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Endodontic Intercurrences in The Coronal Opening During The Covid-19 Pandemic: A Cross-sectional Study

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ORIGINAL PAPER

ABSTRACT

Objective: This research aimed to assess the impact of the suggestion of changing the clinical moment for the installation of rubber dam isolation during the COVID-19 pandemic, during the graduation period in Faculdade de Odontologia de Pernambuco, Universidade de Pernambuco (FOP/UPE). **Materials and methods:** This is an observational descriptive, cross-sectional survey of a quantitative nature, which aims to identify the main impacts of the suggestion of changing the clinical moment for the installation of rubber dam isolation in endodontic procedures, which was approved by the Ethics Committee in Research of the University of Pernambuco (CEP/UPE), under allowance ethics committee number CAAE: 47786521.4.0000.5207. The population of this research consisted of FOP/UPE undergraduate students, regularly enrolled from the 6th to the 10th period, in the years 2021 and 2022, and who accomplished dental coronal opening in endodontic treatments, in the practicing clinics of the university during the pandemic period. Information was collected through a questionnaire the researchers prepared, using the online forms application named Google Forms. **Results:** Only 6.7% identified intercurrences during coronal opening, restricted to difficulties in accessing the pulp chamber. **Conclusion:** It is understood, therefore, that the suggestions for changing the endodontic care protocol related to the prior installation of rubber dam isolation to the coronal opening procedure were used and did not increase the risk of operative complications by FOP/UPE academics, in the clinics-school during the COVID-19 pandemic.

Keywords: Endodontics; Rubber Dams; Coronavirus Infections.

Intercorrências Endodônticas na Abertura Coronal Durante a Pandemia de Covid-19: Um Estudo Transversal

RESUMO

Objetivo: A intenção desta pesquisa foi avaliar o impacto da sugestão de alteração do momento clínico para instalação do isolamento absoluto durante a pandemia da COVID-19, na graduação em Odontologia da Faculdade de Odontologia de Pernambuco, Universidade de Pernambuco (FOP/UPE). **Materiais e métodos:** Trata-se de uma pesquisa, descritiva, transversal, de levantamento e natureza quantitativa, que visa identificar quais foram os principais impactos da sugestão da alteração do momento clínico para a instalação do isolamento absoluto, que obteve aprovação pelo Comitê de Ética em Pesquisa da UPE, sob parecer consubstanciado número 4.905.371. A população do estudo foi constituída por discentes da graduação da FOP/UPE, regularmente matriculados do 6º período ao 10º período, nos anos de 2021 e 2022, e que realizaram abertura coronária em tratamentos endodônticos nas clínicas-escola durante a pandemia. **Resultados:** Apenas 6,7% identificaram intercorrências durante a abertura coronária, restritas a dificuldades de acesso à câmara pulpar. **Conclusão:** Entende-se, portanto, que as sugestões de alteração do protocolo de atendimento endodôntico relacionada a instalação prévia do isolamento absoluto ao procedimento de abertura coronária foram empregadas e não elevaram o risco de intercorrências operatórias pelos acadêmicos da FOP/UPE, nas clínicas-escola, durante a pandemia da COVID-19.

Palavras-chave: Endodontia; Diques de borracha; Infecções por Coronavirus.

Instituição afiliada – [1]Faculdade de Odontologia da Universidade de Pernambuco-FOP/UPE; [2]Faculdade de Odontologia do Recife-FOR/FOPCB.
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INTRODUCTION

In December 2019, on the last day of the year, a severe, highly infectious acute respiratory syndrome caused by SARS-CoV-2 was announced. It was identified in Wuhan, China, which would later be responsible for a global pandemic (HUANG et al., 2020).

The COVID-19 pandemic created challenging working conditions and several frontline workers were infected and died from the disease which impacted mental health, increasing levels of depression, anxiety, and insomnia (LAI et al., 2020; MEDSCAPE, 2020).

