

## Relationship between Fear, Attitude and Knowledge, and COVID-19 Preventive Behaviors in Dentists

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### ABSTRACT

**BACKGROUND AND OBJECTIVE:** Dentists are at risk for respiratory diseases such as COVID-19 due to the nature of their occupation, close contact with patients, and exposure to microdroplets. One of the most important psychological variables affecting the regular implementation of preventive health behaviors is fear. Therefore, the present study was conducted to determine the relationship between knowledge, fear and attitude, and COVID-19 preventive behaviors in dentists.

**METHODS:** In this cross-sectional study, based on multi-stage sampling method, 190 dentists in Tehran were included in the study. Data were collected based on self-administered method using demographic questions: the 8-item Fear of COVID-19 Scale (range of 8 to 16), the 8-item Attitude Scale (range of 8 to 40), the 15-item Knowledge Scale (range of 0 to 15), and the 12-item COVID-19 Preventive Performance Questionnaire (range of 12 to 60).

**FINDINGS:** Only 24.74% of dentists received official training on COVID-19. The mean performance score of dentists towards COVID-19 prevention was  $52.2 \pm 7.6$  and was satisfactory. However, behaviors such as preparing disinfectants and masks for patients, regular air conditioning and disinfection of surfaces were observed in 38.95%, 17.37% and 16.32% of dentists, respectively. Preventive performance was significantly correlated with fear ( $p < 0.05$ ,  $r = 0.427$ ), attitude ( $p < 0.01$ ,  $r = 0.305$ ), knowledge ( $p < 0.01$ ,  $r = 0.276$ ) and work experience ( $p < 0.05$ ,  $r = 0.108$ ). Moreover, these variables predicted 63% of the variance of preventive performance.

**CONCLUSION:** Based on the results of this study, the overall performance of dentists in complying with COVID-19 prevention protocols was satisfactory. Moreover, there was a significant relationship between knowledge, fear and attitude and preventive performance.

**KEY WORDS:** COVID-19, Dentist, Fear, Knowledge, Health Behavior.

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## Introduction

COVID-19 is an acute respiratory syndrome with unique features such as high transmission rate and a two-week incubation period (1-3). Statistics show a higher prevalence of infection and mortality due to COVID-19 in health care workers (4). In addition, dentists are at high risk for infectious respiratory diseases due to the nature of their professional tasks such as close contact with patients (5-7). Despite the importance of following the preventive guidelines for COVID-19, the results of various studies indicate poor performance of dentists in this area (5, 6, 8). For example, Ahmed et al. showed that 90% of dentists are unaware of changes in health guidelines and only 40% follow preventive guidelines (8).

One of the most important psychological variables affecting the regular implementation of preventive health behaviors is fear, the appropriate level of which can reduce involvement in high-risk behaviors and thus increase adherence to preventive strategies such as social distancing or hand hygiene (9, 10). Providing unrealistic statistics, inaccurate information, increasing cyberspace rumors and lack of access to appropriate treatment can lead to excessive fear and increased anxiety, which in turn leads to a decrease in protective reactions (8). A study by Consolo et al. shows an 85% prevalence of anxiety in dentists since the onset of the COVID-19 pandemic (11). Therefore, it is necessary to evaluate the psychological profile of dentists in order to determine their level of psychological readiness to resume dental activities along with the observance of health guidelines (12).

Successful control of COVID-19 requires the increase in knowledge, improved attitudes, and changes in the behavior of high-risk groups (13, 14). However, many dentists do not show the recommended behaviors for reasons such as low level of knowledge, low perceived vulnerability, inadequate perceived threat, and fear (15-20). For example, the performance of 58.7% of Lebanese dentists in the prevention of COVID-19 was good (17) and approximately 60% of dentists in Indonesia were well aware of the pathogenicity and methods of diagnosis of COVID-19 (18). Understanding the factors influencing the adoption of preventive behaviors is an essential step in designing behavior change interventions (21, 22). Obviously, evaluating the role of psychological variables such as attitudes and emotional factors such as fear in persuading health care workers to follow health guidelines can increase the effectiveness of cognitive-

behavioral interventions. Therefore, the aim of this study was to determine the relationship between knowledge, attitude and fear and COVID-19 preventive behaviors in dentists.

