Received: 8 November 2021 | Revised: 30 May 2022 | Accepted: 12 June 2022

DOI: 10.1111/eje.12840

ORIGINAL ARTICLE

WILEY

Impact of public health and higher education policies on the profile of final-year Brazilian dental students: Challenges and future developments

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Funding information
UFRGS – scholarship

Abstract

Introduction: Brazil has experienced transformations in higher education and health services, including launching more inclusive public policies focused on these two areas.

Objective: To evaluate the profile of final-year dental students from a Brazilian public university from 2010 to 2019, accompanied by changes in public health and higher education policies.

Methods: A prospective observacional study was carried out with final-year dental students. A self-applicable semi-structured questionnaire was applied.

Result: Six-hundred and seventy-seven students participated, of which 71.5% were women, 72.9% aged between 21 and 25 years, 96.2% single, and 96.4% were without children. Over ten years, it was possible to identify trends in the profile explained by implementing public policies toward more inclusive access to Brazilian higher education by socioeconomically disadvantaged individuals. Students who completed the course between 2018 and 2019 did not have the state capital city (the wealthiest area) as their origin city and had lower parental education and income levels than dental students graduating between 2010 and 2011. Moreover, working as a primary care dentist in the Brazilian National Health System was considered a professional possibility by 61.4% of the students, and has gained prominence significantly over time, ranging from 21.1% in 2010 to 72.9% in 2019 ($p < .05$).

Conclusion: Over the study period, concomitantly to advances in public health and higher education policies in Brazil, more diverse access to public dental education was observed, allowing students from low socioeconomic positions to take the education. Changes have also impacted the students' perspectives regarding the need for post-graduate training and a career in public health dentistry. However, these trends need to be consolidated, and public policies continued and strengthened.

KEYWORDS
curriculum, dental education, dental students, graduate education, public health

1 | BACKGROUND

The World Health Organization (WHO) has produced a call for action on the social determinants of health. The framework emphasises upstream structural and intermediate determinants, e.g., economic, welfare policies, and education, pressure society to create social hierarchies and impact people's socioeconomic position.[1] Moreover, the socioeconomic position influences how a person lives, works, ages, and consequently accumulates risk for diseases.

In the past two decades in Brazil, public policies and affirmative actions have been implemented to expand and facilitate access to higher education by the socially disadvantaged and more isolated communities. These policies and actions target structural and intermediate determinants of health, e.g., social and welfare, income, education, gender, and ethnicity. Among them, we highlight the common national exam for access to higher education with a Unified Admission System (SiSU), increased access to government student loan funds and scholarships, the Affirmative Action Program and the Restructuring and Expansion of Courses and Vacancies at Public Institutions (REUNI).[2] Before these changes, Brazil had only privileged access to higher education,[3] and students from the countryside could not afford living expenses in a different city.

At the same time, Brazil embarked on a journey to prioritise primary care as its main access to the health care system, and oral health professionals were included as essential components of the primary care team.[4] Altogether, these policies brought sociodemographic and educational changes to the profile of dental students, which consequently opened spaces for new job perspectives in the public sector that required a discussion of the profile of the oral health team to attend to the population needs.[5–7]

A dental course solely focused on restorative/extractive procedures gave place to a more generalist and humanist dentist, focusing on prevention and health promotion[8]: The "new" dentist should critically reflect upon the population needs and work at all levels of the health care system, based on technical-scientific, and ethical rigour. The academic training should be aligned with the paradigm of free public health and the principles of universality, comprehensiveness, and equity of the Brazilian National Health System.[9,10]

Brazil has undergone profound transformation processes in dental training, involving conceptual changes, institutional relations, and confrontation of knowledge and values. Analysing public policies requires long follow-up periods to identify substantial changes. These processes demand an extensive maturation and construction time and periodic evaluations. Although education is the most important modifiable social determinant of health,[1] there are no observational studies monitoring the impact on the dental student profile of implementing new public health and higher education policies. Therefore, we analysed the changes in Brazilian final-year dental students' profiles over ten years while new public health and higher education policies were implemented.

