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TO DETERMINE THE KNOWLEDGE OF DENTISTS AS HEALTH PROFESSIONALS REGARDING COVID-19

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Abstract:

Background: *COVID-19 is an extremely infectious viral disease that is caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). It is single stranded RNA virus that belongs to a large family of coronaviruses named as "Coronavirade". Its size ranges from 65-125nm in diameter. The aim of the study was to examine the knowledge, of dentists in our region, regarding novel COVID-19 disease.*

Study Design, Place and Duration: *This was a Descriptive, cross sectional study, conducted in the Department of Dentistry, Peshawar Medical and Dental College, Peshawar from 1st June to 30st June, 2020 in Pakistan.*

Materials and Methods: *A self-designed e-questionnaire was administered through e-mail to 500 dentists. SPSS version 23 was used to analysis data. Descriptive statistics were presented as frequency and percentages. The association between the dependent and independent variables was determined by utilizing Chi-square test and the level of significance was set at p value <0.05. Moreover, the inferential statistics (Mann Whitney U and Kruskal Wallis tests, p-value<0.05) were used for determining the significance among study variables. The correlation between the attitude and knowledge scores was assessed by utilizing Spearman's rank correlation coefficient.*

Results: *A total of 306 dentists responded. Participants' mean knowledge score was 10.69± 2.14, with 91.5 % participants having sufficient knowledge. 242 (79.1%) respondents showed positive attitude (≥4) towards COVID-19. The mean attitude score was 4.28±0.61. The results of current study showed a significant correlation of knowledge with both designation (p-value=0.002) and gender (p-value=0.04).*

Conclusion: *Pakistani dentists have exhibited adequate awareness about general symptoms, transmission mode, cross-infection control and dental practice management in perspective of the COVID-19 outbreak. However, their understanding to protect dental professionals from this highly contagious disease during specialized dental procedures was unsatisfactory.*

Key Words: *COVID-19, Attitude, practice management, cross-infection control.*

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INTRODUCTION:

COVID-19 is an extremely infectious viral disease that is caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2)[1]. It is single stranded RNA virus that belongs to a large family of coronaviruses named as "Coronavirade". Its size ranges from 65-125nm in diameter. SARS-CoV-2 comprises of crown shaped spikes which are present on its outer surface that facilitates its entry into host cells[2]. Moreover, it possesses great binding affinity to the human angiotensin converting enzyme 2 receptors (ACE2) that facilitates its entry into host cells [3]. It is further categorized into four subgroups; alpha (α), beta (β), gamma (γ) and delta (δ) type coronavirus [9]. Alpha and beta types primarily infect human beings and mammals targeting their gastrointestinal tract, central nervous system and respiratory system [4]. SARS-CoV-2 is regarded as the seventh identified human coronavirus that phylogenetically resembles other two highly communicable respiratory coronaviruses i.e Middle East respiratory syndrome coronavirus (MERS -CoV) and severe acute respiratory syndrome coronavirus (SARS-CoV). The routes of spread in humans involve direct contact with respiratory droplets and indirect transmission through fomite [5]. The outbreak of COVID19 has undoubtedly placed healthcare workers at increased risk of acquiring nosocomial infection[6]. Bio-aerosols produced during dental procedures contain bacteria, fungi and viruses that have the potential to float in the air for considerable period of time. Bio-aerosols can be inhaled by dentists and patients[7]. Hence, excessive mutation, increased pathogenicity and various routes of transmission of SARS-CoV-2 may add to nosocomial spread in the dental offices. Due to the distinctive features of dental treatment procedures that involve aerosol generation, close contact with patient's oropharyngeal region, and direct contact of contaminated hands with mucous membrane, the routine infection control measures in dental practice are not adequate to prevent the COVID-19 spread [8]. Therefore, dental health care professionals (DCP) are at increased risk of acquiring infection and becoming potential carriers. In this context American, Dental Association issued an update on 16th March 2020, where it was stated that all elective dental treatments should be postponed and only patients with actual dental emergencies should be accommodated [9]. The current coronavirus pandemic hit Pakistan in February 2020. As of 5th June 2020, the number of confirmed cases in the country is over 89249, with 31198 recoveries and 1838 deaths [10]. Owing to limited resources and fragile health care system, Pakistan is facing a major COVID- 19 challenge. WHO has expressed concerns that if prompt and effective measures are not taken Pakistan might emerge as the next epicentre of this pandemic[11]. Health care workers being the frontline warriors are at an increased risk of acquiring nosocomial infections. Being a low-income country, limited data is available on infection prevention and control strategies but generally it is believed that basic infection control protocols are insufficient in health care settings in Pakistan. One of the recent study concluded that Pakistani health care workers are not fully prepared to face threat of a COVID 19 epidemic as they are not aware of dynamics of disease transmission vis a vis strategy for its prevention and control [12]. Effective implementation of infection control programs should be practiced which depends largely on awareness, training and cooperation of health care workers. Therefore, the main aim of current study was to explore the level of knowledge and attitude of dentists towards the COVID19 disease. The results of this preliminary study will help in formulating future policies, training methods and robust infection control strategies that can be employed in dental settings for safeguarding dentist's wellbeing.

