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The Impact of COVID-19 on Pediatric Dentistry: A Study of the Knowledge and Attitudes of Parents in Jordan

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Abstract

Aims: This study aimed to assess parental knowledge of COVID-19, particularly in the dental setting, and to evaluate the attitudes of parents in Jordan with regard to prevention of COVID-19 transmission especially to children attending dental clinics.

Methods: A cross-sectional study was carried out among parents of pediatric dental patients in Jordan. A questionnaire composed of 37 questions divided into three sections was used. The first covered socio-demographic characteristics of the sample, the second assessed parental knowledge; and the third evaluated the attitudes of parents towards COVID-19, particularly with regard to children visiting the dentist. An online form of the questionnaire was published on social media platforms. Parents who fulfilled the inclusion criteria were asked to complete the questionnaire and share it with acquaintances in a form of snowball sampling. Descriptive and analytical statistical analysis was performed using SPSS for Windows. Statistical significance was set at 0.05.

Results: The number of questionnaires included in the study was 671. Only 44% of the study sample reported that they had accompanied a child to a dental clinic during the COVID-19 outbreak and 60.3% reported that the visit was for emergency reasons. Almost all the parents (94.5%) talked about COVID-19 with their children.

Conclusions: Parents had good knowledge, positive attitude, and appropriate practices towards COVID-19.

Keywords: COVID-19, pediatric dentistry, dental attendance

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INTRODUCTION

The COVID-19 pandemic was proclaimed by the World Health Organization (WHO) as a public health emergency of international concern presenting a high risk to countries with vulnerable health systems [1]. Jordan confirmed its first coronavirus case on March 2, 2020. When Jordan reported 30 cases, National Defense Law 13 of 1992 was enacted to halt the spread of COVID-19. The government in Jordan announced a state of emergency on March 19, 2020, when 69 cases were confirmed. Borders were closed and a national lockdown implemented. At the time, this lockdown was regarded as one of the most severe governmental measures to be carried out in any country in response to COVID-19. By mid-April 2020, the government began reducing limitations on economic activity, ultimately removing them altogether on May 3, 2020, while maintaining a nightly curfew [2]. By a decision from the Crisis Center in Jordan, dental clinics were closed on March 20, 2020, and a gradual reopening began on April 27, 2020 [3]. To limit the spread of COVID-19, clinics were required to undertake various

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precautionary measures according to the requirements of the Jordanian National Committee for Epidemics [4]. These measures included the screening of patients, meticulous sterilization of the dental clinic environment, and special protective equipment for both dentists and patients [4].

The COVID-19 pandemic was accompanied by the generation of a large amount of information, which might have led to confusion regarding the contamination risks that a dental appointment would cause. As such, it was important to evaluate the knowledge and attitudes towards COVID-19 of the parents of pediatric dental patients, so that dental professionals can help improve patient education. This study therefore aimed to assess parental knowledge of COVID-19, particularly in the dental setting, and to evaluate the attitudes of parents in Jordan with regard to prevention of COVID-19 transmission, and especially for children attending the dental clinics.

MATERIALS AND METHODS

Ethical approval was obtained from the School of Graduate Studies at the University of Jordan prior to commencement of the study. This descriptive cross-sectional study was conducted between July 2020 and November 2020.

Sample Size

Jordan has a population of close to 11 million inhabitants [5]. The study population consisted of parents living in Jordan, and having at least one child under 15. Since it was impossible to identify the exact number of such parents, the number was considered unknown. Sample size was calculated using the formula proposed by Smith [6] for a large or unknown population number, as follows:

Sample size = $(\text{Z value})^2$* standard deviation (1-standard deviation)/$(\text{margin of error})^2$.

Sample size = $(1.96)^2 * 0.5 (1-0.5)/(0.05)^2$

Sample size = 3.8416 * 0.25 / 0.0025

Sample size = 384.16

A minimum of 384 participants was needed to have statistical values of 95% confidence interval and a 5% margin of error [6]. The number of questionnaires completed was 765, with 85 excluded, as they were not filled in by parents; therefore, only 671 questionnaires were included in the study.

