

## SURVEY

# Prevalence of Dental Fear and Anxiety and Its Triggering Factors in the Dental Office among School-going Children in Al Ahsa

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## ABSTRACT

### Aims and objectives:

- To estimate the prevalence of dental fear and anxiety (DFA) among school-going children in Al Ahsa.
- To identify the factors that trigger DFA in the dental office.

**Materials and methods:** A cross-sectional questionnaire-based study was conducted. Eight hundred and sixteen, 7–12-year-old children studying in government and private schools spread across the city of Al-Ahsa, Saudi Arabia, participated in the study. A self-reported questionnaire with 15 close-ended questions pertaining to DFA in logical order was distributed to all the participants. Each question had three options as responses with images. The children were asked to choose the option that best fitted their response.

**Results and Conclusion:** The prevalence of DFA among boys and girls was found to be 50.4 and 71.28%, respectively. The majority of the boys studying in government schools reported DFA when informed about the treatment in advance, while most of those studying in private schools reported DFA at the sight of the dental chair and dental injections, while walking into the clinic, in the waiting room, when informed about the treatment in advance and their tooth being drilled. On the contrary, the responses were very similar among girls irrespective of their school. Most of the boys and girls did not experience any DFA when their parents were allowed to accompany them. Hence, a tailor-made approach for the management of the child in the dental office is warranted.

**Clinical significance:** A tailor-made approach for the management of DFA in the dental office plays a significant role in successful treatment.

**Keywords:** Children, Dental anxiety, Dental fear, Prevalence, School.

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## INTRODUCTION

The terms dental fear and dental anxiety are often used interchangeably in the literature. Hence, dental fear and anxiety (DFA) is the term used to describe all sorts of fears and anxieties related to dentistry.<sup>1</sup> It is a unique problem with multifactorial etiology affecting all age groups.<sup>2,3</sup> The environment of the dental clinic, stress-induced while undergoing any procedure, cognitive abilities of the individual, parental attitudes, and cultural practices have been found to have some influence on DFA.<sup>4</sup>

Different studies conducted in different countries have reported that the prevalence of DFA to be 12.5% in Canada,<sup>5</sup> 12.6% in Russia,<sup>6</sup> 13.5% in France,<sup>7</sup> 16.1% in Australia,<sup>8</sup> and 30% in China.<sup>6</sup> Some studies conducted in Saudi Arabia have reported that DFA among adults is 27 to 51%.<sup>4,9</sup> Dental fear and anxiety can limit the utilization of oral health services, which in turn affect early detection and management of the disease.<sup>7,10,11</sup>

Dental fear and anxiety among children is not only frustrating for the child and their family but challenging for the dentist as well. Very often, the planned treatment procedures have to be deferred due to behavior management issues.<sup>12,13</sup> If this gets repeated, it enhances the negative behavior and such patients are extremely difficult to treat by conventional means. Children with higher levels of DFA are likely to have more untreated carious teeth. Thus, it results in poor oral health and an increase in expenses toward dental services.<sup>2,7,12</sup> A longitudinal study conducted on 7–9-year-old children having DFA has reported that at the age of 7 years, 3% of children had complained of toothache; 4% of them had undergone painful treatment. Furthermore, the increase in

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new carious lesions affecting primary and permanent dentitions was found to be 5 and 7%. On the other hand, among 9-year-old caries affecting primary dentition was found to be 4% and the increase in new carious lesions affecting primary and permanent dentitions was 5 and 9%.<sup>2</sup>

The current study was aimed to know the prevalence of dental anxiety and fear in children and to identify the factors that trigger DFA in the dental office.

## MATERIALS AND METHODS

### Study Design

A cross-sectional questionnaire-based study was done for 5 weeks from March 5, 2019, to April 12, 2019. Before the commencement of the study, approval from "College Research Review Committee" (CRRC), College of Dentistry, King Faisal University, Al Ahsa (approval No: KFUCoD/R/0011/2019 DATED 04/04/2019) and permission from the selected schools were obtained.

