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What's new for the clinician– summaries of recently published papers

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1. The prevalence of SARS-CoV-2 IgG antibodies among dental teams compared to the general population

The Corona pandemic fundamentally changed the world of business, communication, healthcare delivery and infection control in the last 2-3 years. Dentistry, which was already a high-risk category during the HIV pandemic went into a lockdown that saw many practices close or offer very limited non-aerosol generating procedures (non-AGPs) during this period. The science and best practice also changed significantly from an initial period where interventions such as fogging, mandatory testing with the slightest presentation of symptoms, isolation of suspected covid-19 infected patients, etc resulted in closure or limited scope of practice being offered at most private and public facilities. SARS-CoV-2 is mainly transmitted through droplets and aerosol particles.

Aerosols generated during dental procedures, such as osteotomies, drilling, prophylaxis, and ultrasonic scaling, became a focal point with utmost urgency for policy-makers due to the fear of coronavirus transmission. Living coronavirus has been detected in the saliva; thus, dentists and their team were presumed to be highly susceptible due to their frequent occupational exposure to aerosol-generating dental procedures (AGDP) compared to the general population. The question whether the dental team may even be "super spreaders" for the SARS-CoV-2 to their patients was widely discussed and caused major uncertainty. This led regulators and health authorities worldwide to call for postponing elective procedures and provide emergency-only treatment hoping to restrict the spread of the virus.

Mksoud et al (2022)[1] reported on a multi-center study that sought to investigate the risk of infection among the dental team compared to the general population, and clarify the impact of protective measures in preventing SARS-CoV-2 infection.

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MATERIALS AND METHODS

This cross-sectional study involved 2998 individuals who work at licensed private dental practices in Germany between January and April 202.

Participants were recruited from 5 urban regions in Germany:- (1) Berlin, (2) Hamburg, (3) Dresden, (4) Stuttgart, and (5) Cologne/Düsseldorf. In total, 7300 invitations were sent out to participate in this study. Each dental practice was asked to name three designated participants including a dentist, a dental nurse, and a dental prophylaxis nurse. Overall, 3305 participants from 1390 dental practices (equalling 4170 subjects) agreed to participate in this study and gave their written informed consent (response rate 79%).

Each participant received a study package that included a questionnaire and a dry blood collection set (EUROIMMUN), both labelled with the same numerical identifier "ID." IDs were automatically generated prior to sending out the study materials to ensure data privacy and enable the matching of self-reported data with biomaterials afterwards. Participants who did not complete the questionnaire (n=297) or failed to provide a dry blood sample as instructed (n=10) were excluded. By 21 April 2021, 2998 packages were received and included in the study. A total of 200 participants had to be excluded due to vaccination. Furthermore, we excluded 14 participants who reported being previously tested positive for SARS-CoV-2 but no antibodies in their dry blood sample could be detected, thus leaving us with data from 2784 participants.

Participants were asked if they had already suffered from a SARS-CoV-2 infection confirmed by a PCR test, had been vaccinated, or had treated patients positively tested for coronavirus disease. The remaining questions revealed how the practice activity and working hours were affected by the pandemic, the working circumstances in the practice, and implemented personal protective equipment (PPE). The survey encompassed the year 2020 and the answers were given in quarterly periods (Q1: January–March, Q2: April–June, Q3: July–September, Q4: October–December). This study focused on the answers from the second, third, and fourth quarters.

Participants collected a capillary blood sample from the fingertip which were tested for anti-SARS-CoV-2 IgG antibodies. The diagnostic sensitivity of this assay was reported to be 43.7% in samples taken until day 10 after symptom onset or positive direct detection and 94.4% in samples collected after day 10 and specificity was reported to be 99.6%. A participant was considered as having had a SARS-CoV-2 infection if he/she had SARS-CoV-2 antibodies or reported having a positive SARS-CoV-2 PCR test before our study period. Data from 24 individuals with a borderline laboratory finding without reporting a positive SARS-CoV-2 PCR test were set to missing.

