INTRODUCTION

While not all people consider visiting a dentist as strange or astonishing event still for some, it turns out to be an excruciatingly painful and dreadful experience. Such experiences or fear of dental treatment among the populace affects the quality of dental services and dental visits. Children are mostly the ones found to fear dentists, as they most often perceive them to be sadistic who perform procedures in their mouths that hurt. Anxiety and fear among children have plagued the practice of dental care and also affected the efficiency of patient management. Anxiety toward dental procedures, treatments of even issues is considered as an abnormal fear of paying a visit to a dentist’s clinic for proceeding with a necessary therapy or treatment. Such anxiety has repercussions on the psychological and cognitive well-being of children or adolescents. It is an acknowledged fact that those who fear dental procedures often image the treatment as more painful than it is in reality, thereby demonstrating a lack of cooperating behavior during the dental treatments. Due to fear, children avoid dental care as long as they can bear the pain, which, however, results in the severity of the oral health issue. Without treatment, negative consequences are faced by the patients where later, a more complex treatment is undertaken due to the intensified oral health issue developed because of negligence and fear of visiting the dentist.

Dental anxiety, fear, or phobia among children can be measured through the observance of nurse, parents or doctors, or through the child’s own agreeableness toward feeling fear. Comprehending fear and anxiety among children toward dental procedures, several dentists adopt innovative approaches to reduce the patients’ fear. Understanding the causes of children’s fear can also be helpful in developing effective treatment strategies. However, dentists need to develop an engaging dental practice that reduces the children’s anxiety and fear of dental procedures.

Objective: The objective of the study is to understand the attitude and perceptions of children toward dentists, dental treatment, and clinical environment. Materials and Methods: A cross-sectional study was conducted where pictorial questionnaires were distributed among 498 children, within the age range of 3–14 years, who visited dental clinics in Aseer region of Saudi Arabia. Fisher’s exact and Chi-square tests were applied to the collected data. Results: A majority (59.6%) of the children did like their visit to the dentists. About 63.1% of children preferred to be treated by a female dentist, and 53% of them liked their dentists wearing a colored coat. Female children were found to have significantly more positive responses toward protective gear of dentist and dental experience as compared to the males. Further, 9–11 years of children had more positive responses than the other children of different age groups. Conclusions: It was observed that most of the children liked visiting the clinics, and their siblings also shared their positive experience during dental treatment. However, children are found to fear the dental treatment procedure, especially the use of syringes. Fear toward dentists and clinical environment can be curbed using engaging dental practices. Children are found to be strongly affected by the gender and appearance of the dentists.

Key words: Anxiety, children, clinical environment, dental treatments
methods of care and implement anxiety management techniques so as to facilitate a smooth and caring environment for the child.\textsuperscript{34} It is therefore, recognized that studying the perceptions and attitude of children toward the dentists or dental treatment is of utmost importance as it would assist in developing intervention strategies or improving the dental visit experiences through the implementation of positive adjustments. Such a study will assist in ensuring a comfortable child experience during dental care. There are several studies exploring the element of anxiety and trust issues of children with dentists, yet, there are few studies that elaborate on the feelings of children and ideas that can be developed and applied for improving dental services. The present study was therefore conducted to understand the attitude of children, their preferences and needs considering dental care. Their perceptions toward dentists, dental treatment, and clinical environment have been studied so as to combat patient fears and deliver an efficient oral health treatment. The study is particularly focused on evaluating the perceptions of children who resides in Aseer region in Saudi Arabia.

**MATERIALS AND METHODS**

In this research, data were collected from a sample of children through the distribution of pictorial questionnaires. A cross-sectional study is conducted as cross-sectional studies are only limited to the specific time frames, where opinions of a group of people having different characteristics or demographics are taken at a given point of time. They are time and cost-efficient studies. Prior to conduct of the study, ethical approval was taken from Scientific Research Committee, King Khalid University, College of Dentistry, abha (SRC/ETH/2018-19/064). Using convenient sampling, 498 children who visited the dental clinics in Department of Pediatric Dentistry, King Khalid University, Saudi Arabia, were approached for data collection. The children within the age group of 3–14 years were considered for the study.

