Implications of the COVID-19 Pandemic on the Mental Health and Professional Psychomotor Skills of Dental Students

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Purpose: To estimate dental students’ self-perception of mental well-being (MWB) and its effects on their clinical psychomotor skills (CPS) once they (or their family members) get infected with COVID-19.

Materials and Methods: This is a cross-sectional (n = 268) study from a public dental college in Riyadh. We collected data on MWB and CPS. An 18-item online survey was used to collect the responses from the participants. The inter-rater reliability for the finalised survey came out to be 0.86.

Results: The participants (54.3%) who were infected with COVID-19 recorded that their CPS were significantly affected (almost 4 times higher) as compared to others (OR = 4.02; P = 0.0004). However, 42.2% reported infection control measures at clinics resulted in bringing significant (OR = 2.22, P = 0.04) psychological upsets, for those who were infected with COVID-19. Participants (45.1%) also reported that they have difficulty in recalling old memories or information due to the COVID-19 pandemic; among them, 46.7% were the ones who (and/or any family member) were exposed to COVID-19.

Conclusion: The study spotlighted the extent of dental students’ MWB and its significant effect on their CPS once (themselves or a family member) infected with COVID-19. Moreover, levels of infection control measures at clinics resulted in psychological upsets for dental students.

Clinical Significance: The issue is fundamental as participants enter the clinical workforce and face the ever-increasing demands of dental practice.

Keywords: dental students, clinical psychomotor skills, mental well-being, pandemic, COVID-19

Background
In the midst of confining due to the COVID-19 pandemic, regular educational activities for students of undergraduate and postgraduate dentistry were significantly disrupted around the world.1 Currently, healthcare in general, and oral healthcare in particular, is being profoundly reshaped by a convergence of economic, demographic, and technological trends.2 In such demanding and challenging times, E-learning, and in particular, the use of internet sources, boost learning and comprehension for students.3 This transformation was a rapid response, so was not devoid of limitations and drawbacks, specialty for academic fields requiring face-to-face sessions. Acquiring authentic dental education4 requires realistic, practical participation. Students’ understanding of the topic of dental education tends to be

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improved by pragmatic involvement.\textsuperscript{5} Hence, this recent transition from face-to-face classes on campus to online distance learning sessions not only brought facilitation in the demanding times as well as generated challenges for dental students to cope with their clinical psychomotor skills (CPS).\textsuperscript{6} The intern doctor and the patient, as well as the teacher, will have frequent interaction. In a pandemic situation, this is also the most daunting aspect of dental education to contend with.\textsuperscript{7}

Dental environments have particular features that necessitate extra attention to infection control. Although dentists are knowledgeable, they are yet prone to various infectious diseases, as hepatitis B and C. Many other occupations do not have to worry about infection to the same extent.\textsuperscript{8–9} Dental practitioners and dental students face an elevated risk from dental patients for viral infections because their practice and everyday training require face-to-face contact with patients involving contact with saliva and blood. SARS-CoV-2 transmission can thus occur during dental procedures through inhalation of infected individuals’ aerosol/droplets or direct interaction with mucous membranes, oral fluids, and contaminated instruments and surfaces.\textsuperscript{9,10} The WHO was urged by the unique and uncertain existence of this pandemic to warn about the potential outbreak of workplace stress and psychiatric disorders.\textsuperscript{11} The New York Times prompted that dentists are the most vulnerable individuals when it comes to COVID-19 risk.\textsuperscript{12}

Human beings are mostly living in close association with other family members, depending on various cultures. Hence, there are always chances of any viral disease to affect mentally and physically from one person to another in a family or group of people. When it comes to COVID-19, the transmission rate or attack gets higher, with worse clinical outcomes in the family cluster.\textsuperscript{13} Individuals with COVID-19 infection (at risk) family members were three-fold more likely to have mental health-related symptoms.\textsuperscript{14}

Dental education is progressing at a rapid rate.\textsuperscript{15} Dental students and teachers are also using these available digital resources for communication on an everyday basis. Despite these new developments focused on education-related issues, no information remains vivid about the actual effect of these resources on the learning development of students. Research in the domains of dentistry not only allows for reliable monitoring of the prevalence and spread of oral disease, but it also permits stakeholders for the preparation and evaluation of various educational challenges.\textsuperscript{16} Moreover, the negative impacts of the COVID-19 pandemic on dental students’ performance in clinical settings are not much explored. Studies have shown good experiences but in with grave limitations.\textsuperscript{17}