Exclusion criteria

- Participants who did not have a child younger than 15 years of age;
- Participants whose children had never received dental treatment;
- Participants who were not living in Jordan;
- Participants from health sectors.

Based on two previous studies that had used similar questionnaires [7, 8], a questionnaire was developed and modified to serve the study requirements for a Jordanian population. Simple and clear questions in Arabic were employed. Aims and objectives of the study, as well as the respondent's information confidentiality, were detailed at the beginning of the questionnaire.

The questionnaire consisted of 37 questions, divided into three sections. The first section covered the socio-demographic characteristics of parents and their children. The second section contained questions assessing parental knowledge of COVID-19, especially in the dental setting. The third section included questions concerned with the attitudes of parents towards the COVID-19 outbreak in Jordan, particularly with regard to their children visiting the dentist.

A pilot study was conducted on a group of 20 Jordanian parents who were not included in the main study. Participants were asked to comment on the clarity of the questions and the language used. Modifications were made to the questionnaire based on the participants' suggestions and comments. Reliability was tested by asking participants engaged in the pilot study to complete the questionnaire on two separate occasions, with an interval of approximately three weeks between them. The test-retest reliability result was high at 0.86.

Due to the COVID-19 outbreak, and the various lockdowns in Jordan, having face-to-face interviews with parents was difficult. Consequently, an online version of the questionnaire was created using Google Forms.

A convenience sampling method was utilized through groups on social media applications, such as Facebook, WhatsApp, and Twitter (now X). The link for the questionnaire was uploaded on the social media applications and participants who fulfilled the inclusion criteria were asked to fill out the form and share it with their acquaintances in a form of snowball sampling.

Data Analysis

Data were entered, processed, and analyzed using IBM SPSS software (SPSS for Windows, version 26). Data analysis included descriptive statistics to describe items included in the questionnaire by numbers and percentages. Data normality was tested and it was not normally distributed, so non-parametric tests were used to analyze the data.

A total knowledge score was calculated. Ten questions were included in the total knowledge score: from question #24 to question #33. A correct answer was given a score of one, while an incorrect or 'do not know' answer was given a score of zero. The mean score out of ten was calculated and this was computed into a score out of 100; the result was used to investigate the relationship between the total knowledge score and demographic and personal characteristics using the Mann-Whitney and Kruskal Wallis tests. The association between variables was assessed using Chi-square test. A *p*-value of ≤0.05 was considered statistically significant.

RESULTS

Demographic characteristics of the study sample are presented in Table 1. Only 44% of the sample reported that they had accompanied a child to the dentist during the outbreak of COVID-19 and after dentists reopened. Around two thirds of these respondents (60.3%) reported that the visit was for emergency reasons (Table 2). The difference in the reasons behind bringing children for a dental visit before and after the COVID-19 pandemic was not statistically significant (p=0.26).

Table 1. Demographic characteristics (n=671)

	N (%)
Number of children	
One	96 (14.3)
Two	196 (29.2)
Three	170 (25.3)
Four	151 (22.5)
Five and more	58 (8.6)
Parent's gender	
Male (Father)	176 (26.2)
Female (Mother)	495 (73.8)
Parent's age	
20–29	85 (12.7)
30–39	311 (46.3)
40–49	227 (33.8)
≥50	48 (7.2)
Parent's educational level	
High school or less	67 (10.0)
Diploma	81 (12.1)
Bachelor's degree	358 (53.4)
Postgraduate studies	165 (24.6)
Residency area	
North territory	72 (10.7)
Middle territory	562 (83.8)
South territory	37 (5.5)

Table 2. Reasons for bringing a child to the dentist

	N (%)
Reasons for dental attendance before COVID-19	
Emergency	379 (56.5)
Routine	292 (43.5)
Reasons for dental attendance after COVID-19	
Emergency	178 (60.3)
Routine	117 (39.7)

