the research team. Negative case analysis was also undertaken.

Results

Four themes were obtained from the analysis of focus group interviews undertaken with dental teams. Within each theme, barriers and facilitators are discussed.

1. Instruction and execution
2. Direct communication with the child
3. Awareness from other sources
4. Product preferences

Theme 1: Instruction and execution

Instruction for parents mainly entails supervising the child's brushing, also making sure that they brush at least twice a day. Parents are advised to regulate their child's diet to restrict the amount of sugary food they consume. These are the basic information delivered to maintain good oral health. However, some parents said that they did not receive advice from the dentist about how to take care of their child's teeth:

> Parent: He basically sits in the chair, asks him to open his mouth and checks his teeth and how things are happening. Erm, and that's it. He will say oh, 'his molars are coming through shortly'. He did say last time he is grinding his teeth at night but he didn't advise anything else so he basically just checks all his teeth.
>
> Interviewer 1: So how long does it last then?
>
> Parent: Erm, very short, erm a minute tops.

In this case, the short time spent in the child's check-up could be explained by the fact that she did not take her child to the dentist in the sole interest of consulting for her child. It was only when she went for her own check-up that the dentist made a quick check on her child as well:

> Parent: No, I attend for him and I attend for me. When I go I see the Dental Hygienist for me but when I take him he basically looks at the teeth but doesn't confirm if I should do anything further or anything.

> Interviewer 1: Ok. So you were not advised about his brushing and how often, and how to do it?
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> Parent: No, no I wasn't. I mean, we just do it twice a day and I'm quite strict as I've had a lot of trouble myself. So I'm quite strict from that perspective so no he's not, but every time we go everything seems fine and there's never any issues but I don't receive any extra advice so yeah, I erm, I assume we are doing ok.

It was only through her personal experience that she learnt about how many times to brush and the diet that needs to be maintained. Although parents may feel confident about their efforts, not always are they aware of the updated information of how to maintain good oral health. For instance, the above participant assumed that unlike adults, children should rinse after brushing.

It is essential that children register to a dentist and visit for regular check-ups right from when their first teeth erupt. Most often parents only start showing concern about oral health either when they start getting their adult teeth or when their child experiences some pain in their gums. There was one participant who said that the first time she took her child to the dentist was when he was eight years old and up until then she let her child eat and drink whatever he pleased without any restrictions:

> He was brushing his teeth but … with all this fizzy drinks, he was my first child so, I just let him loose!

Unless parents were made aware of the vitality of good oral health practices for their child, most undervalued its importance. Parents need to be made aware and educated about the latest developments in oral health care so that they can regulate good oral health of their children based on new research rather than their assumptions of care, acquired from what they learnt previously:

> Parent: I think it would be good for Dentists to reinforce it. Because I think there are things as well that I might think are perfectly ok to eat but actually not advisable and when mine were little they ate a lot of dried fruit. I didn't know at the time I wasn't doing the right thing. As a parent you think you're doing the right thing, we get it wrong don't we? So it does need that reinforcement from the Dentist and things change as well, you know what's ok and what's not.

In the above extract, the participant said, ‘when mine were little they ate a lot of dried fruit’ suggesting that parents tend to visit the dentist late after the child is born, and till then they are unexposed to, and unaware of, the appropriate information. This could be a major barrier to good oral health in children, not only because of the damage it has already caused, but also because they might get habituated with certain food, making it hard to change later.

When asked about demonstrations in the clinic about how to brush, some participants reported having never been exposed to such delivery of information. Further to this, the interviewer asked one participant, ‘Do you think if they did that it would be quite useful?’, to which the participant replied:

> Parent: Definitely, yeah and I think even some instructions for the parent how to brush their teeth because brushing someone else’s teeth is quite hard isn’t it?

The participant recognised the need for some training and explanation of how to brush their child’s teeth. For parents having their first child, it could be especially overwhelming when they are unsure about how best to perform their role. Thus, there is a demand for some attention from the dentist about how parents can do their part in ensuring good oral health of their child.