2 | METHODS

2.1 | Study design and sample

A prospective observational study was carried out with final-year dental students. This study was elaborated under the "Strengthening the Reporting of Observational Studies in Epidemiology" (STROBE)[11] guidelines for reporting observational studies (Appendix S1). All final-year dental students graduating between 2010 and 2019 from a federal public university, Federal University of Rio Grande do Sul (UFRGS), Brazil, were considered for the study ($n = 795$). The study protocol has been approved by the Ethics Committee of UFRGS (#18249), in accordance with the Helsinki Declaration of 1975 on experiments involving human subjects. Written informed consent was obtained from all participants. Two researchers (JSL and FVB) explained the participants' rights, procedures, purpose and duration of the study, potential risks and benefits of participation, the confidentiality of their identification, and guarantee of participation consent withdrawal at any time.

2.2 | Study context

The study was carried out at the UFRGS. A federal public university setting guarantees that all democratisation policies for higher education access and curricular reevaluation attending the National Health System needs would be implemented.

The last major curriculum change to align with the Brazilian National Health System's needs was performed in 2005. Considering the five years duration of the course, the data collection started in 2010 with the graduation of the first cohort. In 2005, the establishment of a new pedagogical project was guided by the new National Curricular Guidelines and the country's health policies.[12] The curricular model extended the course from four to five years and provided pedagogical innovation in teachings, such as seminars combining different basic disciplines (e.g., anatomy, histology, physiology) in the first years; dental clinics integrating all specialities with increasing levels of procedure complexity; extramural internships in public clinics supported by the Brazilian National Health System and interprofessional education initiatives.[13,14] From 2010, the dental school expanded the intake of students, its physical structure, and staff; in addition, from 2013, the university adopted the national unified admission system and reserved part of the intake to a quote system that considers income, race and physical disabilities. It is worth

mentioning that the students could apply for government financial support for their studies.

2.3 | Data collection and instrument

Recruitment was done every six months after the end of a teaching activity in the last semester of the course, where final-year dental students met in person for this activity. A professional specialist in education (JSL) and a researcher (FVB) were responsible for inviting the students, eliciting informed consent, and distributing the paper-based questionnaire. The data collection instrument was characterised as a semi-structured, self-administered questionnaire, unidentified and pretested before the beginning of the study in 15 volunteer students.

The research instrument was based on the consultation of the text of the Pedagogical Project of the university,[12] and in studies that had described the sociodemographic-family characteristics of dental students,[15] evaluations of dental courses,[16] expectations of postgraduation,[17] and professional performance perspectives.[18] The instrument consisted of 26 questions (24 closed and two open) organised in four thematic axes (Table 1). The students answered the questionnaires anonymously in a room reserved by the university, and the researchers could not track the respondents. The time to complete the instrument was approximately 45 min. A researcher with experience in qualitative research (FVB) typed the answers to the open and closed questions. When completing data collection, participants' responses were coded using a term followed by random numbers to ensure confidentially (i.e., student 001 and student 002) and stored on a secure server.

2.4 | Data analysis

Our study included investigators with a background in Education, Academic Teaching, Dentistry, and Public Health to foster reflection and dialogue. The data from this qualitative-quantitative approach were analysed separately by three researchers (JSL, FVB, and RFCT), allowing an in-depth understanding of the profile of final-year dental students from multiple perspectives.

Concerning the quantitative approach, descriptive analyses were performed using the *SPSS* software version 21.0, considering the distribution of absolute frequencies and percentages of answers to closed questions by the year the students completed the course. The data relating to the variable perspective of professional performance in the Brazilian National Health System (full-time position) were analysed using the one-sample T-test with Bonferroni correction. The statistical significance was defined at 5%.

