

Access this article online
Quick Response Code:

Website: www.jehp.net
DOI: 10.4103/jehp.jehp_721_21

Influence of knowledge on Brazilian student's perception of life and clinical classes during COVID-19

Fernanda de Souza e Silva Ramos, Laryssa de Castro Oliveira, Diego Felipe Mardegan Gonçalves, Rafael Santos Rocha¹, Eduardo Bresciani¹, Ticiane Cestari Fagundes

Abstract:

BACKGROUND: The current pandemic associated with SARS-CoV-2 has negatively influenced several activities, including teaching in Operative Dentistry. The aim of this study was to evaluate the influence of knowledge in Operative Dentistry on undergraduate students' perception related to personal life and return to clinical practices classes during pandemic.

MATERIALS AND METHODS: The present research was a cross-sectional, observational, and qualitative survey. The 16-item based questionnaire was sent to undergraduate students in 2020, which were divided into two groups, according to the Operative Dentistry knowledge: G1-not started clinical practice; G2-already started or completed clinical practice. Questions were focused on the impact of the pandemic in relation to their personal lives and return to clinical practice classes. Chi-square association test was performed using the SigmaPlot 12.0 software ($P \leq 0.05$).

RESULTS: The response rate was 55.5% for G1 and 44.4% for G2. Regarding the questions related to personal life, G1 demonstrated higher percentages of fear of contracting the virus during theoretical classes. Same observations were found when students answered about their fear of contracting coronavirus during the clinical practice classes. However, G2 presented the highest agreement responses for the preparedness feeling to return to theoretical classroom, clinical practice classes, and the possibility of applying online learning.

CONCLUSIONS: In general, students' knowledge had little influence on perception of personal life. However, students who have more knowledge in operative dentistry presented more security about returning to clinical classes.

Keywords:

Coronavirus, dental education, perception, students, teaching methods

Department of Preventive and Restorative Dentistry, UNESP – São Paulo State University, Araçatuba School of Dentistry, Araçatuba, SP, Brazil,
¹Department of Restorative Dentistry, São Paulo State University (Unesp), Institute of Science and Technology, São José dos Campos, SP, Brazil

Address for correspondence:

Prof. Ticiane Cestari Fagundes, Department of Preventive and Restorative Dentistry, São Paulo State University (UNESP), School of Dentistry, Araçatuba, SP, Brazil.
E-mail: ticiane.fagundes@unesp.br

Received: 19-05-2021
Accepted: 04-07-2021
Published: 26-02-2022

Introduction

The current Coronavirus, quickly spread around the world receiving the title of pandemic 3 months after the first case.^[1] The rapid advance of the disease is explained by the highly contagious characteristic through infected droplets released during talk, breathe, cough, or sneeze.^[2] In this scenario, many healthcare professionals had to modify their work routine and intensify biosafety measures, as well many universities and

schools had to delay face-to-face classes, due to the demands of social distancing, searching new methodologies to teach.^[3-7]

Therefore, classes were suspended to prioritize social isolation and this measure promotes a challenging factor for education sector, increasing the anxiety and fear among undergraduate students.^[3-7] Besides that, the association between Dentistry and the use of high-speed handpiece, which promotes the spread of aerosol, represents

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: WKHLRPMedknow_reprints@wolterskluwer.com

How to cite this article: e Silva Ramos Fd, Castro Oliveira Ld, Mardegan Gonçalves DF, Rocha RS, Bresciani E, Fagundes TC. Influence of knowledge on Brazilian student's perception of life and clinical classes during COVID-19. J Edu Health Promot 2022;11:62.

potential risks of infection transmission, being a challenge the return to dental clinical practice classes.^[8-10] Besides that, the aggressive and contagious nature of the COVID-19 is connected with the direct or indirect contact with contaminated droplets, and its characteristic of remaining in the air for much longer, increase the risk of spreading the virus from their natural reservoir to a susceptible host far from the origin.^[2,8] Due to the fact that operative dentistry produces so much aerosols during clinical activities,^[2] instruction regarding this knowledge associated with the return of clinical practical activities during the dental course, may affect the undergraduate students.

