Perceptions of Fathers and Special Education Teachers Concerning Oral Health of Children with Down Syndrome: A Qualitative Approach

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Abstract

**Aim** The aim of this qualitative study was to explore the role of parents of children with Down syndrome (DS) and the role of special education teachers in creating and maintaining oral health behaviors in children with (DS) in primary school in Jeddah. **Methods** The information was collected through semi-structured interviews with 45 participants, 18 parents and 27 teachers. All interviews conducted in Arabic, then transcription in English, general thematic analysis was adopted in this study. **Results** A number of barriers related to maintaining good oral health for children are mentioned due to: Saudi lifestyle, routine and cultural standards. Moreover, there was a lack of knowledge related to promoting oral health and children's demand to brush their teeth. A preventable visit to the dentist was not necessary according to the participants, as it was required only when seeking treatment. The teachers agreed on the importance of having a school program to promote oral health and expressed willingness to participate in it; however, they also expressed their lack of knowledge about promoting it. This study concluded that Jeddah residents are keen to maintain the health of their children but do not know the correct ways to do this; moreover, they have some concern about doing so. A number of interventions are needed to improve children's oral health; these interventions need to target parents, teachers and children. **Conclusion**: the participants showed oral health was something they valued, and confidence for educating children and improving their oral health was low.

**Key words:** Oral health; Down syndrome; Qualitative research; Special education teachers; Fathers.
Introduction

It is well known that oral diseases are one of the most common diseases around the world, especially dental caries among children, which can be classified as a chronic disease (Gussy, Waters, Walsh & Kilpatrick, 2006). In any community, the children are the most important part of it. Although it is useful to maintain the status of children’s oral health as it is critical for their advancement. Some studies argue that oral health is related to the children’s growth, development, weight and general wellbeing (Selwitz et al., 2007, Shieham, 2006). Children who have dental caries may suffer from pain, which will affect their sleep and feeding and their school attendance (Anil & Anand, 2011). Further, oral health status can affect the children psychologically (Sheiham, 2006). However, maintaining the children’s oral health has a long term. Prowse et al., (2006) argued that children with good oral health are more likely to have good oral health when they become adults, which leads to the understanding that preventing oral health problems needs to start early. That was also indicated by Benzian et al., (2017), when she stated that setting oral health habits during childhood is important.

Dental caries is a multifactorial illness that contributed between three factors: biological, social and behaviours factors (Selwitz et al, 2007). Locker (2007) indicated that SES is associated with children’s oral health, arguing that children from low SES tend to have bad oral health. Edelstein & Chinn (2009) declared in their cohort study that dental caries in children is related to social factors of their parents (such as their SES, parent’s education level, parent’s income and type of home). Furthermore, there have been arguments concerning other factors. An eight-year-long cohort study conducted in China investigated other risk factors of dental caries, arguing that the presence of dental caries on primary teeth is one of the risk factors for dental caries on permanent teeth (Li & Wang 2002).
Regarding dental caries among Saudi Arabian children, Alshammari & Algahtani (2019), conducted a systematic review to measure the dental caries prevalence on primary teeth across Saudi Arabia and found it to be 78% (ranged between 0.67 to 0.87 confidence intervals). Previously, a systematic review conducted by Al-Agili in 2013 to investigate the prevalence of dental caries in Saudi children between 1988 and 2010 found that 80% of Saudi primary teeth have dental caries. Another systematic review was conducted by Al-Ansari (2014) to measure the dmft in Saudi, and found that the mean dmft of children aged from 3 to 7 years old is 7.34. Comparing these results of dental caries prevalence in children across Saudi with the United Kingdom, which is only 40% (Vernazza et al., 2016), we can state that Saudi Arabia has a high prevalence of dental caries in its children.

DS, denominated as trisomy 21, is a genetic alteration in which the affected individuals carry an extra chromosome 21 (Moraes et al., 2007). The craniofacial and oral features involved in (DS) include brachycephalic (condition where the head is disproportionately wide), usually small nose associated with a low nasal bridge, small maxilla, oval palate and tong with fissures and papillary hypertrophy (Davidovich et al., 2010). Children with (DS) have a smaller brain volume than other children. Previously unreported reductions in parietal cortex, oft-reported reductions in the temporal lobe and improper neural development might be responsible for the particular features of mental retardation that in some way result from trisomy 21 (Potier & Reeves, 2016). There is no significant difference in dental arch shape between (DS) patients and non-syndromic subjects.

According to Mubayrik (2016), people with (DS) generally have intellectual disability, variable physical characteristics, and many intraoral characteristics. The intraoral characteristics of (DS) are congenital oligodontia, malocclusion, a delayed eruption, defects in the tooth shape and size, amelogenesis imperfecta, tongue thrust, tongue disease such as hypertrophy of the tongue papilla and a fissured tongue, precipitation of a high calculus and severe periodontal
disease, as well as a lower prevalence of dental caries. Some studies on the prevalence of dental caries in (DS) have shown that there is no difference between children with (DS) and children without (DS) (Baab et al, 2015). However, other studies have shown that the prevalence of dental caries in children with (DS) is relatively low compared to other mentally retarded or normal children. It has been reported that the lower prevalence of dental caries may be caused by different environmental factors, congenital oligodontia, delayed eruption, or a different salivary composition from people without (DS). However, in several studies, acidity in the oral cavity, the salivary buffer capacity, and the number of bacteria were not significantly different from those without (DS). Therefore, the precise cause of the lower prevalence of dental caries in (DS) people is still unclear (Norderyd et al., 2015, Hala., et al, 2016). Primary and permanent teeth, and in the patients with (DS), dental anomalies occur with an incidence five times greater than in the normal population (Khocht et al., 2010). In the primary dentition, the most commonly absent teeth are lateral incisors, while in the permanent dentition, third molars, second premolars and lateral incisors, in this sequence, are the most frequently missing teeth (Wang Y, Zhao, 2015).