Regarding the qualitative approach, the answers to the open questions were qualitatively analysed by thematic content analysis, organised, and categorised by emerging themes with the support of the *ATLAS.ti* software.[19] The main theoretical framework[14,20–23] used was constituted from reflections on teaching in dentistry and public policies in the Brazilian context (Figure 1). Briefly, the content

TABLE 1 Thematic axes and variables of the data collection instrument

Thematic axes	Variables
Sociodemographic characteristics and family context	Sex Age Marital status Children City/state of origin Parents' education Insertion of parents in the labour market Self-reported monthly family income Presence of a dentist in the family
Dentistry course	Age of entry in the course Previous higher education Reasons for choosing dentistry Failure and pausing Performing extracurricular activities Satisfaction with the choice of the course Course evaluation Course duration time Significant learnings
Graduate expectations	Intention to undertake postgraduate studies Time after graduation How far you want to improve Area in which you want to improve
Professional expectations	Work claim Exclusive professional performance in the Primary Health Care/Brazilian National Health System Expected financial return

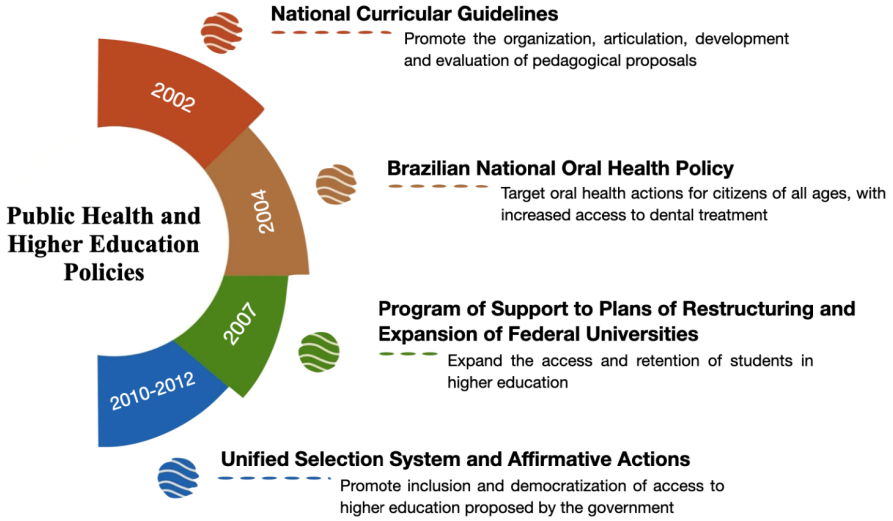

FIGURE 1 Successive transformations in the higher education and organisation of health services in Brazil (2002–2012)

analysis followed a descriptive phenomenological approach.[24] This method comprises an analysis of the original data with subsequent identification of meanings, followed by organising these into patterns and writing the results of themes related to the actual context. The themes were illustrated with quotes to ensure the content and expressed meanings were reliable. This process was supplemented with regular discussions and consultations with other research team members.

Some strategies used in this study need to be pointed out to ensure scientific rigour and validity. First, the data were generated from a qualitative–quantitative approach. It allowed us to compare results and have deeper insights along the process. Second, reflexivity was maintained during the entire process. Typically, reflexivity shifts part of the focus away from the subjects and actively involves the researchers, examining judgements, practices, and belief systems during the entire study.[25] Third, the methodological protocol and preliminary results were presented to the management team of the dental school and at the annual meeting of the Brazilian Association of Dental Education (acronym in Portuguese ABENO) to obtain feedback on the study from other researchers in the field. Sharing preliminary results allowed the researchers to situate themselves as co-learners and promoted methodological quality engagement at every step of the research project.

3 | RESULTS

A total of 677 final-year dental students participated in the study from 2010 to 2019 (85.1% response). Students who were absent when the questionnaire was applied justify the nonresponse rate.

3.1 | Sociodemographic and family context characteristics

Most dental students were women (71.5%), aged between 21 and 25 years (72.9%), single (96.2%), without children (96.4%), and 49.3% did not originally live in the city where they attended dental school. Approximately 68% of the students did not have any close family members related to dentistry. Concerning parental education, half of the parents have completed higher education (54.8% of mothers and 47.6% of fathers). Self-reported monthly family income ranged from 1 to 50 minimum wages (36.9% from 6 to 10 and 21.1% from 1 to 5; Table 2).

