

**Title** Co-design of an oral health promotion animated film with families in the South of England

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## Abstract

**Introduction:** Oral health promotion interventions should be evidence-based and designed with community involvement. In England, Family Hubs are attended by families from a range of social backgrounds and provide an ideal setting for co-design of health interventions.

**Aim:** To co-design and evaluate an animated film for promoting oral health in community settings.

**Methods:** Families attended two co-design workshops at a Family Hub in Portsmouth, during which they discussed oral health priorities and commented on the animation design. A before-and-after survey questionnaire assessed its impact on oral health knowledge in another Family Hub in Portsmouth. Qualitative data was analysed using the Framework method, while the survey data was analysed descriptively.

**Results:** Families prioritised evidence-based advice for inclusion in the film and contributed to the film storyline. This enabled relevant alterations to ensure the animation was engaging and age-appropriate. Although the survey response rate was low for inferential statistics, descriptive analysis indicated variation in the oral health knowledge of parents and carers.

**Conclusion:** Families can offer valuable contributions to the design of health promotion interventions. A co-design method provides an approach for communicating health advice in a form that is relevant and applicable to target audiences.

**Keywords:** co-design, participatory research, dentistry, oral health, children, digital media

## Key points

- Presents in detail the process of co-designing an animated film for promoting oral health in young children.
- Provides a blueprint for clinicians and public health practitioners to incorporate lay perspectives into the design process for health promotion interventions.
- Demonstrates the utility of co-design approaches using a mixed-methods evaluation.

## Introduction

The most common oral diseases are largely preventable through oral health promotion.<sup>1</sup> Effective oral health promotion requires supportive environments, community action, and the development of personal skills to facilitate behaviour change.<sup>2</sup> Furthermore, health promotion interventions are most successful when designed in the relevant social context using a robust evidence base.<sup>3</sup> Public Health England's *Delivering Better Oral Health: An Evidence-Based Tool Kit for Prevention* provides evidence-based information to promote oral health and prevent oral diseases.<sup>4</sup> However, challenges still exist around how to effectively communicate these messages and achieve positive behaviour change, particularly in populations at greater risk of dental disease.<sup>5</sup>

In 2017 almost a quarter (23.3%) of five-year-old children in England had obvious dental caries experience.<sup>6</sup> A stark socioeconomic gradient exists, in which disadvantaged communities carry the greatest burden of dental caries. Whereas 13.6% of children in the least deprived areas had experience of dental caries, 33.7% of those in the most deprived areas had been affected.<sup>6</sup> As the most frequent reason for hospital admission of young children, 31 666 children aged 10 years or under were admitted by NHS England in the year 2016/17 for tooth extractions due to dental caries.<sup>7</sup> The rate of general anaesthetic procedures for dental caries was 2.5 to 3 times higher in the most deprived Index of Multiple Deprivation (IMD) quintile compared to the least.<sup>8</sup> Effective interventions are therefore needed to reduce disease levels, especially in more deprived communities.

A co-design approach to developing health promotion interventions, which incorporates lay perspectives into intervention development alongside that of health professionals, has been recommended as a way to create effective interventions.<sup>9,10</sup> In Portsmouth, Family Hubs are managed by the city council and offer support to children and young people up to 19 years of age. This can include playgroups, appointments with health visitors and parenting workshops.<sup>11</sup> As such, they provide an ideal setting to engage young children and their parents in the co-design process.

## **Aim**

This study aimed to co-design and evaluate an animated film for promoting oral health in families with young children.

## **Methods**

A collaborative approach to improve the oral health of families in Portsmouth was developed by Portsmouth City Council (led by CC) and the University of Portsmouth Dental Academy (led by KW). The project was supported by the Public Health England dental lead for the region (JJ), and it was competitively funded through Public Health England's pump priming fund for the South East region. The methodology was informed by contemporary co-design and co-creation strategies.<sup>9,10</sup> Ethical approval was granted by the University of Portsmouth Research Ethics Committee (Reference Number: SFEC 2018-041).