### Study Participants

Four government and four private schools spread across the city of Al-Ahsa, Saudi Arabia were randomly selected and from each school, all the 7–12-year-old children were selected. Eight hundred and sixteen children from these eight schools participated in the study with their parental consent.

### Data Collection

A 15-item questionnaire was developed in English based on Aberer Children Dental Anxiety Scale (ACDAS).<sup>10</sup> To ensure content validity, the questionnaire was translated to Arabic by one of the authors with the assistance of an expert who had good command over both languages. Furthermore, the piloting of the questionnaire revealed that there was no need for any changes.

The structured questionnaire in the Arabic language was provided to all the students who had parental consent. Before the distribution of the questionnaire, it was confirmed with the students that they had previous dental visit experience. The purpose and method of filling the questionnaire were clearly explained at the beginning of the session to the participants and all of them completed the form individually. The questionnaire had two sections wherein the initial part had the general information like age, gender, grade, and school and an approval box to provide participants' assent. The second part comprised of a self-reported questionnaire with 15 close-ended questions pertaining to DFA appearing in logical order. Each question had three options with facial images. Facial Image 1 represented the feeling of a relaxed, happy, "not anxious" person. Facial Image 2 represented a fair feeling of being "slightly anxious." Facial Image 3 represented the scary feeling of being "very anxious". The child was asked to choose the best option that best fitted his response. Only completely filled questionnaire forms were considered. Scores 1, 2, and 3 were assigned to Images 1, 2, and 3 respectively. The prevalence of dental anxiety was calculated based on the responses received for all 15 questions. A total score of 15 was considered as "not anxious" while the score 16 and above was "Anxious." All the 816 questionnaires were returned and were found to be completely answered without any missing data. The data were entered into a spreadsheet for further statistical analysis.

### Statistical Analysis

Data were analyzed with Statistical Software for Social Sciences, IBM SPSS version 16. The prevalence of DFA and the difference in the proportion of DFA between boys' and girls' students studying in government and private schools were assessed using the Chi-square test.  $p \leq 0.05$  was considered as statistically significant for all analyses.

## RESULTS

Eight hundred and sixteen, 7–12-year-old students studying in government and private schools participated in the study. There

was almost an equal representation of boys (49.3%) and girls (50.7%). Table 1 represents the prevalence of DFA. It was found that 50.4% of boys ( $N = 403$ ) and 71.28% of girls ( $N = 413$ ) were anxious and the differences were statistically significant ( $p = 0.000$ ).

Table 2 represents the factors triggering DFA in the dental operatory. In response to the question, "If you are going to your dentist for treatment tomorrow, how you would feel?" among the boys studying in the government school, 59.5% reported as not anxious, 32.7% slightly anxious, and 7.8% very anxious, whereas in private schools 43.6% of the children reported as not anxious, 43.6% slightly anxious, and 12.8% as very anxious and the differences were statistically significant ( $p = 0.007$ ). However, among girls studying in the government school, 30.4% were not anxious, 52.2% were slightly anxious, and 17.3% were very anxious. Further, in private schools, 39% of the children were not anxious, 45.5% were slightly anxious, and 15.4% were very anxious ( $p = 0.238$ ) and the differences were statistically not significant.

When asked about their feeling while sitting in the waiting room, the majority of the boys reported not anxious (52% in government and 44% in private school). 39.2% of boys studying in government school felt slightly anxious, 7.8% of them felt very anxious while those studying in private school 40.4% reported slightly anxious, 15.6% of them very anxious ( $p = 0.046$ ). On the contrary, the majority of the girls felt anxious when made to sit in the waiting room ( $p = 0.947$ ).

Boys studying in government schools (52.4%) did not feel any anxiety while walking into the dental clinic area, while 59.2% of them studying in private school felt anxious ( $p = 0.024$ ). However, the majority of girls did feel anxious while walking into the clinic irrespective of their school of study (77.2% in government and 70.7% in private school;  $p = 0.351$ ).