According to the year in which the students completed the course, results indicated that, about the city/state of origin, until 2013, most of the students were from the state capital city ($n = 113$ vs. 96 students from other cities). As of 2014, this figure reversed and, in 2019, 70% of the students reported not having the state capital city as their city of origin. Between 2010 and 2018, most parents had completed higher education except fathers in the 2014 class. In 2019, complete secondary education (42.9% fathers and 41.4% mothers) was the most frequent among students' parents. Regarding income, as of 2013, there was an increase in families whose income was up to five minimum wages, highlighting the result of 2019, when this percentage reached 47.1%.

3.2 | About the dental course: choice by profession, academic performance, course evaluation, and significant learning

When the students entered the course, they were between 17 and 22 years old (90.1%) and had not started another higher education before dentistry (80.3%).

The main reasons for students to choose dentistry were the possibility of a balance between personal and professional life (477 responses), security and job stability/social position/financial comfort (128 responses), and the influence of dentists among family members or friends (97 responses; Table 3).

During dental education, students attended extracurricular teaching or performed research and/or activities (97.8%), and the majority received financial remuneration for such activities (83%). Regarding academic performance, 88.2% of students did not pause

TABLE 2 Sociodemographic and family characteristics of final-year dental students

Variables	2010 *n* (%)	2011 *n* (%)	2012 *n* (%)	2013 *n* (%)	2014 *n* (%)	2015 *n* (%)	2016 *n* (%)	2017 *n* (%)	2018 *n* (%)	2019 *n* (%)	Total *n* (%)
Sex											
Female	23 (60.5)	46 (64.8)	47 (67.1)	45 (67.2)	61 (77.2)	45 (76.3)	46 (66.7)	60 (76.9)	59 (77.6)	52 (74.3)	484 (71.5)
Male	14 (36.8)	15 (21.1)	20 (28.6)	20 (29.8)	18 (22.8)	14 (23.7)	22 (31.9)	15 (19.2)	13 (17.1)	16 (22.9)	167 (24.7)