The questionnaire included 11-item developed and designed to comprehend the perceptions of children toward dentists. The questionnaire, placed in Appendix 1, comprised of both text and pictures [Figures 1-10] so as to make it easier for younger children to understand the questions well. The validity of the questionnaire was assessed using Cronbach’s alpha which was found to be 0.8 (acceptable). All the children were asked if they and their siblings had been to the dentist before, and their thinking and feelings about the dental visit. Their preferences toward the gender and appearance of dentists and the design of dental equipment were asked for understanding whether these attributes elicited fear among them or not. The responses of the participants were recorded through their selection of pictures in the questionnaire. Questions were also asked regarding their preference to visit the same dentist in the future.

All the responses along with the demographic data of respondents were recorded. The data collected was quantitative in nature, and its analysis and interpretation were done using the statistical tool- Statistical Package for the Social Sciences version 18.0 software (SPSS 18, IBM, Armonk, NY, United States of America). Descriptive statistics along with Fisher’s exact test and Chi-square tests were implemented at statistical significance of $P < 0.05$ to analyze the data and estimate the relationship between study constructs.

**RESULTS**

It was observed that majority (70.5%) of the study participants were female while 29.5% of the respondents were male. The statistical analysis of the gathered data made it clear that majority of the respondents (about 36.10%) belonged to 9–11 years of age group; further 29.3% of the respondents belonged to 6–8 years of age group; also 18.9% of the respondents belonged to 3–5 years of age group; and finally, only 15.7% of the respondents belonged to 12–14 years of age group.

As shown in Table 1, a majority of 71.7% of the respondents had visited dental clinics before. About 78.9% of the children had their siblings who had the past experience of visiting dental clinics. Most of the children (40.8%) voiced that their sibling shared their dental experience and told that they had liked the clinical visit. Only a minority of 26.5% revealed that their siblings had not liked the experience of visiting the clinic. When asked about their feelings toward the dental clinic, a majority of 59.6% of the children agreed that they had liked their visit.

The respondents were then asked about their perceptions toward the dentists, particularly about the attire of dentists, their gender and equipment used [Table 2]. A majority of 63.1% of the respondents stated that they preferred to be treated by a female dentist; when the responses were compared based on gender, a major portion (85.4%) of female participants preferred to be treated by female dentists with a statistically significant difference ($P < 0.001$) between the responses of male and female participants. Fifty-three percent of the respondents also preferred their dentists to wear a colored coat; however, 47% of them preferred white coats. A majority of 48.6% of the children were comfortable with their dentist wearing a mouth mask but without any protective glasses. Twenty-eight percent of them were comfortable with both of these protective gears, but 22% of the participants did not want dentists to cover their faces. When asked about the ambience of the clinic, a majority of 51.2% of the children preferred a decorative clinic, but 48.8% of the children wanted a normal clinic. Not much difference between the two opinions is witnessed. A majority of 57.2% of the children felt fearful about syringes being used. 20.7% and 12.2% of the children were apprehensive about extraction.

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forceps and handpiece, respectively. When asked about their preference toward the dentist, a majority of 63.3% of the children stated that they would prefer visiting the same doctor in the future.

Table 3 shows the comparison of responses according to the gender of children. On applying Pearson’s Chi-square test and Fisher’s exact test, it was observed that the females visited the dentists more often as compared to the males with a statistically significant (P < 0.05) difference. Female children (85.4%) preferred to be treated by female dentists, while male children (54.9%) preferred to be treated by male...
dentists, with \( P < 0.05 \). Further, females had significantly more positive responses toward protective gear of dentists as compared to the males with \( P < 0.05 \).