For the control population, biospecimens (dry blood sample and a swab sample from the mouth and nose) were collected from a nationwide population sample drawn from the German Socio-Economic Panel (SOEP).

RESULTS

The researchers examined 2784 dental team members from 1125 offices in Germany. They recorded 146 participants with positive SARS-CoV-2 IgG antibodies (5.2%) and 30 subjects with a borderline finding (1.1%). In total, 74 out of the 146 participants with SARS-CoV-2 IgG antibodies did not report a positive SARS-CoV-2 PCR test (50.7%) and 27 participants without SARS-CoV-2 IgG antibodies did report a positive SARS-CoV-2 PCR test (1.1%). When combining the laboratory and self-reported information, the number of participants with a SARS-CoV-2 infection was 179 (6.5%). The frequency of SARS-CoV-2 IgG antibodies was highest in Dresden, followed by Stuttgart and Cologne. In comparison to Hamburg, the risk for SARS-CoV-2 IgG antibodies was significantly higher in Dresden (OR = 6.11; 95% CI: 2.77–13.47; $p < 0.001$), Cologne (OR = 2.73; 95% CI: 1.15–6.48; $p = 0.023$), and Stuttgart (OR = 3.06; 95% CI: 1.21–7.76; $p = 0.018$) but not in Berlin (OR = 1.70; 95% CI: 0.72–4.02; $p = 0.227$).

Usage of filtering face pieces (FFP) masks increased from 48 to 75% from the 2nd to the 4th quarter of 2020, whereas visors and goggles were used regardless of the timeline in 60% and 80% of all participants, respectively. AGDP working time dropped about 3 h from the 28 h/week to 25 h/week from the 1st to 2nd quarter but then increased steadily up to the 4th quarter to reach 29 h/week. The frequency of applying distancing measures was comparable (i.e., about 96%) in all regions

In logistic mixed-effects models adjusted for regions, the risk for a SARS-CoV-2 infection was significantly associated with using a rubber dam (OR = 1.65, 95% CI: 1.01–2.72) and with the number of protective measures (OR = 1.16, 95% CI: 1.01–1.34). No such associations were observed for the other protective equipment or ventilation measures. Age, sex, occupational group, working time with the patient, application of distancing measures, number of aerosol-generating devices, use of ventilation systems, ventilation after each examination, pre-treatment mouthwash, and size of the practice rooms were not significantly associated with a SARS-CoV-2 infection. In a multivariable logistic mixed-effects model including age, sex, occupational group, working time with patient, use of FFP mask, use of visor, use of rubber dam, application of distancing measures, number of aerosol-generating devices, availability of ventilation systems, pre-treatment mouthwash, and size of practice rooms, none of those variables was significantly associated with a SARS-CoV-2 status. Particularly, reported significant association between using a rubber dam and SARS-CoV-2 status attenuated and turned non-significant (OR = 1.44, 95% CI 0.82–2.53; $p = 0.206$).

In the general German population, the cumulative incidence of PCR-validated SARS-CoV-2 infections reported for the time between October 1, 2020, and April 15, 2021, was 5.0% for Dresden, 4.1% for Berlin, 3.4% for Hamburg, 3.7% for Cologne, and 3.5% for Stuttgart. The prevalence of SARS-CoV-2 antibodies was about 3% in January, 6% in February, and 7% in March across Germany.

CONCLUSIONS

The researchers concluded that the risk of SARS-CoV-2 transmission was not higher among the dental team compared to the general population.

Implications for practice: The WHO safety protocols implemented in many practices worldwide has demonstrated a protective effect among the dental team. This has ensured that the risk for acquiring SARS COVID infection among the dental team is similar to that of the general population provided they adhere to recommended infection control protocols.

REFERENCE

1. Mksoud M, Ittermann T, Holtfreter B, Söhnel A, Söhnel C, Welk A, Ulm L, Becker K, Hübner NO, Rau A, Kindler S. Prevalence of SARS-CoV-2 IgG antibodies among dental teams in Germany. Clinical oral investigations; 2022; 26:3965-74.

