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Return of on-site activities in Brazilian Dentistry courses during the COVID-19 pandemic: comparison between public and private institutions

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Return of on-site activities in Brazilian Dentistry courses during the COVID-19 pandemic: comparison between public and private institutions

Abstract This is a quantitative-qualitative study analyzing the return of on-site activities in Brazilian dentistry undergraduate courses during the COVID-19 pandemic and the difficulties faced, comparing public and private institutions. An online form with open and multiple-choice questions was sent via e-mail to the representatives of dentistry courses from March to June 2021. The courses included were those registered on the e-MEC webpage that had started up to 2017. The quantitative analysis employed the chi-square, the Fisher exact, and the T student tests ($p<0.05$); the open question was subjected to thematic content analysis. Out of the 329 eligible courses, 83 forms were answered and returned (21 public and 62 private). Public institution courses showed lower frequency of return to on-site activities up to the data collection ($p=0.038$), and presented higher proportion of suspension of clinical and laboratory activities ($p\leq0.001$), but no difference regarding remote theoretical lessons ($p>0.05$). Private courses showed higher availability of resources supporting the return to on-site activities, namely, structure, workers, and professors ($p<0.001$). Although biosafety norms presented a common challenge, the main difficulties reported in private institutions related to the return to on-site activities were the modulation and schedule of the classes and lesson environments, controlling the flow of people, and the implementation of protocols. Public institutions highlighted difficulties related to adjustment of the structure and material acquisition. The results showed that most dentistry courses had returned to on-site lessons in the early 2021, but private institutions reported higher proportion of return to on-site laboratory and clinical activities.

Descriptors: COVID-19. Dentistry. Education, Dental.

Retorno de las actividades presenciales en los cursos de Odontología brasileños durante la pandemia de COVID-19: comparación entre instituciones públicas y privadas

Resumen Se trata de un estudio cuantitativo y cualitativo que analiza el retorno de las actividades presenciales en las carreras de Odontología brasileñas, durante la pandemia de COVID-19, y las dificultades enfrentadas, comparando instituciones públicas y privadas. Se envió por correo electrónico un formulario en línea con preguntas abiertas y cerradas a los representantes de los cursos de Odontología, de marzo a junio de 2021. Se incluyeron los cursos registrados en el sitio web de e-MEC que iniciaron hasta el año 2017. El análisis cuantitativo utilizó las pruebas chi-cuadrado, Fisher exacta y t de Student ($p<0,05$); se sometió una pregunta abierta al análisis de contenido temático. De los 329 cursos elegibles, se completaron 83 formularios (21 públicos y 62 privados). Los cursos de instituciones públicas mostraron una menor frecuencia de retorno a actividades presenciales hasta la fecha de cobro ($p=0,038$), incluyendo una mayor proporción de suspensión de actividades clínicas y de laboratorio ($p\leq0,001$), pero sin diferencia para clases teóricas remotas ($p>0.05$). Los cursos privados demostraron mayor disponibilidad de recursos para el retorno presencial, tales como: estructura, personal y docentes ($p<0,001$). Si bien los estándares de bioseguridad constituyen un desafío común, las principales dificultades reportadas en las instituciones privadas ante el regreso de las actividades presenciales fueron

modular o escalonar clases y ambientes de aula, controlar el flujo de personas e implementar protocolos. En las públicas destacan dificultades relacionadas con la adecuación de la estructura y adquisición de materiales. Se concluye que la mayoría de las carreras de Odontología habían retomado clases a inicios de 2021, pero las instituciones privadas tuvieron una mayor proporción de retorno a las actividades presenciales de laboratorio y clínicas.
Descriptores: COVID-19. Odontología. Educación en Odontología.