Farsi et al. (2009) claimed that 89% of Saudi children are at high risk of dental caries because of those social factors (such as SES and parent’s education level). A Cochrane review conducted by Walsh et al. (2010) confirmed that brushing children’s teeth using fluoridated toothpaste will help in reducing dental caries. In their study, Benzian et al. (2017) identified that children who are reminded to brush their teeth by their parents have less dental caries. However, in Saudi, there is a lack of awareness regarding teeth brushing in children. Paul (2003) reported that the majority of Saudi children aged 5 years old do not brush their teeth on a regular basis. Moreover, it has been reported that one out of every two children in Saudi has never had their teeth cleaned at all (Baghdadi 2011). That was confirmed by other studies (Al-Banyan et al, 2000; Ashiry et al, 2013; Al-Amri et al. 2015).
Further, Sabbah and colleagues (2003) claimed that the mother’s level of education as well as the children’s high consumption of sweet foods is associated with these high dmft values in Saudi. Moreover, Ba'akdah (2008) stated that the majority of Jeddah children who had high caries prevalence consume sweet foods and drinks every day. Al Dosari and colleagues (2004) argued that diet and social factors are the main reasons for dental disease prevalence in Saudi and that water fluoridation does not protect against these factors. Moreover, they stated that gender plays a major role in dental caries prevalence in Saudi, as the parents give more attention to female oral health than to male, because of the focus on female beauty.

Further, Al-Shalan and colleagues (2002) stated that the majority of Saudi parents’ have poor knowledge about when their child’s first dental visit should take place; 42% of parents thought that the first visit should be at age 3 years, while 34% of them thought it should be at 6 years (Al-Shalan et al. 2002). Further, Farsi et al. (2013) stated that 72.5% of Saudi children never visited a dentist.

Consequently, the current research explored how Saudi adults perceive the (DS) children’s oral health from the perspectives of their parents and teachers. As a result, this study looked at the perceptions of parents and special education teachers regarding their children’s/students’ oral health behaviours. Potential issues may include families’ knowledge of oral health and the value they place on their children having good oral health; families’ culture and/or beliefs and the potential effect they may have on children’s oral health; and accessibility to dental service caries prevention programmes. In addition, from a teacher’s/school’s point of view, issues may include knowledge regarding oral hygiene behaviours and the importance of oral health (including impact learning); and the evidence for school-based oral health programmes (such as ‘supervised tooth-brushing schemes’); and teachers’ agreement to be part of a school-based oral health programme.
The main purpose of this research is to explore the role of parents of children with (DS) and the role of special education teachers in establishing and maintaining children’s oral health behaviours.

This research has two main objectives:

1) To understand how parents care for their children’s oral health through an exploration of their attitudes, beliefs and behaviours regarding their children’s oral health.

2) To understand how special education teachers care for their pupils’ oral health through an exploration of their attitudes, beliefs and behaviours regarding their pupils’ oral health.

**Methods**

This study was an exploratory study focused around exploring the roles of parents of children with (DS) and special education teachers’ roles in establishing and supporting children’s oral health behaviours. In order to explore these roles, the study searched at the attitudes, beliefs and behaviours of these adults around oral health behaviours as well as their experiences. This study utilised semi-structured interviews with parents of children with (DS) and their special education teachers in inclusion primary school in Jeddah. Parents and teachers were selected for recruitment in this research as children spend half of their daytime in the school and the other half in the home, so the experiences of the participants added rich data in this study, where the lack of relevant literature in this area and in this age group in particular; no study had been conducted in Saudi Arabia to explore the parents'/teachers’ attitudes towards (DS) children’s oral health. Inclusion primary schools were used as the sampling frame for this study because they included the age range that we wanted to target, children. In primary schools, there is a special education teacher who is the head of the class. Therefore, we limited our research to target those teachers as they spend more time with the children than other teachers do.
The qualitative and exploratory nature of this study makes the researcher thoroughly agree that: “There are no rules for sample size in qualitative inquiry. Sample size depends on what you want to know, the purpose of the inquiry. What’s at stake. What will be useful, what will have credibility and what can be done with available time and resources” (Patton, 2002. p. 244). Further, Mason (2010) argued that, when conducting interviews with participants, different thoughts and stories will appear as participants do not have the same opinions. As a result, she suggested that any qualitative research should involve a large sample size of participants to be sure that no important information is missed. For that, she claimed that sample size in qualitative research must follow the perception of saturation point of information. As the aim of this research was to find the role of the families and the schools in establishing and maintaining children’s oral health behaviours, which required a deep understanding of their knowledge regarding oral health and how to prevent dental caries as well as to the oral health value of children, we included a number of participants (fathers and teachers) until we reached the saturation point. (Where no more information is gained from participants, they start to repeat the information from previous interviews (Gill et al., 2008). It was thought that more information could be gained from the fathers; however, more information was gained from the teachers, as all the teachers who were included in this study were fathers as well. There were 45 participants, 18 fathers and 27 teachers (Table 1). Most of the participants were aged from 31 to 40 years old. However, there were two senior teachers who were over 50 years old. All the teachers had a bachelor’s degree, which is the minimal requirement to be a teacher in Saudi Arabia. Teachers in Saudi almost earn the same salary. Regarding to accommodation, only two teachers owned their house, while the others rent. It should be notice that, they all live in houses. On the other hand, 88% of parents had a bachelor’s degree and earned more than 16,000 SR (£3,300) monthly. In general parents/teachers were from a good SES. The Ministry of
Education in Jeddah approved this study and we gained ethical approval from the University of Jeddah.