The comparison of response of the participants according to the age of children and experience of sibling’s visit to the dental clinic is shown in Tables 4 and 5, respectively.

**DISCUSSION**

Children are the future of humankind, and any experience they endure as a child can affect their life-long perceptions and building of their adult personalities. Poor dental experiences due to wrong perceptions of children who consider doctors as tooth-pullers leads uncalled to the management issues in a dental clinic. \[^{[5]}\] Dental behavior management problems may evolve due to stress generating situations a child undergoes during oral health treatment. Such situations are concerned with meeting strangers (dentists and nurses) during treatment, un-experienced sounds and tastes, bleeding in mouth due to procedures, keeping the mouth open for prolonged time, and having to lie down on unfamiliar or uncomfortable dental chairs. \[^{[6]}\]

While mild fear toward dental clinics or
dentists is normal, aggravated fear reactions and lack of cooperation imposes confounding situations for the dentists as well. Depending on the level of fear, different reactions may emerge and also result in the avoidance of dental treatment and severe damage to oral health.\textsuperscript{[7]}

The results and analysis of the study revealed that a dentist’s gender, appearance, and instruments used are having a significant impact on the experiences and perceptions of children toward the dentists and dental clinic. Most of the respondents preferred female dentists, and colorful coats worn by the dentists. In case of the protective gear used by the dentists, most of the respondents were comfortable with the dentists wearing a protective mouth mask but not with the glasses. Contrary to these findings, a study by Alsarheed\textsuperscript{[1]} found that children liked their doctors to wear
white coats and protective gears including both mask and glasses. However, another study by Sangeetha et al.\[8\] found that the children preferred to be treated by a female dentist. And further, they preferred colored coats over the white ones.

Jayakaran et al.\[5\] emphasized in their findings that children preferred decorative clinic walls, toys on the dental chairs, and also preferred watching cartoons during the treatment. While this is not entirely related to the specific finding of the present study, it does prove a point that children prefer colorful and decorative clothes and pediatric dental clinic ambience. As per the current analysis, majority of the children were afraid of the syringes which made them more anxious about the dental procedure as well. Most of the respondents liked visiting the dental clinic, and would prefer visiting the same dentist in the future. As per the literature review, Alsarheed\[1\] found that most of the children liked their visit to the dentists. Al-OMiri et al.\[9\] also found that while the children like their dentists, they do fear dental treatments. According to Mittal and Sharma,\[10\] negative perceptions of children further cause more distress to them as well, where they experience emotional upheaval and psychological disturbance. Fear of dental clinic may not only emerge due to painful dental encounters but also occur due to disturbing hospitalization experiences. Due to this, they do not want to visit the dentists or clinics in the future.

The current study found that the perceptions of the children varied as per their gender and age as well. Female children