## Methods

This cross-sectional study was approved by the ethics committee of Qazvin University of Medical Sciences with the code IR.QUMS.REC.1399.422 and was conducted among 190 dentists working in public and private clinics in Tehran who were included by multi-stage sampling method from May to August 2020. The required sample size according to previous studies (7), using G\*Power software based on 95% confidence interval, error rate ( $\alpha$ ) of 0.05 and 10% dropout, was finally determined to be 190 people. Volunteers with PhD in general dentistry and higher, working in a public or private center in Tehran, and not suffering from any psychological or physical disorders were included in the study.

Due to cultural, economic and social differences in Tehran, a list of all dentists working in 22 districts of Tehran was prepared and then, according to the difference in the number of dentists working in different districts, the required number of samples was determined based on the proportion of dentists in each district. For this purpose, 12 people were assigned into the high-density region 1 (including eight districts of 1-3, 5-7, 11, 12), 8 people into the medium-density region 2 (including five districts of 4, 8, 9, 10 and 21) and 6 people into the low-density region 3 (including nine districts of 13-20 and 22).

Questionnaires were provided to all dentists and all individuals were asked to answer their questions within one month. During the mentioned period, 4 text messages and 2 reminder messages were sent via WhatsApp to complete the questions within the time frame. Along with the questionnaires, the participants were given two forms of written consent and a guideline for answering the questions. Completed questionnaires were collected after the specified time and in person by a trained expert. The self-administered questionnaire included the following:

A) The contextual and demographic variables included age, gender, marital status, work experience (years), specialization, educational background and sources of information about COVID-19, etc.

B) Fear of COVID-19 Scale in Dentists (8 questions with "yes", "no" and "don't know" options) (16), and

after the translation process, the face and content validity of this scale was approved by the panel of experts (content validity rate [CVR] of 0.75 and content validity index [CVI] of 0.78). Furthermore, the reliability of the scale was determined by retests at 15-day intervals among 14 general dentists ( $r=0.82$ ). In addition, Cronbach's alpha coefficient was used to evaluate the internal consistency of the scale ( $\alpha=0.88$ ).

C) The attitude scale consisted of 8 questions with a 5-point Likert type scale (from 1, "strongly disagree" to 5, "strongly agree") and a score range of 8 to 40. This scale was developed based on previous studies (11, 23) and similar to the fear scale, its internal consistency and reliability were assessed using Cronbach's alpha coefficients and retest coefficient ( $\alpha=0.89$ ,  $r=0.94$ ).

D) Knowledge Scale of COVID-19 consisted of 15 questions with "correct", "incorrect", and "don't know" options. Each correct answer was given a score of one and negative answers, and "do not know", a score of zero, and the scores ranged from 0 to 15. The final knowledge score was classified into three levels: low (0-5), medium (6-10) and high (11-15). The validity and reliability of this questionnaire were confirmed in previous studies (15, 16).

E) COVID-19 Preventive Performance Questionnaire (11, 15, 16) included 12 questions with a 5-point Likert type scale (from "never" [1] to "always" [5]). The scores of the performance questionnaire ranged from 12 to 60, with higher scores indicating better performance and vice versa. CVR and CVI indices (equal to 0.81 and 0.85, respectively) and Cronbach's alpha coefficient ( $\alpha=0.90$ ) and retest coefficient ( $r=0.88$ ) confirmed the content validity, internal consistency and reliability, respectively. The questionnaires were anonymous and their information was confidential.

Data were entered into SPSS 25.0 software and analyzed by one-way analysis of variance with LSD

post hoc test along with stepwise regression analysis to identify factors affecting preventive behaviors and  $p<0.05$  was considered significant.

## Results

The mean age of participants was  $37.54\pm 11.85$  years (ranging from 27 to 60 years) and the mean years of work experience was  $9.23\pm 7.48$  years. 80.53% of the participants were general dentists and only 24.74% had received official training about COVID-19 and the sources of information of 25.26% of cases were official sources such as the Ministry of Health. The results of one-way analysis of variance (ANOVA) showed a significant difference between the mean of variables of fear, attitude and preventive performance in terms of different levels of knowledge in the dentists participating in the study ( $p<0.001$ ). In other words, dentists who had a higher level of awareness about COVID-19, had more fear, better attitude, and better preventive performance (Table 1).

The total score of preventive performance in dentists was  $52.19\pm 7.64$ , and 64.04% of dentists stated that they always perform preventive behaviors. 17.4% and 4.87% had very poor (never) and poor (rarely) performance, respectively. Moreover, the performance of dentists in behaviors such as providing disinfectants and masks for patients, regular air conditioning and disinfection was not at optimal levels (Table 2). In the final model, with the simultaneous introduction of four variables, correlation coefficient was  $R=0.792$ , and the adjusted coefficient of determination was upgraded to  $R^2_{(Adj)}=0.627$ . In other words, based on the adjusted coefficient of determination in the final model, 62.7% of the dependent variable changes or preventive performance were explained by the four variables of work experience, knowledge, attitude and fear (Table 3).