The dental surgeon works in an environment with a high risk of contamination by SARS-CoV-2, due to the production of aerosols caused mainly by the high-speed turbine, dispersing the virus on the surfaces, lasting for a time interval of 3-16 hours in the surrounding working areas (PENG et. al., 2020; VAN et. al., 2020). Therefore, some readjustments were necessary in the clinical protocols for dental procedures in general, to reduce the dispersion of viral particles in clinics and offices, especially during the coronal opening in endodontic emergencies, in which the use of high-speed handpieces is indispensable (SERON et al., 2020).

The handpieces, the contra-angle, and the micromotor are the equipment responsible for the production of most aerosols and contaminated droplets; representing potential routes for the transmission and dissemination of many infectious diseases, such as measles, tuberculosis, hepatitis, and HIV (WONG, 1988; FORREST & PEREZ, 1989; HARREL & MOLINARI, 2004).

The prior installation of rubber dam isolation to the coronal opening contributes to a significant reduction in the production of aerosol or contaminated droplets by up to 90%, consequently, contributes to the reduction of the dispersion of SARS-CoV-2 during endodontic emergencies, beginning to be recommended to its installation from that clinical moment (COCHRAN et al., 1989).

However, the rubber sheet prevents the observation of the position of the tooth and its neighbors in the dental arch, in addition to the direction of insertion in the periodontal tissues, which may lead to accidental intercurrences during the coronal opening in inexperienced hands, as well as in cases of difficult access to the pulp chamber, as in teeth with crowns inclined towards the root, in fenestration of total crowns, endodontic access in teeth prepared for prosthesis, calcifications in the pulp chamber, among other situations (LOPES; SIQUEIRA JUNIOR, 2015).

Therefore, it is appropriate to investigate and discuss some issues related to this change, to find out whether the change in the clinical moment for the installation of rubber dam isolation increases the chances of operative complications in the coronal opening, by undergraduate students of the Faculty of Dentistry of Pernambuco, University of Pernambuco (FOP/UPE), in the practicing clinics, during the pandemic time.

MATERIALS AND METHODS

This is an applied observational descriptive, cross-sectional survey of a quantitative nature.

This research was submitted and approved by the Research Ethics Committee of the University of Pernambuco (CEP/UPE) under the number CAAE: 47786521.4.0000.5207.

The study was developed at the Faculty of Dentistry of Pernambuco, University of Pernambuco (FOP/UPE). The study population consisted of undergraduate students from the mentioned university, regularly enrolled from the 6th to the 10th period, and who had achieved coronal opening in endodontic treatments during the pandemic. As inclusion criteria, students needed to be regularly enrolled, in the years 2021 and 2022, from the 6th period to the 10th trans-pandemic academic period. Students who were not able to perform clinical procedures during the pandemic, as well as regularly enrolled students who did not agree to participate in the research and regularly enrolled students who did not sign the informed consent form (TCLE) were excluded from the research.

For data collection, a questionnaire with multiple-choice items was prepared, using the online forms application Google Forms. Therefore, the collection took place in the last weeks of the current 2021 and 2022 school periods, until August 2022. To this end, the researchers sent an invitation to answer the online questionnaire, via Google Forms platform, by e-mail to the students ' institutional mails, as well as WhatsApp application groups of students from the university, enrolled between the 6th and 10th periods. The online questionnaire consisted of 9 multiple-choice items and the results were tabulated by the platform itself, in spreadsheets that can be viewed and scrutinized in graphics (via Google Sheets).

Data were analyzed by using descriptive statistical analysis (mean and standard deviation, maximum and minimum value), and inferential analysis, considering p-value ≤ 0.05 as a significance level for a 95% confidence interval. Frequency and cross-reference tables were used (with a percentage in the column) and the “CHI-SQUARE” test of association was used. This test confirms whether there is any kind of relationship between variables A and B.