| Questions                                           | Age category (years), n (%) | Total, n (%) | P     |
|-----------------------------------------------------|----------------------------|--------------|-------|
| 1st dental visit                                    |                           |              |       |
| Yes                                                 | 58 (16.2)                  | 98 (27.5)    | 131 (36.7) | 70 (19.6) | 357 (100.0) | <0.001* |
| No                                                  | 36 (25.5)                  | 48 (34.0)    | 49 (34.8)  | 8 (5.7)   | 141 (100.0) |
| Sibling has visited dental clinic before?           |                           |              |       |
| Yes                                                 | 62 (15.8)                  | 119 (30.3)   | 144 (36.6) | 68 (17.3) | 393 (100.0) | 0.004   |
| No                                                  | 32 (30.5)                  | 27 (25.7)    | 36 (34.3)  | 10 (9.5)  | 105 (100.0) |
| What did they tell you about the visit?             |                           |              |       |
| Liked it                                            | 60 (29.6)                  | 65 (32.0)    | 51 (25.1)  | 27 (13.3) | 203 (100.0) | <0.001  |
| Did not like it                                     | 19 (14.4)                  | 39 (29.5)    | 55 (41.7)  | 19 (14.4) | 132 (100.0) |
| No response                                         | 15 (9.2)                   | 42 (25.8)    | 74 (45.4)  | 32 (19.6) | 163 (100.0) |
| How do you feel during dental clinic?                |                           |              |       |
| Liked it                                            | 72 (24.2)                  | 83 (27.9)    | 104 (35.0) | 38 (12.8) | 297 (100.0) | 0.003   |
| Did not like it                                     | 18 (13.2)                  | 44 (32.4)    | 51 (37.5)  | 23 (16.9) | 136 (100.0) |
| No response                                         | 4 (6.2)                    | 19 (29.2)    | 25 (38.5)  | 17 (26.2) | 65 (100.0)  |
| Male or female                                      |                           |              |       |
| Preferred male                                      | 33 (17.9)                  | 35 (19.0)    | 75 (40.8)  | 41 (22.3) | 184 (100.0) | <0.001  |
| Preferred female                                    | 61 (19.4)                  | 111 (35.4)   | 105 (33.4) | 37 (11.8) | 314 (100.0) |
| White or colored coat                               |                           |              |       |
| Preferred white coat                                | 32 (13.7)                  | 74 (31.6)    | 88 (37.6)  | 40 (17.1) | 234 (100.0) | 0.047   |
| Preferred colored coat                              | 62 (23.5)                  | 72 (27.3)    | 92 (34.8)  | 38 (14.4) | 264 (100.0) |
| Protective gear                                      |                           |              |       |
| With mouth mask and protective glasses              | 29 (20.1)                  | 34 (23.6)    | 57 (39.6)  | 24 (16.7) | 144 (100.0) | <0.001  |
| With mouth mask but without protective glasses      | 30 (12.4)                  | 77 (31.8)    | 90 (37.2)  | 45 (18.6) | 242 (100.0) |
| Without face being covered by either                | 35 (31.2)                  | 35 (31.2)    | 33 (29.5)  | 9 (8.0)   | 112 (100.0) |
| Decorated or normal clinic                          |                           |              |       |
| Preferred decorated clinic                          | 64 (25.1)                  | 86 (33.7)    | 83 (32.5)  | 22 (8.6)  | 255 (100.0) | <0.001  |
| Preferred normal clinic                             | 30 (12.3)                  | 60 (24.7)    | 97 (39.9)  | 56 (23.0) | 243 (100.0) |
| Most anxiety                                        |                           |              |       |
| Syringe                                             | 45 (15.8)                  | 84 (29.5)    | 111 (38.9) | 45 (15.8) | 285 (100.0) | <0.001  |
| Extraction forceps                                  | 15 (14.6)                  | 31 (30.1)    | 43 (41.7)  | 14 (13.6) | 103 (100.0) |
| Hand piece                                          | 7 (11.5)                   | 19 (31.1)    | 20 (32.8)  | 15 (24.6) | 61 (100.0)  |
| Three-way syringe                                   | 17 (70.8)                  | 3 (12.5)     | 3 (12.5)   | 0 (0.0)   | 7 (100.0)  |
| Filling instrument                                  | 3 (42.9)                   | 2 (28.6)     | 2 (28.6)   | 0 (0.0)   | 7 (100.0)  |
| Do you want to be treated by the same dentist next time? | 49 (15.6)                  | 76 (24.1)    | 139 (44.1) | 51 (16.2) | 315 (100.0) | <0.001  |
| Yes                                                 | 45 (24.6)                  | 70 (38.3)    | 41 (22.4)  | 27 (14.8) | 183 (100.0) |