At College of Dentistry, we have a five-year program. Students are required to attend clinical training in different courses, with real and simulated patients and mannequins, which starts from 2nd year onwards. According to our best knowledge, this is the first study in Saudi Arabia, and we explored dental students’ self-perception of MWB and its effects on their CPS once they (or their family members) get infected with COVID-19. This is significant, as there is currently very little published work available, and the findings from this investigation can improve current and post-pandemic learning and teaching, especially in programs that rely heavily on clinical training. This is especially significant in undergraduate dental education.

Methods
Study Design and Settings
This was a cross-sectional type observational study conducted from September to December 2020.

Study Participants
A total of 309 participants agreed for this study. We employed a convenience sampling. Inclusion criteria consisted of: undergraduated dental students, from year 2 to 5. Dental interns were also included in this study Dental students who were in year 1 were not requested as they are not getting trained in the dental clinics for clinical psychomotor skills. All the agreed participants were informed about the objectives of the study. Later on, we included completed responses from 268 participants for this study. All the participants were informed about the study and an ethical approval was also received from the institutional review board (IRB # E-20-5321). Verbal, as well as written consents were obtained from all participants before data collection. This study was conducted in accordance with the Declaration of Helsinki.

Instrument
A panel of 3 experts working as medical educationists held a 4 hour meeting to form survey items. Initially, 30 item survey (1st version) was prepared in the light of available literature. In 2 subsequent meetings (week apart), this panel discussed and agreed upon deleting 3 items and keep 27 items for the 2nd version. To achieve reliability
and validity of the survey items, the 2nd version was pilot tested with 17 students from year 2nd and 3rd, and 4 interns of College of Dentistry. After standardising all items, reasonably a good inter-rater reliability score was achieved (Cronbach’s $\alpha=0.71$). Face validation of the questionnaire was performed by two independent experts among the team of experts. After carefully evaluating the results from the pilot study, face validation of the instrument was carried out and 5 items were removed, as they were found to be duplicating or ambiguous. Thus, a 22 item survey was used to collect the data from the agreeing participants. The inter-rater reliability for the finalised survey came out to be 0.86.

We used Google forms for collecting the data. The finalised questionnaire sought responses using a Five-Point Likert Scale. The demographic details (using 4 items) were collected for gender, age, study level, and a question asking the participants, “Have you and/or your family member were infected with COVID-19”. Here family member depicts blood relatives living in the close vicinity of the participants (Table 1). The following 11 items were designed to explore participants’ personal feelings amid the COVID-19 pandemic outbreak (Table 2). Whereas the last part (7 items) addressed the items related to the participants’ interaction with patients at the dental clinic and their knowledge/skills during the COVID-19 pandemic outbreak (Table 3).

### Data Collection

Participant’s responses were collected using online distribution of the questionnaire. This online survey consisted of informed consent stating that the participation was on a volunteer basis. There was no incentive for the participants. The collected information was kept secure and confidential.

### Statistical Analysis

Once the data were collected, we entered and analysed it using SPSS version 22.0 (IBM, Armonk, NY, USA). The prevalence of a result variable was estimated along with confidence intervals of 95%. Pearson’s chi-square test and odds ratios (ORs) were used to determine and quantify the associations between a definite outcome and the variables being considered. During the entire study, the statistical significance level has been established as $P<0.05$.

### Results

A total of 268 (out of 309 initially agreed participants) completed surveys were included with a response rate of 86.73%. Among 268 participants, 111 (41.4%) were male, and 157 (58.6%) female. The most (96.6%) contributing age group was 21 to 25. Out of the total participants, 92 (34.3%) reported a direct or indirect association of infection (Table 1). It was recorded that male participants have a higher (52.2%) rate of exposure as were themselves and/or their family members infected with COVID-19, as compared to female participants who were themselves and/or any of their family members) were infected (47.8%). This shows a significantly higher rate in male participants (OR=1.95; $P=0.01$) (Table 1).