In this context, many studies are analyzing student's perception and knowledge regarding the online learning and mental health.^[3,5-7,11,12] However, little is known if the level of knowledge of undergraduate students could influence the return to presential classes. Thus, the aim of this study was to evaluate the influence of the level of knowledge of undergraduate students from dental schools on personal lives and return of clinical practices classes.

Materials and Methods

Study design and setting

The present original article is classified as cross-sectional, observational, and qualitative, and was conducted using an online survey questionnaire from September 25 to October 25, 2020, at Google Forms (Google LLC, Mountain View, California, USA).

Study participants and sampling

The validation of the questionnaire was performed through the Kappa concordance test, with the aim of assess the reliability of the questions. Twenty-five students from each proposed group were invited to answer the questions with an interval of 48 h.^[11] The online survey link was circulated through social media and an E-mail to undergraduate students which received a response through an online survey submission.^[10] The responses of students from dental courses and over 18 years old were considered. The gender factor and the maximum age limit were not considered as inclusion criteria.

Students were divided into two groups according to the level of knowledge: G1-not started clinical practice classes in operative dentistry ($n = 190$); G2-already started or completed clinical practice classes in operative dentistry ($n = 152$).

Data collection tool and technique

The survey was composed of 16 closed questions based on an adapted version of the Depression Anxiety

Stress Scales (DASS)^[12] which collected information on demographic characteristics (questions 1-4), impact of COVID-19 on their personal lives (questions 5-8) and implications for the return of clinical practice classes (questions 9-16). For most responses, participants used a 5-point Likert scale classified into 1-strongly disagree; 2-disagree; 3-do not agree or disagree; 4-agree; and 5-strongly agree.^[12] Demographic data will be present descriptively. The quantitative statistical analysis was performed using the SigmaPlot 12.0 software (System Software, San Jose, CA, USA) included the Chi-square test for 5×2 associations. When a statistical difference was found, 2×2 analysis was done considering grouped negative or positive answers, or both scenarios compared to indifferent response, adopting a significance level of 5%.

Ethical considerations

The ethical approval for this study was obtained from the local Institutional Review Board (approval number 34784720.9.0000.5420) and all participants were aware of the informed consent form.

Results

Kappa test was considered as substantial agreement with a value of 0.71. The response rate for this study was 55.5% for G1 and 44.4% for G2, from a total of 342 volunteers. Demographic data are presented in Table 1.

Impact on personal life

Data about the impact on personal life are present in Table 2. There is no correlation between the level of knowledge of undergraduate students and how students respect the quarantine and the increase in anxiety

Table 1: Demographic information of dental students

Demographics	n (%)
Age	
18-30	324 (94.7)
31-50	15 (4.4)
Older than 50	3 (0.9)
Gender	
Male	78 (22.8)
Female	263 (76.9)
Undeclared	1 (0.3)
College	
Public	238 (69.6)
Private	104 (30.4)
Semester	
1-6	259 (57.6)
7-12	145 (42.4)
Groups	
G1	190 (55.5)
G2	152 (44.4)

G1=Not started clinical practice, G2=Already started or completed clinical practice

Table 2: Aspects related to the coronavirus disease 2019 pandemic and its impact on personal life

Question	G1, n (%)	G2, n (%)	P
How are you respecting the quarantine?			
I'm not leaving for anything	2 (1)	4 (2.6)	0.453
I'm leaving only when necessary, always wearing a mask	183 (96.3)	144 (94.7)	
I'm leaving only when necessary, without wearing a mask	0	1 (0.6)	
I'm not respecting the quarantine	5 (2.6)	3 (1.9)	
Did the period of social distancing and quarantine increase your anxiety?			
Strongly disagree	4 (2.1)	2 (1.3)	0.727
Disagree	4 (2.1)	5 (3.3)	
Do not agree or disagree	14 (7.3)	16 (10.5)	
Agree	84 (44.2)	61 (41.1)	
Strongly agree	84 (44.2)	68 (44.7)	
Would you be afraid of contracting coronavirus during presential theoretical classroom lectures?			
Strongly disagree	4 (2.1)	8 (5.2)	0.032
Disagree	22 (11.6)	33 (21.7)	
Do not agree or disagree	31 (16.3)	23 (15.1)	
Agree	72 (37.9)	53 (34.8)	
Strongly agree	61 (32.1)	35 (23)	

G1=Not started clinical practice, G2=Already started or completed clinical practice

during quarantine (questions 1 and 2). According to the feeling of fear of contracting the coronavirus with the return of presential theoretical classes (question 3), G1 group showed 70% of agreement responses, while this feeling is present in 57.8% of G2, occurring statistical differences when both negative and positive answers were compared ($P = 0.025$).