Retorno das atividades presenciais nos cursos de Odontologia brasileiros na pandemia de COVID-19: comparação entre instituições públicas e privadas

Resumo Trata-se de estudo quanti-qualitativo que analisa o retorno das atividades presenciais nos cursos de Odontologia brasileiros, durante a pandemia de COVID-19, e as dificuldades enfrentadas, comparando instituições públicas e privadas. Um formulário on-line com questões abertas e fechadas foi encaminhado por e-mail aos representantes dos cursos de Odontologia, de março a junho de 2021. Foram incluídos os cursos cadastrados no *site* e-MEC iniciados até 2017. A análise quantitativa utilizou os testes qui-quadrado, exato de Fisher e t de Student ($p<0,05$); uma questão aberta foi submetida à análise temática de conteúdo. Dos 329 cursos elegíveis, foram respondidos 83 formulários (21 públicos e 62 privados). Os cursos de instituições públicas apresentaram menor frequência de retorno das atividades presenciais até a data da coleta ($p=0,038$), inclusive com maior proporção de suspensão das atividades clínicas e laboratoriais ($p\leq0,001$), mas sem diferença para aulas teóricas remotas ($p>0,05$). Os cursos privados demonstraram ter maior disponibilidade de recursos para o retorno presencial, tais como: estrutura, funcionários e docentes ($p<0,001$). Apesar das normas de biossegurança constituírem um desafio comum, as principais dificuldades relatadas nas instituições privadas diante do retorno das atividades presenciais foram a modulação ou escalonamento das turmas e ambientes de aula, controle do fluxo de pessoas e implantação de protocolos. Nas públicas, destacam-se dificuldades relacionadas à adequação da estrutura e aquisição de materiais. Conclui-se que a maioria dos cursos de Odontologia havia retomado às aulas no início de 2021, mas as instituições privadas apresentaram maior proporção de retorno às atividades laboratoriais e clínicas presenciais.
Descritores: COVID-19. Odontologia. Educação em Odontologia.

INTRODUCTION

With the outbreak of the COVID-19 pandemic in March 2020, the world witnessed fast increase in the number of cases and deaths, with varied incidence depending on the place and date researched[1]. The pandemic caused global socioeconomic and environmental impacts, as well as in the education and health sectors[2]. In education, challenges were experienced in dentistry higher education institutions (HEI), both public and private, to continue with their activities.

Action plans were required to face the particularities of dental education[3,4], with more strict infection control strategies since that is one environment characterized by potentially high risks for COVID-19 due to the production of aerosols, the physical proximity between students, with their professors and patients; and the number of students in the teaching clinics[5].

At the beginning of the pandemic, the HEI with dentistry courses had to protect the health of students, professors, administrative technicians, and patients, meet the surveillance requirements, pursuant to the local/regional or national policies and, at the same time, guarantee the continuity of the courses[6]. Initially, due to the need to stop the pandemic, via the implementation of preventive measures that prioritized social distancing in public and private institutions, HEI were closed practically at a global [7] and national level, and remote teaching was adopted in many

of them[8].

Although dental education potentially incorporates technological resources and distance education strategies[9], dental clinical practice is inescapably physical and demands on-site activities. In Brazil, the Dentistry Teaching Brazilian Association (ABENO - Associação Brasileira de Ensino Odontológico), published a Consensus on Biosafety Guidelines[10] on 3rd July 2020, and dentistry undergraduate courses gradually returned to on-site teaching.

The need to create and implement guidelines and to follow those instructions, via protocols set by public agencies, were crucial for the return in a safe way for all users[11]. Sharing the challenges faced by the dentistry course in response to the COVID-19 is relevant to help a safe education planning, during this and in future pandemics[5].

Taking that into consideration, the objective of this study was to analyze the return of on-site activities in Brazilian dentistry courses, during the COVID-19 pandemic, comparing public and private institutions.

METHODS

This is a cross-sectional study approved by the Research Ethics Committee of the State University of Ponta Grossa (CAAE: 41147220.3.0000.0105, opinion: 4.478.520). Its design followed the online research methodological reference (websurveys)[12]. The research universe included all dentistry undergraduate courses (and those responsible for biosafety issues in each of them), public and private HEI with active register in the Education Ministry webpage (e-MEC platform)[13] up to 2017. There were 329 eligible courses.