RESULTS AND DISCUSSION

The analysis of the results aimed to describe the sample, in addition to verifying whether there was, indeed, a correlation between the suggestion of changing the clinical moment for the installation of rubber dam isolation before the coronal opening and the susceptibility of the increase in endodontic intercurrences during the pandemic. The

sample consisted of 44 students regularly enrolled from the 6th to the 10th period. The graphs below show the data related to the responses of the participants to the questionnaire:

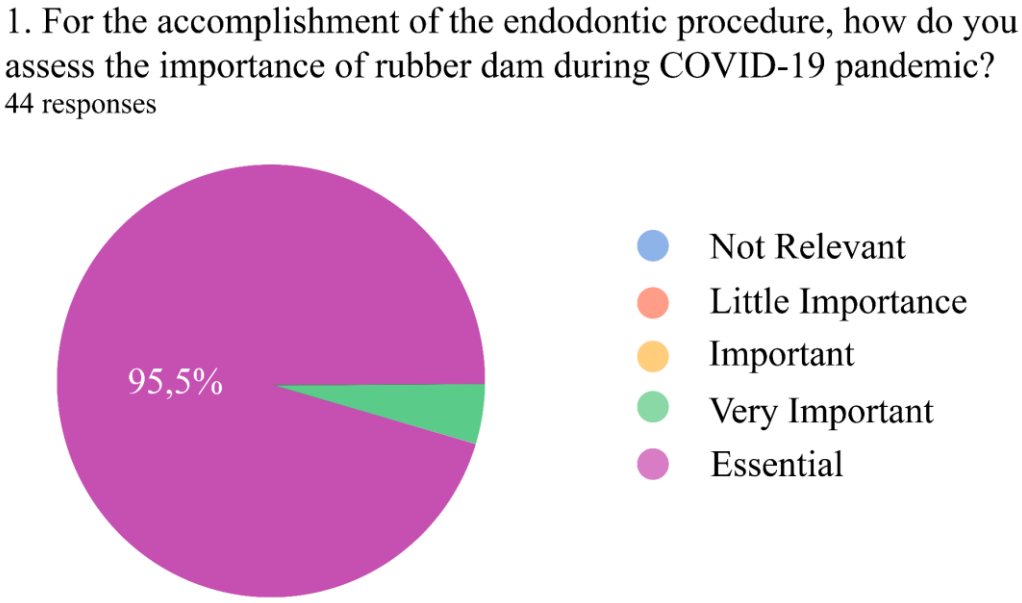

Figure 1 - Participants' responses to question 1.

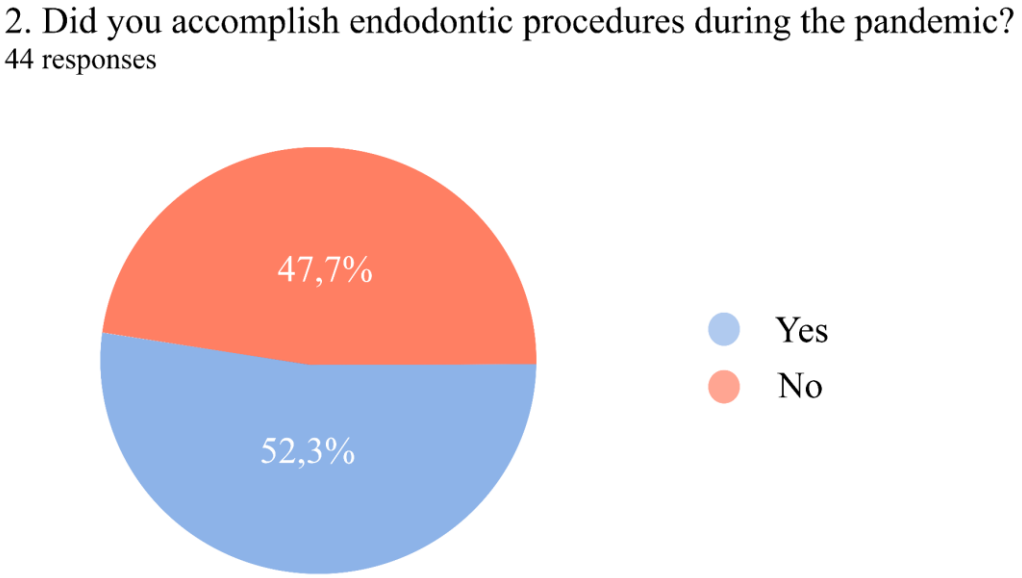

Figure 2 - Participants' responses to question 2.