It was also found that the age group (21–25 years) had more chances for infection (OR= 3.25; $P=0.27$).

Utilization of the online resources (to get information about coronavirus) was 2.6 times significantly higher (OR=2.61; $P=0.006$) by the infected participants, as compared to those who remained uninfected (Table 4).

Experience of insomnia was found to be 3.53 times more among those who themselves (or a family member) were infected. Concerning the self-reported depression during the current pandemic, 23.1% of the participants stated positive affirmation, and among them, the ones who were directly exposed have stated prevalence of depression (OR=1.78; $P=0.06$). Moreover, 37.2% of students have perceived feeling of hopelessness, and among

### Table 1 Demographic Information of Participants

| Variable                  | Description | Number (%) |
|---------------------------|-------------|------------|
| Gender                    | Male        | 111 (41.4) |
|                           | Female      | 157 (58.6) |
| Age                       | ≤ 20        | 7 (2.6)    |
|                           | 21 to 25    | 259 (96.6) |
|                           | 26 to 30    | 2 (0.7)    |
| Level of Study            | 2nd Year    | 6 (2.23)   |
|                           | 3rd Year    | 49 (18.3)  |
|                           | 4th Year    | 68 (25.4)  |
|                           | 5th Year    | 78 (29.1)  |
|                           | Intern      | 67 (25.0)  |
| Have you and/or your family member were infected with COVID-19 | Yes | 92 (34.3) |
|                           | No          | 176 (65.7) |

**Notes:** *Blood relative, living in close vicinity.*
Table 2: Students Personal Feeling About Own Health During the COVID-19 Pandemic Outbreak

| Variable                                                                 | Description       | Number (%) | Yes n(%)       | No n(%)       | $\chi^2$ (P-value) |
|--------------------------------------------------------------------------|-------------------|------------|----------------|---------------|-------------------|
| I have poor concentration on your work in clinic during COVID-outbreak   | Agree             | 85(31.7)   | 36(9.1)        | 49(27.8)      | 3.56 (0.16)       |
|                                                                          | Neutral           | 71(26.5)   | 22(23.9)       | 49(27.8)      |                   |
|                                                                          | Disagree          | 112(41.8)  | 34(37.0)       | 78(44.3)      |                   |
| I am afraid of the dental clinic because there is a possibility of getting infected with COVID-19 | Agree             | 140(52.2)  | 56(60.9)       | 84(47.7)      | 5.67 (0.05)       |
|                                                                          | Neutral           | 56(20.9)   | 19(20.7)       | 37(21.0)      |                   |
|                                                                          | Disagree          | 112(41.8)  | 17(18.5)       | 55(31.3)      |                   |
| I feel a slowness in the execution of movement                           | Agree             | 87(32.5)   | 36(39.1)       | 51(29.0)      | 3.20 (0.20)       |
|                                                                          | Neutral           | 62(23.1)   | 21(22.8)       | 41(23.3)      |                   |
|                                                                          | Disagree          | 119(44.4)  | 35(38.0)       | 84(47.7)      |                   |
| I have frequent thoughts of being infected during COVID-19 pandemic      | Agree             | 145(54.1)  | 55(59.8)       | 90(51.1)      | 2.61 (0.27)       |
|                                                                          | Neutral           | 62(23.1)   | 21(22.8)       | 41(23.3)      |                   |
|                                                                          | Disagree          | 61(22.8)   | 16(17.4)       | 45(25.6)      |                   |
| I have a feeling of being in a confused state most of the time           | Agree             | 104(38.8)  | 37(40.2)       | 67(38.1)      | 11.77 (0.003)     |
|                                                                          | Neutral           | 57(21.3)   | 29(31.5)       | 28(15.9)      |                   |
|                                                                          | Disagree          | 107(39.9)  | 26(28.3)       | 81(46.0)      |                   |
| I have a sense of being emotionally detached from family and friends     | Agree             | 108(40.3)  | 50(54.3)       | 58(33.0)      | 11.95 (0.003)     |
|                                                                          | Neutral           | 57(21.3)   | 13(14.1)       | 44(25.0)      |                   |
|                                                                          | Disagree          | 103(38.4)  | 29(31.5)       | 74(42.0)      |                   |
| I feel anxious while dealing with febrile patients                       | Agree             | 134(50.0)  | 49(53.3)       | 85(48.3)      | 0.68 (0.71)       |
|                                                                          | Neutral           | 68(25.4)   | 21(22.8)       | 47(26.7)      |                   |
|                                                                          | Disagree          | 66(24.6)   | 22(23.9)       | 44(25.0)      |                   |
| I can remember my subject’s contents appropriately                       | Agree             | 102(38.1)  | 29(31.5)       | 73(41.5)      | 2.66 (0.26)       |
|                                                                          | Neutral           | 108(40.3)  | 42(45.7)       | 66(37.5)      |                   |
|                                                                          | Disagree          | 58(21.6)   | 21(22.8)       | 37(21.0)      |                   |
| I can concentrate on my studies                                          | Agree             | 113(42.2)  | 43(46.7)       | 70(39.8)      | 1.48 (0.47)       |
|                                                                          | Neutral           | 84(31.3)   | 25(27.2)       | 59(33.5)      |                   |
|                                                                          | Disagree          | 71(26.5)   | 24(26.1)       | 47(26.7)      |                   |
them a higher prevalence rate was found among those who were infected with COVID-19 ($OR=2.43; P=0.002$).