\*Pearson Chi-square test, *Significant<0.05, NSNonsignificant P>0.05
were found to provide positive responses when compared to their male counterparts. They also visited the dental clinics more often. It is therefore inferred, that the children who are positive and less anxious toward dental treatment visit clinics more frequently as compared to those who are anxious. When considering the age factor, 9–11 years old children had more positive responses than the other children of different age groups. On the contrary, they are also found to prefer male dentists, and dentists with white coats. Younger children, 6–8 years old, preferred female dentists and decorated coats, and were not willing to visit the same dentist the next time. As per the literature review, Suprabha et al. [11] found that the age of a child has a crucial role to play in affecting his/her perceptions toward dental clinics, dentists, and the fear of treatment. Past experiences were also found to have a strong influence. A yet another study by Kamavaram Ellore et al. [12] found that the fear among children toward dental procedures and clinics are also dependent on the demographic factors, cognition, temperament, intellectual strength, and distinct personality traits of the children. It is also affected by the past experiences, family background, and support received. These determinants affect the elicitation of fear reactions and level of anxiety among the children.

As per the current research, those children whose sibling’s visited the dental clinic earlier were interested in visiting the dentists when compared to those whose siblings did not visit the dental clinic before. Therefore, the experience, perceptions, and willingness of the children are affected by the experience of their siblings. According to Sangeetha et al. [10] children’s’ pleasant perceptions toward a dentist and clinic are formed with the positive experiences shared by their siblings. This is in alignment to the results of the present study. Ramos-Jorge et al. [13] observed that children with high anxiety and previously painful experience have

| Table 5: Comparison of responses according to sibling’s visit in dental clinic |
|-------------------------------------------------|-------------------|-------------------|-------------------|-------------------|
| Questions                                        | Sibling has visited dental clinic before | Total, n (%) |
|                                                 | Yes, n (%) | No, n (%) | Yes, n (%) | No, n (%) | p-value |
| What did they tell you about the visit?          |             |             |             |             |         |
| Liked it                                         | 173 (44.0)  | 30 (28.6)  | 203 (40.8) | <0.001*  |
| Didn’t like it                                    | 118 (30.0)  | 14 (13.3)  | 132 (26.5) |           |
| No response                                      | 102 (26.0)  | 61 (58.1)  | 163 (32.7) |           |
| How do you feel during dental clinic?            |             |             |             |             |         |
| Liked it                                         | 225 (57.3)  | 72 (68.6)  | 297 (59.6) | 0.109NS  |
| Did not like it                                   | 114 (29.0)  | 22 (21.0)  | 136 (27.3) |           |
| No response                                      | 54 (13.7)   | 11 (10.5)  | 65 (13.1)  |           |
| Male or female                                   |             |             |             |             |         |
| Preferred male                                   | 144 (36.6)  | 40 (38.1)  | 184 (36.9) | 0.820NS  |
| Preferred female                                 | 249 (63.4)  | 65 (61.9)  | 314 (63.1) |           |
| White or colored coat                            |             |             |             |             |         |
| Preferred white coat                             | 183 (46.6)  | 51 (48.6)  | 234 (47.0) | 0.742NS  |
| Preferred colored coat                           | 210 (53.4)  | 54 (51.4)  | 264 (53.0) |           |
| Protective gear                                  |             |             |             |             |         |
| With mouth mask and protective glasses           | 122 (31.0)  | 22 (21.0)  | 144 (28.9) | 0.085NS  |
| With mouth mask but without protective glasses   | 182 (46.3)  | 60 (57.1)  | 242 (48.6) |           |
| Without face being covered by either             | 89 (22.6)   | 23 (21.9)  | 112 (22.5) |           |
| Decorated or normal clinic                       |             |             |             |             |         |
| Preferred decorated clinic                       | 199 (50.6)  | 56 (53.3)  | 255 (51.2) | 0.661NS  |
| Preferred normal clinic                          | 194 (49.4)  | 49 (46.7)  | 243 (48.8) |           |
| Most anxiety                                     |             |             |             |             |         |
| Syringe                                          | 222 (56.5)  | 63 (60.0)  | 285 (57.2) | 0.303NS  |
| Extraction forceps                               | 86 (21.9)   | 17 (16.2)  | 103 (20.7) |           |
| Hand piece                                       | 48 (12.2)   | 13 (12.4)  | 61 (12.2)  |           |
| Three-way syringe                                | 19 (4.8)    | 5 (4.8)    | 24 (4.8)   |           |
| Filling instrument                               | 3 (0.8)     | 4 (3.8)    | 7 (1.4)    |           |
| Suction                                          | 9 (2.3)     | 2 (1.9)    | 11 (2.2)   |           |
| Overhead light                                   | 6 (1.5)     | 1 (1.0)    | 7 (1.4)    |           |
| Do you want to be treated by the same dentist next time? | | | | |
| Yes                                              | 248 (63.1)  | 67 (63.8)  | 315 (63.3) | 0.910NS  |
| No                                               | 145 (36.9)  | 38 (36.2)  | 183 (36.7) |           |