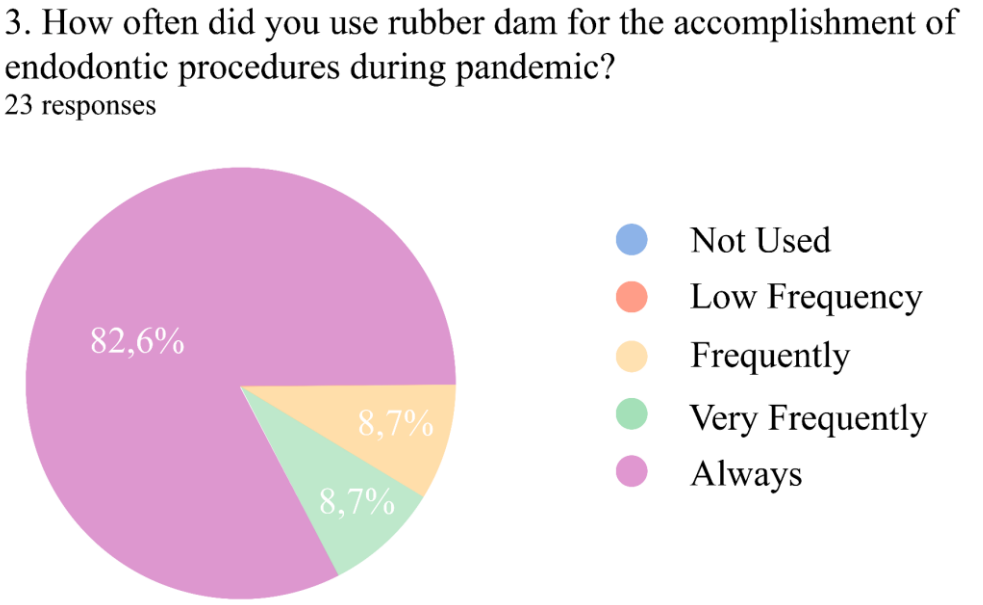

Figure 3 - Participants' responses to question 3.