The participants (54.3%) who were infected with COVID-19 recorded that their CPS were significantly affected (almost 4 times higher) during the pandemic as compared to others ($OR= 4.02; P=0.0004$) (Table 4). Furthermore, 42.2% reported infection control measures required to practice at clinics affecting psychologically, which is significantly high ($OR=2.22, P=0.04$) for those who were infected with COVID-19. However, 50.4% of participants were reported as ready to treat patients during the current pandemic situation; among them was not significant of those who themselves (and/or any family member) were exposed to coronavirus ($OR=1.97; P=0.06$) (Table 4).

Table 2 summarises the personal feeling about own health during the COVID-19 pandemic outback. This study found that most (52.2%) of the participants were found to be afraid of their training and practice at dental clinics because there was a possibility of coronavirus infection, among these a significantly high ($P=0.05$) number was of those students (60.9%) who themselves (or any family member) were exposed to COVID-19. In the current study, 54.1% of students reported that they have frequent thoughts of being infected during the COVID-19 pandemic. 38.8% of students agreed that they have the feeling of being in a confused state most of the time, and among them, 40.2% were those students who themselves (or any family member) were infected with COVID-19. This was statistically significant ($\chi^2=11.7; P=0.003$). Similarly, 40.3% of students reported that they have a sense of being emotionally detached from family and friends due to coronavirus, this type of feeling was reported mostly (54.3%) by those who themselves (or any family member) were infected with COVID-19 ($\chi^2=11.95; P=0.003$). Furthermore, 45.1% of participants reported that they have difficulty in recalling old memories or information due to the COVID-19 pandemic; among them 46.7% were the ones who (or any family member) were infected with COVID-19.

Table 3 summaries the participants’ knowledge and skills and the way of interaction with patient at the dental clinical during the COVID-19 pandemic. Majority of the participants (91.8%) inquired the visiting patients about fever, cough, or recent travel history during regular check-ups. Similarly, 82.8% of the participants agreed about using hand sanitisation more frequently while at the dental clinic. Furthermore, 60.8% of students with no history of
Table 3: Students Interaction with Patients at the Dental Clinic and Their Knowledge/Skills During the COVID-19 Pandemic Outbreak