2. How have undergraduate dental students' coped with the COVID-19 pandemic?

A novel human coronavirus named severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) was first reported in Wuhan Province, China, in late 2019.[1] Within a month, the World Health Organization (WHO) declared the coronavirus (COVID-19) outbreak as a public health emergency of international concern.[2] Due to the disease being highly infectious, together with the ease of transportation and people movement between countries, COVID-19 spread quickly from China to other countries. The WHO recognised the spread of COVID-19 as a pandemic on 11 March 2020, as Italy, Iran, South Korea and Japan reported surging numbers of cases.[3]

South Africa, like much of the rest of the world, introduced severe restrictions in the early days of the pandemic to try and contain the spread of the disease. For dental schools, this meant that there was severe restrictions on face-to-face and clinical activities, especially aerosol generating procedures (AGPs). Internationally, although there is some variation, many dental schools have also suspended clinical teaching and implemented working from home policies.

Dental education programmes are known to be technically and academically extremely demanding. These closures and/or restrcitions resulted in emotional, psychological and physical stress for students, as they had to deal with the demands of time and scheduling pressures, management of difficult patients, examination anxiety and financial commitment.[1] As the country entered the alert level 4, the responsibility fell on academic staff to actively repurpose and redeploy resources, upskill their digital competencies and develop new material to transition traditional face-to-face and blended programmes to a remote learning and/or online education delivery mode.[1] Pandemic crises inadvertently ignite social disruption and mental disturbance such as increased fear and anxiety among the public. Therefore, it may be hypothesised that some dental students who were already stressed due to the demands of the training course may have felt even more emotionally unsettled by the disruptions caused by COVID-19 restrictions, affecting them psychologically, physically and emotionally. Poma and colleagues from New Zealand (2022) [1], which had some of the toughest restrictions in the world, reported on a study that sought to evaluate the impact of the COVID-19 restriction measures on the undergraduate dental students' perception of their physical, mental and social well-being, as well as their financial stress. This study also investigated the students' perceived level of anxiety in relation to their future dental careers.

MATERIALS AND METHODS

An electronic questionnaire was structured using an online platform (Qualtrics) with four main themes related to the ongoing COVID-19 situation as well as the four-week COVID-19 lockdown period. The themes were General well-being, Physical well-being, Psychological and emotional well-being and Behavioural and social well-being

The questionnaire was modelled according to the Depression, Anxiety and Stress Scale (DASS-42)15 and the Perceived Wellness Survey (PWS). Participants were asked to rank their answers according to a 5-level Likert scale (1-strongly disagree, 2-somewhat disagree, 3-neither agree nor disagree, 4-somewhat agree and 5-strongly agree). To allow easier management of results within each theme of the online questionnaire via Qualtrics, any positively worded questions from the PWS were modified with a negative wording approach and followed the general trend of negatively worded questions based on the DASS-42. This meant that lower Likert scale would indicate a positive outcome, whereas the higher Likert scale would indicate a negative outcome. Other questions included demographic information, tuition fee-paying status and living situation during the lockdown period. Free-text comment boxes, which were optional to complete, were also available at the end of each theme for the participants to elaborate further on the answers that they have given.

The online link to the survey was distributed to all undergraduate Bachelor of Dental Surgery (BDS) students (n = 376; Year 2–5) via their email addresses as well as posting it to each class Facebook page. The survey period occurred during a lockdown with alert level 4. Student participation was on a voluntary and anonymous basis and no incentives were used to improve the rate of responses.

RESULTS

There were 301 out of 376 undergraduate dental students (80.1% response rate; 102 males, 198 females, 1 did not want to answer) with a mean age of 22.0 ± 2.70 years (range: 18–40 years) who participated in the survey. The highest response rate was from the BDS Year 5 class (85.6%; 83 out of 97) followed closely by Year 4 (85.1%; 86 out of 101), Year 3 (81.0%; 64 out of 79) and Year 2 (68.7%; 68 out of 99).