The data collection instrument was devised based on the questionnaire developed by the Dentistry Teaching European Association[14] and on the ABENO[10] consensus document. Face validity and pilot tests were carried out with ten professors in dentistry courses that were not included in the final sample. In that phase, the participants were contacted via e-mail and could access the instrument on the Google Forms® platform, where they could indicate how much they understood each item, ranking their answers with the five-point scale Likert, and had a space to present comments and suggestions.

In the final version, the data collection instrument included two blocks, as follows: 1) Characteristics of the respondents with nine items; and 2) Planning, challenges, and return of on-site activities in the dentistry course, totaling 28 items. Finally, an open question was included, namely, "what is/are the difficulty(ies) faced for the return of on-site activities in the teaching clinics, mainly regarding the COVID-19 biosafety, prevention and control?".

The data collection instrument and the Free and Informed Consent Form (FICF) were sent via e-mail using the Google Forms® platform to coordinators, head of departments, or those in charge of the biosafety of the eligible dentistry courses. The forms were sent five times with a 15-day interval between them. The data collection was carried out from 26th March to 11th June 2021.

The quantitative analysis was aided by the Statistical Package for the Social Sciences – SPSS software (Version 25. IBM, Armonk, NY, EUA)®. Descriptive statistics and bivariate associations were obtained, using the chi-square, Fisher's Exact, and Student T-tests ($p<0.05$).

The open question was subjected to qualitative analysis. The study planning and execution followed the Consolidated Criteria for Reporting Qualitative Research - COREQ)[15]. The qualitative rigor was met by applying the credibility, transferability, reliability, and confirmability critera[16]. The content analysis of the answers was carried out using a data oriented inductive approach[17], to codify the content into categories[18]. The answers were organized using an alphanumeric codification.

Two researchers (RCSF and AGF), individually examined the answers for codification and theme development. The reliability test proposed by Sampaio and Lycarião (2018)[19] was carried out to verify agreement between them.

The qualitative approach included the development of a code book with variables and themes, training the codifiers with discussions to build up consensus, reviewing the code book, pilot codification of a sample, and final codification with the Cohen Kappa test to verify the level of agreement between assessors, whose value was 0.89. This value was considered the test result with almost perfect agreement[20]. A third researcher (MHB), who had not been

involved in the previous phases, examined the codification, and provided the final adjustment regarding possible divergences.

RESULTS

Quantitative Analyses

The study sample comprised 83 dentistry courses that answered the form (25.2% response rate). Regarding the characteristics of the courses, more private HEI participated (74.7%), most curricula were divided into semesters (86.7%), and they already had a Dental Infection Control Committee (CCIO - Comissão de Controle de Infecção Odontológica) before the pandemic (56,6%). The mean number of students per class in the sampled courses was 42.6±17.5 (Table 1).

As for the respondents, most were female (56.6%), professors (98.8%) and coordinators (67.5) in dentistry courses and worked in the clinical area and/or intramural internship (75.9%). The respondents mean age was 42.1±9.1 years with 11.8±8.2 years of teaching experience (Table 1).

Regarding course organization, in the first semester of 2021, higher percentage of private institutions stated to be working during the research period (88.7%; p=0.038), with access by all students (85.5%; p=0.009), and with dental services provided (93.4%; p=0.005) by all students (56.1%; p=0.001). Public institutions presented the highest percentage of suspension of laboratory practice (71.4%) and clinical practice (76.2%) lessons ($p \leq 0.001$) (Table 2).

To adopt biosafety measures to face the COVID-19, the private HEI courses presented higher availability of financial resources, enough suppliers, suitable physical structure, technical employees, and sufficient number of professors (Figure 1). There was greater need for modifications, or complete restructuring in the reception areas (45%; p=0.015) and patients' clinical care (63.2%; p=0.002) in public HEI courses (Table 3).