| Variable                                                                 | Description                                                                 | Number (%)      | Yes: 92 [n(%)] | No: 176 [n(%)] | \(\chi^2\) (P-value) |
|--------------------------------------------------------------------------|-----------------------------------------------------------------------------|-----------------|----------------|----------------|-----------------------|
| It is important to ask patients about high fever, dry cough, or recent travel history | Agree                                                                       | 246(91.8)       | 85(92.4)       | 161(91.5)       | 0.11(0.94)            |
|                                                                          | Neutral                                                                     | 15(5.6)         | 5(5.4)         | 10(5.7)         |                       |
|                                                                          | Disagree                                                                    | 7(2.6)          | 2(2.2)         | 5(2.8)          |                       |
| I hesitate to treat a patient once he/she is recovered from COVID-19 infection | Agree                                                                       | 77(28.7)        | 24(26.1)       | 53(30.1)        | 0.61(0.73)            |
|                                                                          | Neutral                                                                     | 67(25.0)        | 25(27.2)       | 42(23.9)        |                       |
|                                                                          | Disagree                                                                    | 124(46.3)       | 43(46.7)       | 81(46.0)        |                       |
| I use hand sanitization more frequently while at the dental clinic        | Agree                                                                       | 222(82.8)       | 88(95.7)       | 159(90.3)       | 2.25(0.32)            |
|                                                                          | Neutral                                                                     | 30(11.2)        | 3(3.3)         | 10(5.7)         |                       |
|                                                                          | Disagree                                                                    | 16(6.0)         | 1(1.1)         | 7(4.0)          |                       |
| I like to wear Personal Protective Equipment (PPE) while at the dental clinic | Agree                                                                       | 247(92.2)       | 88(95.7)       | 159(90.3)       | 2.60(0.27)            |
|                                                                          | Neutral                                                                     | 13(4.9)         | 3(3.3)         | 10(5.7)         |                       |
|                                                                          | Disagree                                                                    | 8(3.0)          | 1(1.1)         | 7(4.0)          |                       |
| I am confidently using the equipment and tools at the dental clinic       | Agree                                                                       | 197(73.5)       | 67(72.8)       | 130(73.9)       | 0.09(0.95)            |
|                                                                          | Neutral                                                                     | 47(17.5)        | 17(18.5)       | 30(17.0)        |                       |
|                                                                          | Disagree                                                                    | 41(15.9)        | 8(8.7)         | 16(9.1)         |                       |
| I am confident to treat my patients                                      | Agree                                                                       | 163(60.8)       | 46(50.0)       | 117(66.5)       | 16.70(<0.000)         |
|                                                                          | Neutral                                                                     | 73(27.2)        | 39(42.4)       | 34(19.3)        |                       |
|                                                                          | Disagree                                                                    | 32(11.9)        | 7(7.6)         | 25(14.2)        |                       |
| The pandemic has affected my clinical skills and it reflects on the treatment outcome of my patient | Agree                                                                       | 99(36.9)        | 42(45.7)       | 57(32.4)        | 18.90(<0.000)         |
|                                                                          | Neutral                                                                     | 89(33.2)        | 38(41.3)       | 51(29.0)        |                       |
|                                                                          | Disagree                                                                    | 80(29.9)        | 12(13.0)       | 68(38.6)        |                       |

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### Table 4: Associations (Regression Analysis) Between Prevalence and Strategies with Different Variables of Dental Students in the During COVID-19 Pandemic