Not informed	1 (2.6)	10 (14.1)	3 (4.3)	2 (3)	–	–	1 (1.4)	3 (3.8)	4 (5.3)	2 (2.8)	26 (3.8)
Age (years)											
21–25	33 (86.8)	54 (76.1)	56 (80.0)	51 (76.1)	54 (68.3)	44 (74.5)	57 (82.5)	59 (75.6)	48 (63.1)	38 (54.3)	494 (73.0)
26–29	4 (10.6)	13 (18.3)	13 (18.6)	16 (23.9)	22 (27.8)	13 (22.1)	10 (14.5)	17 (21.8)	21 (27.6)	17 (24.3)	146 (21.6)
30–34	1 (2.6)	4 (5.6)	1 (1.4)	–	3 (3.9)	2 (3.4)	1 (1.5)	1 (1.3)	3 (3.9)	6 (8.6)	22 (3.2)
35–40	–	–	–	–	–	–	–	1 (1.3)	4 (5.4)	6 (8.6)	11 (1.6)
Over 40 years	–	–	–	–	–	–	–	–	–	3 (4.2)	3 (0.4)
Not informed	–	–	–	–	–	–	1 (1.5)	–	–	–	1 (0.1)
Marital status											
Single	37 (97.4)	68 (95.8)	69 (98.6)	65 (97.0)	74 (93.7)	59 (100.0)	69 (100.0)	76 (97.4)	73 (96.0)	61 (87.2)	651 (96.2)
Married	1 (2.6)	2 (2.8)	–	2 (3.0)	5 (6.3)	–	–	1 (1.3)	3 (4.0)	8 (11.4)	22 (3.2)
Divorced	–	–	–	–	–	–	–	–	–	1 (1.4)	1 (0.1)
Not informed	–	1 (1.4)	1 (1.4)	–	–	–	–	1 (1.3)	–	–	3 (0.4)
Children											
No	38 (100.0)	67 (94.4)	68 (97.1)	65 (97.0)	75 (94.9)	59 (100.0)	68 (98.6)	77 (98.7)	72 (94.8)	63 (90.0)	652 (96.3)
Yes	–	4 (5.6)	2 (2.9)	1 (1.5)	2 (2.5)	–	1 (1.4)	1 (1.3)	3 (3.9)	7 (10.0)	21 (3.1)
Not informed	–	–	–	1 (1.5)	2 (2.5)	–	–	–	1 (1.3)	–	4 (0.6)
City/state of origin											
Capital city	15 (39.5)	36 (50.7)	43 (61.4)	37 (55.2)	34 (43.0)	22 (37.3)	19 (27.5)	32 (41.0)	33 (43.4)	21 (30.0)	292 (43.1)
Remainder of state	19 (50.0)	27 (38.0)	24 (34.3)	26 (38.8)	39 (49.4)	31 (52.5)	44 (63.8)	42 (53.8)	37 (48.7)	45 (64.3)	334 (49.3)
Other states	4 (10.5)	6 (8.5)	3 (4.3)	4 (6.0)	4 (5.1)	4 (6.8)	5 (7.2)	2 (2.6)	5 (6.6)	4 (5.7)	41 (6.1)
Other countries	– (–)	1 (1.4)	– (–)	– (–)	2 (2.5)	– (–)	1 (1.4)	1 (1.3)	1 (1.3)	– (–)	6 (0.9)
Not informed	– (–)	1 (1.4)	– (–)	– (–)	– (–)	2 (3.4)	– (–)	1 (1.3)	– (–)	– (–)	4 (0.6)
Dentist in the family											
No	23 (60.5)	48 (67.6)	44 (62.9)	46 (68.7)	54 (68.4)	39 (66.1)	48 (69.6)	52 (66.7)	55 (72.4)	52 (74.3)	461 (68.1)
Father	4 (10.5)	6 (8.5)	7 (10.0)	4 (6.0)	2 (2.5)	2 (3.4)	8 (11.6)	5 (6.4)	4 (5.3)	2 (2.9)	44 (6.5)
Mother	3 (7.9)	4 (5.6)	3 (4.3)	3 (4.5)	2 (2.5)	2 (3.4)	2 (2.9)	3 (3.8)	4 (5.3)	– (–)	26 (3.8)