**Table 1. Comparison of mean and standard deviation of variables in research in terms of three levels of knowledge (n=190)**

| Variable    | Levels of knowledge             |                                 |                                 | p-value                          |
|-------------|---------------------------------|---------------------------------|---------------------------------|----------------------------------|
|             | Low (n=20)<br>Mean $\pm$ SD     | Medium (n=48)<br>Mean $\pm$ SD  | High (n=122)<br>Mean $\pm$ SD   |                                  |
| Fear        | 11.2 $\pm$ 08.34 <sup>(a)</sup> | 12.1 $\pm$ 05.64 <sup>(b)</sup> | 14.1 $\pm$ 32.89 <sup>(c)</sup> | $p=0.0001$ , $df=2$ , $F=36.064$ |
| Attitude    | 30.3 $\pm$ 69.40 <sup>(a)</sup> | 34.3 $\pm$ 10.13 <sup>(b)</sup> | 36.2 $\pm$ 23.72 <sup>(c)</sup> | $p=0.0001$ , $df=2$ , $F=26.901$ |
| Performance | 47.7 $\pm$ 18.13 <sup>(a)</sup> | 50.7 $\pm$ 34.72 <sup>(b)</sup> | 53.8 $\pm$ 56.38 <sup>(c)</sup> | $p=0.0001$ , $df=2$ , $F=30.176$ |

<sup>a-c</sup> LSD post hoc test result and significant difference of means between the three groups

**Table 2. Dentists' performance regarding COVID-19 prevention (n=190)**

| Item                                                                                             | Never<br>Number(%) | Rarely<br>Number(%) | Sometimes<br>Number(%) | Often<br>Number(%) | Always<br>Number(%) |
|--------------------------------------------------------------------------------------------------|--------------------|---------------------|------------------------|--------------------|---------------------|
| Risk assessment and travel history of patients                                                   | 5(2.63)            | 13(6.84)            | 11(5.79)               | 38(20)             | 123(64.74)          |
| Evaluation of symptoms of upper respiratory tract infection and body temperature of patients     | 0(0)               | 3(1.58)             | 12(6.32)               | 58(30.53)          | 117(61.58)          |
| Disinfect hands using soap and water or alcohol-based handrub                                    | 0(0)               | 0(0)                | 2(1.05)                | 34(17.89)          | 154(81.05)          |
| Disinfection of workplace surfaces                                                               | 20(10.53)          | 11(5.79)            | 11(5.79)               | 30(15.79)          | 118(62.11)          |
| Use of personal protective equipment                                                             | 0(0)               | 0(0)                | 3(1.58)                | 43(22.63)          | 144(75.79)          |
| Hand washing before and after treatment                                                          | 1(0.53)            | 3(1.58)             | 12(6.32)               | 22(11.58)          | 152(80.0)           |
| Changing gloves for each patient                                                                 | 4(2.11)            | 4(2.11)             | 11(5.79)               | 31(16.32)          | 140(73.68)          |
| Observe hand hygiene before and after using gloves                                               | 0 (0)              | 3(1.58)             | 11(5.79)               | 41(21.58)          | 135(71.05)          |
| Observe the distance between each patient's visit                                                | 10(5.26)           | 6(3.16)             | 25(13.16)              | 21(11.05)          | 128(67.37)          |
| Preparation of alcoholic disinfectant and mask in waiting rooms for patients                     | 41(21.58)          | 33(17.37)           | 52(27.37)              | 26(13.68)          | 38(20.0)            |
| Disinfect all surfaces, chairs and waiting room doors every 2 hours with chlorine solution, etc. | 1(0.53)            | 15(7.89)            | 21(11.05)              | 54(28.42)          | 99(52.11)           |
| Regular room air conditioning                                                                    | 13(6.84)           | 20(10.53)           | 8(4.21)                | 37(19.47)          | 112(58.95)          |