| Variable                  | Description | Number (%) | Yes: 92 N(%) | No: 176 N(%) | OR(95% CI) | P-value |
|---------------------------|-------------|------------|--------------|--------------|------------|---------|
| Gender                    | Male        | 111(41.4)  | 48(52.2)     | 63(35.8)     | 1.95(1.17–3.26) | 0.01    |
|                           | Female      | 157(58.6)  | 44(47.8)     | 113(64.2)    |            |         |
| Age                       | ≤20         | 7(2.6)     | 1(1.1)       | 6(3.4)       | 0.00         | 0.27    |
|                           | 21–25       | 259(96.6)  | 91(98.9)     | 168(95.5)    | 2.35(1.38–4.01) |         |
|                           | 26–30       | 2(0.7)     | 0(0.0)       | 2(1.1)       | 0.00         |         |
| Laval of study            | 2nd Year    | 6(2.23)    | 3(3.3)       | 3(1.70)      | 0.00         |         |
|                           | 3rd Year    | 49(18.3)   | 15(16.3)     | 34(19.3)     | 1.68(0.77–3.65) | 0.18    |
|                           | 4th Year    | 68(25.4)   | 29(31.5)     | 39(22.2)     |            |         |
|                           | 5th Year    | 78(29.1)   | 22(23.9)     | 56(31.8)     | 0.89(0.40–1.94) | 0.77    |
|                           | Intern      | 67(25.0)   | 23(25.0)     | 44(25.0)     | 1.18(0.53–2.60) | 0.67    |
| Personal feeling about COVID-19 pandemic | I read and watch more about COVID-19 | Agree | 108(40.3) | 45(48.9) | 63(35.8) | 2.61(1.31–5.20) | 0.006 |
|                           | Neutral     | 90(33.6)   | 32(34.8)     | 58(33.0)     | 2.02(0.98–4.13) | 0.05   |
|                           | Disagree    | 70(26.1)   | 15(16.3)     | 55(31.3)     |            |         |
|                           | I feel anxious | Agree | 136(50.7) | 57(62.0) | 79(44.9) | 2.26(1.15–4.43) | 0.017 |
|                           | Neutral     | 70(26.1)   | 20(21.7)     | 50(28.4)     | 1.25(0.57–2.73) | 0.56   |
|                           | Disagree    | 62(23.1)   | 15(16.3)     | 47(26.7)     |            |         |
|                           | I feel insomnia | Agree | 37(13.8) | 21(22.8) | 16(9.1) | 3.53(1.68–7.40) | 0.0008 |
|                           | Neutral     | 76(28.4)   | 29(31.5)     | 47(26.7)     | 1.67(0.92–2.97) | 0.08   |
|                           | Disagree    | 155(57.8)  | 42(45.7)     | 113(64.2)    |            |         |
|                           | I feel depressed | Agree | 62(23.1) | 26(28.3) | 36(20.5) | 1.78(0.96–3.29) | 0.066 |
|                           | Neutral     | 57(21.3)   | 23(25.0)     | 34(19.3)     | 1.67(0.88–3.15) | 0.11   |
|                           | Disagree    | 149(55.6)  | 43(46.7)     | 106(60.2)    |            |         |
|                           | I feel hopeless | Agree | 100(37.3) | 48(52.2) | 52(29.5) | 2.43(1.36–4.31) | 0.002 |
|                           | Neutral     | 59(22.0)   | 14(15.2)     | 45(25.6)     | 0.81(0.39–1.70) | 0.59   |
|                           | Disagree    | 109(40.7)  | 30(32.6)     | 79(44.9)     |            |         |
| Patient interaction at clinic during COVID-19 pandemic | I have fear to get infected by COVID-19 patients | Agree | 162(60.4) | 58(63) | 104(59.1) | 1.67(0.78–3.55) | 0.181 |
|                           | Neutral     | 62(23.1)   | 23(25.0)     | 39(22.2)     | 1.76(0.75–4.16) | 0.19   |
|                           | Disagree    | 44(16.4)   | 11(12.0)     | 33(18.8)     |            |         |
COVID-19 had much more confidence to treat patients than those who had a history of infection of COVID-19 ($\chi^2=16.70$; $P=0.000$). Only 36.9% reported that the COVID-19 pandemic had affected their CPS, and among them, a significantly high percentage was for those who themselves (or any family member) were exposed ($\chi^2=18.90$; $P=0.000$) with COVID-19.

**Discussion**

Behavioral and social methods are being used in many countries to monitor and control the transmission of coronavirus disease. In health-care facilities, both infected and non-infected patients are isolated. If they are capable, patients can only interact with their family members through mobile phones or electronic tablets.

Supporting patients allow physicians, students (medical and dental), and nurses who are already stressed by the emergency load to serve humanity by treating the ailing community, but it can also be emotionally draining. During the current pandemic, doctors are also cared for at home, mainly by their close family and relatives.

In this study, the participants who themselves (or any family member) were infected had a higher inclination towards gathering information through videos and other online resources to get coronavirus information. Similarly, another study from Pakistan stated that due to the limited data available as COVID-19 preventive guidance for dental practitioners, dental students often turn to the internet for details. It is noteworthy that similar findings were reported in a study from China, stating, social media and TV were also among the preferred ways to gather information regarding pandemic, and also in Saudi Arabia. In the current study, we found that most dental students (if any of their family member has infected with coronavirus) were anxious and recorded for having more than 2 times high anxiety levels as compared to other respondents (whose family members were not infected). Two other published studies from China and Albania reported a similar finding. The dental clinical students were worried about their family members and friends to get infected hence, experienced anxiety and insomnia.