Qualitative Analysis

The open question analysis resulted in five categories that qualified the difficulties related to the return of on-site activities in dentistry courses (Table 4). These categories and some reports expressing their meanings and sub-categories are presented below.

Category 1: Difficulties related to physical structure: "Structure adjustment in clinics" (Id32- public HEI); "Outpatient care without proper ventilation" (Id18- private HEI); "Control of air-conditioner flow" (Id8- public HEI); "Lack of funding" (Id74- public HEI); "Availability of Personal Protection Equipment (PPE)" (Id2- public HEI); "Availability of materials" (Id9- private HEI); "Cost of students' PPE" (Id4- private HEI)".

Category 2: Difficulties related to students', workers', and professors' behavior: "Controlling everybody's anxiety and fear" (Id1- private HEI); "Psychological balance of workers and students, to face fear of uncertainties and face the new normal" (Id77- private HEI); "Respect to norms and constant monitoring" (Id26- public HEI); "Lack of understanding by the students regarding the seriousness of the situation and about their responsibility in this process" (Id37- private HEI).

Category 3: Difficulties in the maintenance of the safe distancing: "scheduling lessons, division of students for on-site and remote lessons" (Id72- private HEI); "Organizing students' schedules in clinics..." (Id5- private HEI); "Professor/students ratio" (Id17- private HEI); "Relation equipment use and distancing" (Id53- public HEI).

Category 4: Difficulties regarding compliance with norms and protocols: "Raising students' and professors' awareness regarding the effective compliance with the norms" (Id29- private HEI); "... acceptance and commitment with the necessary changes to carry out the activities in a biosafe mode" (Id79- public HEI); "Creating protocols" (Id61- private HEI); "Logistics of the mandatory training for students, professors, and workers..." (Id58- private HEI).

Category 5: Difficulties related to control and safety: "Safety regarding everybody's health (students, professors, and patients)" (Id46- private HEI); "Unstable epidemiologic scenario" (Id12- private HEI); "Lack of adherence to

vaccination by students, professors, and technicians" (Id64-public HEI); "Patients' honesty to report when they were contaminated with the COVID-19" (Id26- public HEI).

Table 1. Characteristics of dentistry undergraduate courses and their representatives who answered the research questionnaire. Brazil, first semester 2021 (n=83).

Characteristics of dentistry courses	n (%)
Geographical region	
North	4 (4.8)
Northeast	26 (31.3)
Midwest	4 (4.8)
Southeast	26 (31.3)
South	23 (27.7)
Higher Education Institution (HEI) administrative category	
Federal public	13 (15.7)
State public	6 (7.2)
Municipal public	2 (2.4)
Total public institutions	21 (25.3)
Private non-profit	22 (26.5)
Private profit	39 (47.0)
Special	1 (1.2)
Total private institutions	62 (74.7)
Course periodicity	
Annual	11 (13.3)
Semestral	72 (86.7)
Study hours (multiple choice)	
Full-time	52 (62.7)
Morning	26 (31.3)
Afternoon	10 (12.0)
Evening	34 (41.0)
The course has a Dental Infection Control Committee (CCIO)	
No	7 (8.4)
Yes. created due to the pandemic	26 (31.3)
Yes. created before the pandemic	47 (56.6)
Not informed	3(3.6)
	Mean (sd)
Number of students per class in the dentistry course	42.5 (17.5)
Respondents' characteristics (n=83)	**n (%)**
Gender	
Male	36 (43.4)
Female	47 (56.6)
Function or position occupied in the HEI (multiple choice)	
Vice-rector/ Health Sector Director	2 (2.4)
Dentistry Course Coordinator	56 (67.5)
Head of Department linked to the Dentistry Course	3 (3.6)
CCIO Coordinator	5 (6.0)
CCIO Member	7 (8.4)
Professor in the Dentistry Course	82 (98.8)
Professional in charge of supervised internship	1 (1.2)
Teaching area (multiple choice)	
Basic	25 (30.1)
Pre-clinic	38 (45.8)
Clinic and/or intramural internship	63 (75.9)
Clinic and/or extramural internship	23 (27.7)
Not working in the Dentistry Course	1 (1.2)
	Mean (sd)
Age (years)	42.1 (9.1)
Teaching time (years)	11.8 (8.2)