One of the issues that parents raised about maintaining good oral health for their children is with regard to controllability of their child’s behaviour. There were a few who blamed their partner for not fulfilling their responsibilities of maintaining good oral health:

> Everything that I’ve had to do with [names her child] the older one. Saying that, going to the Dentist hasn’t but now he’s getting older he’s getting lazy and it is a push to get him to do them. He will do them but, say if I’m at work and he’s at home with his Dad, guaranteed he won’t do his teeth but he said he will and that’s his Dad, you know men they just…

Similarly another participant said, ‘if he goes to it I try to steer him onto something else but then he will go with his dad and he, god he came back with some bright blue bon bons [laughter]’. Both parents need to be similarly aware and sensitive about the oral health of their children. The dentist could make sure that the information is provided to both the parents, but it is also the responsibility of the parents to communicate the necessary information and make sure consistent

behaviour is maintained. For instance, if one parent is not particularly aware of the kind of food that needs to be restricted, the child's oral health could be compromised despite the efforts put by the other parent.

Parents are found to be sensitive about oral health especially when they learn the repercussions of poor practices:

> So that's why I was shocked when they came back because the Dentist said it was quite a big build-up of plaque and if they carried on the way they was he would probably end up with some missing teeth but they wouldn't have that so that's probably shocked me as well because I was letting him do it so it made me go up, sit with them and do it so…

When a parent goes to the dentist and realizes the problems with the child's oral health, they tend to take it more seriously and consequently maintain strict regulation of oral health. If the other parent is not exposed to the information in the similar way and does not get the direct advice from the dentist, it is likely that he/she would maintain less restriction or take oral health less seriously. Thus, going to the dentist and realizing the problems associated with the child's oral health could be vital in understanding and implementing the necessary changes in oral health practices.

Another participant talked about schools that sometimes pose as barriers to maintaining healthy diet, especially when they are not aware of the required diet restrictions for good oral health:

> ...it does concern me at school because we restrict sugary snacks at home but school doesn't and I have actually written to local council about this. They offer at lunch time like puddings and cakes as well as fruit as an alternative but we all know what the children are going to go for so it's kind of a bit deflating that we restrict but he isn't obviously restricted at school.

It is essential that both parents and schools, who are integrally involved in the child's development, are aware of, and sensitive about oral health care. It is only through combined efforts that effective behavioural change could be implemented towards better oral health.

Most participants also talked about the difficulty they faced in following the instructions and regulating good oral health behaviour especially when their child grew older.

> Interviewer: Yes. So is there a problem when you, you know, sometimes children don't want you to look at them and you know, you know kind of be around them when tooth brushing? Is there a problem that you, can you think?
>
> Participant C: Sometimes.
>
> Participant D: Yes sometimes.
>
> Participant C: They don't want to brush them really.
>
> Interviewer: Ok, ok.
>
> Participant E: Mine never a problem. I, I brush the younger two's teeth. And the older one I constantly have to be supervising those ones.
>
> Interviewer: Right.
>
> Participant E: Because he doesn't like brushing his teeth! And it's come to a point, the last time that we went… the dentist said that, you know, it looks like you have to start brushing his teeth back again.

Another participant explained the same problem with her child, noticing that it is harder to regulate good oral health practices for her older child than the younger one:

> And my younger one absolutely loves going to the Dentist, loves getting in the chair, likes getting a sticker, so excited, so you know he likes it. I wouldn't say, it's, when he were younger a battle to do his teeth I think it's as he's getting older he's just getting lazier. He's getting to that age where if he never had to wash again he would be absolutely happy, or wash his hair, wash his face, change his clothes, he would all week stop in his clothes and go to bed.