**Table 3. Summary of stepwise regression model with coefficient of determination, adjusted coefficient of determination, F and P**

| Variable        | R (correlation coefficient) | R <sup>2</sup> (coefficient of determination) | R <sup>2</sup> (Adj) (adjusted coefficient of determination) | Estimation error | F       | P     |
|-----------------|-----------------------------|-----------------------------------------------|--------------------------------------------------------------|------------------|---------|-------|
| Work experience | 0.748                       | 0.560                                         | 0.556                                                        | 2.44             | 137.254 | 0.000 |
| Knowledge       | 0.763                       | 0.583                                         | 0.575                                                        | 2.40             | 74.693  | 0.000 |
| Attitude        | 0.780                       | 0.608                                         | 0.597                                                        | 2.34             | 54.758  | 0.000 |
| Fear            | 0.792                       | 0.627                                         | 0.613                                                        | 2.29             | 44.093  | 0.000 |

## Discussion

The results of this study showed a positive relationship between fear, attitude and performance and knowledge about COVID-19. Furthermore, despite the good performance of the majority of dentists, they did not have adequate performance levels in cases such as providing disinfectants and masks for patients, regular ventilation of the workplace and disinfection. Dentists' knowledge of topics such as incubation period, appropriate laboratory testing, duration of virus infection, and disinfection methods was undesirable. However, the majority of dentists (64.21%) had a sufficient level of knowledge about COVID-19, which was consistent with previous studies (20, 23, 24). Possible reasons for the high level of knowledge of dentists can be the frequent reception of information about COVID-19 through continuous training from the mass media. Findings of the present study showed that

only 24.74% of dentists received official training on COVID-19, which was lower compared to similar studies (17, 25, 26). Failure to receive official training may lead to disruption of the decision-making process for dealing with patients (27, 28). Therefore, consultation of health professionals with reliable media is essential to obtain the latest information and prevention strategies of COVID-19 (29). In the present study, significant relationships were shown between knowledge and attitude and practice, which were consistent with the findings of previous studies (19, 20, 27). The level of knowledge of dentists and their attitude towards the usefulness of preventive instructions affect their performance (30). Dentists who are aware of the symptoms, risk factors, and consequences of COVID-19 are more likely to believe in the need for preventative behaviors (24). For this reason, improving the level of

knowledge of dentists about COVID-19 by updating the content of the sites of the Ministry of Health will play an important role in improving their performance. The general status of attitudes toward prevention of COVID-19 was relatively favorable and consistent with the findings of previous studies (20, 27, 28). Dentists can prevent COVID-19, even if they have a negative attitude towards the treatment of patients with COVID-19, if they believe that personal protective equipment is beneficial (31). Adequate feedback on the experiences of other health care professionals and participation in online group discussions can be a good strategy to change dentists' attitudes about the importance of following preventive protocols.

The mean score of fear was  $13.65 \pm 1.79$  in dentists, which was consistent with the results of previous studies (8, 33). Findings of Aly et al. indicate the prevalence of fear of coping with COVID-19 in 90% of dentists (32). Causes of fear in dentists can be factors such as the likelihood of getting infected with COVID-19 and transmitting to family members, lack of social distance with patients, post-infection quarantine, and treatment costs (33). Therefore, providing appropriate personal protective equipment and increasing the level of knowledge about the effectiveness of personal protective equipment can significantly reduce the level of anxiety and fear of dentists by changing attitudes.

The results of the study showed that 64.04% of dentists had good preventive performance and about 9% had poor performance, which is consistent with the findings of previous studies (8, 23, 24). Moreover, knowledge, attitude and fear were predictors of preventive performance of dentists, which was consistent with the findings of previous studies (8-10, 32-34). Updating the content of reliable websites and

providing training programs on new Ministry of Health guidelines can improve preventive performance by reducing anxiety and fear.

In general, the findings of the present study indicate a good level of knowledge and relatively favorable attitude in dentists. Furthermore, despite the satisfactory performance of most dentists, the level of behaviors such as providing disinfection equipment and masks for patients, continuous surface disinfection, and regular air conditioning were not favorable. The variables of knowledge, attitude, fear and work history were also able to significantly explain the variance of preventive performance in dentists.

Due to the cross-sectional nature of the present study, only the relationships between the variables could be examined, and to investigate the causal relationships, it is necessary to conduct longitudinal studies by measuring the variables at repeated intervals. In addition, the selection of samples from Tehran prevented the generalization of the results, and with the financial support and participation of dentists from different parts of the country, the generalizability of the findings can be strengthened. Another limitation of the present study was the use of questionnaire and self-report method for data collection, which is naturally not free of bias. In addition, due to the conditions of COVID-19 and the fear of the possibility of physical transmission of the disease, the design of an online questionnaire is recommended as a useful tool for rapid and safe data collection.