(Continues)

TABLE 2 (Continued)

Variables	2010 *n* (%)	2011 *n* (%)	2012 *n* (%)	2013 *n* (%)	2014 *n* (%)	2015 *n* (%)	2016 *n* (%)	2017 *n* (%)	2018 *n* (%)	2019 *n* (%)	Total *n* (%)
Others[a]	8 (21.1)	13 (18.3)	15 (21.4)	14 (20.9)	21 (26.6)	16 (27.1)	9 (13.0)	17 (21.8)	13 (17.1)	16 (22.9)	142 (21.0)
Not informed	– (–)	– (–)	1 (1.4)	– (–)	– (–)	– (–)	2 (2.9)	1 (1.3)	– (–)	– (–)	4 (0.6)
Parent's education (father; mother)											
Elementary incomplete	– (–)	3 (4.2)	4 (5.7)	1 (1.5)	2 (2.5)	6 (10.2)	7 (10.1)	6 (7.7)	6 (7.9)	11 (15.7)	46 (6.8)
	1 (2.6)	1 (1.4)	2 (2.9)	2 (3.0)	6 (7.6)	3 (5.1)	2 (2.9)	3 (3.8)	4 (5.3)	7 (10.0)	31 (4.6)
Elementary complete	– (–)	3 (4.2)	5 (7.1)	6 (9.0)	9 (11.4)	3 (5.1)	5 (7.2)	4 (5.1)	5 (6.6)	9 (12.9)	49 (7.2)
	1 (2.6)	2 (2.8)	2 (2.9)	5 (7.5)	5 (6.3)	1 (1.7)	6 (8.7)	4 (5.1)	4 (5.3)	9 (12.9)	39 (5.8)
High school complete	17 (44.7)	26 (36.6)	17 (24.3)	27 (40.3)	35 (44.3)	21 (35.6)	27 (39.1)	29 (37.2)	27 (35.5)	30 (42.9)	256 (37.8)
	11 (28.9)	24 (33.8)	15 (21.4)	25 (37.3)	31 (39.2)	18 (30.5)	27 (39.1)	24 (30.8)	24 (31.6)	29 (41.4)	228 (33.7)
Higher education complete	21 (55.3)	38 (53.5)	43 (61.4)	33 (49.3)	33 (41.8)	28 (47.5)	30 (43.5)	39 (50.0)	38 (50.0)	20 (28.6)	323 (47.7)
	24 (63.2)	44 (62.0)	49 (70.0)	35 (52.2)	36 (45.6)	35 (59.3)	34 (49.3)	47 (60.3)	42 (55.3)	25 (35.7)	371 (54.8)
Not informed	– (–)	1 (1.4)	1 (1.4)	– (–)	– (–)	1 (1.7)	– (–)	– (–)	– (–)	– (–)	3 (0.4)
	1 (2.6)	– (–)	2 (2.9)	– (–)	1 (1.3)	2 (3.4)	– (–)	– (–)	2 (2.6)	– (–)	8 (1.2)
Family income (minimum wages)[b]											
Up to 5	6 (15.8)	3 (4.2)	5 (7.1)	11 (16.4)	18 (22.8)	12 (20.3)	16 (23.2)	15 (19.2)	24 (31.6)	33 (47.1)	143 (21.1)
6–10	18 (47.4)	25 (35.2)	28 (40.0)	23 (34.3)	27 (34.2)	26 (44.1)	23 (33.3)	29 (37.2)	31 (40.8)	20 (28.6)	250 (36.9)
11–20	11 (28.9)	18 (25.4)	23 (32.9)	17 (25.4)	21 (26.6)	9 (15.3)	15 (21.7)	16 (20.5)	14 (18.4)	10 (14.3)	154 (22.7)
≥21	2 (5.3)	6 (8.5)	6 (8.6)	8 (11.9)	4 (5.1)	1 (1.7)	1 (1.4)	5 (6.4)	2 (2.6)	2 (2.9)	37 (5.5)
Not informed	1 (2.6)	19 (26.8)	8 (11.4)	8 (11.9)	9 (11.4)	11 (18.6)	14 (20.3)	13 (16.7)	5 (6.6)	5 (7.1)	93 (13.7)
Total	38.0 (100.0)	71.0 (100.0)	70.0 (100.0)	67.0 (100.0)	79.0 (100.0)	59.0 (100.0)	69.0 (100.0)	78.0 (100.0)	76.0 (100.0)	70.0 (100.0)	677.0 (100.0)

[a]Others: brothers, cousins, uncles, grandmother, grandfather.

[b]Family income Brazilian monthly minimum wage ≈ US$ 208 during the study period.

TABLE 3 Reasons for choosing dentistry

Main reasons	2010 n	2011 n	2012 n	2013 n	2014 n	2015 n	2016 n	2017 n	2018 n	2019 n	Total n
Work-life balance (personal and professional)	23	49	43	43	58	38	45	51	53	44	447
Security and tranquillity in the future/social position and financial comfort	11	11	15	20	12	8	12	17	11	11	128
Influence of dentists on family or friends	7	9	10	13	11	7	11	10	10	9	97
Interest in acting in the community	—	2	2	5	4	3	—	8	7	5	36
Great job market	—	—	2	3	2	3	1	1	1	1	14
Other reasons[a]	1	1	4	5	2	4	2	3	4	2	28

[a]Other reasons: Influence of other people; a course that got approved; to take care of the others; manual skills; market stability.

the course, and 81.2% did not fail in any course/subject over the dental education. These students were satisfied with the professional option for dentistry (95.1%) and rated the course as good (49.9%) and excellent (44.6%), and considered the duration of the five-year course as adequate (80.4%).

In terms of the most important learning topics over education, the most frequent answers turned to the themes of "humanisation and comprehensive health care" and "knowledge in specific disciplines/areas". In addition, the students highlighted the benefits of dental clinics with different dental specialities structured according to increasing levels of complexity and the extramural internships in the dental public health facilities.