Table 1: Summary of participants’ socio-demographic characteristics

| Characteristics         | Fathers (n=18) | Teachers (n=27) |
|-------------------------|---------------|-----------------|
| Age group               |               |                 |
| 31-35                   | 5             | 2               |
| 36-40                   | 13            | 24              |
| 46-50                   | 0             | 1               |
| Education degree        |               |                 |
| High school             | 2             | 0               |
| Bachelor’s degree       | 15            | 27              |
| Master’s degree         | 1             | 0               |
| Employed status         |               |                 |
| Employed                | 18            | 27              |
| Non-employed            | 0             | 0               |
| Family income           |               |                 |
| 1500-2200£              | 0             | 0               |
| 2300-3300£              | 15            | 26              |
| >3400£                  | 3             | 1               |
| Family members          |               |                 |
| 1-2                     | 12            | 15              |
| 3-4                     | 5             | 10              |
| >5                      | 0             | 2               |
| Accommodation type      |               |                 |
| House                   | 18            | 27              |
| Flat                    | 0             | 0               |

Data Collecting and Analysis

The data collection of this research went through three stages. The first one was selecting the schools from where the teachers and parents would be recruited. The second stage was recruitment of the teachers who met the inclusion criteria of this research. The final stage was recruitment of the parents who were capable of being part of this research.
The first step of this research was to select the schools. The number and location of primary schools were taken from the Ministry of Education. There are many inclusion primary public schools in Jeddah city, and we could not include them all in our study. Thus, we decided to select schools randomly from each compass direction of Jeddah city.

Once access was gained to the schools, each school was contacted via email to request a formal meeting with the school director. At this meeting, information sheets and consent forms were provided to the school director, who was asked to distribute these to teachers meeting the inclusion criteria of this study. It was also arranged that the researcher would hold a meeting at the school with teachers who were interested in the study in order to answer any questions, formally enroll participants on to the study and collect the signed consent forms. The best way in which to contact parents was by sending the information sheets home with the children. This avoided the need to collect personal details of potential participants in order to contact them directly. School directors agreed to facilitate the distribution of information sheets and consent forms to parents via their children.

In addition to distributing the study information sheets, each school director sent text messages to the children’s fathers to inform them that they would receive information about a research study through their children. The children’s fathers were also informed via text message that they were welcome to attend a meeting with the researcher at their child’s school to discuss the study further.

A week after the information sheets had been sent to the parents, the director of each school set a date for the researcher to meet up with fathers in order to discuss the research with them. Each meeting was held inside the teachers’ room inside the schools; during the meetings, the fathers asked some questions about the research after it was explained to them. The number of fathers who attended each meeting were ranged from two to four fathers. All fathers who joined the meetings showed interest in being part of the research; at that point, they were
asked to sign the consent form and set a date to conduct the interview. It should be mentioned that most of the teachers and fathers’ interviews were conducted inside the schools by Arabic language. However, as the interviews took from 30 minutes to 45 minutes, some had to be delayed to the next day. Seven fathers called the researcher and asked some question about the research. Four of them showed interest in the research so the interviews were conducted in a public place, while the other three declined to participate without mentioning any reasons for the declining. All participants were informed through the participant information form and again at the start of the interview that the interviews were being recorded using a digital voice recorder. It was highlighted that all data will be stored safely and only accessible by the researcher or supervisory team. Furthermore, it was clearly explained to the participants that none of them or the institutions will be identified or named. Moreover, all participants were informed that the interviews would be transcribed, after which they would have a chance to look at them and add, modify or delete any information; this would take place over a two-week timeframe. Finally, they were informed that all the files relating to this research would be kept for a five-year period. All interviews were transcribed and encrypted in Arabic then translated into English and the participants’ real names have not been used; rather, they have been replaced with false names to keep the identity of the participants private. The first step of analysing the interviews was by analysing the socio-demographic information in order to know the participants’ age group, education level, employment status and SES. This was important for me to categorise the participants into groups based on their SES information and make award about their answer of the interview guide. After I understood the SES of each of my participants, we started the second step of analysing, using ‘thematic analysis’. Braun and Clarke (2006) argued that thematic analysis is one of the most stable analysing methods for researchers who do not have experience of qualitative studies as it is easy to learn. In this study we adopted Braun and
Clarke's (2006) phenomenologically oriented approach to thematic analysis with content analysis.

**Results**

During the interviews, all participants provided rich information regarding the value of oral health and they all agreed that it was important. Some of them explained that was because it is related to general health. In addition, they all agreed that primary teeth are as valuable as permanent teeth due because they are important from a nutrition point of view, i.e. these teeth are necessary in order for children to eat. The data was categorised into:

**Perception of Oral Health**

Perception of oral health was gauged by the participants in two ways, firstly through appearance and also through function. It was generally agreed that, if teeth were white in colour with no obvious defects and the child could eat and speak effectively, oral health was good. A good appearance to teeth was thought to be a sign of no disease. Dental caries was most often talked about, with only one participant (a teacher) referring to periodontal disease and no mention of dental trauma, which can be common among school children.

“I think it depends on the colour of the teeth and if there are any dental caries, so we consider them as healthy if the mouth is clear or if [the teeth have] no other colours [except white]...” Khalid (Teacher)

“Regarding children, I think if the child has white teeth without any different colours and this child does not show any sort of pain when he is eating, then we can say that this child apparently is in good oral health.” Fahad (Father)

Interestingly, the appearance of the mouth and teeth was linked not just with oral health, but with the health of the whole body and cleanliness in general.

“I think it is very important as it is related to body health and it also gives a picture of who the person is, healthy and clean...” Khalid (Teacher)

“It [having good primary teeth] is very important as it is related to the whole body health... we have this saying that [the] mouth is the mirror of the body health... so if the teeth [are in a] in bad condition I think the whole body will be affected by it. [Good oral health] make me think that the child is came from healthy and educate environment” Mashial (Teacher)
Appearance of the mouth and teeth was thought to have far reaching consequences for the child. It was considered by two participants that appearance could impact on the interactions between children at school and might result in isolation or loneliness for the child with a sub-optimal appearance.

“it is very important. I have a degree in psychology and I know how the appearance affects the person, even if he was adult or young. One of the [main aspects of] appearance is the tooth, so the person who does not have a good smile, I do not think that he could communicate with other people. So, you can think about children, especially that children, they like to [have] fun [with] other children... you can imagine a child with bad teeth, either broken or black, in the class. I do not think any of the children will like to talk with him and they will all the time give him nicknames such as teeth boy. I do not think that anyone wants his children to suffer from these things or have a nickname because of his teeth. I think this thing can affect his confidence in the future so the child will grow up and he does not believe in himself and is ashamed of himself” Mohammed (Teacher).