She noticed that like her younger child, earlier even her older child did not create any issues and took care of his teeth and allowed his parents to assist him. It is only when he got older that he started disregarding regular habits including brushing. Many participants raised the same issue, not just in terms of brushing, but also diet. As they grew older, parents recognized the reduced control over their children's oral health:

> You see when he was younger he wouldn't eat sweets, he'd only eat chocolate so that I think helped a lot. But now he's getting older someone's introduced him to Haribo's but saying that he's backed off them a bit but he would never have the hard lollies, he wouldn't touch them so. […] he would only ever eat chocolate and then all of a sudden he's discovered like Pepsi […] up until this last year, couple of years he wouldn't eat a lot of sugary things but after discovering, you know, but he doesn't really eat the Haribo stuff now it's more chocolate, it's the Coke, the Pepsi.

Imposing restrictions and being strict about their diet were perceived to be a harder task especially when their child got older. Not being exposed to products at a younger age meant that parents could easily control what they make available to their child. As they grow older, they might not be as keen on following their parents' advice and at the same time discover new products in the market that may be harmful to their teeth. If the child is not educated about maintaining good oral health and/or unaware of the repercussions of poor practices, they may not take their parents' advice seriously.

This suggests that oral health education is important for both parents and the child and it is essential that there is some amount of awareness, cooperation and understanding from the child's end in order to bring successful behavioural change. Some parents have attempted to reasonably explain and make their child understand about the vitality of maintaining good oral health:

> Yes but when it comes to the older ones [8 years old], it's…it's a battle! Battle with the older. And it's like you know I say to my own well you'll grow up and you'll be thanking me!

Similarly, there were other participants who tried their best to make their child understand so as to get their cooperation to maintain good oral health:

> Oh yeah. I erm, well aware of fizzy drinks, we reduce sugary treats to only at the weekend and then maybe one per day. Fruit juices as well I know that's and drinking more water I'm conscious with that. We actually share that information with him and why it's important. So, yeah we do, you know, we have kind of a, what's it called, we actually have it in place where he is restricted what he can have and when. Erm, he is fine with that. He accepts that.

Making children sensitive and understand the instructions given to the parents could also help them regulate their behaviour. In the similar way like dentists give instructions with explanations of the causes and consequences of poor oral health practices, children (especially older ones) too could develop sensitivity to their oral health if they are made aware of the rational explanations for the oral health practices at home and at the same time giving them a sense of responsibility for care. Although some may have received advice when they were younger, there is a recognised need for the doctor to reinforce that advice when they get older. We discuss this further in our next theme- Direct communication with the child.

Theme 2: Direct communication with the child

Just as parents take responsibility of their child's oral health when they are explained and advised about certain practices, children too can be given the same advice with adequate explanations. This can potentially give them a sense of responsibility and also ensure that they cooperate with their parents when they have to supervise brushing or restrict diet. Most of the participants shared their views about this, saying that it is essential that the dentist communicates the information with the child as much as with them:

> Erm, a general check-up of their teeth obviously. At the end they put fluoride on. I would say probably more when they were younger there was a discussion around what food they were eating. I think as they got older I wouldn't say that particularly takes place any more. If they notice a build-up of plaque anywhere then they will say you know you should be focussed on these areas. I would say my older boy has had x-rays and things recently and the Dentist really had a good talk to us with that and like look at the x-ray and got him really quite involved with it which was really nice for him.

It is crucial that dentists repeat and follow up the advice delivered to children when they are older because as they grow older, they might understand more about oral health and could be given detailed explanation about taking care of their teeth. For instance, showing the x-ray and explaining the need for good practices could be impactful for the child especially when they are older. Thus, it is crucial that dentists involve the children in the delivery of advice rather than

solely directing it to their parents. One of the parents said that using disclosing tablets could also be useful in making the child understand and realise when they are not brushing properly:

> Interviewer 1: So, do you think the disclosing tablets, like if you had that as sort of a way of showing them?
>
> Parent**:** I do, because I think, I think they'd find it fun, especially boys, I think anything like that they will find it fascinating. I think it would just reinforce what you're telling them. At the end of the day, if you say you're not brushing your teeth properly as far as they are concerned they are. I think if they can see I think it would just back up your argument a bit better.