*Fisher’s exact test, **Pearson Chi-square test, *Significant<0.05, **Nonsignificant P>0.05
higher chances of being uncooperative with the dentists during treatment. Onyejaka et al.\(^{[14]}\) reported that children visit dental clinics for follow-ups due to the emphasis laid by the dentists and that the parents are inefficient at making time to visit the clinics. While the present study did not question regarding the parents, it is acknowledged that siblings or family members do play a part in motivating the children to visit dental clinics. Yet, in most of the scenarios, visiting a dentist is a decision made by the parents and not the children themselves.\(^{[15]}\) Parents are found to have a large impact in the dental behavior among their children, wherein they influence the child’s attitude toward perceived maintenance of oral health as good and essential.\(^{[16]}\) On the other hand, parents who are not enough supportive or those who show more interfering attitude are found to generate anxiety among children, which is further found to exist in their adult life. Parents, if themselves, are anxious about dental care, the same is conveyed to the children.\(^{[16]}\) Apart from this, fear of dentists or clinical environment may emerge due to traumatic and painful past experiences with the treatment, unprofessional and bad attitude of dentists, or lack of awareness toward the dental treatments.\(^{[17]}\)

**CONCLUSIONS**

The study has found age and gender of the children to have significant impact on their perceptions toward dentists and clinical environment. It was observed most of the children liked visiting the clinics, and their siblings also shared their positive experience during dental treatment. However, children are found to fear the dental treatment procedure, especially the use of syringes. In this regard, the study offers recommendation where the dentists must also evaluate the multifactorial etiology of anxiety and fear among children for ensuring that better care is provided in pediatric dental clinics. A decorated ambience of the dental clinic must be created where colorful walls and toys should be displayed to ease the mind of young children. The dentists must also find the predictive factors for child behavior during the first check-up by asking relevant questions from the child or their parents. Finally, the parents must put in more efforts in motivating their children to improve their oral health, and also taking them to dentists for frequent regular check-ups.

**Declaration of patient consent**

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Nil.

**Conflicts of interest**

There are no conflicts of interest.

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## APPENDIX

### Appendix 1: Questionnaire

| Questions                                                                 | Options                                    |
|---------------------------------------------------------------------------|--------------------------------------------|
| Age/gender                                                               | Months/male/female                         |
| First dental visit                                                       | Yes                                        |
| Sibling has visited dental clinic before                                 | Yes                                        |
| If your answer to above question was yes what did he/she tell you about the visit | Liked it, Didn't like it, No response     |
| How do you feel during the dental clinic                                 | Liked it, Didn't like it, No response     |
| Response to picture when shown a male or a female dentist                | Preferred male                             |
| Response to picture when shown a dentist in white or colored coat         | Preferred white coat                       |
| Response to picture when shown a dentist in protective gear              | With mouth mask and protective glasses     |
| Response to picture when shown a decorated and a normal dental clinic   | Preferred decorated clinic                 |
| What caused the child most anxiety                                       | Syringe, Extraction forceps, Hand piece, 3 way syringe, Filling instrument, Suction, Overhead Light |
| Do you want to be treated by the same dentist next time                  | Yes                                        |