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# DENTAL ANXIETY AMONG CHILDREN AND THEIR PARENTS PRE AND DURING THE THIRD WAVE OF COVID-19 PANDEMIC IN EGYPT: A CROSS SECTIONAL STUDY

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## *ABSTRACT*

**Purpose**: This study aimed to evaluate the anxiety level of children and their parents in dental setting during the third wave of COVID-19 pandemic and to compare it to an age matched group of pediatric patients pre-COVID-19 pandemic and their parents.

**Materials and Methods**: This was a two cross sectional studies. Eighty children, 5-7 years, who require dentalhealth care and with no previous dental experience were included in the study. The dental anxiety level of children was assessed using the Facial image scale during the third wave of COVID-19 pandemic (n=40 children) and pre-COVID-19 pandemic (n=40 children). The accompanied parent's dental anxiety level was also evaluated using a Likert scale,0-10.

**Results**: The dental anxiety assessment using the Facial image scale prooved higher median children' dental anxiety during the pandemic (3.00) than pre-pandemic (2.00) with statistically significant difference ($P$=0.043). In addition, the median dental anxiety of parents using Likert scale showed more anxious parents during the pandemic (10.00) than pre-pandemic (2.50) with statistically significant difference ( $P$<0.0001). A positive correlation has been revealed between the parents and their children's dental anxiety level ($P$ <0.0001).

**Conclusion**: Pediatric dentist should consider the adverse impact of COVID-19 on the dental anxiety level of parents and their children. Therefore, they must be committed to take every attempt to relieve parents and children's anxiety and to comfort them during dental treatment.

**KEYWORDS**: COVID-19, Dental anxiety, Pediatric patients

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## INTRODUCTION

The COVID-19 is a highly infectious disease caused by a newly discovered coronavirus, causing "novel coronavirus-infected pneumonia". It was declared as a global pandemic on March 12, 2020 by the WHO [1]. Corona virus is highly concentrated in the saliva of infected individuals, blood and other body fluids [2]. The direct contact via respiratory droplets and saliva, added the risk for rapid transmission of coronavirus from human to human, and created challenges in health care services [3]. Since the outbreak of COVID-19 pandemic, the situation in dental practices became complicated as it was declared that dentists are among the highest risk personal to become infected and transmit the virus among healthy people [2]. As a consequence many parents became anxious and avoided dental treatment for their children except for those imposed by pain or urgency [3].

It is well known that dental appointments are usually met with dental fear and anxiety, from procedure and pain, to a level which might interfere with dental procedures especially in pre and early school age children [4,5]. Furthermore, parents may express their anxiety in front of their children creating a negative influence on dental settings [6]. Therefore, dental anxiety is considered to be a serious challenge that faces the pediatric dentist as well as the child in the dental clinic [4,7]. The children's behavior is a reflection of their inability to cope with the anxiety [8]. In an attempt to provide successful treatment, early notification of dental anxiety among children is essential for appropriate behaviour management [9]. In regular settings, effective management of children's fear and anxiety can be performed through different management techniques [6, 10]. Nowadays, due to the COVID-19 pandemic, a special personal protective equipment are essential to be used by dental staff such as suits, googles, face visors and face masks [11]. This by its turn affected the voice tone, masks the facial expressions that are required to create a rapport between the dentist and children and hinders the interaction with the child [3, 12]. Therefore, this may increase the level of children's dental anxiety and worsen their relationship with the dentist [11]. In addition to, the knowledge of the easy spread of the COVID-19 virus in the air during dental procedure increased the parents' anxiety toward the dental settings which can affect their children adding to their anxiety [12, 13].

Therefore, this study was designed to evaluate the anxiety level of children and their parents in dental visits during the third wave of COVID-19 pandemic and to compare it to an age matched group of pediatric patients pre-COVID-19 pandemic and their parents. The null hypothesis tested was that there is no difference in the dental anxiety level of children and their parents during the COVID-19 pandemic as compared to the pre-pandemic stage.

## MATERIALS AND METHODS

### Study design

This study was two cross-sectional studies. Data were collected pre and during the COVID-19 pandemic. It was set up and reported according to Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines [14]. The Research Ethical Committee of the Faculty of Dentistry, Kafrelsheikh University, had approved the research protocol (#IRB NO: KD/08/21) and it was registered at ClinicalTrials.gov (NCT04815759).

### Sample size estimation

The sample size was calculated based on previous estimates according to Olszewska and Rzymski [11], the mean (SD) of anxiety level of pre-pandemic was 3±1.59 and 2±1.57 during pandemic. Based on difference between two independent means using Gpower 3.0.10, 5% alpha error and 80% power, 40 children per group were needed with total sample of 80 children.