Through such demonstrations, the dentist can add weight to the advice delivered to them. The dentist might be aware that they are not brushing properly and want to communicate this to the child to direct change in behaviour, but if this is visually demonstrated for the children, they are likely to be more convinced of the extra effort that they need to put in maintaining good oral health. In this way, apart from direct verbal communication, they could employ different methods to grasp children's attention and educate them about the essential oral health practices

> Participant E: The dentist should make … like a leaflet. Yes to tell the children look … if they are drinking fizzy juice, fizzy drinks and … eating more sweets. They should to tell the children look they are eating too much chocolates and their teeth are no good.
>
> Participant A: They could make a chart or something.
>
> Participant E: Yes.
>
> Interviewer: Right having a chart
>
> Participant E: So they should to tell them if you will, if you do same like these children, your teeth will be like same dirty and… fall out. Like…
>
> Participant A: They should, yes because they should give more information because the children, you know… they listen to us but they won't listen to us as...
>
> Interviewer: As much as they would the dentist?

Participant A: Yes. They would listen to the dentist and keep in mind.

Getting the information from someone else other than their parents, could sometimes be effective in bringing behavioural change. Parents hoped that the same scare tactics that led them to become conscious of their child's oral health could also be effectively used to sensitize children:

> So I think really with [names her child] like I said you need to show him the worst photos of what could happen to his teeth to make him do it because the last time he went to the Dentist the Dentist did say that if he carried on the way he was, he is going to have to have some teeth out.

Given the expertise of the dentists, children are more likely to respond when they are advised directly by them than the parents. As suggested in the above extract, advice could be delivered in the form of visual information ensuring they understand and realise the consequences of poor oral health.

Leaflets, posters and visuals in the screen (in the clinic) could be used to deliver information to the child in ways that would be appealing. One of the parents said,

> There is booklets in the one but I think ideally for the kids a screen. Cos the kids aren't gonna pick up a booklet but if it's on a screen ya know they will ya know well they would see it so I think they'd take it in more, yeah.

The above participant noticed booklets with information available in the clinic, but she felt that there should also be resources that would be appealing to a child so that they are naturally inclined to view it. Although children may not be internally motivated to derive information about taking care of their teeth, attractive resources could help gain their attention and educate them about the necessary behavioural changes. Rather than being imposed, if children gain knowledge through resources that they can choose to view themselves, they might be inclined to take responsibility for care. Thus, making information attractive and understandable for children could be impactful in bringing behavioural change:

> Oh yes, oh definitely, definitely, I'm totally up for any information that I can share you know. And also for the children to have information too directly. Maybe information leaflets that they can understand.

In this way, different resources could be developed to communicate the message directly to children so as to promote a sense of awareness and responsibility, also making it easier for parents to assist good oral health practices at home.

Theme 3: Awareness from other sources

There were participants who shared information about brushing and diet related to good oral health for their children, but claimed that they have not had any advice from the dentist. This instigated further enquiry which led to information about different sources through which parents gained awareness:

> Interviewer: Your dentist didn't tell you? Ok. So how do you know about this then? About brushing twice a day and that?
>
> Participant B: When my elder one was about 3 years old I brought him in the centre and there was someone who came. This was about a couple of years ago and they explained to me.