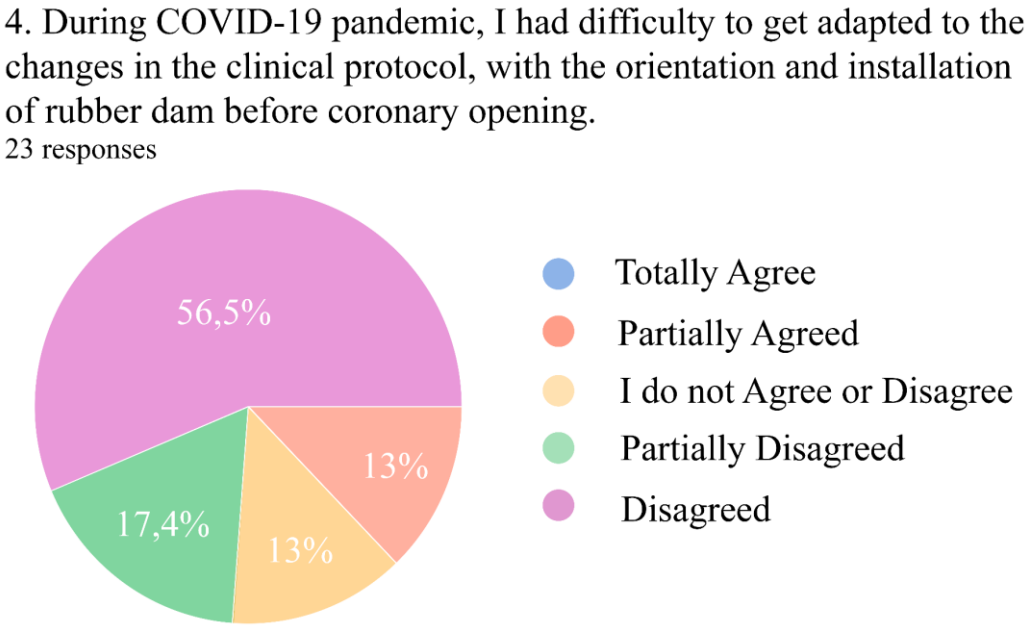

Figure 4 - Participants' responses to question 4.

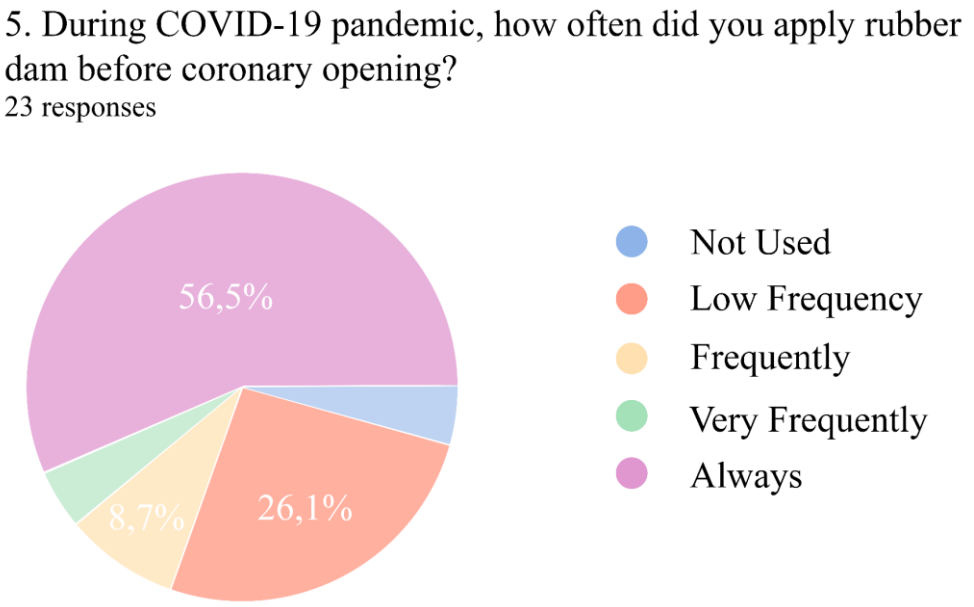

Figure 5 - Participants' responses to question 5.