**Study sample**

The study was conducted on children with an age range 5-7 years, attending the outpatient clinic of the Pediatric Dentistry and Dental Public Health Department, Faculty of Dentistry, Alexandria University. The pre-pandemic group (n=40 children) used for comparison consisted of children requiring dental intervention between March and August 2018, while data from pandemic group (n= 40 children) was collected during the third wave of COVID-19 pandemic, between March and April 2021.

All participants included in the study had no previous dental experience, no history of chronic illness and no mental disability. Children with definitely negative behavior, according to Frankl Rating Scale [15], who required treatment under general anesthesia were excluded from the study. Participation in the study was voluntary and a parent's informed consent as well as the children's approval to participate in the study were obtained.

**Dental Anxiety level assessment**

Accompanied with their parents, children were allowed to enter the operatory room and sit on dental chair. Before examination, children's as well as their parents' dental anxiety level were evaluated.

Children's assessment was performed by using Facial image scale (FIS) [16]. (Fig. 1) It is a simple and valid measure of dental anxiety, and can be used with young children in the clinical setting [9]. The facial image scale comprises a row of five faces ranging from very happy (not anxious) to very unhappy (extremely anxious). At the beginning, the 5 faces have been explained to all children and they were asked to point to the face which best describes how he/she felt at the moment [9]. The numbers associated with FIS were turned into 1-5 Likert scale for analysis where 1 indicated the lowest level of anxiety, while 5 represented the highest level. The accompanied parents' anxiety level over the dental visit was also assessed using a Likert scale 0-10, where 0 indicated lack of anxiety, 5 indicated medium anxiety and 10 represented the highest level of anxiety [11]. Each child and his accompanied parent were asked to respond to the assessment scale at the same time, to avoid any effect of parents' responses on their children or vice versa.

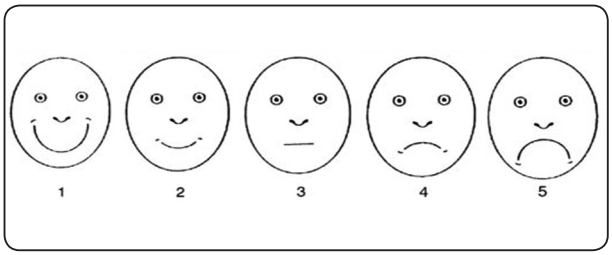


Fig. (1): Facial Image Scale. [16]

**Statistical analysis**

Independent t test and Pearson's Chi Square test were applied to compare the groups regarding the age and gender, respectively. Children's and parents' dental anxiety scores were compared used Mann Whitney U test and correlation between both was done using Spearman test. Significance level was set at 5%, and SPSS version 23.0 was used for statistical analysis.

**RESULTS**

From the results of the present study, there was no statistically significant difference in the age group of the pre-pandemic and pandemic groups ($P$=0.345). Each group consisted of 20 boys and 20 girls with no significant difference between the two groups ($P$= 1.00).

By comparing the child's dental anxiety score, children in the pre-pandemic group showed less anxiety level than those in the pandemic group with statistically significant difference ($P$=0.043). Moreover, a statistically significant difference in the parent's dental anxiety was observed pre and during pandemic with a median of 2.50 and 10.00 respectively ($P$ <0.0001) (Table 1). Girls in the two study groups were more anxious than boys with

statistically significant difference ($P$ <0.0001). Additionally, by comparing the two groups, girls showed higher anxiety score during the pandemic than pre-pandemic with statistically significant difference ($P$= 0.033). However, no statistically significant difference in the boys' anxiety scores between the two study groups was recorded ($P$= 0.289) (Table 2). By relating the parents and children's dental anxiety, a positive correlation has been revealed between the parents and their children's dental anxiety level ($P$ <0.0001) (Table 3).

TABLE (1): Child's and parent's dental anxiety scores between pre and during pandemic groups

| | | **Pre-pandemic group (n=40)** | **During pandemic group (n=40)** | ***P* value** |
|---|---|---|---|---|
| **Child's dental anxiety** | Mean (SD) | 2.23 (1.16) | 2.85 (1.41) | **0.043*** |
| | Median | 2.00 | 3.00 | |
| | Min - Max | 1 - 5 | 1 -5 | |
| **Parent's dental anxiety** | Mean (SD) | 2.35 (1.77) | 6.13 (4.45) | **<0.0001*** |
| | Median | 2.50 | 10.00 | |
| | Min - Max | 0 - 5 | 0 - 10 | |

***Statistically significant at P value≤0.05***

TABLE (2) Gender's dental anxiety scores between pre and during pandemic groups

| **Child's dental anxiety** | | **Pre-pandemic group (n=40)** | **During pandemic group (n=40)** | ***P* value** |
|---|---|---|---|---|
| **Boys** | Mean (SD) | 1.60 (0.88) | 2.05 (1.14) | 0.289 |
| | Median | 1.00 | 2.00 | |
| | Min - Max | 1 - 4 | 1 - 4 | |
| **Girls** | Mean (SD) | 2.85 (1.09) | 3.65 (1.18) | **0.033*** |
| | Median | 3.00 | 4.00 | |
| | Min - Max | 1 - 5 | 1 - 5 | |
| ***P* value** | | **<0.0001*** | **<0.0001*** | |