There was no active seeking for information about oral health suggesting that this area is often undermined and undervalued until awareness is built through different sources. Thus, most were involuntarily and coincidentally exposed to information about oral health. Another participant talked about different diet restrictions, but said that she never took her child to a paediatric dentist. The following extract explicates a part of the discussion that took place between the interviewer and the participant in this regard:

> Interviewer: Yeah ok but you said regards juices and everything. Erm, how did you know erm what to restrict on in terms of you know for oral health concerns? I mean you said you know about food choices?
>
> Parent: How did I know? Erm, from information that came, a yellow leaflet, Health for Life is it that comes home from school and also our own research as well because I've just found out recently, I didn't know this cos we're trying to erm find, erm, when we go out for a meal we allow him a treat, like a Sprite or 7Up and we wanted to find an alternative like Soda Water with a little bit of cordial but I've just discovered that this

> week sparkling water is just as bad so I'm, you know it's just constant research and understanding. I'm a little paranoid about it because I went through such a horrible time and I was poorly educated when I was growing up so I'm doubly conscious of making sure his teeth stay healthy.

For the above participant, there are various factors that contributed to the development of knowledge about oral health. Firstly, the information was delivered through the leaflet sent from school, also successfully stimulating desire for obtaining more information. Furthermore, because the participant was internally motivated and concerned about her child's oral health, she put effort to research on, and obtain knowledge about, diet restrictions. It was also her personal negative experience that made her conscious about her child's oral health. Without such kind of motivation from parents, such resources may not always be useful in developing knowledge and awareness among parents.

School was found to be a source of information for many parents and some also considered it to be an ideal environment for children to learn about oral health:

> I think things like that they just make it a little bit more light hearted and a bit more fun. When they're in a dental environment there's a job to be done, it's a bit more serious so I do think schools are good definitely.

The environment in which the advice is delivered is found to be a crucial determinant of child's receptivity to information. Firstly, the advice is solely directed to them giving them a sense of authority and responsibility for care and secondly, the environment sets a light tone, making it informative and at the same time fun for the children whilst understanding the importance of good oral health practices. One of the participants said:

> Again, that's something that erm the children come home and told me and my husband. We've been doing the same. So I think they were quite proud to tell us something that they've learnt. It was like you're doing it wrong.

On one hand parents get to know new and updated information about oral health and on the other, children too take pride in being more informed than their parents. These effects of learning from school have potentiality of leading to behavioural change.

When we conducted focus group interviews with children, we did a similar exercise in the school where we delivered information about oral health while making it fun through pictures in slides and a game at the end of the session. One of the children's parents said:

> Parent: Not something too hard. I think even in school, you know, within the lessons and things and mine loved, what you did last week, they found it really interesting.
>
> Interviewer 1: Oh good.
>
> Parent: Erm, so you can imagine that's something schools could built into lesson time. It doesn't have to take a long time, does it...

Thus, schools can be a useful source of information not just for the children, but for the parents as well. By building awareness and knowledge about the importance of certain oral health practices, parents, and sometimes children, may be motivated to visit the dentist and enquire for more information.

Parents also talked about health visitors who gave them useful information about oral health:

> Interviewer: Yes. Ok. How about toothpaste content? Were you said how much toothpaste to use?
>
> Participant A: Em… It was the health visitor. It was the health visitor told me that, what, because there's the ages

The participant claimed that the dentist did not give her any information about toothpaste. It was only through the health visitor that she was informed about fluoride content and the amount of toothpaste to use for her child. Furthermore, some directed attention to the fact that health visitors spent more time advising about oral health than the dentist:

> Interviewer: Ok. So for you? You said the health visitor told you so how long did they spend in giving, in giving you advice?
>
> Participant C: It was when, you know they come for an hour. So within that talk so it must have been about 10, 15 minutes.
>
> Interviewer: Ok. Alright.

Participant A: The dentist only spend two seconds when he sees me. Just like in out, in out (laughs)

Because they spent so little time with the dentist, it made them feel that the health visitors were doing a better job in advising than the dentists. There is a general expectation that information about oral health should come primarily from the dentist, especially because quite often dental care is separated from other health concerns. As against their expectation, most claimed getting more information about oral health from sources like schools, health visitors and personal research. These sources are not constant and hence cannot be a substitute to a visit to the dentist.