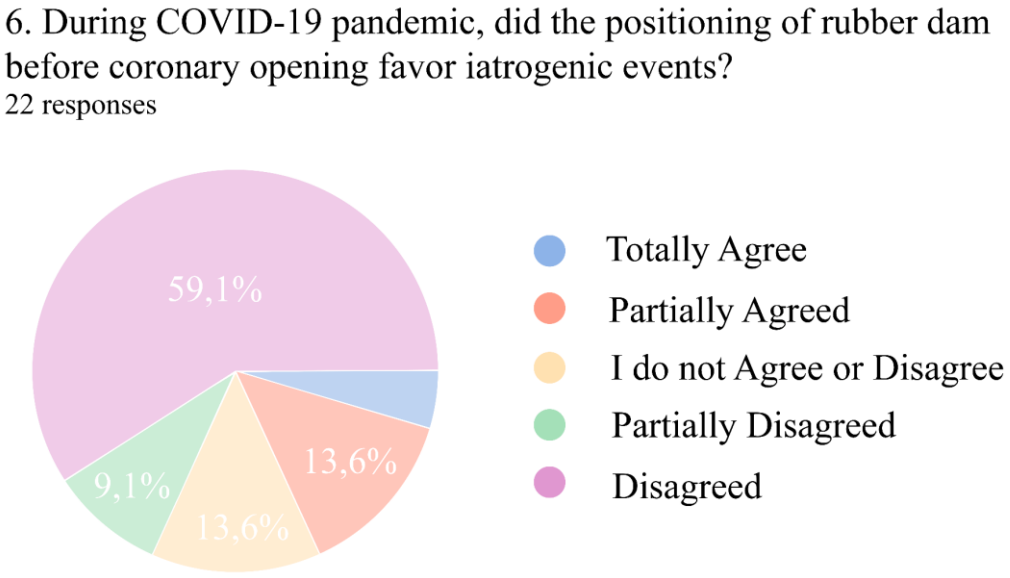

Figure 6 - Participants' responses to question 6.

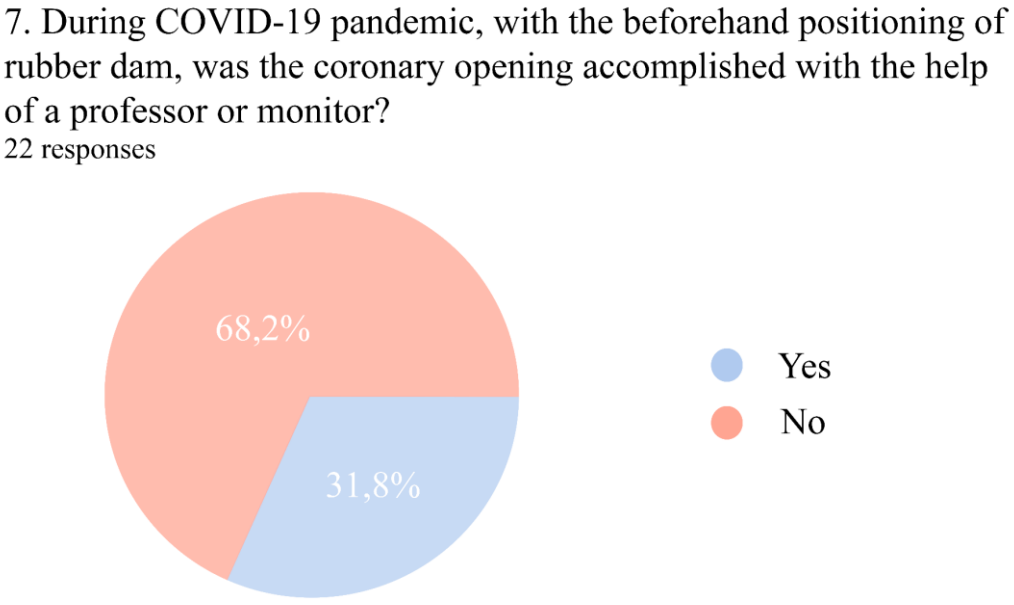

Figure 7 - Participants' responses to question 7.