When they were made to watch another child being treated 62.1% of boys from government school were not anxious while 45.6% from private school were not anxious ( $p = 0.003$ ). In contrast, few of the girls were not anxious (23.9% in government and 26.8% in private schools;  $p = 0.491$ ) while the majority of them felt slightly anxious (56.7% in government and 50.4% in private schools). Similar observations were seen when they had to watch their siblings or parents being treated and the differences were statistically not significant ( $p = 0.072$  for boys;  $p = 0.839$  for girls).

Even though, a significant number of boys preferred to be informed in advance about the treatment (48.4% in government; 40.4% in private schools) majority of them had anxiety ( $p = 0.007$ ). When informed about the treatment in advance, most of the girls reported slight anxiety (46.7% in government and 35% in private school;  $p = 0.088$ ).

The sight of a dental chair led to anxiety in girls predominantly ( $p = 0.001$ ) when compared with boys ( $p = 0.998$ ). Further, the majority of boys studying in private schools ( $p = 0.003$ ) and girls irrespective of the schools ( $p = 0.035$ ) were anxious when they saw the dentist in their professional attire. However, 61.4% of the boys studying government schools did not show any DFA toward dentist's attire.

**Table 1:** Prevalence of dental anxiety and fear

Boys ( $N = 403$ )		Girls ( $N = 413$ )		<i>p</i> value
Not anxious ( $\leq 15$ )	Anxious ( $\geq 16$ )	Not anxious ( $\leq 15$ )	Anxious ( $\geq 16$ )	
203 50.4%	200 49.6%	119 28.72%	294 71.28%	0.000*

\*Significant

Table 2: Difference in the perception of male and female students studying in government and private schools

Question	Male (N = 403)						Female (N = 413)						Pearson Chi-square value - female
	Government school (N = 153)			Private school (N = 150)			Government school (N = 289)			Private school (N = 124)			
	Not anxious	Slightly anxious	Very anxious	Not anxious	Slightly anxious	Very anxious	Not anxious	Slightly anxious	Very anxious	Not anxious	Slightly anxious	Very anxious	
If you are going to your dentist for treatment tomorrow, how would you feel?	91 59.5%	50 32.7%	12 7.8%	109 43.6%	109 43.6%	32 12.8%	88 30.4%	151 52.2%	50 17.3%	48 39.0%	56 45.5%	19 15.4%	0.238
If you are sitting in the waiting room for dental treatment, how would you feel?	81 52.9%	60 39.2%	12 7.8%	110 44%	101 40.4%	39 15.6%	81 28%	136 47.1%	72 24.9%	33 26.8%	60 48.8%	30 24.4%	0.947
What do you experience when you walk into the dental clinic?	83 54.2%	54 35.3%	16 10.5%	102 40.8%	107 42.8%	41 16.4%	66 22.8%	156 54.0%	67 23.2%	36 29.3%	63 51.2%	24 19.5%	0.351
Before the treatment, how do you feel when you are watching the treatment being done on another child?	95 62.1%	46 30.1%	12 7.8%	114 45.6%	96 38.4%	40 16.0%	69 23.9%	164 56.7%	56 19.4%	33 26.8%	62 50.4%	28 22.8%	0.491
Before the treatment, how do you feel when you are watching the treatment being done on your siblings or parents?	82 53.6%	60 39.2%	11 7.2%	121 48.4%	92 36.8%	37 14.8%	109 37.7%	131 45.3%	49 17.0%	50 40.7%	54 43.9%	19 15.4%	0.839
If you are informed about the treatment before the procedure, how do you feel?	74 48.4%	63 41.2%	16 10.5%	101 40.4%	92 36.8%	57 22.8%	77 26.6%	135 46.7%	77 26.6%	40 32.5%	43 35.0%	40 32.5%	0.088
How would you feel when you look at the dental chair?	97 63.4%	41 26.8%	15 9.8%	158 63.2%	67 26.8%	25 10.0%	88 30.4%	132 45.7%	69 23.9%	54 43.9%	58 47.2%	11 8.9%	0.001*
How do you feel when your dentist is wearing professional attire (like an apron, his gloves, and mask)?	94 61.4%	48 31.4%	11 7.2%	111 44.4%	104 41.6%	35 14.0%	95 32.9%	114 39.4%	80 27.7%	37 30.1%	64 52.0%	22 17.9%	0.035*
How do you feel with the smell of the dental clinic or the dental materials used while treating you?	88 57.5%	49 32.0%	16 10.5%	134 53.6%	78 31.2%	38 15.2%	63 21.8%	121 41.9%	105 36.3%	34 27.6%	66 53.7%	23 18.7%	0.002*
If you have a lot of doctors are sitting around you in the clinic how do you feel?	67 43.8%	55 35.9%	31 20.3%	77 30.8%	92 36.8%	81 32.4%	43 14.9%	104 36.0%	142 49.1%	19 15.4%	54 43.9%	50 40.7%	0.251
How do you feel when you are hearing other children in the clinic crying?	89 58.2%	41 26.8%	23 15.0%	109 43.8%	90 36.1%	50 20.1%	51 17.6%	127 43.9%	111 38.4%	31 25.2%	52 42.3%	40 32.5%	0.188