### *Co-designing the intervention*

Two co-design workshops were held in a Family Hub in Portsmouth. A purposive sample of parents/carers and children (aged four to seven years) was recruited through the Family Hub. Potential participants were initially approached by reception staff at the Family Hub and through Portsmouth City Council social media, aiming for a target sample size of approximately six parent-child dyads. Families were invited to participate if they had attended the Family Hub regularly within the past four months, were expected to continue attending during the study period and were able to speak English at a conversational level. No monetary incentives for participation were offered. A few parents confirmed that they were interested in participation but were unable to attend the scheduled workshops due to other appointments.

The first workshop was held in May 2018 (facilitated by DS, CC, TS, CS and KW) and lasted approximately 90 minutes. KW, an academic public health dentist with previous experience of co-design research, introduced the session and outlined the workshop aims. All participants engaged in three tasks: (1) an activity sheet which assessed their knowledge and understanding of oral health; (2) a priority ranking exercise, in which oral health messages were arranged in order of relative importance; and (3) feedback on three concept

storyboards produced by the design team. The three concept storyboards were introduced by DS, CC and CS, respectively, who each led the ensuing discussions around the three concepts. Throughout the session, children were encouraged to draw and write down their ideas on the activity sheets provided. The second workshop was arranged for September 2018 (facilitated by DS, CC, TS, CS and KW) and lasted approximately 60 minutes. Attendees all participated in a further four tasks: (1) feedback on recommendations that arose from the first workshop; (2) watching the animated film on three separate occasions throughout the session; (3) voting on the popularity of characters with 'happy' and 'sad' emoji signs (led by TS); and (4) one-to-one, semi-structured interviews with parents (conducted by CC and CS) using a topic guide (Table 1). CC is a public health consultant and CS is a communications officer, both of whom are experienced in discussing health issues with members of the public. The topic guide was informed by relevant published literature on oral health promotion and the principles of co-design; however, it was not tested in an interview scenario prior to use.

Non-verbal, behavioural observations were captured as fieldnotes during the workshops (recorded by TS and DS). TS is a social anthropologist trained in ethnographic research, while DS is an academic public health dentist trained in qualitative research. Both workshops were audio-recorded and transcribed verbatim. Data collected from the different sources (e.g., activity sheets and interview transcripts) were triangulated in the analysis. Qualitative data analysis of researcher fieldnotes, participant writings and audio transcripts was undertaken with NVivo software (Version 11, QSR International) using the Framework method.<sup>12,13</sup> DS and TS developed an initial framework based on key oral health messages from *Delivering Better Oral Health*.<sup>4</sup> Both researchers independently coded the data line-by-line in accordance with this framework. The framework was then refined through discussions between the two researchers to incorporate additional themes derived inductively from the data. Discussions with the whole research team led to consensus on a list of aggregated themes that was then used to develop a brief for the design team. This comprised a summary of feedback on design concepts from the workshop, alongside recommendations for subsequent alteration.

### *Evaluating the intervention*

The amended film was displayed in a different Family Hub in Portsmouth. A questionnaire

measuring oral health knowledge was offered to all parents/carers attending this Family Hub over a three-week period in May 2018. Once the animated film had been finalised, it was displayed in the Family Hub communal waiting area for a two-week period in November 2018 to be viewed passively by attending families. Immediately after the film was removed, the effect of the intervention on oral health knowledge was measured through post-intervention questionnaires over a subsequent three-week period in November and December 2018. The film was removed before this period to ensure that respondents did not complete the survey and answer the oral health knowledge questions while watching the animation. Potential differences in pre- and post-intervention responses were analysed with Chi-squared tests using SPSS software (Version 24, IBM).

#### *Managing the consent process*

A participation information sheet was distributed to all co-design participants at least three days prior to the scheduled workshop. On the day of the co-design workshop, written informed consent was obtained from each parent/carer and implied consent was assumed for their children. All questionnaire and workshop data were anonymised with codes assigned to co-design participants. Audio-recordings were kept on a storage drive belonging to the University of Portsmouth Dental Academy, and subsequently destroyed after transcription. Participants were able to withdraw consent at any time during the co-design workshops, in which case their data would not be used.