Thus, despite the different sources of information available to the parents about child's oral health, it is essential that they make regular visits to the dentist to monitor oral health of their child and at the same time get productive and updated advice about how to take care of their teeth. There is a need for a structure and a system at place that would ensure that adequate amount of time is spent in delivering advice in the dental clinic.

Theme 4: Product preferences

Participants talked about different products that they found useful in maintaining and regulating the child's oral health practices. In this section we discuss their preferences that mainly include: toothbrushes with fictional characters, toothpastes with age specifications, timers and sugar apps.

One of the common products found useful by most parents was toothbrushes with fictional characters. Some claimed that they would brush more just because they were attractive:

Participant E: Yes my girl, the big one, she really loves these. All kinds of Frozen. With these.

Interviewer: So after, do you think after buying this, it means that they are going to use it?

General Consensus: Yes.

Participant E: Yes I think they will brush two times a day! (Laughs)

Interviewer: You think it's that. Ok.

Participant C: So it's their toy.

Toothbrushes with pictures in them could be perceived more as a personal possession thus, making it 'their toy'. This may in turn make them use it more, without the effort of their parents to persuade them to brush.

Some parents showed preference for electric toothbrushes with added features in them. When the interviewer asked whether her child uses an electric toothbrush, the participant said:

> Yeah, yeah I mean we got the Star Wars flashing Lightsaber one that kind of gives you a time limit of 2 minutes. It flashes for 2 minutes and makes noises for 2 minutes so yes that worked until it broke but it's very expensive so we didn't get it again but it did make him respond.

With such attractive features and added advantage of an inbuilt timer, it was not only appealing to the child, but it also ensured that they brushed for the required amount of time. For some parents the costs precluded replacement of the electric toothbrush. Parents also identified how the appeal of toothbrushes with characters changed with age of their child.

> When they were young definitely I think erm, they liked the electric toothbrushes with the characters on, they were hugely popular. Erm, definitely, but like you say they are no longer of interest but when they were younger definitely.

Attractive toothbrushes with the child's favourite characters in them could be useful in developing brushing habit, but as they grow older they may not serve the same purpose. Thus, such products can be introduced at a young age so that they get habituated with brushing routines.

Thus, toothbrushes were often purchased based on the preferences of the child rather than the parent. When the interviewer asked who chooses the toothbrush for the child, the participants said:

Participant B: Pictures. I just, they look at the pictures.

Interviewer: Look at the pictures. Right. You don't look at the heads as to whether they are small?

Participant C: The age, yes. Yes.

Participant D: We've got one for the smaller ones. Yes but then I look at the pictures you know?

Participant B: Oh yes sorry the heads! The heads, if I thought, sorry, yes there were the ages but you know the characters they choose.

There were two elements considered in the choice of brushes: age marked and the pictures selected by the child. However, with toothpastes, parents did not let their child choose. Although there are toothpastes available in the market for children with attractive packaging, parents did not pay attention to, or regard, the fact that it could make children brush more. Even when toothpaste products with attractive characters and colours were shown to the parents during the interview, they hardly commented about how it would appeal to the child. It seemed as though attractive packaging only mattered in terms of toothbrushes to make children brush more. One of the participants said,

Participant B: The toothpaste I choose. Because I, I go for the, the number

Interviewer: The fluoride number.

Participant B: But the tooth, the toothbrushes they choose.

Although some talked about the fluoride content, there were others who chose just children's' toothpastes without necessarily looking at the fluoride content:

Interviewer 1: No, ok. Right, so do you…were you ever told anything about the fluoride content of the toothpaste?

Parent: No. I just judge that myself, no.

Interviewer 1: Right. So, erm, I mean how do you do that, I mean erm…?

Parent: Just by looking on the toothpaste, at the age.

Interviewer 1: Ok, so that age that is indicated on the tooth paste?

Parent: Yeah.

