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COVID-19 induced stress among dentists affecting pediatric cooperation and alter treatment of choice

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ABSTRACT

Objectives: To assess the effect of the COVID-19 pandemic on self-rated stress levels among dentists who treated children during the outbreak and pediatric patient cooperation during dental treatments.

Methods and materials: This cross-sectional study was assessed by enrolling an online questionnaire among dental practitioners treated children during April 2020.

Results: Dentists with higher COVID-19-induced distress reported a lower degree of pediatric patient cooperation during dental treatments than dentists with lower reported stress (p value < 0.01). Additional factors negatively impacting patient cooperation were degree of professional practitioner seniority in pediatric dentistry, and perceived knowledge about the COVID-19 disease infectivity and feeling protective against viral transmission with Personal Protective Equipment (PPE). Also, stress levels among dentists treating children influenced medical decisions, such as the selected treatment approach influenced by COVID-19 considerations.

Conclusion: The COVID-19 pandemic has adverse effects on clinicians and pediatric patients. Educational programs should be developed to advance dental staff.

1. Introduction

The coronavirus disease 2019 (COVID-19) pandemic is causing significant clinical challenges in all medical disciplines ranging from emergency medicine to routine ambulatory treatment [1,2]. On March 11th, 2020, the Israeli government-initiated lockdown restrictions, similar to those implemented in many other countries, as a measurement to contains the pandemic. The novel restrictions created a societal behavior modification, affecting regular daily activities, which required rapid adaptation to the social distancing guidelines to avoid viral spreading. The sudden and unexpected changes triggered significant stress in the general population and among medical care professionals, who were at an increased risk of exposure to the novel coronavirus [3]. Regardless of the pandemic, the pediatric population's treatment in the dental profession is associated with increased stress levels among

general practitioners, students, and specialists in pediatric [4,5]. Coping that stress with strategies of behavior management is a crucial part of pediatric treatment. The dental clinical setup requires proximity between the clinician and the oropharyngeal cavity of the patients; and, therefore, is considered a high-risk environment for viral transmission. The frequent aerosol-generating procedures lead to an increased likelihood for exposure to SARS-CoV-2 viral shedding from an infected patient [1,6]. Unlike adults, children are often having an asymptomatic course of COVID-19 infection [7] and therefore, the dentist cannot identify potential pediatric patients that pose a significant infection source during treatment [8]. At the beginning of the first lockdown in Israel, the Israeli Ministry of Health issued particular COVID-19 guidelines for dentists, limiting dental treatments to emergency care only, demanding strict adherence with appropriate personal protective equipment (PPE) requirements. Moreover, standard precautions and

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patient management through telephone screening before treatment are advised to avoid unnecessary COVID-19 positive patients [9,10]. In physical visits in the clinics, the patient should undergo a thorough assessment for typical COVID-19 signs and symptoms upon arrival and before dental treatment [11]. We suppose that the behavioral changes associated with the COVID-19 pandemic increase dentists' stress and negatively affect children's cooperation during dental treatment.

This cross-sectional study aims to evaluate the effect of the COVID-19 pandemic on self-rated stress levels reported by dentists who treated children during the outbreak. Also, we evaluated COVID-19 induced changes in treatment approach and pediatric patient cooperation during dental treatment.

2. Material and methods

A questionnaire was designed for dentists in Israel who had treated children during the ongoing COVID-19 outbreak. Before survey distribution, the Helsinki committee of the Galilee Medical Center, Nahariya, Israel, was granted (NHR 0083–20). The survey enrolled during April 2020. The research was carried out by distributing an anonymous online questionnaire. It was designed in Hebrew and consisted of 31 questions about dentists' demographic characteristics, attitudes toward treatment, children's cooperation in the dental setting, infection control, and PPE adherence. Most questions were dichotomous, whereas additional questions required participants to score their answer out of four rank values (not at all, mildly, moderately, highly).

The survey was anonymous, and participants were allowed to stop at any time point, those fulfilled the entire survey gave their informed consent prior to their inclusion in the study. There were no geographic or ethnic limitations for participation.

Links to the questionnaire were distributed via the Mailing list and WhatsApp® (WhatsApp Inc. California, USA). (Appendix 1).

2.1. Statistical analysis

Quantitative data were presented with Mean and std. Qualitative data was presented with frequencies and percentages. Quantitative data were compared between groups using a T-test, whereas ordinal data were compared with the Wilcoxon Test. Results were considered significant if p value < 0.05 . The analysis was performed using IBM SPSS Statistics software, version 25.