Implications for clinical practice classes

There was an association between the level of knowledge of undergraduate students in implications for clinical practice classes [Table 3]. Regarding the fear of contracting the virus with and without the use of high-speed (questions 1 and 2), G1 presented high percentage of agreement responses with this feeling for both situations (82% and 54.7%, respectively), with statistical differences when both negative and positive answers were compared ($P = 0.032$) with promoting aerosol and not promoting aerosol ($P = 0.042$). However, for the return of the theoretical classroom and clinical practice classes (questions 3 and 4), the G2 group demonstrated more prepared feelings (43.4% and 43.3% respectively), presenting statistical differences when both negative and positive answers were compared ($P < 0.001$) or positive answers were associated with indifferent ones ($P < 0.001$).

Analyzing the possibility of applying online learning knowledge in clinical practical classes (question 5), G2 students believed in this possibility more than G1 (44.7% and 38.4% respectively), with statistical differences when both negative and positive answers were compared ($P = 0.05$). However, for the use of personal protective equipment (PPE) could hinder practical classes performance (question 6), both groups discredited this sentence, with a high percentage

for G1 (35.8%), when grouped comparisons were done as cited above, no statistical differences were found ($P > 0.05$).

For the final questions, there was no association between the level of knowledge of undergraduate students about how quarantine could affect their clinical performance and what is necessary for the effective return of clinical practice classes [Figures 1 and 2].

Discussion

The questionnaire was applied to undergraduate dental students at a time when government recommendations proposed greater flexibility in quarantine and face-to-face classes already had a return date in most states. Thus, we can attribute the lack of association between the level of knowledge of undergraduate students and how students respect the quarantine, as well as, the increase in anxiety during this period. Widespread epidemics of fatal infectious diseases have a substantial negative impact on people's mental health.^[13] Results of a survey study suggested a high prevalence of mental health issues among students who experienced quarantine.^[14] Many studies have shown that there is a generalized confusion about the feelings faced during pandemic, with fear and anxiety becoming increasingly common among undergraduate students around the world.^[13-15] These findings corroborate with this present study since high percentages of agreement responses were found when students were asked about anxiety, independently of the group.

The professional and personal experiences, age, mental health, and academic social adaptability are conditions that are related to lack of knowledge and an effective

Table 3: Implications for clinical practice classes in the coronavirus disease 2019 pandemic

Question	G1, n (%)	G2, n (%)	P
Would you be afraid of contracting coronavirus during the clinical practice classes (promoting aerosol)?			
Strongly disagree	2 (1)	5 (3.2)	0.017
Disagree	16 (8.4)	22 (14.5)	
Do not agree or disagree	16 (8.4)	14 (9.2)	
Agree	82 (43.1)	41 (27)	
Strongly agree	74 (38.9)	70 (46)	
Would you be afraid of contracting coronavirus during clinical practice classes without the use of high-speed (not promoting aerosol)?			
Strongly disagree	11 (5.8)	18 (11.8)	0.015
Disagree	30 (15.8)	36 (23.6)	
Do not agree or disagree	45 (23.7)	19 (12.5)	
Agree	69 (36.3)	50 (32.9)	
Strongly agree	35 (18.4)	29 (19)	
How would you feel about returning to classroom with theoretical lectures?			
Totally unprepared	21 (11)	5 (3.3)	<0.001
Unprepared	51 (26.8)	28 (18.4)	
Neither unprepared nor prepared	71 (37.3)	42 (27.6)	
Prepared	40 (21)	57 (37.5)	
Totally prepared	7 (3.7)	20 (5.8)	
How would you feel about returning to clinical practice classes?			
Totally unprepared	34 (17.9)	17 (11.1)	<0.001
Unprepared	66 (34.7)	39 (25.6)	
Neither unprepared nor prepared	52 (27.3)	30 (19.7)	
Prepared	33 (17.3)	44 (28.9)	
Totally prepared	5 (2.6)	22 (14.5)	
Do you believe that it is possible to apply the knowledge acquired by online theoretical learning in practical classes of operative dentistry?			
Totally discredited	23 (12.1)	8 (5.2)	0.018
Discredited	39 (20.5)	30 (19.7)	
Neither discredit nor believe	51 (26.8)	34 (22.3)	
Believe	73 (38.4)	68 (44.7)	
Totally believe	4 (2.1)	12 (7.9)	
Do you believe that the use of additional PPE would hinder your performance in practical classes?			
Totally discredited	39 (28.9)	45 (29.6)	0.005
Discredited	68 (35.8)	42 (27.6)	
Neither discredit nor believe	55 (28.9)	33 (21.7)	
Believe	19 (10)	30 (19.7)	
Totally believe	9 (4.7)	2 (1.3)	