Some parents claimed that they were not informed about the fluoride content and thus chose toothpastes only based on the fact that they are marked as for children. This is where some problems may appear as most children's' toothpastes are flavoured with mild tastes. Shifting to adult toothpastes was found to be a major issue expressed by many participants.

Interviewer: I was going to say, is that based on sort of you reading the packet or is it their taste that you've got a child one?

Parent: I think they once had a go with ours but they found it too strong so, I bought a child's […] I've never read it to be honest.

Just like the above participant, many said they initially chose children's' toothpastes, but complained about the difficulty they faced in transitioning to an adult toothpaste later:

I've finally got em all onto adult. Yeah so erm, which one is it….I seem to have found one that they like and it's not too minty. It might be Oral B. [...] It's like a white tube with a red and blue stripe [...] Might be Aqua. Are they all alright or would you… it's only I found that because [names the child] was very funny and it took me a long time to get him off children's toothpaste.

It might be difficult to find a toothpaste that is meant for adults and yet not too strong for children to refuse brushing. This is an area that many parents struggled with as they were fixed in a dilemma of having to shift to an adult toothpaste and on the other, children only agreed to brush using the toothpaste they are habituated with.

Apart from toothbrushes and toothpastes, many participants talked about using timers for their child while brushing:

Participant C: Well at home I use a timer.

Interviewer: Timer. Ok.

> Participant B: I also a little… timers. When they're up I start them so until they rinse out. So they'd be brushing.

There are a few participants who also commented about sugar apps:

> Yes, yes, because the yellow leaflets the Health for Life, there's an app where you can check how much sugar is in certain products. My son really responded to that well. Even though I knew about it too he came to me and said lets oh let's get this and he wanted to go and scan and find out how much sugar is in things and so on. It kind of helps you know the consistent method that parents will be getting children already have or do have as well and will want to respond.

According to the participant, just like knowledge of sugar content affects eating behaviour of adults, children too may become sensitive about sugary diet. An attractive application like the sugar app could pose as a game for the children, but at the same time make them understand and implement diet restrictions whilst taking responsibility for the same.

Conclusions

This is one of the first studies to explore the experiences of parents regarding the oral health advice received from dental practitioners for their child, and the other factors that influence the oral health of their child. Parents reported that the oral health advice they received for their child does not primarily come from the dentist, but from other sources such as health visitors, leaflets and advice sessions in children's centres. Additionally, some parents reported not taking their child regularly to the dentist. This suggests a need for an emphasis on the importance of regular dental visits from birth, and the need for a regular, structured programme of advice provided during these visits, to reinforce oral health messages. Parents also suggested that although they themselves may be motivated to care for their child's oral health, it is when the child is in other care situations (e.g., at school or with other family members) that control of oral health is undermined, suggesting a need for messages to be communicated to all those involved in a child's care. With regards to the advice delivered from dentists, parents expressed a desire for the child to be actively involved when the advice is communicated, and for other methods of communication to be used alongside oral advice such as practical demonstrations (e.g., using disclosing tablets) and the use of technology (e.g., TV screens), as these were thought to be more likely to engage the child. When discussing preferences for oral health products, they agreed that the use of fictional characters and additional features (e.g., built in timers) were appealing to their child and likely to motivate them to brush more often. However, there was some concern over the price of these products and acknowledgement that the appeal reduced as the child got older. This suggests a need to consider alternative ways to motivate older children to practice appropriate oral hygiene behaviours. Attractive packaging and fictional characters were not seen as appealing on toothpastes, with toothpastes more likely to be chosen according to the level of fluoride or the age on the label. However, some concerns were expressed regarding the difficulty of transitioning children from a flavoured child's toothpaste to an adult one due to the taste. This suggests the need for child's toothpastes with milder flavoured but that are still mint based, in order to facilitate the transition from child to adult toothpaste.

The results of these focus groups constitute personal experiences of a limited number of parents, which will differ according to child temperament and other contextual factors. Therefore, although it is useful to gain insight into individual experiences, in comparison to the systematic

reviews, these experiences are not evidence based. Therefore, some degree of caution must be exercised when interpreting the results or using these findings to advocate the use of or effectiveness of specific practices, unless triangulated by other evidence.