Knowledge related to COVID-19

Two-thirds (66.6%) always followed up on information related to COVID-19. Most of the participants (94.5%) had discussed COVID-19 with their children, either frequently or sometimes. Mothers (55.4%) had a tendency to discuss COVID-19 more frequently with their children than fathers (38.3%) ($p<0.00001$). In addition, parents older than 30 years with postgraduate education were statistically more likely to have discussed COVID-19 with their children compared to other groups ($p<0.00001$, $p<0.025$, respectively).

Of all the participants, 41.7% believed that dental treatment and the dental clinic could cause transmission of the virus more than other locations. Participants believed that virus transmission occurred through medical devices (71.5%), followed by aerosol (62.1%) and by the dentists themselves (54.2%).

The majority (83.0%) of participants reported that they felt confident about bringing their children for dental treatment, provided that dental clinics had taken various preventive measures according to the requirements of the Jordanian National Committee for Epidemics [4].

The questions included in the calculated total knowledge score are presented in Table 3. A higher score reflected better knowledge of COVID-19. The average of the total knowledge score was 75.34 (±15.55). The total knowledge score was influenced by the education level of the participants, with the score for participants whose education level was high school or less (66.3±18.6) being significantly less than those with a higher level of education ($p<0.000001$). The total knowledge score of those living in the north and middle areas was statistically higher compared with those who resided in the south ($p=0.040$).

Table 3. Knowledge of participants about COVID-19 (N=671)

	N (%)
The most common clinical symptoms of COVID-19 are fever, fatigue, dry cough, loss of smell and/or taste, and muscle pain	
Yes	383 (57.1)
No	93 (13.9)
Don't know	195 (29.0)
Unlike the common cold, stuffy nose, runny nose and sneezing are less common in people with COVID-19	
Yes	318 (47.4)
No	88 (13.1)
Don't know	265 (39.5)
Early symptomatic supportive treatment can greatly aid the recovery of those infected	
Yes	519 (77.3)
No	29 (4.3)
Don't know	123 (18.3)

The elderly who suffer from chronic illnesses are more likely to develop into severe cases	
Yes	608 (90.6)
No	15 (2.2)
Don't know	48 (7.2)
People with asymptomatic infection with COVID-19 cannot transmit the virus	
Yes	117 (17.4)
No	406 (60.5)
Don't know	148 (22.1)
Wearing medical masks reduces the risk of transmission of COVID-19	
Yes	537 (80.0)
No	73 (10.9)
Don't know	61 (9.1)
Washing hands well with soap and water is helpful in reducing COVID-19 transmission	
Yes	652 (97.2)
No	5 (0.7)
Don't know	14 (2.1)
Not touching eyes and nose with hands is helpful in reducing COVID-19 transmission	
Yes	646 (96.3)
No	16 (2.4)
Don't know	9 (1.3)
Avoidance of crowded gatherings can limit the spread of the virus	
Yes	649 (96.7)
No	10 (1.5)
Don't know	12 (1.8)
Self-isolation of people infected with COVID-19 can limit the spread of the virus	
Yes	627 (93.4)
No	24 (3.6)
Don't know	20 (3.0)

Parents who accompanied at least one child to the dental clinic after clinics reopened had a statistically greater level of knowledge about COVID-19 than parents who did not (p=0.007). Parents who reported that they were frequently following up on everything related to COVID-19 had a higher total score of knowledge about the disease compared with those who did not (p<0.00001). Respondents who thought that dental clinics could cause COVID-19 transmission had greater knowledge scores compared to those who answered with no or reported not knowing the answer (p<0.00001).