There were 211 domestic and 90 international students. For domestic students, a significant proportion was relying on New Zealand government student loans (n = 149; 70.62%) followed by personal loans (n = 5; 2.37%), scholarship (n = 4; 1.90%) and other means such as parents (n = 53; 25.12%). Most of the international students (n = 40; 44.44%) relied on their parents and family support as the main source of funding for their tuition fees, followed by their personal loans (n = 29; 32.22%) and scholarships (n = 21; 23.33%).

During the 4-week lockdown period, the majority of participants decided to stay in Dunedin where the Dental School was located (187 out of 301) while the remaining students returned to their hometowns. Among those who stayed in Dunedin, a significant proportion (71%) were in shared houses with others, while a few students (9 out of 187) moved back with their families in Dunedin.

Approximately a quarter of the respondents (n = 75; 24.9%) were employed in a part-time job during the academic year of 2020. Approximately one-third (n = 24; 32%) of them did not experience any changes with their employment status, while the same proportion (n = 24; 32%) had lost their job

as a result of the COVID-19 lock down and the remaining students had their working hours reduced (n = 27; 36%). Most of the respondents reported no dependents (81.7%). Respondents mainly gained information about COVID-19 through social media such as Facebook or Twitter (32.58%) as well as online government or news websites (36.81%). Less than 1% of the respondents chose not to listen to any information related to COVID-19.

Overall, students perceived their physical well-being as relatively on the positive side (mean Likert score 2.75 ± 0.82). There were insignificant differences between each BDS year levels (Year 2 = 2.98 ± 0.83; Year 3 = 2.64 ± 0.74; Year 4 = 2.74 ± 0.84; Year 5 = 2.65 ± 0.80). In terms of gender differences, there was no significant difference between males (2.68 ± 0.90) and females (2.77 ± 0.77). On average, students reported a similar level of impact on their psychological well-being (2.79 ± 0.62) compared to their physical well-being. There was no statistically significant difference in the psychological and emotional well-being in relation to the year of study. However, female students (2.85 ± 0.60) reported to be more psychologically and emotionally affected compared to their male counterparts (2.67 ± 0.65) (p = 0.011).

On average, students appeared to be more affected (3.20 ± 0.745) in terms of their behavioural changes due to the COVID-19 situation. There was no difference in the behavioural and social well-being of students in relation to the year of study or gender.

On average, students were not too significantly affected in terms of financial concerns (2.74 ± 1.14). There was also no difference when comparing between different years of study or whether the students had a part-time job (2.85 ± 1.20) or not (2.70 ± 1.13). However, there was a statistically significant difference in the financial concerns in relation to the tuition fee-paying status (p = 0.000) as well as the dependent status (p = 0.001).

On average, students were negatively affected by the COVID-19 situation in terms of their future career prospects (3.41 ± 1.20). There was a clear tendency for increase in future career concerns as the respondents were closer to their graduation. The final year BDS class had the highest concerns showing an average of 4.26 on the Likert scale. The most junior BDS class had the lowest Likert score (mean 2.63), indicating that they were not so affected by the COVID-19 situation when it came to their job prospects.

CONCLUSIONS

The study provides valuable information on the impact of COVID-19 pandemic on undergraduate dental students, and areas that the University should consider when providing support to the affected students.

Implications for practice: the COVD-19 pandemic has created the opportunity to be more proactive and prepared to deal with future pandemics effectively and efficiently.

REFERENCE

1. Poma M, Al Amri F, Tawse-Smith A, Ma S. How are you coping with the COVID-19 pandemic? Survey of undergraduate dental students' well-being during an unexpected global event. European Journal of Dental Education. 2022 Aug;26(3):459-67.

CPD questionnaire on page 512

The Continuous Professional Development (CPD) section provides for twenty general questions and five ethics questions. The section provides members with a valuable source of CPD points whilst also achieving the objective of CPD, to assure continuing education. The importance of continuing professional development should not be underestimated, it is a career-long obligation for practicing professionals.