***Statistically significant at P value≤0.05***

TABLE (3): Correlation between children's and parent's dental anxiety levels pre and during pandemic

| | | **Parent's dental anxiety level** | |
|---|---|---|---|
| | | Correlation coefficient | *P* value |
| **Child's dental anxiety level** | Pre-pandemic | 0.632 | **<0.0001*** |
| | During pandemic | 0.792 | **<0.0001*** |
| | Overall | 0.756 | **<0.0001*** |

***Statistically significant at P value≤0.05***

## DISCUSSION

The aim of the current study was to assess the dental anxiety level in school age children and their parents during the third wave of COVID-19 pandemic and to compare it to an age matched group of pediatric patients prior COVID-19 pandemic and their parents. From the results of the present study, the null hypothesis was rejected as children and their parents during pandemic showed more dental anxiety than their counterpart in the pre-pandemic group with notable difference. Generally, there was an increased level of anxiety reported during the COVID-19 pandemic [17]. The rapidly evolving pandemic turned daily habits upside down especially activity engaged with the health sector[3]. Because of the nature of dental settings, there is a substantial danger of cross-infection through direct transfer, which has increased parental dental concern[3,4]. Moreover, parents had increased their children awareness level about infection control measures to protect them from infection which might increase their children psychological stress and made them more anxious

Olszewska, and Rzymski [11], in their study reached the same conclusion regarding the parents of the children, however, they did not notify a significant change in the emotional state of children requiring dental treatment during COVID-19 pandemic group compared to those in the pre-pandemic group. This contradiction could be due to different methodology as in their study they counted on the children, the caregivers and the dentists for evaluation, while in the present research, the emotional state of pediatric patients was self-reported. As stated by von Baeyer[18], self-reporting tools can be inaccurate for children below 7 years due to poor understanding of the method.

The result of the two study groups revealed that girls were more anxious than boys. Moreover, they showed more dental anxiety during pandemic than pre-pandemic. This can be hypothesized that during early childhood, girls' anxiety levels tend to be higher than boys [19]. This goes in line with several studies [20- 21]. On the contrary Klingberg and Broberg [22], and Holst and Crossner [23], reported that dental anxiety is more prevalent in boys. The latter stated that females experience higher dental anxiety levels in school-age groups, whereas males show higher dental anxiety in preschool age group. Similarly, Olszewska, and Rzymski [11], observed higher level of anxiety in boys aged 4. This was explained that due to differences in the development of their language skills, it is more difficult to describe the nature of the pandemic situation to younger boys than girls [24]. However, Kilinç et al [25], did not show a significant difference in the anxiety level in relation to gender.

By evaluating the role of parents in their children's anxiety, results revealed a positive correlation in the two study groups. Several studies showed the significant role of parents in their children's anxiety[26,27], therefore one of the essential role of the dentist is to aware the parents of this link and to educate them on how to make the dental visit a non-stressful event for their children. The result of the present research goes in line with Olszewska, and Rzymski[11], and Themessl-Huber et al[26], who found that parental anxiety was demonstrated as an indicator for their children' anxiety. This could be explained as most of children at early school age consider their parents as models and start to imitate them [28]. However, Wu and Gao [29], in their study found that that children's dental anxiety is not associated with parents' anxiety. The contradiction from the present study could be due to the difference in the age group of children included in their study as they worked on older children who noted to be more influenced by their actual dental experience such as painful procedure and professional's behaviors [30].

A possible limitation of the present study was that dental anxiety among children is influenced by several factors and this research did not study the effect of personal traits, the clinical environment, and family related issues, including number of siblings, educational level of the parents and socioeconomic status. Another possible limitation, children's anxiety level was self-reported which could be inaccurate in the young age group.

From the present study, authors recommend that pediatric dentists should be aware of the signs of dental anxiety of children and their parents and must be committed to take every attempt to relieve parents and children's anxiety and to comfort them during dental treatment. As well as parents should be educated about the relationship between parental and child anxiety. Dentists and parents should make maximum effort to prepare children for dental visits.

## CONCLUSION

The emotional and psychological impact of pandemics is natural. This was more obvious during the COVID-19 pandemic specially with the national wide social interaction restrictions and quarantine. During the third wave of the COVID-19 pandemic and following the surge of cases, anxiety level became at its most prevalence. Pediatric dentist should consider the adverse impact of COVID-19 on the dental anxiety level of parents as they are considered the key role in their children's dental anxiety. This association should be clearly explained to the parents.

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