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## References

1. Gralinski LE, Menachery VD. Return of the coronavirus: 2019-nCoV. *Viruses*. 2020;12(2):135.
2. Nemati M, Ebrahimi B, Nemati F. Assessment of Iranian Nurses' Knowledge and Anxiety toward COVID-19 during the Current Outbreak in Iran. *Arch Clin Infect Dis*. 2020; 15(COVID-19):e102848.
3. Peng X, Xu X, Li Y, Cheng L, Zhou X, Ren B. Transmission routes of 2019-nCoV and controls in dental practice. *Int J Oral Sci*. 2020;12:9.
4. Schwartz J, King C-C, Yen M-Y. Protecting Healthcare Workers During the Coronavirus Disease 2019 (COVID-19) Outbreak: Lessons From Taiwan's Severe Acute Respiratory Syndrome Response. *Clin Infect Dis*. 2020;71(15):858-60.
5. Barbieri T, Basso G, Scicchitano S. Italian Workers at Risk during the COVID-19 Epidemic. *Social Science Research Network (SSRN)*. 2020 (April 12). Available from: [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=3572065](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3572065)
6. Takian A, Raoofi A, Kazempour-Ardebili S. COVID-19 battle during the toughest sanctions against Iran. *Lancet*. 2020;395(10229):1035-6.
7. Sarkarat F, Tootoonchian A, Haraji A, Rastegarmoghaddam Shaldoozi H, Mostafavi M, Naghibi Sistani SM. Evaluation of dentistry staff involvement with COVID-19 in the first 3 month of epidemiologic spreading in Iran. *J Res Dent Sci*. 2020;17(2):137-45. [In Persian]
8. Ahmed MA, Jouhar R, Ahmed N, Adnan S, Aftab M, Zafar MS, et al. Fear and Practice Modifications among Dentists to Combat Novel Coronavirus Disease (COVID-19) Outbreak. *Int J Environ Res Public Health*. 2020;17(8):2821.
9. Harper CA, Satchell LP, Fido D, Latzman RD. Functional fear predicts public health compliance in the COVID-19 pandemic. *Int J Ment Health Addict*. 2020;1-14.
10. Ren S-Y, Gao R-D, Chen Y-L. Fear can be more harmful than the severe acute respiratory syndrome coronavirus 2 in controlling the corona virus disease 2019 epidemic. *World J Clin Cases*. 2020;8(4):652-7.
11. Consolo U, Bellini P, Bencivenni D, Iani C, Checchi V. Epidemiological Aspects and Psychological Reactions to COVID-19 of Dental Practitioners in the Northern Italy Districts of Modena and Reggio Emilia. *Int J Environ Res Public Health*. 2020;17(10):3459.
12. Shacham M, Hamama-Raz Y, Kolerman R, Mijiritsky O, Ben-Ezra M, Mijiritsky E. COVID-19 Factors and Psychological Factors Associated with Elevated Psychological Distress among Dentists and Dental Hygienists in Israel. *Int J Environ Res Public Health*. 2020;17(8):2900.
13. Geldsetzer P. Knowledge and Perceptions of COVID-19 Among the General Public in the United States and the United Kingdom: A Cross-sectional Online Survey. *Ann Intern Med*. 2020;173(2):157-60.
14. Ge Z-Y, Yang L-M, Xia J-J, Fu X-H, Zhang Y-Z. Possible aerosol transmission of COVID-19 and special precautions In dentistry. *J Zhejiang Univ Sci B*. 2020;21(5):361-8.
15. Gambhir RS, Dhaliwal JS, Aggarwal A, Anand S, Anand V, Kaur Bhangu A. Covid-19: a survey on knowledge, awareness and hygiene practices among dental health professionals in an Indian scenario. *Rocz Panstw Zakl Hig*. 2020;71(2):223-9.
16. Putrino A, Raso M, Magazzino C, Galluccio G. Coronavirus (COVID-19) in Italy: knowledge, management of patients and clinical experience of Italian dentists during the spread of contagion. *BMC Oral Health*. 2020;20(1):200.
17. Nasser Z, Fares Y, Daoud R, Abou-Abbas L. Assessment of knowledge and practice of dentists towards Coronavirus Disease (COVID-19): a cross-sectional survey from Lebanon. *BMC Oral Health*. 2020;20(1):281.
18. Widyarman AS, Bachtiar EW, Theodorea CF, Rizal MI, Roeslan MO, Djamil MS, et al. COVID-19 Awareness among Dental Professionals in Indonesia. *Front Med (Lausanne)*. 2020;7:589759.
19. Mustafa RM, Alshali RZ, Bukhary DM. Dentists' Knowledge, Attitudes, and Awareness of Infection Control Measures during COVID-19 Outbreak: A Cross-Sectional Study in Saudi Arabia. *Int J Environ Res Public Health*. 2020;17(23):9016.
20. Kamate SK, Sharma S, Thakar S, Srivastava D, Sengupta K, Hadi AJ, et al. Assessing Knowledge, Attitudes and Practices of dental practitioners regarding the COVID-19 pandemic: A multinational study. *Dent Med Probl*. 2020;57(1):11-7.