Exploring the experiences of delivering oral health advice from the dental health professionals point of view, and exploring experiences of children when being delivered oral health advice will help us to further understand how oral health advice could most effectively be delivered within an oral health setting, in order to develop appropriate materials to support the advice delivered within the dental setting.

A combined paper of focus groups with dental teams, parents, and children within this project is in preparation for publication.

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References

BROADBENT, J. M., THOMSON, W. M. & POULTON, R. 2008. Trajectory patterns of dental caries experience in the permanent dentition to the fourth decade of life. J Dent Res, 87**,** 69-72.

DEPARTMENT OF HEALTH 2012. Healthy lives, healthy people: Improving outcomes and supporting transparency. Download Part 1: A public health outcomes framework for England, 2013-2016. London HMSO: HM Government.

FEREDAY, J. & MUIR-COCHRANE, E. 2006. Demonstrating rigor using thematic analysis: A hybrid approach of inductive and deductive coding and theme development. International journal of qualitative methods, 5**,** 80-92.

HALL-SCULLIN, E., WHITEHEAD, H., MILSOM, K., TICKLE, M., SU, T.-L. & WALSH, T. 2017. Longitidutinal study of caries development from childhood to adolescence. Journal of Dental Research, 10.1177/0022034517696457.

KASSEBAUM, N. J., BERNABE, E., DAHIYA, M., BHANDARI, B., MURRAY, C. J. & MARCENES, W. 2015. Global burden of untreated caries: a systematic review and metaregression. J Dent Res, 94**,** 650-8.

MARINHO, V. C., HIGGINS, J., LOGAN, S. & SHEIHAM, A. 2003. Fluoride toothpastes for preventing dental caries in children and adolescents. The Cochrane Library.

MATTILA, M. L. R., P.; AROMAA, M.; OJANLATVA, A.; PAUNIO, P.; HYSSALA, L.; HELENIUS, H.; SILLANPAA, M. 2005. Behavioural and demographic factors during early childhood and poor dental health at 10 years of age. Caries Research, 39**,** 85-91.

MOYNIHAN, P. 2005. The interrelationship between diet and oral health. Proceedings of the Nutrition Society, 64**,** 571-580.

NATIONAL INSTITUTE FOR HEALTH AND CARE EXCELLENCE 2014. Oral health: approaches for local authorities and their partners to improve the oral health of their communities. Public Health Guidance 55.

PUBLIC HEALTH ENGLAND 2013. National Dental Epidemiology Programme for England: Oral health survey of three-year-old children 2013. London: http://www.nwph.net/dentalhealth/reports/DPHEP%20for%20England%20OH%20Survey%203yr%202013%20Report.pdf.

PUBLIC HEALTH ENGLAND 2014. Commissioning Better Oral Health. London: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/321503/CBOHMaindocumentJUNE2014.pdf.

PUBLIC HEALTH ENGLAND 2016. National Dental Epidemiology Programme for England: oral health survey of five-year-old children 2015. A report on the prevalence and severity of dental decay. London: http://www.nwph.net/dentalhealth/14_15_5yearold/14_15_16/DPHEP%20for%20England%20OH%20Survey%205yr%202015%20Report%20FINAL%20Gateway%20approved.pdf.

PUBLIC HEALTH ENGLAND 2017. Delivering better oral health: an evidence-based toolkit for prevention. London.

RICE, P. L. & EZZY, D. 1999. Qualitative research methods: A health focus. Melbourne, Australia.

WYBORN, C., DYER, T. A. & GODSON, J. 2012. The impact of deprivation on the dental health of five-year-olds in Yorkshire and Humber 2007/2008. http://www.yhpho.org.uk/resource/item.aspx?RID=158355. Yorkshire Public Health Observatory.