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Using Children's Fear Survey Schedule-Dental Subscale to Identify the Prevalence of Dental Fear and its Relationship with Primary Dental Caries: A Survey on 8-year-old Children

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ABSTRACT

Introduction: Dental fear is also a significant determinant of dental caries and is associated with caries' escalated occurrence among adolescents and children.

Aims: The study aims to evaluate the fear level of dental procedures among 8-year-old female children and correlate the occurrence of dental caries with their dental fear scores.

Material and Methods: This cross-sectional and analytical study design recruited 322 female primary school children (8 years old) from government and private schools in Madinah, Saudi Arabia. To measure students' dental fear level and Prevalence, an Arabic version of CFSS-DS was used as the study's instrument.

Results and Discussion: No statistically significant difference was found between the groups at dmft and DMFT levels. For individual outcomes of DMFT/dmft, the mean total score with untreated filled primary teeth was significantly higher than other groups.

Conclusion: The study has concluded that the Prevalence of dental fear among students was low. Both preventive dental visits and caries risk assessment are important to reduce dental problems. The study has contacted only female students, which was the main limitation.

Key words: Child, Dental Caries, Fear

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INTRODUCTION

Dental fear has been ranked fourth among common fears and recognized in many countries as a public health problem. Dental fear disrupts dentists' ability to manage the clinical setting of a dental clinic, which particularly leads to failure to pursue timely dental treatment [1]. It is also considered as one of the essential reasons for negligence and avoidance of regular dental care. Dental decay and pain can be led by the negligence of dental care that often results in a visit to the dentist, which consequently escalates the dental fear of a patient. This challenge may allow neglecting dental care and thus portrays an issue to dentists and patients identically [2].

Several personal and environmental factors drive the development of anxiety and fear in a dental care situation. Furthermore, psychological factors such as general fearfulness, shyness, or immaturity have been examined and were found to be noteworthy [3]. A multifactorial etiology of dental fear is observed in children. It is associated with previous painful dental experiences, parental dental fear, increased general fears, personality, age, and gender [4]. Girls and younger children are usually reported as more fearful as compared to boys and older children. The Prevalence of childhood fear varies significantly, from 3 to 43% in different countries and age groups [4-6]. This difference might be due to the selection of methodological variables, different cultural parameters, and patient populations' selection.

Dental fear is also a significant determinant of dental caries and is associated with caries' escalated occurrence among adolescents and children [7]. A high level of dental fear has been related to poor dental health, and there is a general consensus that negative experiences from dental treatment might persuade dental fear among children. Furthermore, dental fear is related to

poor oral health habits, poor dental health, and irregular dental attendance [7]. Dental caries is still a major dental public health concern, which influences almost 35% permanent and 9% of the world population's primary teeth. It usually led to functional, social, and emotional impairment even though a global decrease in untreated dental caries has been observed in permanent and primary teeth [8].

The occurrence of dental caries might be affected by demographic, behavioral, biological, socioeconomic, and clinical conditions [9]. Childhood fears are usually associated with developmental changes, and the nature of each fear seems to be associated with the age of a child [10]. Separation fear is one important fear for a preschool child, while social and injury fears become more prominent at a later age (from 7 years old) [11]. Dental caries is among the main reasons for the first visit of a child to the dentist even though the dental profession induces the need for preventive visits to the dentist. The relationship between dental fears to caries is controversial among researchers [7,12,13]. It has been observed that children with higher decayed, missing, and filled surface index (DMFS) scores have reduced dental fear [12,13], whereas children have higher levels of dental fear in the presence of more dental caries [7].

To assess the dental fear in children, this study has used the dental subscale of the children's fear survey schedule (CFSS-DS), which was developed in 1982. CFSS-DS is used for registering differences in dental fear between control and experimental groups for selecting fearful and non-fearful children from a larger reference population as well as to measure the Prevalence of dental fear in children [4]. To the best of the author's knowledge, there lacks evidence regarding the relationship between dental fear and dental caries in the Saudi Arabian region. Therefore, the study aims to evaluate the fear level of dental procedures among 8-year-old children and correlate the occurrence of dental caries with their dental fear scores; to explain the gender distribution of these children based on the dental fear level; and to compare the mean decayed-missing-filled teeth (DMFT), DMFS, and decayed-extracted-filled teeth (DEFS) with CFSS-DS.

MATERIAL AND METHODS

Study design and setting

A cross-sectional and analytical study design was applied to achieve the objectives of the study. Furthermore, the guidelines for Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) were followed to report this study. The study was conducted from February to March 2020 in primary schools in Madinah, Saudi Arabia.

Sample

A sample of 322 primary school female children (8 years old) participated in this study. A total of 2000 students were enrolled in primary school, specifically 8 years old. It was hypothesized that the prevalence of dental fear was 20% in the target population based on different findings among various populations. Therefore, the percentage of the result was determined to be 20% with ±2% confidence boundaries for calculating the sample's exact size. The confidence level was settled to be at 95%, the power was at 85%, and the significance level was at 0.05. The inclusion criteria were settled to be 8-year old children and attending private or government primary schools from first to sixth grade. Parents should have agreed and signed the informed consent, and their native language should be Arabic. The income level and education level were asked of the parent in the consent form. The research ethical approval was obtained from Taibah University.