“From my experience as a teacher, if the teeth of a child are unhealthy the other children will make fun of him and might not [be friends with] him and call him the dirty boy who does not clean his teeth. That for sure will affect his psychological life.” Talal (Teacher).

Similar to appearance of the mouth and teeth, function was considered to be a marker of oral health. Children who could eat and speak without any problems tended to be considered to be in good oral health. During the interviews, many of the participants focused the necessity of teeth for food consumption.

“If you count the appearance, I think primary teeth and permanent teeth are important; however, primary teeth are so important for children as the child needs to consume food and without them they cannot.” Rami (Father)

“Oral health is crucially important as it certainly affects our eating habits; the mouth is the first point to digest food, so looking after our teeth will help [to have] a healthy body”. Shaib (Father)

Many of the parents expressed concern around their children being able to eat enough food and enough of the right food. This relates to perception of oral health in that if the child is struggling to eat, it may indicate for the parents that there is a problem with their oral health.
Conversely, the parents may think there is no cause for concern about their child’s oral health if they are able to eat without any issues.

A number of participants commented on how having poor oral health could impact on general health because food was passing through the unhealthy mouth to the rest of the body. This represents a slightly different aspect of function, as children may be able to physically eat food with poor oral health condition but they may then spread disease to the rest of the body. Thus the function of eating still happens but it does harm to the body.

“Oral health is [as] important as any other parts of the body; the mouth is the gate for the human and all the food is coming through it. I think if you have [an] unhealthy mouth that will come back at your whole body, as all the food that you consume will be affected by your mouth health.” Tariq (Teacher)

“Oral health is crucially important as it certainly affects our eating habits; the mouth is the first point to digest food, so looking after our teeth will help in the result of having a healthy body.” Shaib (Father)

“If your teeth are not healthy, that means they will have dental caries and cavities that will contain some food that had been eaten earlier; then, when the person is eating again, the cavities will mix the new food with the old food, which will make it unhealthy and can be the reason for a number of illnesses, especially for the stomach.” Mustafa (Teacher)

The ability to speak without any problems was also associated with good oral health from the participants’ viewpoint, as some participants argued that good oral health is important for being able to speak.

“teeth have many different roles, one of them is speaking; without using them, speaking becomes a very hard job.” Saud (Teacher)

“Our children use their teeth for many different things such as eating, speaking, and they make children look nice.” Mustafa (Father)

In terms of perception of oral health, it is clear from the data presented that both appearance and function are used to indicate health. Appearance, in particular the colour of teeth as well as physical function by way of eating and speaking were used as markers of good oral health. The data indicates that teachers and parents were in agreement that, if a child can smile without showing obvious discolouration, eat and speak without a problem, then that child will be in good oral health.
Knowledge and Behaviour around Prevention of Oral Diseases

Throughout the interviews, it became clear that participants had a positive attitude around the importance of keeping children’s teeth healthy and in good condition. They were all in agreement that primary teeth and permanent teeth are both important and have the same value. Some of them thought that primary teeth need more attention as they are weak and can get caries easier than the permanent teeth.

“As you know, primary teeth are linked to children so children’s food will go through the primary teeth and the child can be affected by anything as his immune system is still weak so, in order to keep your child healthy and avoid sickness, you need to take care of the primary teeth, and primary teeth, as far as I know, are weak so they need extra care than permanent teeth.” Shafi (Teacher)

The participants reported that their children did not have much information about oral health. Some participants felt that their children did not know the reasons why they should brush their teeth or of the importance of tooth brushing. This was considered, by participants, to be one of the reasons that their children did not brush their teeth.

Omar (Father): “They do not like to brush their teeth and I am sure they do not understand the reasons for teeth brushing.”

Interestingly, participants indicated that they had not tried themselves to educate their children about tooth brushing or oral health more generally. Instead they felt that any information their children had on the matter would have been gleaned from other sources such as TV or from the school, but not from them.

“I think if they get some they will get it from TV and from school.” Salman (Father)
“Not sure about that but I think as they watch TV a lot they might have.” Talal (Teacher)

Participants argued that their children were still young and careless about their own health. They reported that children at this age are much more interested in entertainment such as play and watching the television. It was also considered that this was normal for the age group.
“I do not think they are ready yet to brush their teeth. More than that, they need to understand the importance of oral health. I think if we start telling them about the difference between black teeth and white teeth and how the teeth get black and how they can keep their teeth, they will for sure brush their teeth.” Fadi (Father)

Of the fathers included in this study, it seemed apparent that they lacked the confidence to encourage tooth brushing behaviour in their children. This appeared to be because they were worried that the children would not like brushing their teeth. This was considered to be a reasonable course of action because the children were still young and did not need to brush their teeth until they were older.

“You cannot force your children to brush [their] teeth as most of their time [they] get [a] little lazy regarding teeth brushing.” Sattam (Father):
“As a father, I would like and be so happy if I see my children brush their teeth, but the problem [is that] they do not like this process, even [though] I am all the time reminding them.” Hani (Teacher)
“Well, it is not easy to take care of children, especially when talking of oral health as they do not like to brush their teeth.” Masood (Father):
“I want to force them but the problem [is] if I force them they will hate it, so I decided just to remind them.” Khalil (Teacher)
“Unfortunately, they do not use it [a toothbrush] even when I ask them to do it as they are very lazy and spend most of their time watching TV.” Khalif (Teacher)
“He is young and he does not want to have any duty at this age, more than that children at this age just care about pleasure and playing and never think of the consequences.” Adam (Father)

Some participants admitted that they were so worried that they would become unpopular with their children if they forced the issue of tooth brushing, that they didn’t bother. This was seemingly justified through concern that forcing tooth brushing on children would negatively impact on their health behaviours as adults.