G1=Not started clinical practice, G2=Already started or completed clinical practice, PPE=Personal protective equipment

application of biosafety measures,^[16-18] became a trigger for increased anxiety and unprepared feelings between students.^[19-21] These facts may explain the higher afraid of contracting coronavirus during presential theoretical classroom lectures for G1 than G2.

Higher percentages of students from G1 were also found when compared to G2, regarding the fear of contracting the coronavirus with and without the use of high-speed in clinical practice classes. In contrast, another study that investigated the knowledge, attitudes, and clinical education of dental students about the pandemic, the authors found that 92% of clinical students had fear of becoming infected with COVID-19 working at close range with patient, while 77.6% of preclinical students answered the same response.^[22]

As a result of the closure of Universities, the online learning model was implanted to prevent the cancel of classes. The large access to information provided by theoretical classroom lectures associated with the lack of practical classes are factors that negatively affect mental health.^[4,17,21] In a study that analyzed the perspectives of dental students and professors on the implementation of this model, a predominance of positive feeling in relation to learning were observed.^[22] In this context, G2 demonstrated are more prepared to return to theoretical and practical classes than G1; then, studies that evaluate the impact of this model on students' clinical competence are necessary, since the lower knowledge degree of students are uncertainly about this scenario. In operative dentistry, different clinical practice classes simulators have

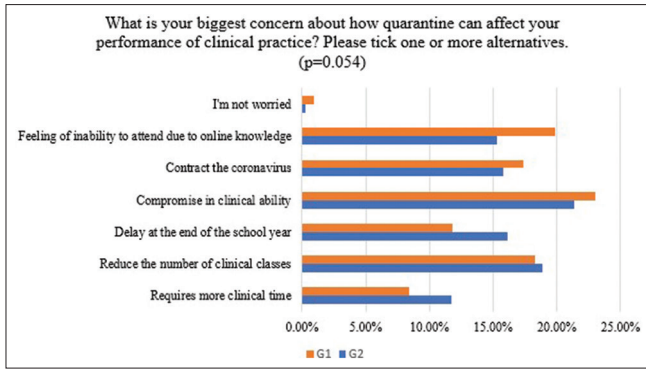


Figure 1: Presentation of percentage about quarantine affect the return to clinical practice classes

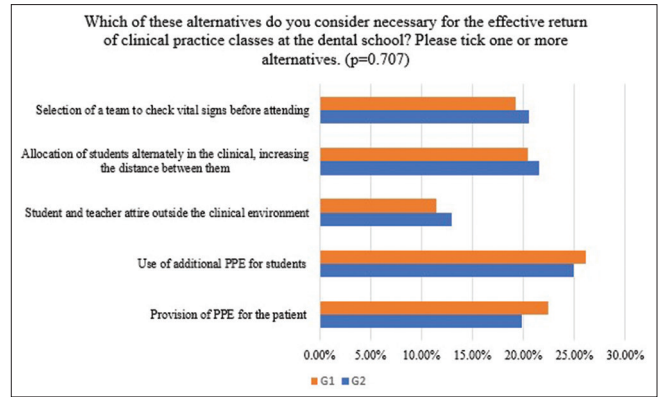


Figure 2: Presentation of percentage about biosafety measures for the return of clinical practice classes

been developed to assist teaching, such as the virtual reality-based technology; however, due to the high cost of implementing these technologies, it is not feasible to use as part of the students' training.^[6,20] Others studies that evaluated the knowledge degree of dental students correlating with the currently pandemic experience, have demonstrated that there is much to improve in dentistry education.^[5,6,23,24] Among the different measures proposed, there is a need to improve students' pandemic knowledge and the required biosafety measures during this period, since the more comprehensive knowledge is, the greater confidence and understanding about proposed measures, resulting in decreased of unprepared feelings and risks of contracting infectious diseases.^[4,17] The undergraduate knowledge degree proposed in this study makes it clear how knowledge can influence conditions of clinical preparation and fear of contracting the virus.