Table 2. Functioning of dentistry undergraduate courses during the COVID-19 pandemic, comparing public and private Higher Education Institutions (HEI) Brazil, first semester 2021 (n=83).

	n (%)			
	Total sample n = 83	Public HEI n=21	Private HEI n=62	p-value[a]
HEI situation on the date of the research				0.038*
Closed	14 (16.9)	7 (33.3)	7 (11.3)	
Open	69 (83.1)	14 (66.7)	55 (88.7)	
*If open, access allowed to (n=69) ***				0.009*
Only workers, administrative agents, professors, and postgraduate students, excluding undergraduates,	15 (21.7)	7 (50.0)	8(14.5)	
workers, administrative agents, professors, and postgraduate students	54 (78.3)	7 (50.0)	47 (85.5)	
Completely suspended lessons (multiple choice)				
Theoretical	4 (4.8)	1 (4.8)	3 (4.8)	1.000*
Laboratory practice	34 (41.0)	15 (71.4)	19 (30.6)	0.001
Clinical practice	26 (31.3)	16 (76.2)	10 (16.1)	<0.001
*Functioning of theoretical lessons (n=79) ****				
Only remotely.	60 (75.9)	17 (85.0)	43 (72.9)	0.371*
Hybrid system (on-site and remote).	19 (24.1)	3 (15.0)	16 (27.1)	
*Functioning of laboratory lessons (n=49) ****				
Restricting the number of students	47 (95.9)	6 (100.0)	41 (95.3)	1.000*
No restriction to the number of students	2 (4.1)	0 (0.0)	2 (4.7)	
*Functioning of clinical practice lessons (n=57) ****				
Restricting number of students and patients	53 (93.0)	4 (80.0)	49 (94.2)	0.315*
No restriction to the number of students and patients	4 (7.0)	1 (20.0)	3 (5.8)	
Dental care being performed:				
Yes	71 (86.6)	14 (66.7)	57 (93.4)	0.005*
No	11 (13.4)	7 (33.3)	4 (6.6)	
*Dental care performed by (multiple choice, n=71) ***:*				
Professors	44 (62.0)	10 (71.4)	34 (59.6)	0.416
Postgraduates	22 (31.0)	8 (57.1)	14 (24.6)	0.026*
Undergraduates of final years	35 (49.3)	10 (71.4)	25 (43.9)	0.065
Undergraduates of all years	33 (46.5)	1 (7.1)	32 (56.1)	0.001
*The HEI provides Personal Protective Equipment (PPE) to (multiple choice, n=69) ***				
Workers	63 (91.3)	12 (100.0)	51 (89.5)	0.581*
Professors	69 (100.0)	12 (100.0)	57 (100.0)	---
Postgraduates	12 (17.4)	1 (8.3)	11 (19.3)	0.677*
Undergraduates	26 (37.7)	2 (16.7)	24 (42.1)	0.116*
Norms/ recommendations adopted to plan the return to the course clinics				
Technical Note 04/2020 by ANVISA	59 (71.1)	13 (61.9)	46 (74.2)	0.283
CFO Recommendation	60 (72.3)	14 (66.7)	46 (74.2)	0.505
ABENO Consensus	68 (81.9)	15 (76.2)	52 (83.9)	0.514*
SMS/SES Recommendation	57 (68.7)	11 (52.4)	46 (74.2)	0.063

[a] Chi-square test ($p<0.05$). * Fisher's Exact test. ** Excluded closed HEI; *** Excluded courses with suspended lessons/care; CFO: Conselho Federal de Odontologia (Federal Dentistry Council); ABENO: Associação Brasileira de Ensino Odontológico (Dentistry Teaching Brazilian Association); SMS/SES: Secretaria Municipal/ Secretaria Estadual de Saúde (Municipal Health Secretariat/State Health Secretariat).