“If I force them to brush their teeth they [will] for sure hate me and they will never like brushing.” Dhafiar (Father)

Some of the participants admitted that they did not carry out tooth brushing themselves. Children may pick up on actions of their parents who model behaviour to them. This may help to explain why their children did not brush either.
“My children do not brush their teeth. I am a little lazy and neglect teeth brushing, so I think that my children got this behaviour from me. Additionally, they have baby teeth which will be replaced by other teeth when they get older, [and] I will certainly ask them to brush their new teeth.” Ryan (Father)
“I think parents should start with themselves; they should brush their teeth in front of their children and ask their children to follow them.” Youssef (Teacher)
“From my experience with my students, I can tell you that usually children have the same character as their fathers. I can teach the student how to brush [their] teeth but they still need to see their father do it.” Saleh (Teacher)
“I know brushing teeth is very important and it is the best method to protect your teeth and your children’s teeth from caries, but because I am lazy and too busy to brush my teeth my children follow me in this respect.” Salman (Father)

Most of the participants stated that they have toothbrushes and toothpaste in their house.

Some of them admitted that it is not hard to get a toothbrush as they are provided free of charge.

“One of the most important necessities in my house is to provide toothbrushes and toothpaste. I also like using Miswak [wood stick] and encourage my children to use that as well.” Saad (Teacher):
“ Toothbrushes and paste are one of the basic needs in my house; they are always available for everyone [who] wants to use them.” Omar (Father)
“Personal hygiene is one of the vital aspects in our house. Toothbrushes and paste are on the top list for that.” Mishaal (Father)

Generally, it was felt that children with healthy teeth (i.e. appearance and function is fine) did not need to brush their teeth because they were already healthy and did not need to become more so. That is to say, tooth brushing was seen to be a treatment rather than a preventive activity. This was further confirmed when participants argued that they would ask their children to brush their teeth if they noticed a problem with their teeth.

" I think my children have very good oral health without any pain or discolour [action], so I do not think they need to brush their teeth. If my children have any kind of teeth problem, I will ask them to brush but for now they [are] all right.” Khalid (Teacher)
“The good thing [with] my children [is] that they all have very good oral health with white teeth, so they do not brush them, but for sure if someone has sensitive teeth I will force him to brush his teeth.” Rakan (Teacher)

To sum up, participants believe that children lack knowledge around oral health and the importance of oral health. There appears to be a belief that increasing this knowledge would
have a positive impact on their children’s oral health behaviours. However, the participants in this study did not attempt to improve child oral health knowledge despite believing that such an action would have a positive impact. It is possible that this is due to low confidence in their ability to deliver this information in an effective way. The data also indicates that parents may feel uncomfortable in giving oral health information or in encouraging oral health behaviours, for example there seems to be a belief that ‘forcing’ children to enact oral health behaviours may have a negative impact on parent-child relationships.

Interestingly, the data also revealed that parents lack knowledge around oral health and oral health behaviours themselves. Some parents believe that tooth brushing is only necessary once a dental problem has been identified seeing it as a treatment for poor oral health rather than a preventive measure.

**Knowledge around Dietary Behaviours for Oral Health**

Similar to their ideas about healthy food, some participants considered that the type of food eaten by children might have an impact on their oral health. They reported that they did their best to be sure that their children consumed healthy food (with vitamin D and calcium) in order to maintain their oral health.

“Me and their mother make sure that they drink a lot of milk as it will help them to have strong bones and teeth. There also other foods which one time I read about that also help in maintaining teeth health, such as cheese.” Saleh (Teacher)

From this data, it can be seen that participants have an understanding of the role of oral health for nutrition. Regarding sugar consumption, some participants admitted that they felt unable to control their children’s levels of sugar consumption due to sugar being readily available in the immediate environment. They clarified that, when visiting friends and relatives, it would be expected that sugary foods and drinks would be offered to their children.

“You know even if you have some control in your house, that control will disappear when they visit my family or my wife’s family.” Fahad (Teacher)
“When I visit my mother and she sees my children, [she] gives them lots and lots of chocolate and sweet foods, and I cannot say no [to] my mother.” Hammed (Father)

Some participants said that they did not feel it would be feasible to ban sugar from their house because they felt this would be unkind to their children. Additionally, they thought their children would feel such an action was unfair when sugar is so ubiquitous within their society.

“I cannot ask my children not to eat sweets when other children in the school eat [them].” Khalid (Teacher)

The point was made by others that sugary food is often given as a prize or reward for children’s achievements.

“When we have [a] competition usually the prize will be sweet food or toys” Khalid (Teacher)

It was also considered that reducing the sugary food and drink available to children could result in them protesting by refusing to eat other foods.

Saleh (Father): “Those children are in love with sweet food, they can stop eating for days if I or their mother try to reduce the sweet food.”

Participants reported that they felt more concerned about sugary fizzy drinks than they did about sugary foods. This seemed to be because they felt fizzy drinks had a negative impact on general health and on how much food children ate.

“I know that sweet food could make my child’s mouth bad, but at least he [is] still eating some food, but the problem [for] me is drinking, such as Pepsi, which affects my children’s bones, kidneys, and makes them stop eating.” Hammed (Father)

Parents interviewed reported an inability to control child sugar consumption and also appeared to be more concerned about the impact of fizzy drinks rather than sugary food. Sugary food was reported as being widely and easily available and part of normal life.

**Attitudes to Dental Visits**

The majority of participants stated that they take took children to a dentist when there was a reason for it. Some of them indicated that, if their children were in pain, they went to the
dentist to ascertain the reason behind the pain and treat it. None of them said that they would go only for check-ups, especially for their children.

“Mmm, my children never saw any dentist before as they did not need to see one; they [are] all until now in a very good condition of oral health. None of them ever complains [about] his or her teeth. For that [reason], we did not visit them [dentists].” Sam (Father)

“I will not drive my child to a dentist when there is no need to see one... if my child [is] in pain, at that time I will take him to be checked up by one and seek [the reason for the pain.]” Khalid (Teacher)

Another issue that arose during the interviews was phobia of seeing a dentist. Some participants claimed that they were scared of dentists and doctors as they were fearful of hearing bad news. Further, some participants worried that dentists might make their children scared.