MATERIALS AND METHODS:

The present descriptive cross-sectional study was conducted on the dentists of Pakistan, in the Department of Dentistry, Peshawar Medical and Dental College, Peshawar from 1st June to 30th June, 2020 in Pakistan. A non-probability convenience sampling technique was employed. Self-administered e-questionnaire was sent through an electronic mail to 500 dentists in private and public sector, health and educational institutes across Pakistan. All the potential participants were informed about purpose of study. 306 dentists including Professors/Associate Professors, assistant professors, lecturers and general dental practitioners responded. The study questionnaire was developed by authors after detailed literature review[5],11. Subsequently, the questionnaire was reviewed by the senior dental professionals with the research background in dentistry to check for the relevancy, time required to fill and ease of understanding. Later, based on the suggestions of the professionals and local requirements the study instrument was simplified. The questionnaire had three sections. The first section embodied questions related to designation and gender of the participants. The second section of the e-questionnaire was comprised of thirteen questions with yes and no options in-order to explore knowledge of the respondents in relation to COVID-19 disease. The last section of the e-survey had nine questions to evaluate the dentists' attitude towards novel COVID-19 disease. The questions were developed on a five

point Likert scale with a neutral midpoint and balanced responses. The participants' knowledge was scored from zero to thirteen. The cut -off point equal to or more than nine (≥9) was set for sufficient knowledge and less than nine (<9) for insufficient knowledge. Data was analyzed by utilizing SPSS version 23. Descriptive statistics were recorded as percentages and frequencies. The association between the dependent and independent variables was determined by utilizing Chi-square test and the level of significance was set at p-value <0.05. Moreover, the inferential statistics (Mann Whitney U and Kruskal-Wallis tests, p-value<0.05) were used for determining the significance among study variables.

RESULTS:

A total number of 306 Dentists responded with an overall response rate of 61.2% with male to female ratio of 1:1.55. Majority of the participants were general dental practitioners (GDP) (35.3%) followed by lecturers (32.7%). The average knowledge score of the respondents was 10.69±2.14. Adequate knowledge was displayed by 91.5% of participants (>9), whereas, 8.5% showed inadequate knowledge (<9). The respondents were most knowledgeable about the items related to the routes of transmission, urgent dental care techniques and personal protective equipment (>95%). On the other hand, minimum knowledge was noted in two questions, one concerning the use of ultrasonic devices while handling Covid-19 suspected cases (51.6%) and the other was associated with effectiveness of 1% of hydrogen peroxide mouthwash use as a pre-rinse (59.6 %). Table-1 is depicting the knowledge of respondents.