Attitudes towards COVID-19

Only about a third of respondents (38.0%) believed that a stage of controlling COVID-19 would be achieved. Two-thirds (66.8%) of the sample reported that they had lately been avoiding crowded places, and 94.6% stated that they wore a mask when leaving the house. A statistically significant higher proportion of males (46.0%) were less committed to avoidance of crowded places compared to females (28.7%) (p<0.00001). Respondents who wore masks when going out had a higher total knowledge score compared with those who did not (p<0.00001).

DISCUSSION

This cross-sectional study aimed to assess the knowledge of parents about COVID-19 in the dental setting. It also aimed to evaluate

parental attitudes in Jordan towards preventing the transmission of COVID-19, particularly when bringing children into a dental clinic during the pandemic.

The sample represented parents of children aged 15 years or below and living in Jordan. A convenience sample was recruited using social media platforms including Facebook, WhatsApp, and Twitter. Social media websites represent a new, powerful method for enrolling participants into medical research [9]. Studies have shown that a high volume of individuals can be successfully recruited for research purposes using social media [10, 11].

The behavior of parents is the main drive behind the behavior of children, particularly in situations such as attendance at dental clinics [12]. According to Jordanian norms, parents are responsible for their children from birth until they reach adulthood; accordingly, it was parents who were asked to complete the questionnaire, regardless of the child's age.

The most common reason for parents to bring their children to a dental clinic was for an emergency visit and this was true for dental visits before and after the COVID-19 pandemic. Emergency visits constituted a slightly higher percentage of the total visits after the pandemic than they did before, but the difference was not statistically significant. This agrees with previous findings that dental visits in Jordan were mostly for emergency dental reasons and not for regular checkups [13].

Nowadays, people can communicate and access news through various means, including TV channels, social media platforms, and radio channels. A daily governmental press conference to highlight the latest epidemiological developments was the official source for families in Jordan to learn about the COVID-19 epidemiological situation in Jordan [2]. The high percentage of respondents following up on information on COVID-19 and passing it on to their children was in accordance with results obtained from a similar study in China [7], indicating that parents highly valued their children's health and sought to involve them in understanding the pandemic. Mothers had a higher tendency to discuss COVID-19 with their children than fathers did, and this could be due to the observation that in Jordan's patriarchal society [14], mothers spend the most time with children, contributing to their cognitive and academic development [15].

The dental clinic has a higher risk of the spread of infection for COVID-19 than other locations, including other medical clinics [16]. Dentistry offers close human-to-human contact and viral spread can occur through saliva, blood splatter or aerosol dispersion as well as by contact with contaminated instruments or surfaces [16]. In contrast to the majority (91.9%) reported in a Chinese population [7], less than half of parents participating in the present study agreed that their child could be easily infected while receiving dental treatment; this could be attributed to the lack of understanding by parents in Jordan of the nature of virus transmission for COVID-19.

The majority of respondents reported that they felt confident about bringing their children in for dental treatment provided the dental clinic had taken the various preventive measures as required by the Jordanian National Committee for Epidemics [4]. This indicated that parents had high confidence in the infection control policies imposed by the government and the extent of compliance by dentists in Jordan.

The total knowledge score in the present study regarding general understanding of COVID-19 was comparable to the 90% knowledge score reported in a Chinese population [8]. Parents living in the central and north areas of Jordan were statistically more likely to have higher knowledge scores. The capital Amman is the largest city in Jordan and is located in the central region, while the north region holds the second largest city (Irbid). These two urbanized regions benefitted from having more access to news in their various forms, with the high availability of internet connections. In fact, Irbid entered the Guinness Book of World Records in 2001 for having 105 internet cafes in one street only a kilometer long [17].

In a study in China, the majority (90.8%) of participants agreed that COVID-19 would eventually be successfully controlled [8],

whereas only one third of the sample in the present study had the same belief. Jordan's initial strict measures to halt the spread of COVID-19 were among the most successful anywhere in the world, with the country flattening the curve and limiting the number of cases with active infection [2]. However, daily new cases of COVID-19 were rising exponentially in Jordan during the period of data collection, between July 2020 and November 2020 [2], and this may explain the low percentage of participants who believed that COVID-19 would eventually be controlled.