3. Results

The survey included a total of 428 dentists who responded to the questionnaire. After excluding the responders who did not answer all of the questions, the data had dentists who treated children and completed the questionnaire include 394 responders - the total responsiveness rate was 92%. A 72% of the responders were general practitioners, 10% were pediatric dentists, while the rest were residents in pediatric dentistry. A 49% of dental practitioners defined themselves as belonging to a high-risk group (Fig. 1A), and 75% of whom reported high-stress levels during providing treatment (Fig. 1B). We found a significant statistical difference in the self-reported knowledge level of COVID19 on self-rated stress levels among dentists. Most (53%) of practitioners with a reported good level of knowledge on COVID-19 reported low-stress levels, while 24% having high stress, compared to 70% of responders with a reported 'fair' level of knowledge COVID-19 reported having high stress ($P < 0.01$).

A Significant statistical difference was found between dental clinicians who considered themselves as highly stressed and dentists who reported no stress regarding their perceived experience of children's cooperation during dental treatment, dentists' who self-perceived no stress level, reported more excellent-good child cooperation during dental treatment than dentists who self-perceived high stress level ($P < 0.01$) (Fig. 2). When comparing the effect of COVID-19 on children's cooperation concerning the dentists' specialty, general practitioners reported a higher rate of poor children cooperation during treatment as compared to pediatric dentists (38% and 18% respectively; $P < 0.05$).

Notably, the vast majority (79%) of dentists reported adverse effects of the PPE on children's cooperation. Administered treatment also correlated with stress levels, with 38% of the high-stress dentists prescribing antibiotics versus only 12% in the low-stress group. Besides, attitude toward inhaled sedation significantly differed with stress level, with 66% of dentists who decreased nitrous oxide's use belonging to the high-stress group (Fig. 3).

4. Discussion

The COVID-19 pandemic has created a tense atmosphere, including in the dental setting, which poses numerous risks of virus transmission, including aerosol, which is of especially great concern. Affiliation with high-risk groups naturally causes stress during dental treatments as they are associated with an increased likelihood of being infected with SARS-CoV-2.

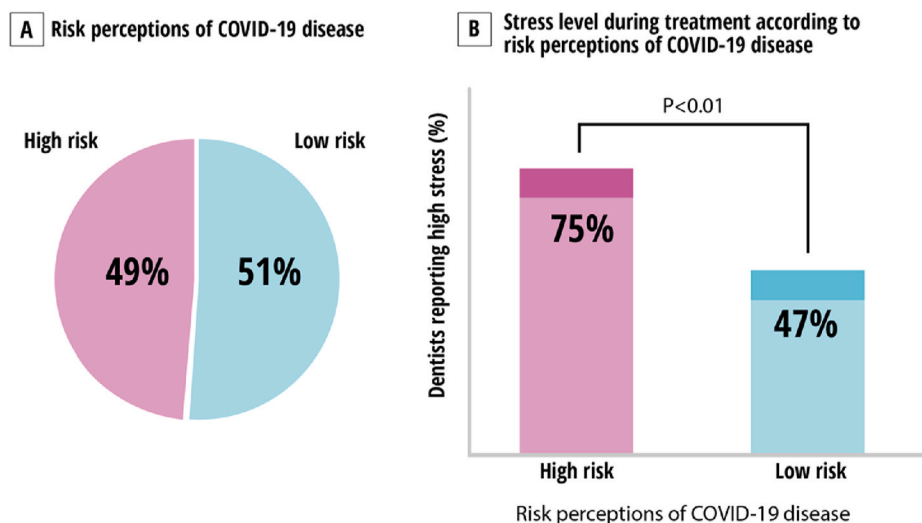


Fig. 1. Risk perceptions of COVID-19 disease among dentists and stress level during treatment. (A) Risk perceptions of COVID-19 disease; (B) Stress level during treatment according to risk perceptions of COVID-19 disease.