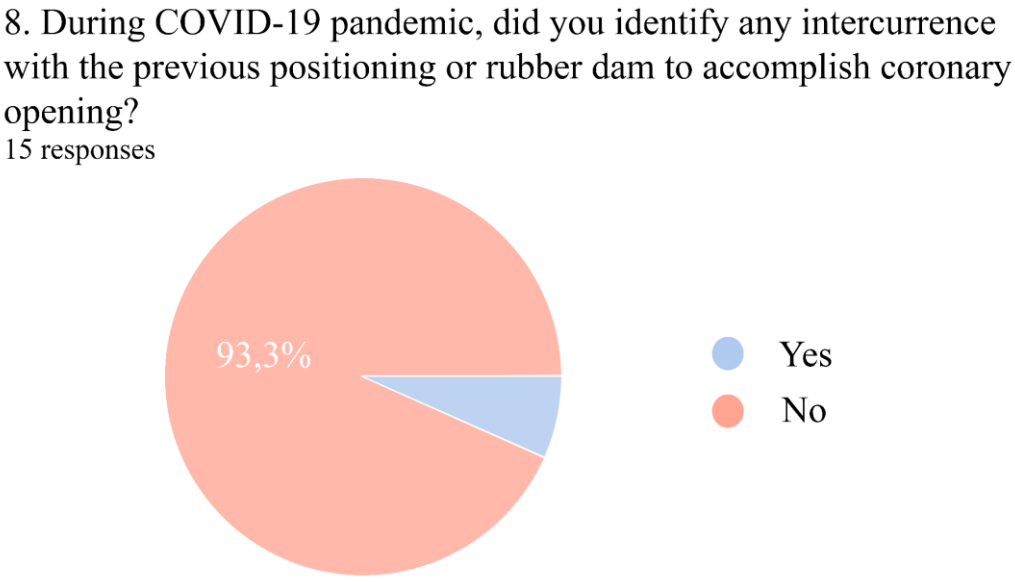

Figure 8 - Participants' responses to question 8.

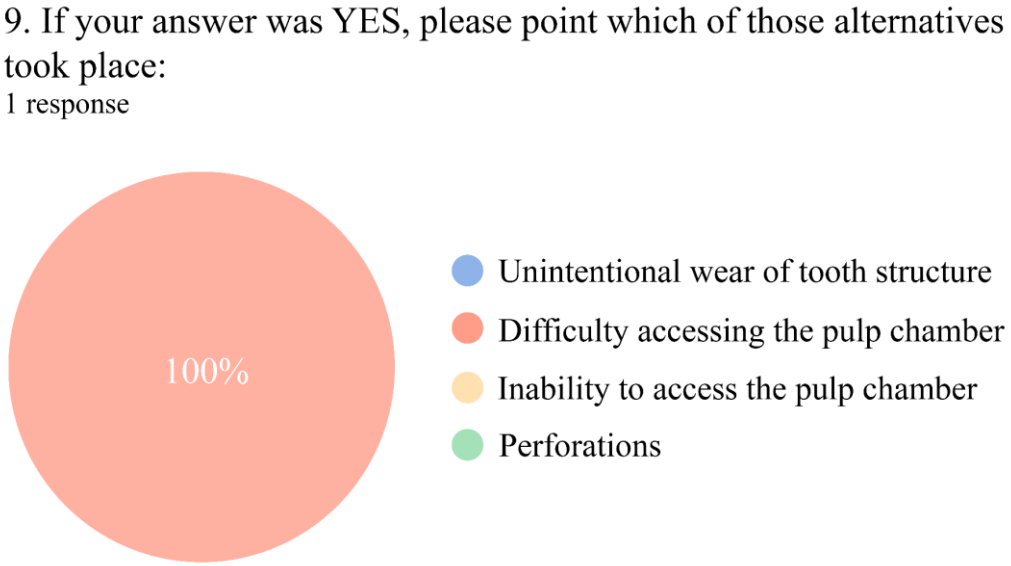

Figure 9 - Participants' responses to question 9.

Faced with the COVID-19 pandemic, since 2020, the use of rubber dam isolation has become essential in dental practice to significantly minimize, by up to 90%, the production of aerosols or droplets contaminated by saliva and blood (COCHRAN et al., 1989), especially in cases where high-speed hand instruments had been used in the coronal opening, serving as another mechanical barrier to protect the practitioners (PENG, 2020) and therefore this research indicates that all participants confirmed their importance according to figure 1.

According to Van et al. (2020), SARS-CoV-2 is able to remain in an estimated time of 3-16 hours in the environment after its dispersion, increasing the risk of contamination. In 2022, AKIN et al. identified its presence in petri dishes distributed inside dental offices, after the production of aerosol from the procedures performed there.

COVID-19 impacted the daily activities of academics and health professionals, mainly in the dental profession, since COVID-19 infection had been considered highly contagious and, therefore, safety conditions, isolation, social distancing and changes in procedures had been adopted. Care protocols, such as the suggestion to change the clinical moment to install rubber dam isolation, were planned (ANVISA, 2020).