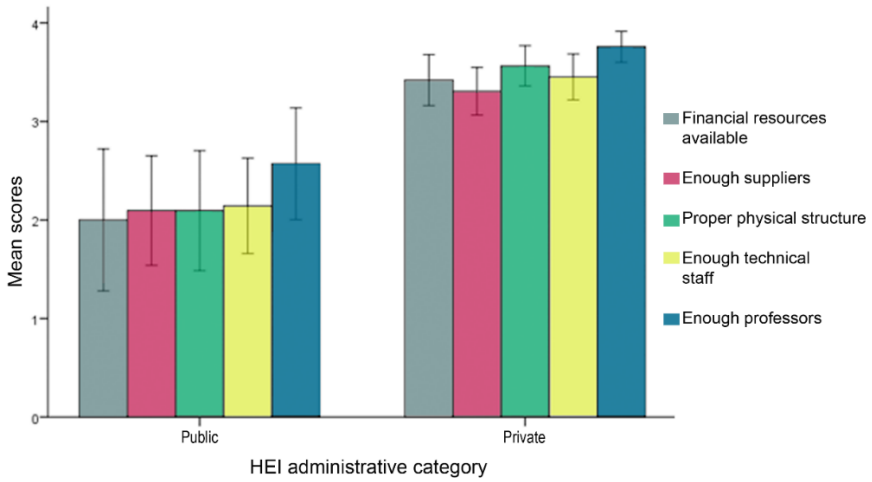

Figure 1. Availability of financial resources, suppliers, proper physical structure, and human resources in dentistry courses during the COVID-19 pandemic, comparing public and private institutions. Brazil, first semester 2021 (n=83). Mean scores using the 5-point Likert-like scale of agreement (0 – totally disagree to 4 – totally agree); Student t-test for differences between public and private HEI (p<0.001).

Table 3. Changes required for the reorganization of dentistry courses during the COVID-19 pandemic, comparing public and private Higher Education Institutions (HEI). Brazil, first semester 2021 (n=83).

	n (%)			
	Total sample n=83	Public HEI n=21	Private HEI n=62	p-value[a]
Physical structure changes that were/are needed (multiple choice):				
Physical structure changes that were/are needed (multiple choice):				
Patients' care area				0.002
None/ little change	52 (65.8)	7 (36.8)	45 (75.0)	
A lot/ total restructuring	27 (34.2)	12 (63.2)	15 (25.0)	
Patients' reception and welcoming				0.015*
None/ little change	61 (76.2)	11 (55.0)	50 (83.3)	
A lot/ total restructuring	19 (23.8)	9 (45.0)	10 (16.7)	
Teaching laboratories				0.749*
None/ little change	64 (81.0)	15 (78.9)	49 (81.7)	
A lot/ total restructuring	15 (19.0)	4 (21.1)	11 (18.3)	
Material and sterilization Center				1.000*
None/ little change	67 (83.8)	17 (85.0)	50 (83.3)	
A lot/ total restructuring	13 (16.2)	3 (15.0)	10 (16.7)	
Classrooms				0.762*
None/ little change	57 (75.0)	13 (72.2)	44 (75.9)	
Functioning organization changes that were /are needed (multiple choice):				
Patient's care				0.282
None/ little change	39 (50.0)	7 (38.9)	32 (53.3)	
A lot/ total restructuring	39 (50.0)	11 (61.1)	28 (46.7)	
Patients' reception and welcoming				0.67
None/ little change	49 (62.0)	11 (57.9)	38 (63.3)	
A lot/ total restructuring	30 (38.0)	8 (42.1)	22 (36.7)	
Teaching laboratories				0.763
None/ little change	50 (64.1)	11 (61.1)	39 (65.0)	
A lot/ total restructuring	28 (35.9)	7 (38.9)	21 (35.0)	
Material and sterelization center				1.000*
None/ little change	57 (73.1)	13 (72.2)	44 (73.3)	
A lot/ total restructuring	21 (26.9)	5 (27.8)	16 (26.7)	
Classrooms				0.824
None/ little change	49 (64.5)	12 (66.7)	37 (63.8)	
A lot/ total restructuring	27 (35.5)	6 (33.3)	21 (36.2)	

[a] Chi-square test (p<0.05). * Ficher's Exact Test.