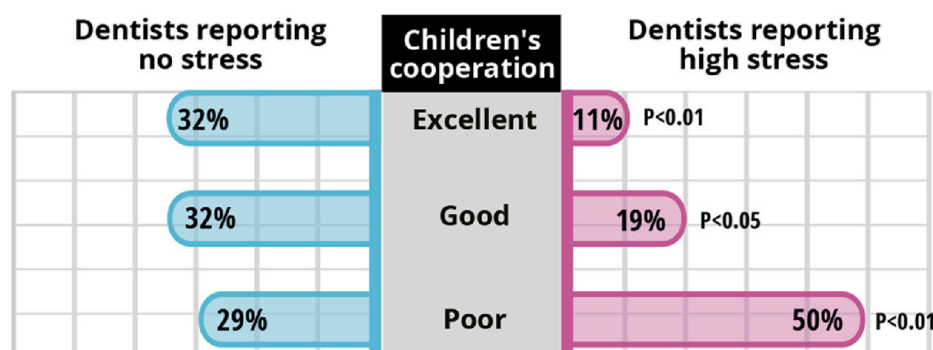


Fig. 2. Children's cooperation perceptions during treatment compared between dentists. Left panel (light blue) represent dentists participants reporting no stress compared to dentists reporting high-stress level during COVID-19 pandemic on right panel (light violet) chart. (For interpretation of the references to color in this figure legend, the reader is referred to the Web version of this article.)

Reported stress level among dentists who lower the use of nitrous oxide following health authority recommendation

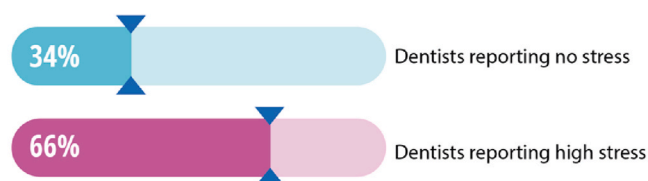


Fig. 3. Effect of self-perceived COVID-19 induced stress by dentists on treatment approach. Reported stress level among dentists who decrease the use of nitrous oxide during treatment following health authority special recommendation for COVID-19 pandemic.

Stress level influenced medical decisions and treatment approach due to personal and emotional consideration; our survey demonstrated that self-perceived high stress level dentists were more likely to prescribe antibiotics than their lower self-perceived stress level colleagues, possibly trying to avoid producing aerosol during treatment. Also, most dentists who reduced using nitrous oxide, wherein a high-stress level, which affect the children's cooperation. In other words, COVID-19 impeded stressed dentists from performing proper and effective treatment like on regular days.

The more you know about the pandemic, the less you are stressed as a dentist. Despite the relative novelty of the virus at the time of the survey, informative dentists coped better with the new challenges. In other words, being well-informed about the current pandemic by reading updated articles and research seemed to correlate with less stress, affecting positively child's cooperation.

As many dental clinics had closed during the pandemic, practitioners who do not usually treat children found themselves obligated to provide urgent pediatric care services. This situation was likely uncomfortable for them due to a lack of experience with this patient age group, unlike specialists in pediatric dentistry. The tension experienced by dentists is probably indirectly transmitted to children and affects their cooperation negatively.

Naturally, the COVID-19 pandemic is causing anxiety among children as well as adults [7]. Social distancing and their disrupted daily routine have brought to unfavorable lifestyles [12,13], which negatively impact the mental, psychosocial, socioeconomic, and physical health of pediatric patients, and should not be ignored [7], as it can be reflected in their dental cooperation.

Children judge dentists depending on their overall attitude and friendly approach during dental visits [14], the present study found a correlation between PPE and lack of pediatric patient cooperation, which may relate to the perceived intimidating appearance of the extra

protection equipment of healthcare professionals by pediatric population. As previously established, pediatric patients prefer traditional white coats or casual attire [15].

There are several limitations of the current study that should be acknowledged when interpreting the data. First, the study enrollment on April 2020 is equivalent to the early days of the pandemic when little information on COVID-19 was available at that time.

Second, during the survey enrollment, many dental practitioners are avoided working in their clinic. Therefore, our responders may represent an inherited selection bias of those practitioners that continued working during the study period. However, the data presented in this work may serve as essential information for developing methods for reducing stress levels among dental practitioners and pediatric patients in global emergencies such as the COVID-19 pandemic.

5. Conclusions

- Self-perceived high levels of COVID-19-related stress reported by dentists negatively impacted pediatric patient cooperation during dental treatment.
- Modify PPE to be more approachable to children (e.g., colorful scrubs, adding decorations) to promote a positive, friendly environment without jeopardizing practitioner safety, comfort, and confidence.
- Educational and stress reduction programs should be developed to advance dental staff knowledge on the ongoing pandemic.

Declare no conflict of interest

The authors declare no conflict of interest.

Ethics approval

Ethics approval and patient consent were obtained.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.adoms.2021.100212>.

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