## Results

Three parents and five children (three 4-year-olds, one 6-year-old and one 7-year-old) attended the first co-design workshop. Although the sample size was smaller than the initial target, the participants' responses were highly detailed, facilitating the development of comprehensive recommendations for the design team. The findings are reported in line with the COnsolidated criteria for REporting Qualitative research (COREQ) checklist for qualitative focus groups.<sup>14</sup>

### *Workshop One: Oral health priorities*

In the priority ranking exercise, parents expressed various reasons for according oral health messages high or low priority (Table 2). Firstly, oral health messages were rated highly if directly linked to the maintenance of good oral health (e.g., tooth-brushing twice daily); and, conversely, some messages which lent more to overall health promotion, such as a low-sugar diet, were not prioritised as highly. Secondly, certain messages were prioritised as key candidates for raising awareness amongst the general public (e.g., dental check by age one), while others were ranked as low priorities due to a lack of awareness among the workshop participants (e.g., spit, don't rinse after tooth-brushing).

All three parents demonstrated an understanding of how to maintain good oral health and were able to freely voice their own opinions and what they believed other families were aware of or not. As one parent commented in response to the guidelines:

Parent: "I have heard of it all... But for other people... This one, a lot of people don't know about..."

The participants often reflected on their interactions with other parents in their past employment or volunteering roles in healthcare services to inform their comments. Parents recognised that they did not always adhere to every recommended oral health message, but justified this by according certain messages a higher priority:

Parent: "I say to my kids as long as you're brushing your teeth properly you can eat and drink whatever you want. As long as you're brushing your teeth properly..."

### *Workshop One: Design alterations*

The three concept storyboards presented at the first workshop included: (1) a superhero storyline, in which tooth-brushing superheroes rescue teeth from dental plaque; (2) a community storyline, where a family of teeth find their home has become dirty from not being brushed; and (3) an alien storyline, in which an alien arrives from outer space to teach humans how to brush their teeth properly.

Parents unanimously reported that their children enjoyed superhero stories and felt that they would relate well to a superhero storyline about tooth-brushing. They maintained a view that superheroes could be kept age-appropriate, citing *SuperTed* and *Bananaman* as positive examples of this:

Facilitator: “Are superheroes sometimes a bit scary?”

Parent: “... I think – Yeah, I think they can be down low to different levels, can’t they? You can get like ones that are a bit dark, and innocent, and – like *Spider-Man*, she loves – she watches *Spider-Man* last night, won’t you? She loves it.”

The community storyline was similarly suggested to be appropriate for the target age group. A perceived benefit of this concept was the opportunity to explain how toothache could stop the children from carrying out activities they enjoyed:

Parent: “I liked the fact that the characters explained their symptoms of toothache or the consequences of not looking after your teeth.”

Child: “Yeah, I like the one that says: ‘I hurt – I don’t want to dance!’”

In contrast to the superhero and community storylines, the younger children seemed to struggle with understanding the concept of aliens arriving from outer space. One of them started playing with a toy while the alien storyline was being discussed, and appeared to become increasingly frustrated with attempts to re-engage him:

Parent: “I think it’s a bit over his head because he’s like ‘what’s an alien? Where’s space? Where’s this separate planet?’ So it’s a bit over his head on that one.”

Judging from this feedback, a decision was made to progress the superhero storyline, which would additionally feature characters from the community storyline.

The feedback from parents and children also provided an opportunity to make specific design alterations to the characters, such as adding capes for the superheroes, re-naming characters to make their names easier to pronounce, and changing their facial expressions:

Facilitator: “What about her face?”

Parent: “Needs to be a bit smiley. It’s a bit scary. It’s like someone stood on her foot. It’s like what mummy does when she steps on *Lego!*”

#### *Workshop Two: Oral health priorities*

Two parents and four children (two 4-year-olds, one 6-year-old and one 7-year-old) attended the second co-design workshop. Shortly before the second workshop began, one parent and one child notified the research team that they were no longer able to attend. They were given the opportunity to view the animated film individually and provide feedback to CS. Although this feedback was not analysed in the same way, it was used to validate the findings of the second workshop.

Oral health advice was disregarded for focussing too elaborately on the details, rather than for the underlying message. When referring to the recommended fluoride concentrations for toothpaste (i.e., 1000 ppm up to 3 years and no less than 1,350 ppm for 3+ years), a parent raised the following point:

Parent: “Yeah, it’s just numbers and then you’re not going to take it in, are you? Like, oh yeah, it needs to have fluoride in it. And you’re not going to really remember what – Like I knew what the numbers were. But I can’t – I’m not going to remember. Even like five minutes after now, I *still* don’t remember.”