“Do not think I will ever take my children to [a] dentist just for check-up, especially in this age... I get scared [in] the dentist chair and I do not want my child to face the same feeling. If you go to a dentist, even if you do not complain of anything, he or she will make your teeth bad and tell you that your teeth or your child’s teeth need to be fixed.” Saleh (Teacher)

“Yes, it [is] true that [the] dentist can see what I cannot see, but I am still a little afraid that he will tell us something that we do not like to hear or something that can be healed by itself, so, as my child [does not] complain [of any] pain, there is no need for a dentist.... You know we do not do lots of blood tests as we afraid that they will discover something or find some illness that we do not know about, and we were living with it without any problem, for that we have a saying: keep it behind the shadow and do not expose it to the sun as it does not want to see the sun.” Obaid (Teacher)

Other participants reported that they were wary of the motives of dentists who may be more interested in making money than acting in the best interests of their child.

“I had [a] bad experience with [a] dentist and I do not blame them, especially the private ones. Whenever you step into their clinic, they will make [out] your teeth [are very] bad and need lot of work just to gain some money, so if you take your child to them they will start to tell you that your child needs this and that just to gain some money, even if he does not need [anything doing].” Hammed (Teacher)

Some participants claimed that visiting a dentist without any reason does not make any difference to children’s oral health. They thought that the dentist would only give them information that they already knew.

“Visiting [a] dentist without any reason is just a waste of time. If you need any advice for your child’s oral health, you can gain it either from [a] website or from [a] pharmacy.” Abdoo (Father)
Participants appeared to be sceptical about the necessity of asymptomatic dental visits. It is not considered that there is a benefit from such visits, in fact it seems there is perceived harm from these visits, both through exposure unnecessary intervention and also to possible dental fear. At best, asymptomatic dental visits are considered to be a waste of time.

**Priorities and Daily Structure**

A number of participants reported that they did not feel they had the time to take care of their children’s oral health needs. It was reported that lifestyles are too busy and this leads to them forgetting to help their children to brush their teeth. They would rather spend their free time from work socialising with friends and family rather than dealing with child oral health behaviours.

“The person these days is too busy, working from morning until afternoon. After that, your body needs to have a nap in order to relax. After that, you need to do some stuff for your home, your family and visit your relatives. Of course, at night you need to visit your friends and when back home you will be so tired [you] forget about teeth brushing and asking other people inside [the] house to brush as well, and [you are] just thinking of sleeping and asking your children to sleep so they can get up [for] school [the] next day.” Faris (Teacher)

Some participants reported that their children do not have specified bedtimes. This sometimes leads to them not brushing their teeth as freedom around bedtime seems to be prioritised over tooth brushing.

“Children at this age do not have a specific time to sleep; sometimes they sleep before sunset while sometimes they stay awake until midnight. Lot of times my children miss their dinner because of their sleeping time, and when they sleep I would not wake them up just to brush their teeth.” Salem (Father)

Others explained that, because they have a busy social life, which contains many visits to their relatives, this means their children sometimes fall asleep before they return home and they are not then woken to brush their teeth. This again speaks to sleep being prioritised over tooth brushing.

“Furthermore, my children do not have a specific time to sleep, so after the sunset they can sleep at any time without any notice, especially on the weekend, as we visit my parents or my
wife’s parents. A lot of time during the weekend they return home after they [have been] asleep.” Khalid (Teacher)

This data indicates that the participants placed higher priority on their own social lives and their children’s sleep rather than on their children brushing their teeth. A further barrier to tooth brushing appeared to be the unstructured days which do not allow for tooth brushing routines to be easily put in place.

Oral Health Education within Schools

Many teachers and some fathers felt that there was a lack of oral health education in schools. In fact, it appeared that there was no training on offer than addressed the health of pupils at all.

“I think the Ministry of Education does not really pay any attention to health or oral health, even [though] it is important to have some courses in order to know how to deal with those issue. For example, if any student has a health problem or oral health problem, we do not know how to deal with [it], I mean first aid.” Khalied (Teacher)

“I remember one day when one student without any reason lost consciousness during playing football. I really got scared and did not know what to do except drive him to the nearest clinic. The good thing [is] that he did not lose his life, otherwise I would be responsible in front of his parents. However, if I had [attended a] first aid training course I would not [have panicked] and [would have known] what to do before we arrived at the clinic.” Faisal (Teacher)

One teacher described an incident that he felt unequipped to deal with.

“Children at this aged lose their primary teeth naturally as they became permanent. When that occurred to one student, I didn’t know how to deal with the student or what to tell him.” Obaid (Teacher)

In general, it seemed that if problems arose to do with child health and child oral health, they did not know what they should do. One teacher described an incident in which a child had lost a tooth due to dental trauma as a result of playing sport with another student.

“I was watching the students playing to ensure that they do not fight together [when] playing football. Suddenly a student was bleeding after he crashed [into] another student’s head. I [went] to him and saw the bleeding was from his moth and after washing it we realised that he [had broken] his tooth. The only thing that I could do is wash his mouth and wait for his father to show up.” Rakan (Teacher)
All the teachers interviewed welcomed the idea of being part of oral health promotion programme.

“I would like to be part of such [a] programme as I feel that my students are like my children and my brothers. I am sure that all teachers will have the same opinion.” Meshail (Teacher)

“I think this kind of programme will be very useful for the students, especially [given] that students see us as their heroes and I am sure they will follow our instructions and advice.” Salamm (Teacher)

“I am willing to be part of it. I can ask students to brush their teeth and next day I will give a prize to the students who brushed their teeth, such as a pen, or write [their] names on the board.” Raid (Teacher)

Some teachers believed that a school programme could be more effective for improving oral health knowledge and behaviours among the children as children follow teachers advice over their parents.

“From my experience, students follow the teacher's instruction and believe their information, even if it [is] wrong.” Saleh (Teacher)

Similarly, fathers seemed to agree that children were more likely to be influenced by their teachers than their families.

“Whenver I do something that does not [agree] with what my son’s teacher tells him, my son does not accept it.” Hammdan (Father)

However, some of the teachers discussed the limitations of such an approach. Not all teachers felt that a single programme would provide them with enough information to promote good oral health.