Most of the students who answered the online questionnaire disagreed that such measure would not cause damages or intercurrences for the accomplishment of the endodontic coronal opening (Figure 6). Still on this topic, only 13% partially agreed that they felt difficulties in getting adapted to the new clinical protocol (Figure 4). For authors such as Akhtar et al. (2016) and Alrahabi et al. (2019), the use of rubber dam isolation at this stage increases the chances of operative complications, due to the loss of the anatomical reference of the tooth in the dental arch, in addition to affecting the perception, clinical efficiency and performance of novice operators , such as students and interns.

Perhaps, this opinion is related to the short time of clinical practice of the apprentices, since it is known that the previous installation of rubber dam isolation in teeth that need access to the pulp chamber, prevents the observation of the dental position in the dental arch , as well as the direction of insertion in the periodontal tissues, which may lead to accidental complications, especially in inexperienced hands, increasing the level of difficulty in teeth with crowns inclined in relation to the root, in the fenestration of complete crowns, teeth prepared for prosthesis or with calcifications in the pulp chamber, among other clinical situations (LOPES; SIQUEIRA JUNIOR, 2015).

Interestingly, it was verified that 32% of the students reported that the coronal openings were performed by professors and monitors in the academic clinic (Figure 7). This may have reduced the frequency of procedural errors, as, according to Alrahabi et al. (2019), may be avoided by a clinical operator confident in his knowledge, intuition, patience and previous psychomotor skills.

All students confirmed the importance of using rubber dam rubber dam isolation during the performance of endodontic procedures, which was developed in the 19th century by Saford Barmun (GROSSMAN, 1987) and became routine in Endodontics, due to its numerous advantages, such as significant reduction in the risk of accidents and the preservation of the aseptic protocol, being able to reduce up to 70% of the salivary fluids of the patients in the composition of the aerosols and, therefore, significantly reduce the suspension of the microorganism in the environment (COCHRAN et al., 1989; RAUTEMAA et al., 2006), regardless of being or not, in the pandemic period.

Even so, 4.3% stated that they had not performed rubber dam installation before

the coronal opening at any time (Figure 5). That is, in some situations, the recommended worldwide protocol was not respected. In the consulted scientific literature, it can be observed that some professionals neglected the procedure, reporting difficulties in handling (MARSHALL, 2017). Occasionally, non-compliance is acceptable, weighing the risks and benefits for the possibilities of operative accidents that may jeopardize the dental organ in order to remain in the oral cavity and during the pandemic, when supplementing the safety and protective measures against contamination by SARS-COV- 2 for the staff and patients in the care environment, with vaccine immunization and a careful pre-anamnesis (MARSHALL, 2017).

Only 6.7% identified complications for coronal opening (Figure 8), being restricted to difficulties in accessing the pulp chamber (Figure 9). This fact is perhaps justifiable by the high percentage of protagonism of the monitors/professors in the execution of the procedure in academic clinics, instead of the students themselves. These data were different from the percentage presented by Akhtar et al. (2016), showing that about 39% of the total of 79 students had committed errors during endodontic procedures, and 3% of such errors had been associated with dentin perforations.

To verify whether there is a possible correlation between the variables, Pearson's chi-square test was used, correlating the number of students who used rubber dam isolation from the moment of coronal opening (question 5), with those who identified complications during the coronal opening (question 8) and with the total number of times the teachers/monitors performed the coronal opening using rubber dam isolation, instead of the students. The analysis revealed that the difference was not statistically significant ($p > 0.05$) (Table 1).

FINAL CONSIDERATIONS

Judging by the methodology used in this paper, It can be concluded that the suggestions for changing the endodontic care protocol, related to the prior installation of rubber dam isolation to the coronal opening procedure, were used and did not increase the risk of operative complications by FOP/UPE students, in academical clinics, during COVID-19 pandemic.

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