This example posed a question to the research team: how can complex information be communicated successfully without over-simplifying the core message? To counter this problem, the team chose to present the numbers visually and, following a parent’s suggestion, refer to ‘age-appropriate’ toothpaste in the accompanying voice-over.

By prioritising evidence-based advice on the timing of tooth-brushing (i.e., twice daily, one of which should be before bed-time) in the animated film, it was felt by several parents that there was a risk of downplaying the significance of tooth-brushing in the morning. As one parent noted:

Parent: “I also said about the fact that it puts a lot of focus on brushing at bed-time, but doesn’t kind of say ‘brush two times a day’...”

This concern brought the research team’s attention to the relevance of adult oral health guidance when applied to children. The team agreed that tooth-brushing programmes in schools or nurseries should not be seen as a replacement for tooth-brushing in the morning, and therefore decided to emphasise both morning and evening timings in the video.

#### *Workshop Two: Design alterations*

At the second workshop, the children seemed highly engaged by the film, mimicking some of the characters’ voices and singing along to the music even after the video had ended. In particular, the use of field observations identified non-verbal responses:

Film: “This is for the grown-ups.”

Child: (looks towards her mother and shakes her finger) “That’s for you.”

Moreover, the parents appeared to react positively when they recognised design alterations made in response to suggestions raised at the first workshop. Throughout the experience, parents seemed to value the opportunity to take part in the co-design workshops:

Parent: “I think it was really good. When I saw your post I thought I’m definitely going to do that, because I always say to people ‘where do these opinions come from?’ You know when they say ‘we’ve done a poll’ or ‘we’ve done a survey’ or, you know. And I’m thinking, well, where do these opinions come from? I’ve never been asked. So when I saw it I thought yeah, I’m definitely going to do that...”

#### *Questionnaire responses*

A total of 120 parents/carers completed the questionnaire (Table 3). This included 56 responses for the pre-intervention survey and 64 responses for the post-intervention

survey. Of those who specified their sex (95.8%), the vast majority of respondents were female (94.8%) and comparatively few were male (5.2%). The mean age of children they attended alongside was 1.6 years, ranging from 4 months to 14 years, and the mean age of adults was 32.8 years, ranging from 21 to 55 years of age. Regarding their relation to the child, 98.3% were parents, one (0.8%) was a grandparent and one was neither. Of the 114 participants who provided details on their employment status, 48 were not in employment (42.1%), 31 were in part-time employment (27.2%), and 35 were in full-time employment (30.7%). Excluding any missing data on educational attainment (6.7%), 51 respondents had degree level or above (45.5%), 46 had another type of qualification (41.1%), and 15 had no qualifications (13.4%). For the 94 participants who recorded their postcodes, the majority were in the two most deprived IMD 2015 (Index of Multiple Deprivation) quintiles: 30.9% in the lowest quintile and 39.4% in the second-lowest quintile.

There was a higher proportion of participants who understood the correct age to start tooth-brushing post-intervention; however, these differences were not statistically significant (67.9% vs. 71.9%). This was also the case in relation to recognition of the visual appearance of early enamel caries (50.0% vs. 51.6%). Both before and after the intervention, more than 90% of participants were aware of the risk of bottle-feeding with fruit juice at night (94.6% vs. 90.6%). The proportion of participants correctly identifying that appropriate levels of fluoride in toothpaste depend on a child's age differed from 57.1% to 71.9%. Although this difference was not statistically significant ( $X=2.054$ ;  $p=0.149$ ), it demonstrated the largest proportional differences before and after the intervention. Overall, most respondents preferred to gain new learning about oral health from their dentist (61.7%). The next most preferred source of information was from health visitors (8.3%).