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Question	Male (N = 403)						Female (N = 413)						Pearson Chi-square value - female
	Government school (N = 153)			Private school (N = 150)			Government school (N = 289)			Private school (N = 124)			
	Not anxious	Slightly anxious	Very anxious	Not anxious	Slightly anxious	Very anxious	Not anxious	Slightly anxious	Very anxious	Not anxious	Slightly anxious	Very anxious	
If your parents are allowed to be with you while you are being treated, how would you feel?	115	32	6	167	68	15	154	107	28	74	39	10	0.438
How do you feel when you are hearing your family and friends' experiences with their dentists?	75.2%	20.9%	3.9%	66.8%	27.2%	6.0%	53.3%	37.0%	9.7%	60.2%	31.7%	8.1%	0.220
If you are about to receive an injection, How would you feel?	78	54	21	130	99	21	95	136	58	42	65	16	0.124
If you are about to have your tooth drilled, how would feel?	51.0%	35.3%	13.7%	52.0%	39.6%	8.4%	32.9%	47.1%	20.1%	34.1%	52.8%	13.0%	0.000*
	80	51	22	84	66	100	42	73	174	28	29	66	0.000*
	52.3%	33.3%	14.4%	33.6%	26.4%	40.0%	14.5%	25.3%	60.2%	22.8%	23.6%	53.7%	0.648
	80	42	31	85	65	100	68	97	124	28	47	48	0.648
	52.3%	27.5%	20.3%	34.0%	26.0%	40.0%	23.5%	33.6%	42.9%	22.8%	38.2%	39.0%	

\*Significant

Further, most of the girls showed signs of significant DFA ( $p = 0.002$ ) to the smell of the dental clinic and the materials. On the contrary, most of the boys did not show any DFA to smell the dental clinic and materials ( $p = 0.291$ ). When they heard another child crying in the clinic, the majority of the boys studying in government school did not fear it. However, a significant number of them studying in private school were either slightly anxious or very anxious ( $p = 0.020$ ). In contrast, most of the girls revealed DFA to another child crying in the clinic which was statistically significant ( $p = 0.188$ ). The majority of the boys and girls did not experience any DFA when their parents were allowed to accompany them during the procedure.

When they heard about the past dental experiences from their family and friends, the majority of boys did not have DFA while most of the girls were slightly anxious. However, none of these differences was statistically significant. 52.3% of boys studying in government schools did not fear dental injections while 40.1% of them in private schools felt very anxious ( $p = 0.000$ ). However, 60.2% of the girls in government schools and 53.7% of them studying in private schools felt very anxious about the dental injections ( $p = 0.124$ ) and these differences were not statistically significant. Very similar observations were found when the tooth was being drilled ( $p = 0.000$  for boys and  $p = 0.648$  for girls).