The current study reported that dental clinical students were affected by fear of contagion and of infecting family members and friends and this resulted in a high level of insomnia problem (3.5 times higher). Similarly, the findings are in conjunction with results from another study. In addition, the effect of insomnia has been linked to...
negative aspects of the doctor–patient relationship. The prevalence of depression in the dental students was recorded to be 1.78 times high if any family member had been infected with the virus, which showed the similar significant effect in another study. Individuals may become hopeless as a result of stressful life events, traumas, depressive symptoms, and anxiety. Anxiety levels in the state are closely linked to traumatic incidents, events that last a long time and are unpredictable, such as a pandemic, can exacerbate anxiety and hopelessness. In this study, there is a significant correlation, as the dental students (and any of their family members), was infected with the coronavirus, they were more hopeless (2.43 times higher). A similar finding reported in a previously published study. On March 11, 2020, the coronavirus disease 2019 (COVID-19) epidemic was declared a pandemic. Several dental clinics in the affected countries have closed or are only offering emergency services. Several facilities in some of the affected nations, however, continue to provide routine dental care. In the current study, most of the dental clinical students reported that their clinical and psychomotor skills were affected badly due to coronavirus, among them more affected were those students who themselves or any family members were infected with COVID-19. These results were consistent with previous international findings.

This study shows most participants agreed about using hand sanitisation more frequently while at the dental clinic. Findings from another study stated that the majority of participants recommended using disinfectants regularly between dental visits. The majority of our study participants also asked patients about fever, cough, or recent travel history during regular checkups at dental clinics. Similar reports were found, emphasising dental staff to inquire about their current health condition before their scheduled appointment.

Dentistry is an example of such vocations where person-to-person interaction is inevitable. The discipline of dentistry uses CPS teaching models. Despite the fact that in current times various modern training resources like mannequins and models are available still, we do require doctor–patient interaction for the learners’ excellence. The majority of students viewed clinical training practices as exposing them to the possibility of contracting COVID-19 infection. Based on our results, the CPS acquisition was affected, as reported by 36.9% of participants. Moreover, this was predominantly higher (almost 4 times higher) as the majority of the participants who were infected with COVID-19 recorded that their CPS were significantly affected during the pandemic as compared to others. Such findings are in conjunction with results from another study.

Cognitive function impairment is also a consequence of the COVID-19 pandemic. Our participants reported that they have difficulty recalling old memories or information due to the COVID-19. These results were consistent with previous international findings. COVID-19-affected patients have been related to a higher risk of cognitive impairment after resolving the primary infection, according to previous studies. The cognitive impairment reported in the earlier studies suggests the need for long-term follow up of the COVID-affected subjects.

Widespread reports from the published work concluded that depression affects people of all ages and is one of the leading causes of sickness and disability. It is also to blame for serious life issues, and both attempted and completed suicides. Participants in our study reported being depressed. This was consistent with various published works in the recent past where dental students were reported to be depressed. Hakami et al identified that the prevalence of high levels of depression among dental students illustrates the need for psychological empowerment measures that involve institutional therapy services.

Limitations and Implications
Findings from one healthcare institute limit the generalizability of important outcomes. Nevertheless, offering safe dental services to patients while also protecting dentists and healthcare staff, is crucial. This all can be highlighted, stressed with practical measures targeting mental wellbeing resulting in improved clinical psychomotor skills of learners.

Conclusion
The risk of cross-infection between dental practitioners and patients is high due to the characteristics of dental settings. This risk is amplified as the current pandemic poses risk of COVID-19 infection within healthcare community. Strict and reliable guidelines on the prevention of infections are urgently required for dental practices and hospitals in countries/regions (potentially) affected by COVID-19. We conclude that the potential risk arising from COVID-19 to the dental students’ MWB (affecting their CPS) is higher, especially during clinical performance.
This study highlighted the magnitude of dental students’ MBW and its substantial influence on their CPS once (themselves or a family member) infected with COVID-19. Additionally, levels of infection control measures at clinics resulted in psychological upsets for dental students, who find it difficult to recall old memories or information.

Ethics Approval and Consent to Participate

The study was approved by the institutional review board college of medicine, KSU. Before completing their responses on the questionnaire, all participants were provided with a written consent to participate in the study.

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Disclosure

The authors report no conflicts of interest in this work.

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