“If such [a] programme [is] admitted by the Ministry, I am happy to be part of it for free, but I think I need to read more about oral health or have [a] little course in order to know what to say to my students and my children as well.” Khalid (Teacher)

Some teachers were concerned about dealing with confrontation with parents if they needed to speak to them about their child’s oral health.

“I can tell the father that, ‘Your son has a problem with his eyes and he cannot read very well’, but telling him that, ‘Your son has bad teeth or he does not brush’ – I am not sure he will accept it and he might be angry [about] it.” Saud (Teacher)
However, this did not seem to be a problem from the perspectives of the parents interviewed. Some fathers reported that they would be pleased if a teacher discussed their children’s oral health with them and some even felt that this was actually the role of the teacher.

“I will be more than happy if a teacher takes care and looks after my son’s oral health and be sure that my son brushes his teeth. If he does that, then I will be sure that my son [is in] safe hands.” Thamer (Father)

Generally, teachers reported that they would welcome being part of an oral health programme. However, there was some concern about confrontation with parents over their children’s oral health. Additionally, teachers felt that they would not feel well equipped to deliver such education. This may indicate low confidence among teachers for providing oral health education to pupils.

**Responsibility for Oral Health**

There appeared to be a significant amount of confusion over who the ultimate responsibility for children’s oral health rested with. Parents did not feel that the child had any responsibility. Teachers felt that the responsibility lay with parents. Teachers argued that, even if they were to provide students with information and advice around tooth brushing, the responsibility for the children enacting these behaviours would still remain with their parents. They made comparisons to other behaviours such as homework and personal hygiene. They cited that these were also the responsibility of the parents and that children who carried out these behaviours were made to do so by their parents.

“I can ask children to brush their teeth, but I cannot be sure that they brush them, as this is his parents’ duty to follow as it [is] their duty to be sure that he [has] done his homework. I think that depends on the social class of the parents, because I can tell the students’ social class from their clothes and their note books.” Obaid (Teacher)

Some fathers reported that they felt that child oral health behaviours were not their responsibility as fathers, instead they were the responsibility of mothers who were in the home more often than fathers.
“My wife spends more time with my children than I, so I think [she] should take care of her children and be sure that they brush their teeth.” Khalid (Father)

The fathers interviewed tended not to think that their children had any responsibility for their own oral health either. Some said that their children are still young and they will not understand any sense of duty.

“Children at this age cannot have any responsibility due to their age and they just care and think about playing, so I think it is unfair to ruin their childhood.” Rami (Father)

Some felt that even if children started to brush their teeth they could not be given the responsibility of maintaining this behaviour in the long term.

“My child started to brush his teeth after he realised that he had a cavity; however, he only brushed [them] for a week; after that, he stopped.” Faisl (Teacher)

It was suggested that peer-to-peer support in which children encouraged each other to brush could help with the maintenance of tooth brushing behaviour.

“I think if there were other children encouraging my child to brush, he will carry on brushing.” Salman (Teacher)

Some felt that the media had a role to play, particularly as children were highly influenced by the media and the actors on television.

“My children and other children watch TV too much and they try to copy their hero, so I think if there [are] some programmes on TV or from famous people aimed to encourage children to brush [their] teeth, that will work; however, there are none.” Salm (Teacher)

There appears to be some confusion over who responsibility for child oral health sits with. Fathers cite the children’s mothers but not their children, ultimately absolving themselves of any responsibility, whereas teachers believe that the responsibility lies with parents in general.

**Discussion**

The aim of this study was to explore the attitudes of parents of children with (DS) and the role of special education teachers in Jeddah city towards the oral health of children with (DS).

To our knowledge, this study is the first of its kind in Saudi. The findings of this study may
be invaluable for determining which oral health interventions would be most appropriate within this setting. Participants reported positive attitudes to oral health in general but their knowledge, particularly around prevention of disease was low. A reason for low levels of brushing behaviours was considered, by parents themselves, to be a lack of demonstrating this behaviour to their children. That is to say, parents did not brush their own teeth and their children followed this example. This finding is supported by a study conducted by Rubin et al. (2006) in which it was found that parent’s ideas and beliefs would be reflected in their children and in their own behaviours. Several studies (Sasahara et al., 1998; Okada et al., 2002) suggest that the oral health practices of parents can be reflected in the oral health habits of their children. Hence, one could predict the risk of caries by looking at the practices of the parents. It is the parents that have the power to determine the oral hygiene practices of their children. Furthermore, significant proportion of fathers admitted that they never promote oral health to their children even though they know the importance of oral health, especially for children in this age group, and some of them claimed that they do not know how to effectively convey this information. This again demonstrates the low levels of oral health knowledge among parents as well as low levels of confidence for encouraging these health behaviours. This is important because it has been shown that reminding children to brush their teeth or helping them to do so can have an impact on caries outcomes (Benzian et al. 2017). Fathers claimed that they do not remind their children for a variety of reasons, such as having unstructured bedtime routines or no routines at all. Ultimately, they reported that tooth brushing was a low priority for them compared with their own social lives and letting their children sleep when they wanted to. All participants reported that they couldn’t control sugar consumption for different reasons; one was because of the Saudi social lifestyle in which sugary food is everywhere. Some of them stated that their children would refuse to eat any food if it was not sweet.
According to the Saudi MOH there is a dental clinic in every neighbourhood in each city and village in Saudi Arabia; however, no Saudi Arabian citizens are registered with one. However, those clinics according to the participants are just used when they need treatment. Treatment need would be determined by whether or not their children’s teeth looked discoloured and if they were having problems eating or speaking that could be attributed to oral health. During the interviews, many participants were surprised to be asked about attending the dentist for preventive purposes. They all felt that they and their children should only attend a dentist when they needed treatment.