The majority of the boys studying in government schools reported DFA when informed about the treatment in advance, while most of those studying in private schools reported DFA at the sight of the dental chair and dental injections while walking into the clinic, in the waiting room, when informed about the treatment in advance and their tooth being drilled. Similarly, girls reported DFA while walking into the clinic, in the waiting room, if another child was crying in the clinic, the smell of dental clinic and the materials, dental injections, the tooth being drilled, and past dental experiences from their family and friends irrespective of their school type. Most of the boys and girls did not experience any DFA when their parents were allowed to accompany them.

Figure 1 depicts the DFA among boys and Figure 2 summarizes the DFA in girls. In the present study, boys reported DFA (Fig. 1) the most, to the item when a lot of the doctors were sitting around them followed by dental injection, the tooth being drilled. However, the majority of them did not report DFA when their parents were allowed to be with them while being treated. Similarly, the majority of the girls reported DFA to all the items (Fig. 2) in the questionnaire except when accompanied by the parents during the procedure.

## DISCUSSION

Despite the advent of technology in dentistry, DFA is still one of the main challenges to the dentist while treating the patient.<sup>6</sup> It is known that children with higher levels of DFA are more likely to have untreated carious teeth and poor oral health.<sup>2,7</sup> Further, invasive dental procedures are more likely to cause DFA among children. To instill a positive attitude toward dental treatment, the dentist needs to identify the factors which can cause DFA and modify the approach toward the planned treatment.<sup>14,15</sup> Furthermore, to correlate the causes and management of DFA, studies done in children have been considered to be more reliable than those conducted in adults.<sup>10,16</sup> Even though some studies have been conducted on DFA in children, none have been reported among the school-going children in this region of Eastern Province in Saudi Arabia. Thus, the present study was aimed to estimate the prevalence of DFA and to identify the factors that trigger DFA in

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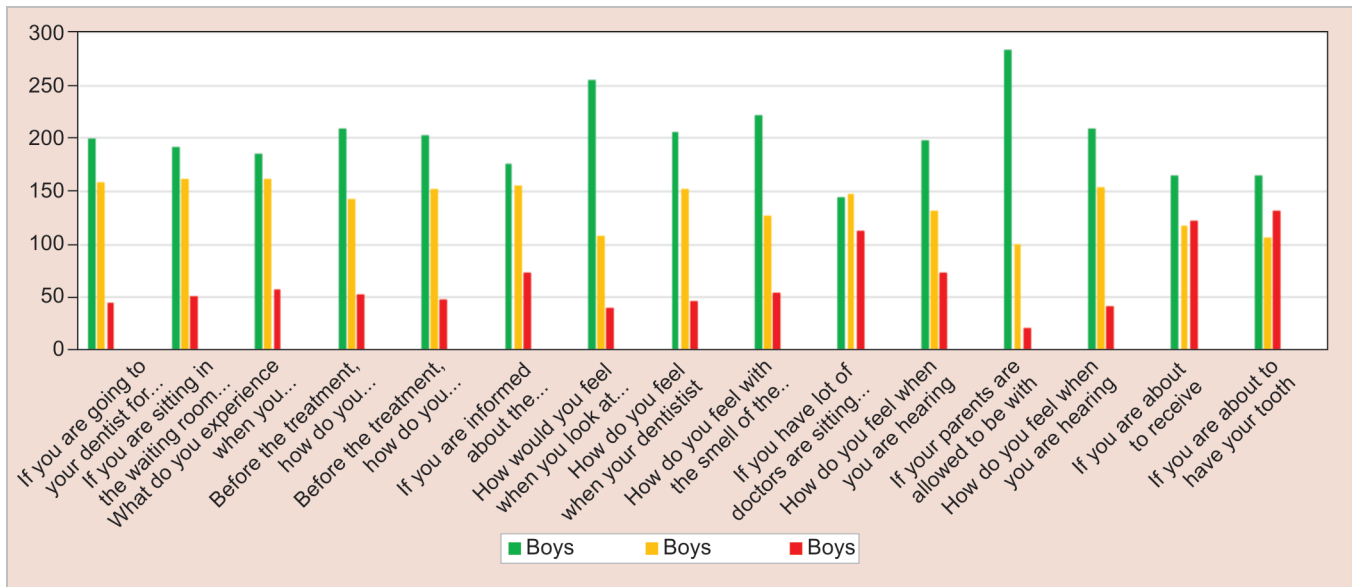