Instrument

A validated Arabic version of CFSS-DS [14-16] was completed by the participated children for measuring their dental fear level and Prevalence (Appendix). The questions were asked by the primary researcher from each child in the school. The researcher has initially checked the teeth and provided the questionnaire to fill it in her presence. It helps in clarifying any queries raised while filling this questionnaire. It consists of 15 items on different dental treatment situations. A 5-point Likert-scale type (1=not afraid at all to 5=very afraid) was used to measure these items. Achievable ratings lie between the scores of 15 and 75, where greater values represented more dental fear. Children's socio-demographic details were also asked in the questionnaire at the time of filling the questionnaire. Income levels (<SAR 10,000, SAR 10,000-SAR 15,000, and >SAR 15,000) and educational level were asked directly from parents [17]. Multiple school visits were made in different districts to be more representative and to achieve the sample needed. The consent from each school was obtained one week before the visit and was collected on the day of examination.

Dental examination

Two indices were used for assessing the caries experience of a child: DMFT for primary teeth and permanent teeth based on the World Health Organization (WHO) criteria. A flat surface mouth mirror and appropriate light with adequate infection control measures were also used for recording dental caries. Children were seated in their classrooms on a chair with a high backrest. Teeth were recorded if they were untreated, non-carious, or had discolored fissures and pits without softening in the walls and floors or cavitation. Teeth were recorded as missing only if they were extracted due to caries.

Statistical analysis

Each completed questionnaire was cross-checked and revised if required. The Statistical Package for Social Sciences (SPSS) version 18 (SPSS Inc., Chicago, IL, USA) was used for statistical analysis. The level of significance was $P < 0.05$. The fear score was calculated

for every child, which ranged from a minimum of 15 and a maximum of 75 for the 15 items of CFSS-DS. Children were divided into low and high fear-based on a dental fear cutoff score of 32. The high fear group was further sub-divided to the cutoff score of 38 into moderate fear and severe fear. Data were presented as percentages based on the fear level. The WHO categorization of caries levels was changed to the following: DMFT scores of zero were considered as no caries, less than 2.7 as low caries, 2.7 to 4.4 as moderate caries, and 4.5 and more as high caries.

Analysis of variance (ANOVA) test was applied for testing the relationship between fear scores and caries experience using DMFT, and fear and income level. The post-hoc test was used for determining significant intergroup mean differences when a significant difference was found. Furthermore, the t-test was used for comparing mean total fear scores per girls. The percentages of children with differences in fear levels were tested using Chi-square based on different age groups.

RESULTS

All the female students belonged to Saudi Arabian nationality (100%). Overall, 80% of the children were enrolled in government schools, while 20% were enrolled in private schools. The average monthly income of parents was SAR 10,000- SAR 15,000. Out of 322 girls, 72.7% had low dental fear; 15.8 had high fear; 7.5% had moderate fear, and 4.0% had severe fear (Table 1). DMFT for permanent teeth and dmft for primary teeth were used to measure the caries experience. Almost 42% and 72.15% of the participated children had no caries experience in their dmft level and DMFT level, respectively (Table 2). An insignificant statistical difference was observed among the girls in the dmft level (P=0.278). Similarly, a statistically insignificant difference was observed among the groups in DMFT level (P=0.412). For individual outcomes of DMFT/dmft, the mean total score who had untreated filled primary teeth was significantly higher as compared to decayed primary teeth and missed primary teeth (P=0.001), while those who had untreated missed permanent teeth was significantly lower as compared to decayed primary teeth and filled primary teeth (P=0.031) (Table 3).

Table 1: Fear Levels comparison per gender.

Fear Level	Frequency	Percentage
Severe fear	13	4
Moderate fear	24	7.5
High fear	51	15.8
Low fear	234	72.7
Total	322	100

Table 2: Total fear scores on caries experience.

Caries experience	Frequency (%)	Mean ± SD	95% CI	P
Dmft level				
No	69 (42.00%)	21.98 (10.40)	19.50-23.81	
Low	31 (19.00%)	21.17 (8.65)	18.89-24.01	
Moderate	52 (31.70)	23.18 (10.27)	21.75-25.10	P=0.278
High	12 (7.30%)	13.26 (10.18)	11.09-15.75	
Total	164	19.89 (9.87)	18.18-21.10	
DMFT level				
No	114 (72.15%)	20.89 (10.80)	19.00-23.31	
Low	26 (16.45%)	22.71 (9.15)	18.39-23.51	
Moderate	12 (7.59%)	24.81 (10.87)	20.25-26.50	P=0.412
High	6 (3.79%)	13.75 (10.58)	11.59-16.25	
Total	158	20.35 (10.25)	18.68-21.60	

Table 3: Total fear scores per caries experience in dmft or DMFT.