As for respondents` preventative behavior with regard to COVID-19 transmission, results were comparable to a study conducted in China which found that the vast majority of participants (96.4%) had not visited crowded places and wore masks when going out (98.0%) [8]. These practices could be primarily attributed to the very strict prevention and control measures implemented by the Jordanian government, such as banning public gatherings and implementing fines on individuals not wearing masks in public [2].

The present study revealed that a significantly higher proportion of males were less likely to avoid crowded locations than females, and the more committed nature of females may explain this result. Participants who reported that they were frequently following up on everything related to COVID-19 had greater knowledge scores, this confirmed that there was harmony between knowledge and attitudes toward COVID-19.

The limitations of this study may include that it took place at the beginning of the pandemic, during which time the nature of the disease was not fully understood. Also, the sample was a convenience sample, which might not offer an accurate representation of parents in Jordan. Another limitation is that no attempt was made to assess the medical status of children. Parents whose children are medically compromised might have markedly different attitudes towards bringing their children to the dental clinic. Similar to any questionnaire-based survey, respondents might have over-reported their answers and there was no assertion that the answers reflected the real knowledge or attitudes of the parents. An attempt was made to overcome this by increasing the sample size.

In conclusion, parents in this study had good knowledge and positive attitudes towards COVID-19 during the rapid rise of new infection of the COVID-19 outbreak in Jordan. More effort should be directed towards informing the public that rigorous measures are being taken to avoid virus transmission within dental offices. This might positively influence parents and motivate them to bring their children for regular checkups and not just emergency visits.

REFERENCES

1. World Health Organization. Timeline: WHO's COVID-19 response [Internet]. World Health Organization, 2021 [Cited 2021 July 30]. Available from: https://www.who.int/emergencies/diseases/novel-coronavirus-2019/interactive-timeline/ .
2. Brookings Doha Center. Policy and Institutional Responses to COVID-19 in the Middle East and North Africa: Jordan [Internet]. The Brookings Institution, 2020 [Cited 2021 January 4]. Available from: https://www.brookings.edu/research/policy-and-institutional-responses-to-covid-19-in-the-middle-east-and-north-africa-jordan/ .
3. Jordanian Dental Association [Internet]. Jordanian Dental Association, 2020 [Cited 2021 March 5]. Available from: https://www.jda.org.jo/.
4. Ministry of Health [Internet]. Ministry of Health, The Hashemite Kingdom of Jordan, 2020 [Cited 2020 May 5]. Available from: https://corona.moh.gov.jo/en.