Fathers felt ill-equipped to educate their children regarding oral health. They reported that they did not have enough information or the ability to give such information to their children. Some stated that they were too busy to give their children oral health information, this may again speak to their priorities. Therefore, it may be that children should be given some health information away from the home. This may be important for habit formation and the maintained of oral health behaviours by children themselves. Positive health habits adopted from a young age, may be likely to have an impact later in life. This is a view supported by Birch and Fisher (1998), who also add that the dilatory preferences of children are linked to several elements, including advertising and modelling, and social and cultural norms. Davies and Bridgman (2011) indicated that in the UK there were strong trends to educate children inside the school, which had a benefit in making the children aware of the importance of oral health. The authors stated that, inside the school, toys, games and books as well as a group-brushing club were all incorporated to educate the children about oral health and give positive results. However, Davies and Bridgman (2011) argued that education of young school children alone is not enough as there is a need to educate the parents as well. They argued that parents have a choice in the food types that they will buy and when to book an appointment to see a dentist, especially for young children.
Regarding teachers, we found that special education teachers had a very positive attitude to promote oral health across their students. Most of them stated that they would be more than happy to do so. However, most of them were not sure if that should be their duty, as their duty is to teach students and not to take part in oral health promotion. They argued that oral health education and promotion should be the parents’ duty and not theirs. The same result was found by a quantitative study conducted by Al-Jobair et al. (2015), whose study was conducted among teachers in the rural area of Riyadh (Al-kharj). They found that schoolteachers have good knowledge regarding oral health but they do not want to be part of any oral health promotion programmes. Furthermore, many of them refused to ask the children to see a dentist when they noticed that they had an oral health problem. The same results were found in our study, and the teachers argued that they would be scared of upsetting the fathers if they complained or provided advice regarding their children’s oral health. However, this concern was not shared by the fathers in this study.

Although, all teachers showed a positive attitude regarding oral health and all of them expressed their willingness to be part of an oral health promotion programme, they also expressed some worries regarding their lack of knowledge of how to maintain good oral health. Some of the teachers reported that school children sometimes are involved in accidents at school that result in dental trauma. They argued that they do not know what to do except to call the father and tell him what has happened. A study conducted by Al-Obaida (2010) targeting primary schools in Riyadh study a concluded that most teachers do not know how to deal with dental trauma when it happens inside the school. The study also stated that most teachers would just call the fathers. The same result was found in later on studies (Togoo et al., 2011; Al-Shamiri, et al., 2015). Thus, there is a need to educate schoolteachers on how to deal with dental trauma when it occurs. In addition, there is a need to make the school environment safe for the children. According to the WHO (2003) recommendation of
promoting oral health through the school, there should be a health team inside the school to promote children about oral health. In Saudi Arabia, according to the Saudi MOE, there is a teacher whose responsibility is to promote health and oral health; however, this role was not affective as it is supposed to be. Many teachers argued that every school has a teacher who has a duty to promote health and oral health but they either do not do or do in inappropriate methods. From that, it is reasonable to think that the teacher who is responsible for oral health promotion inside the school should at least have participated in some training course about oral health promotion.

One of the principles of the Ottawa charter (19986) was “Re-orienting healthcare services toward prevention of illness and promotion of health”, which means that there is a need for different organisations to cooperate, which requires them to work together in order to promote health and oral health. In our case, we strongly recommend that there should be collaboration between the Saudi MOH and MOE to promote oral health across Saudi schools. However, during the interviews, many of the teachers stated that such programmes are not helpful, as the oral health provider does not promote children’s oral health effectively. They indicated that their jobs are limited to provide fluoride applications without any further information. The teachers indicated that none of the oral health providers who visit the schools ever explain how to brush teeth, and none have ever brought a free toothbrush or toothpaste with them. This means that the oral health providers do not provide the children or the schoolteachers with the benefits of those fluoride applications. Furthermore, as my research (interviews) was targeting Jeddah city, which is famous for dental fluorosis (Akpata et al., 1997), such applications could cause another dental problem (dental fluorosis). Kwan et al. (2005) argued that prompting oral health across schools has many benefits. They argued that it is easy to reach people in this way rather than going to individual houses.
One of the issues that appeared in the findings was counting on others to improve the children’s oral health. The fathers were counting on teachers to educate their children on methods to brush their teeth, which was acceptable by teachers. However, some fathers claimed that mothers should supervise their children when brushing their teeth. We could not interview any mothers and ask their opinion about this issue, which limits our findings. I think there should be another future work with the same methods, targeting female teachers and mothers. By combining those two findings together, a full picture of parents’ attitudes towards their children’s oral health will emerge.

In terms of the limitations of this piece of research, even though there were attempts made to select the target schools by random, the participants within the schools were self-selecting meaning that there may be common features among the participants included in this study. This may limit the generalizability of the study findings. Further, interviews were conducted in the Arabic language, as not all the participants could speak English and interviews were transcribed and translated into English. It is possible that some of the original meaning was lost through the translation process.

Regarding SES, most participants are from the same SES, as all of our participants have a university degree and they tended to have similar household incomes. This too may have implications for the generalizability of the study findings to other SES groups. Additionally, it must be pointed out that there is conflation between the data from fathers and that of teachers. This was unplanned and happened naturally during the data collection because the teachers kept referring to their experiences as fathers. This is perhaps as a result of my own inexperience as a qualitative researcher. I should have been able to keep tighter control of the interviews and ensured that the interviews were more focused to each of the roles being investigated. It is not clear what impact this has had on the data. Finally, the most significant limitation of this research is that it was restricted to men only. This was as a result of us, a
man, being the only researcher involved in the data collection of this study. Some fathers expressed the view that their wives were closer to their children than they were because of the lifestyle and so would know better than them about their children’s oral practice. It is therefore likely that important information about home life is missing from this study. Further research might seek to circumvent this problem through the use of surveys.

Conclusion

The most striking trait in perceptions fathers of children with (DS) and special education teachers in inclusion a primary school in this study that oral health was something they valued, however, despite claiming to have good knowledge of oral health and the associated behaviours, knowledge, particularly around prevention was lacking. Furthermore, confidence for educating children and improving their oral health was low.

Abbreviations
DS: Down syndrome.
DMFT: Decayed, Missing, and Filled Teeth.

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Consent for publication
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