Caries experience	Frequency (%)	Mean (SD)	P
Filled primary teeth (ft)			
Yes	67 (19.87%)	23.01 (11.54)	
No	255 (79.19%)	25.51 (10.17)	P=0.149
Total	322	23.91 (10.70)	
Decayed primary teeth (dt)			
Yes	77 (29.92%)	23.11 (10.65)	
No	245 (76.08%)	23.86 (10.11)	P=0.221
Total	322	25.11 (11.01)	
Missed primary teeth (mt)			
Yes	61 (18.45%)	24.12 (9.71)	
No	261 (81.05%)	25.14 (10.14)	P=0.121
Total	322	25.13 (12.18)	
Filled permanent teeth (FT)			
Yes	47 (14.93%)	26.85 (10.19)	
No	268 (85.07%)	24.36 (10.15)	P=0.001
Total	315	25.15 (10.63)	
Decayed permanent teeth (DT)			
Yes	45 (14.28%)	12.85 (7.19)	
No	270 (85.71%)	14.35 (7.15)	P=0.659
Total	315	13.6 (7.7)	
Missed permanent teeth (MT)			
Yes	28 (8.88%)	23.61 (11.29)	
No	287 (91.12%)	21.21 (12.35)	P=0.031
Total	315	22.13 (14.73)	

DISCUSSION

A total of 350 students were distributed questionnaires, out of which 322 questionnaires were returned. The response rate was 92% of 350, which was higher than previous studies in the same context [3,6,18]. This finding is in line with previous studies, indicating higher fear levels among females than male patients [18,19].

The findings have shown no prevalence of dental caries in dmft level (42%) with a statistically insignificant difference (p=0.278). Statistically insignificant findings were reported in previous studies concerning dmft level [6,20,21]. Similarly, the prevalence of "no" dental caries was found in 72.15% of the patients with respect to DMFT level. The study by Bashirian et al. [22] has also found a statistically insignificant relationship between gender and dental caries in DMFT level but this study has included only female participants. This finding was also supported by Son et al. [11] by finding an insignificant relationship between gender and fear scores but found higher CFSS-DS scores among girls as compared to boys. However, a previous study conducted in Germany has reported a higher prevalence of dental caries in Germany [23].

With respect to filled primary teeth, dental caries experience was found in 19.87% of the 8 years old children. Similar findings have been reported by Esa et al. [24] who found lower mean scores for filled primary teeth. However, Esa et al. [24] have found higher mean scores for decayed primary teeth, which was similar to the findings in present study. A study by Alsadat et al. [6] has also found higher mean scores for decayed primary teeth. Koposova et al. [25] have also found higher mean scores for caries experience with respect to socio-demographic variables, filled primary teeth, and decayed primary teeth in North-West Russia and Northern Norway sample.

The severity of caries experience was directly proportional with fear scores in permanent teeth. This was recommended to have an association with both the attitudes of anxious children and the oral health behavior, switching from primary to permanent dentition. Earlier detection of the fear causes is very essential in the solution of the problem. It is identified that children who experience fear in their parents are possibly to obtain that viewpoint and in particular witness painful experiences at an initial age. Attention needs to be paid to the use of epidemiologic clinical risk ascertainment concepts for reducing the dental fear levels among children through early intensive preventive efforts and caries activity tests such as oral hygiene instructions, fissure sealants, routine oral health examinations, and parental education. Children with dental fear imply difficult challenge to the pediatric dentist with respect to behavior management, treatment modalities, and diagnosis. The pediatric dentist should tempt to assess the child for dental fear before dental treatment so that each child can be succeeded individually based on the causes, which pose fear and utilize essential behavior modification techniques for making the dental treatment an uneventful and a pleasant occasion.

STRENGTHS AND LIMITATIONS

This study has its strength in offering comparative data on occurrence of dental caries and causes related with poor oral health among children from Madinah region. The study has reported that dental caries is common among children in the Madinah region and that it is related with oral health consequences. On the contrary, a cross-sectional design report association with minor possibility to disclose causal relationships. In addition, sampling from only Madinah region and not including other regions of Saudi Arabia limits the opportunities for generalization to the whole Saudi Arabia. Moreover, this study was able to cover only female students due to cultural restrictions. Therefore, future studies should include both males and females for undertaking a comparative analysis.

Adopting the validated Arabic version of CFSS-DS instrument is significant in predicting dental fear among children and encourages the dentist while selecting the methods of communication with children prior and during dental treatment. This study has used survey questionnaire to recognize dental fear experience, but did not report attitudes and behavior of school children during the dental treatment procedure. This must be considered as a limitation of the study; also, the study needs to be extended to different age groups.

CONCLUSION

The study has concluded that the Prevalence of dental fear among female students was low. No association was found between caries experience and total fear scores in both primary and permanent teeth. It is suggested to continuously monitor and guide child behavior on the basis of dental fear to ignore its advancement into adulthood. In addition, both preventive dental visits and caries risk assessment are very important to reduce dental problems from declining, which lead to decline in oral health and its outcomes on dental fear.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

Not applicable.

CONSENT FOR PUBLICATION

Not applicable.

AVAILABILITY OF DATA AND MATERIALS

The datasets used and analyzed during the current study are available from the corresponding author on reasonable request.

COMPETING INTEREST

The author declares no competing interest.

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