5. Department of Statistics [Internet]. Department of Statistics, 2021 [Cited 2020 June 26]. Available from: http://dosweb.dos.gov.jo/.
6. Smith, S.M. Determining Sample Size: how to ensure you get the correct sample size [Internet]. Qualtrics, 2013 [Cited, 2020, June 26]. Available from: https://www.qualtrics.com/ebooks-guides/determining-sample-size/.
7. Sun J, Xu Y, Qu Q, and Luo W. (2020), Knowledge of and attitudes toward COVID-19 among parents of child dental patients during the outbreak. Braz Oral Res. 34: e066.
8. Zhong BL, Luo W, Li HM, Zhang QQ, Liu XG, Li WT, and Li Y. (2020), Knowledge, attitudes, and practices towards COVID-19 among Chinese residents during the rapid rise period of the COVID-19 outbreak: a quick online cross-sectional survey. Int J Biol Sci. 16(10):1745-1752.
9. Topolovec-Vranic J, and Natarajan K. (2016), The Use of Social Media in Recruitment for Medical Research Studies: A Scoping Review. **J Med Internet Res.**18(11): e286
10. Fenner Y, Garland SM, Moore EE, Jayasinghe Y, Fletcher A, Tabrizi SN, Gunasekaran B, and Wark JD. (2012), Web-based recruiting for health research using a social networking site: an exploratory study. J Med Internet Res. 14(1):e20.
11. Sinnenberg L, Buttenheim AM, Padrez K, Mancheno C, Ungar L, Merchant RM. Twitter as a Tool for Health Research: A Systematic Review. Am J Public Health. 2017 Jan;107(1):e1-e8. doi: 10.2105/AJPH.2016.303512.
12. Case A, Paxson C. Parental behavior and child health. Health Aff (Millwood). 2002 Mar-Apr;21(2):164-78. doi: 10.1377/hlthaff.21.2.164. PMID: 11900156.
13. Al-Omiri MK, Al-Wahadni AM, Saeed KN. Oral health attitudes, knowledge, and behavior among school children in North Jordan. J Dent Educ. 2006 Feb;70(2):179-87. PMID: 16478932.
14. Dababneh AB. The Jordanian women's movement: a historical analysis focusing on legislative change. University of Leicester (United Kingdom); 2005.
15. Walby, S. (1989). Theorising Patriarchy. *Sociology*, *23*(2), 213–234.
16. Banakar M, Bagheri Lankarani K, Jafarpour D, Moayedi S, Banakar MH, and MohammadSadeghi A. (2020), COVID-19 transmission risk and protective protocols in dentistry: a systematic review. BMC Oral Health**.** 20(1):275.
17. Guinness World Records (2001). Guinness World Records Ltd.

تأثير كوفيد -19 على طب أسنان الأطفال: دراسة حول معرفة وسلوكيات أهالي الأطفال أثناء تفشي المرض في الأردن

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الملخص

الخلفية والأهداف : أدت جائحة كوفيد -19 الى انتاج كمية كبيرة من المعلومات، والتي ربما أفضت إلى الارتباك بين آباء وأمهات مرضى طب أسنان الأطفال.وهدفت هذه الدراسة إلى تقييم معرفة الوالدين بكوفيد -19 خاصة فيما يتعلق بطب الأسنان، وتقييم مواقف أولياء أمور الأطفال في الأردن فيما يتعلق بالوقاية من انتقالCOVID-19 وخاصة فيما يتعلق بالأطفال الذين يحضرون الى عيادة الأسنان.

منهجية البحث: أجريت دراسة مقطعية بين أولياء أمور مرضى طب أسنان الأطفال في الأردن. تم استخدام استبيان مكون من 37 سؤالاً، مقسم إلى ثلاثة أقسام. تناول القسم الأول الخصائص الاجتماعية والديموغرافية. غطى القسم الثاني تقييم معرفة الوالدين بينما قام القسم الثالث بتقييم مواقف الآباء تجاه كوفيد -19 وخاصة فيما يتعلق بالأطفال الذين يزورون عيادة الأسنان. تم نشر نموذج عبر الإنترنت للاستبيان على منصات التواصل الاجتماعي. طُلب من أولياء أمور الأطفال الذين استوفوا معايير التضمين إكمال الاستبيان ومشاركته مع معارفهم. تم إجراء التحليل الإحصائي الوصفي والتحليلي باستخدام برنامجSPSS لنظام التشغيل.Windows تم تعيين الدلالة الإحصائية عند 0.05.

النتائج: بلغ عدد الاستبيانات المشمولة في الدراسة 671. أفاد 44٪ فقط من عينة الدراسة أنهم رافقوا طفلًا إلى عيادة الأسنان أثناء تفشي فيروس كورونا، وأفاد 60.3٪ أن الزيارة كانت لأسباب طارئة تقريبًا جميع الآباء والأمهات. (94.5٪) ناقشوا موضوع كوفيد – 19 مع أطفالهم.

الاستنتاجات: كان لدى الأهالي في هذه الدراسة معرفة جيدة ومواقف إيجابية تجاه كوفيد -19.

الكلمات الدالة: كوفيد-19، طب أسنان الأطفال، زيارة عيادة طبيب الأسنان.