Pragmatic and technical recommendations for correct clinical practice were implemented with the advent of the Covid-19 pandemic, which included the use of masks such as N95 and face-shield.^[25] In this way, students were asked if they believed that the use of these additional equipment in practical classes performance, both groups discredited this sentence, with a high percentage for G1 responses. Therefore, it is essential that dental students have training to use additional PPE to prevent to contract coronavirus in clinical practice classes, mainly for students who are starting the clinical learning, because they are more susceptible to the risk of infections because are not familiar with biosafety standards.^[23,24,26]

Concerning how quarantine can affect the return to practical classes, the answers were between 8% to 24%, with a small percentage of students (3%) who are not worried with this possibility, regardless of the group analyzed. Regarding the additional necessary biosafety measures, the responses were between 11% and 26% of adherence to the new procedures, also regardless of the group analyzed.

Limitation and recommendation

Despite the widespread divulgation of this questionnaire, one of the limitations was the low adherence by representative groups from Universities; however, the number of students that participated in the present study ($n = 342$) was similar to other surveys ($n = 355$).^[10] We believe that the divergence among schools in relation to the model of teaching and returning to face-to-face classes may have influenced the number of respondents. In this context, the present study cannot be generalized to the entire dental community as the survey was done on a group of students. Furthermore, studies with a large sample have to be done, since, observational errors may occur. However, the present study was original because there was no study assessing the influence of knowledge on undergraduate students related to personal life and return to clinical practices during COVID-19 pandemic from several different cities and cultures in Brazil.

In view of this, the experience acquired with COVID-19 brings opportunities for the development of dental education, mainly in the awareness of students regarding the understanding of scientific papers and training biosafety to promote greater familiarity with the prevention measures. In addition, studies that assess the effectiveness of online teaching models and the impact on dental undergraduate students' clinical competence are necessary.

Conclusions

The level of knowledge of undergraduate students influenced the responses, mainly in relation to the fear of contracting the virus and preparation for the return of the clinical practice classes. Students who have more knowledge present more security about returning to clinical practice classes. The unknown about the procedures related to operative dentistry may have contributed to the fear of contracting the virus. Besides that, prior training to clinical practice classes for the

development of experience in personal protection and care in the new current scenario will be necessary.

Acknowledgment

All authors report no sources of funding related to this study.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