## Discussion

Parents and young children offered valuable contributions to the design of the oral health promotion intervention. Their priorities on health did not always coincide with those of health professionals, indicating that health advice must be tailored to optimise how messages are received. Feedback on the animated film during the co-design process revealed instances of misunderstanding, ambiguity, or less relevance in the oral health advice provided, which led to improvements in the film. The finished animation has been distributed more widely by the city council.<sup>15</sup>

Evidence-based advice for preventing oral disease in young children is readily available in national guidelines.<sup>4</sup> However, parents' oral health behaviours may not reflect the evidence base and are greatly influenced by social norms, family support, cultural beliefs and media advertisements.<sup>16</sup> Oral health promotion interventions, including the use of digital media, can improve the knowledge, attitudes and self-efficacy of parents in maintaining good oral health.<sup>17</sup> Previous studies have successfully utilised co-design in oral health promotion for homeless people and socially excluded parents, although the co-design process has not been reported in significant depth.<sup>18,19</sup>

This paper adds to the limited body of work reporting on the development of co-designed interventions for promoting oral health, and offers a blueprint for incorporating lay perspectives into the design process. While dentists were the preferred source of oral health information, parents were reported as valuing advice from health visitors with regard to oral health promotion and encouraging dental attendance for infants. This is important in light of a recent interview study of health visitors in the UK, which found that a lack of awareness regarding dental services acted as a barrier to dental referrals.<sup>20</sup> It demonstrates the importance of health visitors being aware of oral health messages and referral processes for local dental services.

## **Limitations**

The study was restricted to Family Hubs in a single city in the South of England. The same participants attended both co-design workshops and this might have reduced the range of perspectives. However, it provided an opportunity for feedback on design alterations and encouraged familiarity within the group, which may have encouraged more open conversations. The animated film was passively displayed in the waiting area of the Family Hub, which means that some respondents may not have viewed the film in full before completing the survey. Since the response rate for the survey was lower than anticipated, the study had reduced statistical power to detect significant changes in oral health knowledge. Moreover, the limited study period precluded measurement of the intervention's effect on long-term retention of knowledge and behaviour change.

## **Conclusion**

Oral health promotion interventions are most successful when designed in the relevant social context using a robust evidence base. This study demonstrates that families with young children can offer valuable contributions to the design of health promotion interventions. A co-design method provides an approach for communicating health advice in a form that is relevant and applicable to target audiences. Participatory research methods, including co-design, should be evaluated in other community settings for health promotion.

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**Table 1:** Topic guide for semi-structured interviews

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|--|
| Part One: Oral health messages   |
| 1) What oral health messages, if any, did you take from the video?               |
| 2) What new learning, if any, have you gained from the video?                    |
| 3) How effective was the video in promoting oral health messages?                |
| 4) What oral health techniques would you try at home after seeing the video?     |
| 5) Is there anything you did not understand or was missing from the video?       |
| Part Two: Visuals  |
| 6) How would you describe the video?   |
| 7) What did you think of the animated characters? (appearance, names, behaviour) |
| 8) How did your children respond to the video?                                   |
| 9) How does this compare to other animated videos your children may watch?       |
| 10) How engaging/interesting do you feel the video was?                          |
| 11) Who do you feel this video is appropriate for?                               |
| Part Three: General  |
| 12) What did you like, if anything, about the video?                             |
| 13) What did you not like, if anything, about the video?                         |
| 14) What did you think of the length of the video?                               |
| 15) What are your overall views on the video?                                    |
| 16) Is there anything else you would like to say about the video?                |
| Part Four: About you   |
| 17) Where do you prefer to gain new learning about your child's oral health?     |
| 18) Have you seen other oral health promotional material?                        |
| 19) How often do you attend a Family Hub?  |

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**Table 2:** Participant quotations on oral health priorities, ranked by participants in order from most to least important