21. Knell G, Robertson MC, Dooley EE, Burford K, Mendez KS. Health Behavior Changes During COVID-19 Pandemic and Subsequent "Stay-at-Home" Orders. *Int J Environ Res Public Health*. 2020;17(17):6268.
22. Michie S, van Stralen MM, West R. The behavior change wheel: a new method for characterising and designing behaviour change interventions. *Implement Sci*. 2011;6:42.
23. Prasetyo YT, Castillo AM, Salonga LJ, Sia JA, Seneta JA. Factors Affecting Perceived Effectiveness of COVID-19 Prevention Measures among Filipino during Enhanced Community Quarantine in Luzon, Philippines: Integrating Protection Motivation Theory and Extended Theory of Planned Behavior. *Int J Infect Dis*. 2020;99:312-23.
24. Khader Y, Al Nsour M, Al-Batayneh OB, Saadeh R, Bashier H, Alfaqih M, et al. Dentists' Awareness, Perception, and Attitude Regarding COVID-19 and Infection Control: Cross-Sectional Study among Jordanian Dentists. *JMIR Public Health Surveill*. 2020;6(2):e18798.
25. Arora S, Abullais Saquib S, Attar N, Pimpale S, Saifullah Zafar K, Saluja P, et al. Evaluation of Knowledge and Preparedness Among Indian Dentists During the Current COVID-19 Pandemic: A Cross-Sectional Study. *J Multidiscip Healthc*. 2020;13:841-54.
26. Sezgin GP, Şirinoğlu Çapan B. Assessment of dentists' awareness and knowledge levels on the Novel Coronavirus (COVID-19). *Braz Oral Res*. 2020;34:e112.
27. Saqlain M, Munir MM, Rehman SU, Gulzar A, Naz S, Ahmed Z, et al. Knowledge, attitude, practice and perceived barriers among healthcare workers regarding COVID-19: a cross-sectional survey from Pakistan. *J Hosp Infect*. 2020;105(3):419-23.
28. Huynh G, Nguyen TN, Tran VK, Vo KN, Vo VT, Pham LA. Knowledge and attitude toward COVID-19 among healthcare workers at District 2 Hospital, Ho Chi Minh City. *Asian Pac J Trop Med*. 2020;13(6): 260-5.
29. Bhagavathula AS, Aldhaleei WA, Rahmani J, Ashrafi Mahabadi M, Bandari DK. Novel Coronavirus (COVID-19) Knowledge and Perceptions: A Survey of Healthcare Workers. *medRxiv*. 2020. Available from: <https://www.medrxiv.org/content/10.1101/2020.03.09.20033381v2>
30. Bakaeen LG, Masri R, AlTarawneh S, Garcia LT, AlHadidi A, Khamis AH, et al. Dentists' knowledge, attitudes, and professional behavior toward the COVID-19 pandemic: A multisite survey of dentists' perspectives. *J Am Dent Assoc*. 2021;152(1):16-24.
31. Karaaslan F, Dikilitaş A, Aydin EO. Comparison of COVID-19 Relevant Knowledge and Attitudes of Clinical and Preclinical Dental Students in Turkey. *Balkan J Dent Med*. 2020;24(3):1-7.
32. Aly MM, Elchaghaby MA. Impact of novel coronavirus disease (COVID-19) on Egyptian dentists' fear and dental practice (a cross-sectional survey). *BDJ Open*. 2020;6:19.
33. Kumar J, Katto MS, Siddiqui AA, Sahito B, Ahmed B, Jamil M, et al. Predictive Factors Associated With Fear Faced by Healthcare Workers During COVID-19 Pandemic: A Questionnaire-Based Study. *Cureus*. 2020;12(8):e9741.
34. Zhong B-L, Luo W, Li H-M, Zhang Q-Q, Liu X-G, Li W-T, et al. 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*. 2020;16(10):1745-52.