Table No.1: Knowledge of Dentists about COVID -19 Disease:

Knowledge of COVID19	Correct Answer N (%)	Incorrect Answer N (%)
Mode of transmission of COVID 19 is Fomite transmission and by respiratory droplets. (True)	302(98.7)	4(1.3)
WHO suggests that washing hands with water and soap for minimum 20 secs can help in the prevention of disease transmission (True)	262(85.6)	44(14.4)
Tele- screening via phone is recommended as first line of action to identify patients with possible COVID 19 (True)	222(72.5)	84(27.5)
Urgent dental care includes severe toothache, cellulitis, Ludwig's angina, uncontrolled bleeding and Oro-facial trauma (True)	298(97.4)	8(2.6)
Most effective mouth wash as a pre- rinse to protect against COVID 19 infection is 1% hydrogen peroxide (True)	182(59.6)	124(40.5)
Four handed dentistry is highly recommended for controlling the spread of disease (True)	264(86.3)	42(13.7)
Face shields and eye wear are essential while examining the patients (True)	298(97.4)	8(2.6)
Ultrasonic devices can be safely used in dental office for patients (False)	158(51.6)	148(48.4)
After extraction resorbable sutures should be used in patients (True)	254(83)	52(17)
N -95 mask is essential while examining the patients (True)	274(89.5)	32(10.5)
Rubber dam isolation is a prerequisite for every patient (True)	258(84.3)	48(15.7)
High volume suction is mandatory in dental practice (True)	262(85.6)	44(144)
Antibiotics are the first line of treatment (True)	238(77.8)	68(22.2)

Note: Assessment of knowledge was done by awarding 0 for incorrect answer and 1 for correct answer. The range of knowledge score was from 0 to 13. Cumulative score of less than 9 was considered as insufficient score whereas greater than 9 was considered as sufficient knowledge score. Mean value of knowledge score=10.69 ± 2.14

The association of gender and designation with mean knowledge and attitude among the dentist is displayed in Table 2. Results of the current study highlighted significant association of gender and designation with knowledge score. Spearman correlation showed significant correlation between the attitude and the knowledge score of the dentists (r=0.655, p value =0.01).

Table No.2: Association of Gender and Designation with Mean Knowledge and Attitude score

Characteristics	n (%)	Mean Knowledge score with SD	Mean Rank	p-value	Mean Attitude score with SD	Mean Rank	p-value
Gender**							
Male	120(39.2)	10.85+2.33	165.63		4.26+ 0.69	154.50	
Female	186(60.8)	10.59+2.00	145.67	0.04	4.29+0.55	152.85	0.87
Designation*							
Associate Prof/Professor	54(17.6)	11.07+2.24	178.76		4.26+0.62	154.35	
Assistant Professor	44(14.4)	11.32+1.44	179.23		4.34+0.37	151.68	
Lecturer	100(32.7)	10.74+1.86	151.02	0.002	4.30+0.55	155.56	0.99
GDP	108(35.3)	10.20+2.45	132.69		4.23+0.72	151.91	

*Kruskal Wallis Test ($p < 0.05$) **Mann Whitney Test ($p < 0.05$).

DISCUSSION:

COVID-19 pandemic has resulted in the global emergency. Currently, it is a topic of debate in the international media and among the general public. The rapid spread of novel COVID-19 disease has resulted in public-health concerns and collapse of world economy at large. It has laid massive pressure on both social stability and global health systems, particularly affecting the health care workers including the Dentists. Hence, it is imperative that prudent information should be conveyed to health care professionals in this hour of global catastrophe. Envisaging this, the present study has been conducted to explore knowledge and attitude of dentists about COVID-19 disease in Pakistan. There are very few studies that have particularly assessed the knowledge and attitude of dentists considering COVID-19 disease. Consequently, in the current study comparison of the outcome has been done with other related conditions. The results of present study conducted on Pakistani dentists displayed sufficient knowledge with positive attitude towards the COVID-19 disease. The knowledge score of the respondents in present study ranged between 80 to 98% for the items that have investigated routes of transmission, hand hygiene, use of PPE and high-volume suction, urgent dental care procedures, practicing rubber dam isolation and employing four handed dentistry. These finding are in line with results of Khader et al, where Jordanian dentists exhibited knowledge score of more than 85% for items related to PPE, mode of transmission and hand hygiene[18].The results were also in accordance with the outcome of other studies on SARS-CoV and MERS-CoV where the participants depicted sufficient knowledge regarding personal protection and hand hygiene[14, 15]. Participants also displayed good knowledge for questions regarding tele screening and antibiotics use (score range 70% to 80%). This might be attributed to some recently published studies that recommended the initial screening through telephone, while scheduling appointments, for identifying the patients with possible or suspected COVID-19 disease[16]. Contrary to our findings, khan and colleagues reported insufficient knowledge of participants regarding antibiotic use [13]. The participants in current survey exhibited insufficient knowledge regarding the procedures utilizing ultrasonic apparatus for treating suspected Covid-19 patients. This may be due to their lack of understanding about this new disease and its connection with aerosol generating procedures[17]. Current study suggested that the mean attitude score of Pakistani dentists regarding COVID-19 was in positive range (4.28 ±0.61), particularly when inquired about recording patient's appropriate medical and recent travel history, checking body temperature and treating only emergency cases. These findings are in accordance with other researches that have reported mean positive attitude for physicians[18]. Likewise, the findings are also in line with the studies on Jordanian dentists, and on healthcare workers. On the other hand, relatively lower mean attitude scores (<4) were noted when respondents were questioned about fear of contracting COVID-19, anxiousness to treat

suspected patients and caries removal methods. The fearless attitude of the Pakistani dentists might be attributed to the fact that COVID-19 disease didn't hit the region that bad as compared to west and majority of the European countries. This outcome resulted in common perception that disease is moderately dangerous especially for younger individuals. The results are again in accordance with the recent study done in Jordan, where 71.7 % of dentists identified COVID-19 as moderately hazardous and not a major community health issue [13]. Furthermore, encouraging results came out regarding questions related to training workshops to deal with any unfortunate COVID-19 situation and volunteering their assistance as part of medical teams in case of potential emergencies. The findings were in line with the fact that was documented in the paper by United Nations where Pakistan was ranked 10th among the world with the total volunteer work force standing at 56 million [19]. To the best of our knowledge the is no related data to evaluate the dentists' attitude for their participation in the COVID 19 crisis support teams. Nevertheless, in recent study researchers has put forward dental outreach program model for managing the crisis situation during current pandemic[20]. Significant correlation was noted between the participants' attitude and gender for the item exploring the fear of contracting COVID19 (p-value=0.003). The significantly higher percentage (44%) of female dentists strongly agreed that they are scared of contracting the disease as compared to 30% of the male dentists. This finding is in line with the research finding where females reported greater anxiety and fear than male counterparts [21]. Mann-Whitney U and Kruskal Wallis tests were used to analyse the correlation of designation and gender with mean knowledge and mean attitude score. The results showed the mean knowledge score of female dentists were significantly lower than the male dentists (P-value=0.04). Likewise, significant correlation was noted between mean knowledge score and designation (0.002). Senior faculty members were found to have high mean knowledge score. This can be credited to the wisdom of senior faculty members gained through the years of experience as compared to the lecturers and GDPs. The application of Tukeys posthoc test suggested a statistically significant difference between the mean knowledge scores of GDP and Assistant professors (P-value=0.02). The difference may be due to the fact that more than 80% of the female dentists belonged to the GDP and lecturer groups.

CONCLUSION:

Pakistani dentists have exhibited adequate awareness about general symptoms, transmission mode, cross-infection control and dental practice management in perspective of the COVID-19 outbreak. However, their understanding to protect dental professionals from this highly contagious disease during specialized dental procedures was unsatisfactory. Effective implementation of infection control programs depends on adequate knowledge, awareness and teamwork of individuals.

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