| Oral Health Priorities                                | Participant Quotations   |
|---|--|
| Age to begin tooth-brushing ( <i>most important</i> ) | <p>Parent: “When should you start brushing your teeth?”<br/>           Child: “When you’ve got all your teeth.”<br/>           Child: “Got the top set.”<br/>           Parent: “Do you think? What about when you’ve only got one little, teenie-weenie, tiny baby tooth?”<br/>           Child: “Then only brush that one tooth.”</p> <p>Parent: “The thing is, you don’t know – it changes all the time. I remember when my sister was first born, my mum was told ‘oh, don’t worry brushing her teeth until she has more’. And then, by the time I was born, four months later, they were like ‘oh no, you don’t have to brush babies’ teeth’...”</p>                                |
| Timing of tooth-brushing                              | <p>Parent: “Our dentist told us that, um, brushing your teeth in the morning is most important, because that’s when all the acid has built up in your mouth and that’s when you need to brush – in the morning – to get rid of the acid build-up, because that’s what will attack your teeth...”<br/>           Parent: “They do tooth-brushing at my daughter’s nursery school, at lunchtime...”</p>  |
| Parental supervision                                  | <p>Facilitator: “Is it easy to engage him? Like, what’s your technique?”<br/>           Parent: “He does it first and then I do it so, and we do it together.”</p> <p>Parent: “Yeah, so I make a joke of it: ‘ah, I can see a banana back there – better get that off’, I say. ‘Oh, there’s a sweet in there somewhere’, and so yeah, it just makes it a bit more fun.”</p>  |
| Duration of tooth-brushing                            | <p>Parent: “Well... the older one, as much as she knows everything, she kinda runs in and comes back out way before two minutes, and ‘that’s not been two minutes, get back in that bathroom’. It’s just... laziness... It’s just she thinks she’s been doing it for ages, and it’s been like, you know, thirty seconds, so I’m like ‘get in there’. She’s got a timer, but...”</p> <p>Parent: “My friend’s little boy has got a little Thomas train thing that goes round for two minutes and then, when it stops, he’s brushed his teeth. But the only problem is that I don’t think they realised you do each quarter... Yeah, so it’s thirty seconds in each quarter, isn’t it?”</p> |
| Dental check by age one                               | <p>Facilitator: “What about visiting your dentist by the age of one?”</p>  |

Parent: "Well, I'm saying that would be important. But also, I visited the dentist and he didn't say anything about the next time, so he didn't seem bothered about it."

Facilitator: "Really?"

Parent: "Yeah, he wasn't like making a big song and dance about it..."

Parent: "Yeah, I was just saying that I – that when you've got a new-born baby, they put a lot of emphasis on getting them registered at a GP, but they don't actually say much about going to a dentist, and I think that should be part of, like, the health visitor's job. I think it should be their role as well to make sure that babies are registered at dentists."

#### Low-sugar diet

Parent: "People probably know what they should and shouldn't let their children eat and drink but, like you said, it's so difficult to go out places because very often it's full of sugar. I absolutely hate... And although they say no sugar, no additives, they're like syrup – so sweet."

Parent: "It said about healthy diet, but it didn't say what a healthy diet *was*."

Facilitator: "So you think maybe that'd be good to say a bit more about what a healthy diet is?"

Parent: "...Like cheese after sweet stuff... To neutralize the acid."

#### Fluoride toothpaste

Parent: "A lot of this stuff that is designed for six-year-olds still doesn't have the amount of fluoride in it so..."

Parent: "Does your dentist just tell you just to use any fluoride toothpaste?"

Parent: "They said you can use any adult toothpaste... Use a pea-sized amount."

Parent: "Yeah, that's what ours told us. Because we said last time as well – didn't we? – that most kids' toothpaste on the market is like blueberry and that all weird bubble-gum flavour, and I'd much rather kids have just normal stuff."

Parent: "Yeah, the bit about parts per million and the toothpaste and, like I said, that's something I've never even looked at before on toothpaste. But I don't – I wouldn't remember that, those figures. I said 'let's look at the age rating', but I didn't – I wasn't aware that some of the ones on the market aren't the right amount."

#### Spit, don't rinse after brushing (*least important*)

Facilitator: "Are there any of these that you've not heard of before or you don't know about?"

Parent: "Em. I'm not sure about this one."

Facilitator: "Spit, don't rinse?"

Parent: "Yeah, about the rinsing. I'm not sure..."

Child: "Hate that one (referring to 'spit, don't rinse')."

Child: "Don't do it then! ...You always rinse with water."

Parent: "I've just always done it... I just can't get used to doing it without."

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**Table 3:** Questionnaire responses on socio-demographics and oral health knowledge