Table 4. Difficulties faced in the return of on-site activities in dentistry courses regarding COVID-19 biosafety, prevention, and control, reported by representatives of public and private Higher Education Institutions (IES). Brazil, first semester 2021.

Category (n)*	Sub-category*	Occurrence in the registered units n (%)*		
		Public HEI (n=21)	Private HEI (n=62)	Total sample (n=83)
Physical structure adjustment (25)	Acquisition/availability of materials and resources	6 (28.4%)	5 (8.0%)	11 (13,2%)
	Course environment/clinics	9 (42.8%)	0	9 (10,8%)
	Ventilation	3 (14.2%)	2 (3.2%)	5 (6,0%)
Students', workers', and professors' behavior (17)	Anxiety and fear	0	3 (4.8%)	3 (3,6%)
	Regarding control and safety measures	3 (14.2%)	7 (9.6%)	10 (12,0%)
	Regarding the pandemic	0	4 (6.4%)	4 (4,8%)
Safe distancing maintenance (25)	Organization of classes/lesson environment	2 (9.5%)	8 (12.9%)	10 (12,0%)
	Distancing in the dental clinic	2 (9.5%)	1 (1.6%)	3 (3,6%)
	Flow of people in the HEI	0	6 (9.6%)	6 (7,2%)
	Compliance with the norms and distancing	0	6 (9.6%)	6 (7,2%)
Compliance with norms and protocols (16)	Adhesion to protocols	1 (4.7%)	5 (9.6%)	6 (7,2%)
	Guidance and training	2 (9.5%)	2 (3.2%)	4 (4,8%)
	Development and implementation of protocols	1 (4.7%)	5 (9.6%)	6 (7,2%)
Control and safety (19)	Concerns related to the pandemic evolution	1 (4.7%)	4 (6.4%)	5 (6,0%)
	Spread control	2 (9.5%)	6 (9.6%)	8 (9,6%)
	Vaccination	3 (14.2%)	2 (3.2%)	5 (6,0%)
	COVID-19 examination/tests	0	1 (1.6%)	1 (1,2%)
No difficulties (4)		0	4 (6.4%)	4 (4.8%)

* Open question content analysis.

DISCUSSION

This study identified that public dentistry courses in Brazil faced greater difficulty in their return to on-site activities during the COVID-19 pandemic due to financial limitations and the need for physical structure adjustments. Private HEI reported higher availability of resources which enabled them to restart their on-site activities earlier and to tackle the difficulties related to compliance with biosafety protocols, organization of classes and lesson environments, and the negative psychological impact caused by the pandemic.

It seems relevant to observe that the earlier return to on-site activities in the private sector[9], when compared to the public, might be related to the need to offer the services as a way of keeping their income. In the public sector, there were also some difficulties related to the education funding by the federal government. The reduction, suspension, and limitation of financial resources and the public university budget that started in the pre-pandemic period, directly impacted the payment and maintenance of basic services so that the institutions could continue to work[21]. This might have contributed to the later return of public dentistry courses on-site activities when compared to the private ones.

In Brazil, the epidemiologic scenery in the first semester 2021, when the study data was collected, was critical with a considerable increase in the number of new COVID-19 cases, when compared to the same period in the previous year and, consequent, health system collpase[22]. For this reason, the results of this study must be interpreted considering the epidemiologic context. The World Health Organization (WHO) declared that COVID-19 was no longer a global public health emergency in May 2023. However, this does not mean that the disease is no longer a threat to the individuals' health[23].