References

- INSPIRATION Investigators; Sadeghipour P, Talasaz AH, Rashidi F, Sharif-Kashani B, Beigmohammadi MT, et al. Effect of Intermediate-Dose vs. standard-dose prophylactic anticoagulation on thrombotic events, extracorporeal membrane oxygenation treatment, or mortality among patients with COVID-19 admitted to the intensive care unit: The INSPIRATION randomized clinical trial. *JAMA* 2021;325:1620-30.
- Epstein JB, Chow K, Mathias R. Dental procedure aerosols and COVID-19. *Lancet Infect Dis* 2021;21:e73.
- Agius AM, Gatt G, Vento Zahra E, Busuttill A, Gainza-Cirauqui ML, Cortes AR, et al. Self-reported dental student stressors and experiences during the COVID-19 pandemic. *J Dent Educ* 2021;85:208-15.
- Jungmann SM, Witthöft M. Health anxiety, cyberchondria, and coping in the current COVID-19 pandemic: Which factors are related to coronavirus anxiety? *J Anxiety Disord* 2020;73:102239.
- Hung M, Licari FW, Hon ES, Lauren E, Su S, Birmingham WC, et al. In an era of uncertainty: Impact of COVID-19 on dental education. *J Dent Educ* 2021;85:148-56.
- Spanemberg JC, Simões CC, Cardoso JA. The impacts of the COVID-19 pandemic on the teaching of dentistry in Brazil. *J Dent Educ* 2020;84:1185-7.
- Hakami Z, Khanagar SB, Vishwanathaiah S, Hakami A, Bokhari AM, Jabali AH, et al. Psychological impact of the coronavirus disease 2019 (COVID-19) pandemic on dental students: A nationwide study. *J Dent Educ* 2021;85:494-503.
- Ge ZY, Yang LM, Xia JJ, Fu XH, Zhang YZ. Possible aerosol transmission of COVID-19 and special precautions in dentistry. *J Zhejiang Univ Sci B* 2020;21:361-8.
- Wu KY, Wu DT, Nguyen TT, Tran SD. COVID-19's impact on private practice and academic dentistry in North America. *Oral Dis* 2020;30:10.
- Cotrin P, Peloso RM, Oliveira RC, de Oliveira RC, Pini NI, Valarelli FP, et al. Impact of coronavirus pandemic in appointments and anxiety/concerns of patients regarding orthodontic treatment. *Orthod Craniofac Res* 2020;23:455-61.
- 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;17:2821.
- Basudan S, Binanzan N, Alhassan A. Depression, anxiety and stress in dental students. *Int J Med Educ* 2017;8:179-86.
- Ma Z, Zhao J, Li Y, Chen D, Wang T, Zhang Z, et al. Mental health problems and correlates among 746 217 college students during the coronavirus disease 2019 outbreak in China. *Epidemiol Psychiatr Sci* 2020;29:e181.
- Wathelet M, Duhem S, Vaiva G, Baubet T, Habran E, Veerapa E, et al. Factors associated with mental health disorders among university students in France confined during the COVID-19 pandemic. *JAMA Netw Open* 2020;3:e2025591.
- Elmer T, Mepham K, Stadtfeld C. Students under lockdown: Comparisons of students' social networks and mental health before and during the COVID-19 crisis in Switzerland. *PLoS One* 2020;15:e0236337.
- Valim MD, Marziale MH, Richart-Martínez M, Sanjuan-Quiles Á. Instruments for evaluating compliance with infection control practices and factors that affect it: An integrative review. *J Clin Nurs* 2014;23:1502-19.
- Chang J, Yuan Y, Wang D. Mental health status and its influencing factors among college students during the epidemic of COVID-19. *Nan Fang Yi Ke Da Xue Xue Bao* 2020;40:171-6.
- Karimi N, Saadat-Gharin S, Tol A, Sadeghi R, Yaseri M, Mohebbi B. A problem-based learning health literacy intervention program on improving health-promoting behaviors among girl students. *J Educ Health Promot* 2019;8:251.
- Siles-Garcia AA, Alzamora-Cepeda AG, Atoche-Socola KJ, Peña-Soto C, Arriola-Guillén LE. Biosafety for dental patients during dentistry care after COVID-19: A review of the literature. *Disaster Med Public Health Prep* 2021;15:e43-8.
- Machado RA, Bonan PR, Perez DE, Martelli JÚnior H. COVID-19 pandemic and the impact on dental education: Discussing current and future perspectives. *Braz Oral Res* 2020;34:e083.
- Mustafa RM, Alrabadi NN, Alshali RZ, Khader YS, Ahmad DM. Knowledge, attitude, behavior, and stress related to COVID-19 among undergraduate health care students in Jordan. *Eur J Dent* 2020;14:S50-5.
- Schlenz MA, Schmidt A, Wöstmann B, Krämer N, Schulz-Weidner N. Students' and lecturers' perspective on the implementation of online learning in dental education due to SARS-CoV-2 (COVID-19): A cross-sectional study. *BMC Med Educ* 2020;20:354.
- Loch C, Kuan IB, Elsalem L, Schwass D, Brunton PA, Jum'ah A. COVID-19 and dental clinical practice: Students and clinical staff perceptions of health risks and educational impact. *J Dent Educ* 2021;85:44-52.
- Ghai S. Are dental schools adequately preparing dental students to face outbreaks of infectious diseases such as COVID-19? *J Dent Educ* 2020;84:631-3.
- Villani FA, Aiuto R, Paglia L, Re D. COVID-19 and dentistry: Prevention in dental practice, a literature review. *Int J Environ Res Public Health* 2020;17:4609.
- Ataş O, Talo Yildirim T. Evaluation of knowledge, attitudes, and clinical education of dental students about COVID-19 pandemic. *PeerJ* 2020;8:e9575.