|   | Pre-Intervention |      | Post-Intervention |      | Total    |      |
|---|------------------|------|-------------------|------|----------|------|
|   | <i>N</i>         | %    | <i>N</i>          | %    | <i>N</i> | %    |
| <b>Gender</b>   |                  |      |                   |      |          |      |
| Female  | 53               | 94.6 | 56                | 87.5 | 109      | 90.8 |
| Male  | 2                | 3.6  | 4                 | 6.3  | 6        | 5.0  |
| Other   | 0                | 0    | 0                 | 0    | 0        | 0    |
| Missing   | 1                | 1.8  | 4                 | 6.3  | 5        | 4.2  |
| <b>Relation</b>   |                  |      |                   |      |          |      |
| Parent  | 56               | 100  | 62                | 96.9 | 118      | 98.3 |
| Grandparent   | 0                | 0    | 1                 | 1.6  | 1        | 0.8  |
| Other   | 0                | 0    | 1                 | 1.6  | 1        | 0.8  |
| <b>Employment</b>   |                  |      |                   |      |          |      |
| Full-time   | 13               | 23.2 | 22                | 34.4 | 35       | 29.2 |
| Part-time   | 16               | 28.6 | 15                | 23.4 | 31       | 25.8 |
| None  | 25               | 44.6 | 23                | 35.9 | 48       | 40.0 |
| Missing   | 2                | 3.6  | 4                 | 6.3  | 6        | 5.0  |
| <b>Education</b>  |                  |      |                   |      |          |      |
| Degree level  | 24               | 42.9 | 27                | 42.2 | 51       | 42.5 |
| Other qualification   | 22               | 39.3 | 24                | 37.5 | 46       | 38.3 |
| None  | 7                | 12.5 | 8                 | 12.5 | 15       | 12.5 |
| Missing   | 3                | 5.4  | 5                 | 7.8  | 8        | 6.7  |
| <b>Index of Multiple Deprivation</b>                                |                  |      |                   |      |          |      |
| Quintile 1 (most deprived)  | 19               | 33.9 | 10                | 15.6 | 29       | 24.2 |
| Quintile 2  | 14               | 25.0 | 23                | 35.9 | 37       | 30.8 |
| Quintile 3  | 11               | 19.6 | 9                 | 14.1 | 20       | 16.7 |
| Quintile 4  | 2                | 3.6  | 4                 | 6.3  | 6        | 5.0  |
| Quintile 5 (least deprived)   | 2                | 3.6  | 0                 | 0    | 2        | 1.7  |
| Missing   | 8                | 14.3 | 18                | 28.1 | 26       | 21.7 |
| <b>When should you start cleaning a baby's mouth after feeding?</b> |                  |      |                   |      |          |      |

|  |    |      |    |      |     |      |
|--|----|------|----|------|-----|------|
| Correct (after first tooth comes in)                                     | 38 | 67.9 | 46 | 71.9 | 84  | 70.0 |
| Incorrect  | 16 | 28.6 | 18 | 28.1 | 34  | 28.3 |
| Missing  | 2  | 3.6  | 0  | 0    | 2   | 1.7  |
| What could be the reason for white spots on a child's teeth?             |    |      |    |      |     |      |
| Correct (teeth not getting cleaned enough)                               | 28 | 50.0 | 33 | 51.6 | 61  | 50.8 |
| Incorrect  | 17 | 30.4 | 23 | 35.9 | 40  | 33.3 |
| Missing  | 11 | 19.6 | 0  | 0    | 11  | 9.2  |
| What can feeding a baby fruit juice in a bottle at night lead to?        |    |      |    |      |     |      |
| Correct (increased chance of cavities)                                   | 53 | 94.6 | 58 | 90.6 | 111 | 92.5 |
| Incorrect  | 2  | 3.6  | 1  | 1.6  | 3   | 2.5  |
| Missing  | 1  | 1.8  | 5  | 7.8  | 6   | 5.0  |
| How much fluoride does a child need?                                     |    |      |    |      |     |      |
| Correct (depends on their age)   | 32 | 57.1 | 46 | 71.9 | 78  | 65.0 |
| Incorrect  | 22 | 39.3 | 18 | 28.1 | 40  | 33.3 |
| Missing  | 2  | 3.6  | 0  | 0    | 2   | 1.7  |
| Where do you prefer to gain new learning about your child's oral health? |    |      |    |      |     |      |
| Grandparents   | 0  | 0    | 0  | 0    | 0   | 0    |
| Trusted friends  | 0  | 0    | 1  | 1.6  | 1   | 0.8  |
| Parenting websites   | 2  | 3.6  | 4  | 6.3  | 6   | 5.0  |
| Dentists   | 26 | 46.4 | 48 | 75.0 | 74  | 61.7 |
| Health visitors  | 4  | 7.1  | 6  | 9.4  | 10  | 8.3  |
| Missing  | 24 | 42.9 | 5  | 7.8  | 29  | 24.2 |