Fig. 1: Dental fear and anxiety among boys

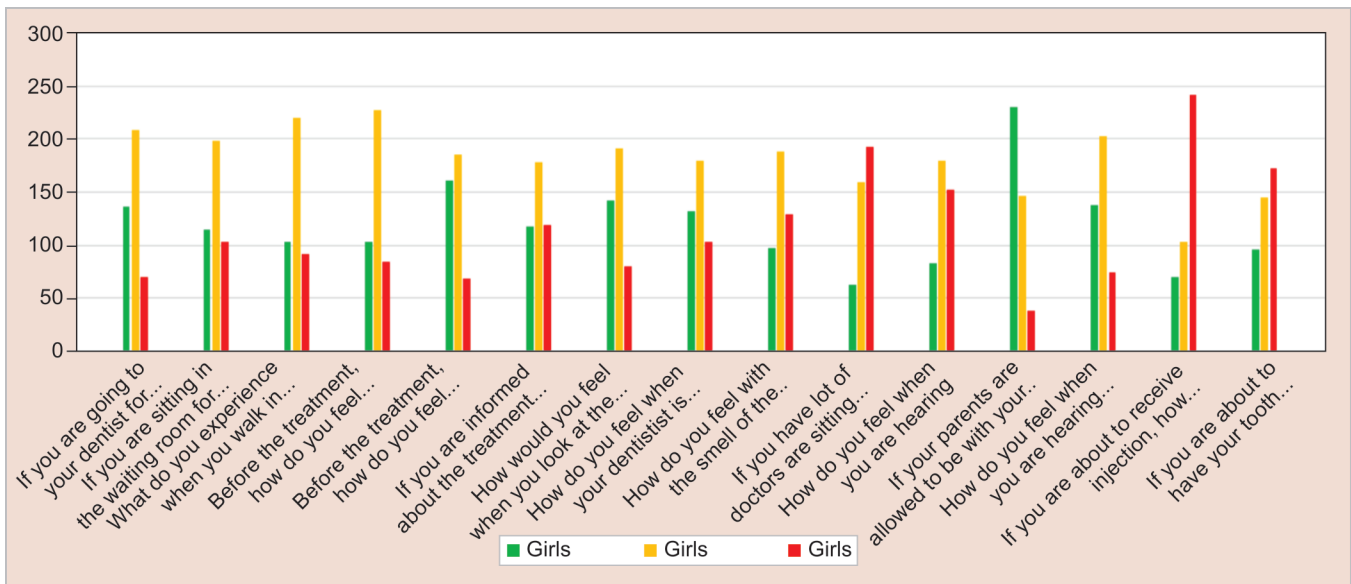


Fig. 2: Dental fear and anxiety among girls

dental operatory among school-going children in Al Ahsa, Eastern Province, Saudi Arabia.

There is no concrete explanation available to describe the development and etiology of DFA in children. Several studies have opined that DFA could be due to multiple factors like age, sociocultural background, parents' and siblings' past dental experiences, or their own experiences.<sup>1,6,10,13</sup> In the present study, 7–12 years of age children were selected as their cognitive development would enable them to understand the questions and provide appropriate answers.<sup>17</sup> Many scales such as CDAS, MDAS, CDFSS, Dental Anxiety Inventory (DAI), and FIS are available to assess dental anxiety. However, due to their own limitations, none of these tools have been considered as a gold standard.<sup>15,18,19</sup>

Abeer Children Dental Anxiety Scale being the first dental anxiety scale for children and adolescence has 13 self-reported questions concerned about the feeling of the child's dental

experiences. Each question uses facial images which represented the feeling of Happy, OK, or Scared.<sup>10,11</sup> As the influence of certain new factors was intended to be evaluated the questionnaire was developed. The prevalence of DFA is usually determined by the questions and the assessment tools used. Self-reported scales are often used as they are more reliable even in children who can read and have the cognitive abilities to understand how to report their anxiety on a scale.<sup>20–22</sup> Considering the anticipated cognitive development among 7- to 12-year-old children, the facial images with the options of "Not anxious", "Slightly anxious", and "Very Anxious" were considered. Thus, 15-item self-reported questionnaire was developed according to the needs of the present study.