The higher rate of respondents from private courses might be related to higher proportion of courses offered by those HEI in Brazil[24]. A noteworthy result was the percentage of dentistry courses that implemented CCIO after the outbreak

of the COVID-19 pandemic and elaborated biosafety protocols, providing qualification and training, and the creation of education materials[25].

The higher percentage of private dentistry courses in on-site activities during the research period resulted from the findings presented by the study regarding greater availability of financial resources, enough suppliers, proper physical structure, and workers, sufficient technicians, and professors ready to return to those activities. Another finding is that investment is needed in HEI in general, so that they can adapt to the new biosafety reality[26], which presents financial challenges such as increased costs to restructure the clinics and improved inputs[27], affecting seriously the restructuring of clinical areas in public HEI that depend directly on public funding.

Moreover, we identified difficulties related to the supply and delivery of PPE in public HEI, while the private institutions reported higher cost of this input[28] and increased costs for the students to purchase them. The adoption of a new biosafety routine implied in the use of new PPE and consequent increase in expenditure[29]. It might have also contributed to the negative impact on the budget of public and private dentistry institutions. Despite not being the object of this study, the budget impact felt by students regarding the acquisition of PPE appeared in the responses of some participants from private HEI. The PPE high cost might have affected the students' budget as well, mainly low-income individuals that were students in public HEI, or those who benefited from education funding programs and studied in private HEI[30].

Some additional difficulties were more evident in private dentistry courses due to the earlier return of on-site activities. For example, the psychological impact related to facing the new reality that resulted in fear and anxiety, which could be expected in a moment when the learning curve related to the pandemic behavior was quite low. This aspect agrees with the literature, in which studies reported the negative psychological effects that the academic community faced during the pandemic[31,32]. This shows the importance of being prepared to support the mental health of those involved in dental education in contexts of public health emergency[33]. Another more evident difficulty in private HEI regarded the maintenance of safe distancing when organizing the classes/lesson environments, distancing in clinics and laboratories, reduced flow of people in the institution, and compliance with the distancing norms.

Research results evidenced the challenges of planning activities for the near future due to the uncertainties regarding new health crises[34]. This included difficulties related to the development of effective vaccines for possible viral mutation, and their immediate and safe release to the community, prioritizing specific risk groups and health professionals[35].

Lack of knowledge and guidance to the academic community in relation to the COVID-19 biosafety protocols[36,37], along with the lack of practical training to dentistry students about preventive measures were reported in the 2022 publication[38]. In this study, however, the participant HEI did not report difficulties to implement training and guidance about biosafety. Therefore, further studies aiming to explore and clarify this theme are needed.

The COVID-19 pandemic challenges represented opportunities for the development of dental education, mainly regarding prevention and improved control of infections[39]. The results of this study on the return of on-site activities and the difficulties faced by public and private dentistry courses might contribute to the fight against future pandemics and health emergencies caused by similar infectious diseases, which require fast adjustments and reorganization of biosafety measures.

This study presents some limitations, for example, due to the challenge of collecting data online, the non-response rate of the universe targeted was high. For being a cross-sectional study, the data refers to the data collection moment in 2021only, which was still a critical period of the pandemic. This allows data interpretation with a certain time distance. Some responses were too concise to allow a clear interpretation of the difficulty described and the lack of an interviewer might have been a disadvantage. Despite these limitations, great effort was made to develop the study according to the online research quality criteria, to obtain the most from the questionnaire answers, and to comply with the rigor of qualitative-quantitative analyses for data interpretation. In addition, the eligibility criteria provided certain diversity in the representation of dentistry undergraduate courses from all Brazilian regions.

CONCLUSION

Dentistry undergraduate courses in Brazil reported different strategies in the return of on-site clinical activities. Public HEI returned later, while the private institutions had greater availability of structure, workers, and professors. Although

the compliance with the biosafety norms was a common challenge, the main difficulties reported by private HEI linked to the return of on-site activities included the organization of timetables and classroom environments, control of the flow of people, and implementation of protocols. Public entities emphasized difficulties related to the availability of resources to adjust the structure and purchase necessary input.

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