The prevalence of DFA was found to be 50.4% in boys ( $N = 403$ ) and 71.28% in girls ( $N = 413$ ). Such high prevalence can be attributed to the fact that age is inversely related to dental

anxiety.<sup>9,23</sup> It has also been suggested that children who have had previous dental experiences could have higher levels of dental anxiety.<sup>13,24,25</sup> In addition, a study reported that the difference in DFA among Arabic-speaking and developed countries may be attributed to the differences in culture and organization of healthcare delivery system. In developed countries, preventive measures are emphasized more than curative measures whereas in developing countries most children seek dental treatment only when in pain.<sup>1</sup> There is no consensus on the relationship between DFA and gender in the available scientific literature as different studies have reported contradicting observations. For example, most studies have concluded that the incidence of DFA is more in girls than boys; while some studies found that boys are more fearful and frequently try to escape during their dental visit.<sup>26-29</sup> However, few studies have reported that there is no significant relationship between DFA and gender.<sup>30,31</sup> In the present study, it was found that girls have more DFA than boys.

The differences in study design, sampling, and DFA scales used to make it difficult to draw accurate comparisons with other studies. However, an overview of the factors that trigger DFA among children can be outlined. The majority of the studies have reported that dental injections and extraction as the most fearful procedures followed by "tooth being drilled".<sup>1,4,6,8-11</sup> In the present study, boys reported DFA (Fig. 1) the most, to the item "when lot of the doctors were sitting around them" followed by dental injection and tooth being drilled. However, the majority of them did not report DFA when their parents were allowed to be with them while being treated. In contrast, the majority of the girls reported DFA to all the items (Fig. 2) in the questionnaire except when accompanied by the parents during the procedure. A lot of doctors sitting around them while being treated were reported to be the most prevalent factor that triggers DFA among girls followed by dental injection and drilling of the tooth. This could be attributed to the fact that in some cultures it is socially acceptable for the girls to express their fear while the boys cannot.<sup>32,33</sup>

Boys also reported DFA when informed about the treatment before the procedure; while walking into the clinic; in the waiting room and when informed about the treatment in advance. On the contrary, girls reported DFA on hearing other children crying in the clinic; the smell of the dental clinic and materials; while walking into the clinic and in the waiting room.

Furthermore in this study, the responses received from the participants studying in the government schools were different as compared to those received from children studying in private schools. For example, the majority of the boys studying in government schools reported DFA when informed about the treatment in advance, while most of those studying in private schools reported DFA at the sight of a dental chair and dental injections while walking into the clinic, in the waiting room, when informed about the treatment in advance and their tooth being drilled. However, the responses were very similar among girls irrespective of their school.

In Saudi Arabia, boys and girls studying in separate schools from primary school and hence social factors affecting DFA may vary among them.<sup>1</sup> The separation between boys' and girls' peer groups was suggested to be at least a minor factor in African populations.<sup>34</sup> However, the difference in responses among boys and girls from government and private schools in the present study cannot be considered to imply the role of school *per se* as a causative or associated factor in triggering DFA. To develop a profound

understanding of the variation in DFA among the children from government and private schools, other factors like socioeconomic background, parents' and siblings' past dental experiences, and their own experiences have to be considered.

## CONCLUSION

This study provides an insight into the factors affecting the DFA that were not investigated previously. The majority of the participants reported DFA. The variations in response to similar factors in the dental office among children enable us to identify those factors that could potentially trigger DFA. Hence, a tailor-made approach for the management of the child in the dental office is warranted to alleviate DFA.

## CLINICAL SIGNIFICANCE

A tailor-made approach for the management of DFA in the dental office plays a significant role in successful treatment.

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