3.3 | Postgraduate perspective

Regarding the intention to pursue postgraduate courses, 97.8% of students answered that they intend to pursue a specialisation/residency (53.2%) in the period from 6 months to 1 year after graduation (63.4%; Table 4).

The students showed interest in specialised training in the areas of Prosthodontics/Implantology (n = 216), Oral and Maxillofacial Surgery (n = 147), Public Health (n = 128), Endodontics (n = 114), Orthodontics (n = 88), Restorative Dentistry (n = 70), Periodontics (n = 49), Paediatric Dentistry (n = 29), Oral Pathology (n = 24), Radiology (n = 7), and Geriatric Dentistry (n = 5). The areas of Dental Materials (n = 5), Forensic Dentistry (n = 5), Temporomandibular Disorders (n = 5), Special Care in Dentistry (n = 4), Epidemiology (n = 2), Orofacial Pain (n = 1), Hospital Dentistry (n = 1), and Occupational Dentistry (n = 1) were also mentioned.

The option for Public Health draws attention. In 2010, only two students (5.3%) had it as a preferred area for improvement, and among the students who completed the course in 2018 and 2019, it was the most cited area (23.7% and 24.3%, respectively). Notably, 42.7% of students chose more than one area, and 10% did not know how to answer the preference for any dental speciality at the end of the course.

3.4 | The perspective of professional performance

After graduating, half of the students (51.4%) intended to combine work in the public and private sectors, while 23.3% intended to work in the public, private, and university services, and 12.4% planned to work exclusively in the private sector (Table 5).

When questioned about a full-time position in the dental public service, 61.4% of students reported that they would work in these services if they had this option after graduating. Over time a growth trend was observed, with 21.1% of students in the 2010 class to 72.9% in the 2019 class (Figure 2).

Students reported that working as a public health dentist would bring them "personal and professional satisfaction". They stated their interest and appreciation for the dentist's work in the Brazilian National Health System, allied with the possibility of a fixed income in this job, leading to financial stability.

> For personal satisfaction, I believe in the good results of the primary care programs and the good earnings in the Brazilian National Health System.
>
> (Student 328)

> It is my goal; I believe that teamwork with families and communities is the best way to improve the country's health, and this satisfies me as a person.
>
> (Student 573)

> [...] I consider our performance [of the dentist] to be of paramount importance in the primary care program; I believe in this service logic.
>
> (Student 421)

Students feel "safe" (Student 330) to work in the Brazilian National Health System, highlighting "positive experiences" (Student 2012) obtained during the extramural internships, with a focus on "professional practice and longitudinal oral care" (Student 404) and "family

TABLE 4 Undergraduate student intentions for postgraduate study

Variables	2010 *n* (%)	2011 *n* (%)	2012 *n* (%)	2013 *n* (%)	2014 *n* (%)	2015 *n* (%)	2016 *n* (%)	2017 *n* (%)	2018 *n* (%)	2019 *n* (%)	Total *n* (%)
Improvement											
No	– (–)	1 (1.4)	– (–)	2 (3.0)	2 (2.5)	– (–)	– (–)	1 (1.3)	1 (1.3)	– (–)	7 (1.0)
Yes	38 (100.0)	69 (97.2)	68 (97.1)	64 (95.5)	77 (97.5)	58 (98.3)	68 (98.6)	76 (97.4)	75 (98.8)	70 (100.0)	663 (97.8)
Not informed	– (–)	1 (1.4)	2 (2.9)	1 (1.5)	– (–)	1 (1.7)	1 (1.4)	1 (1.3)	– (–)	– (–)	7 (1.0)
Period after graduation											
Up to 6 months	5 (13.2)	23 (32.4)	24 (34.3)	25 (37.3)	18 (22.8)	23 (39.0)	33 (47.8)	34 (43.6)	20 (26.3)	33(47.1)	238 (35.2)
Up to 1 year	11 (28.9)	16 (22.5)	19 (27.1)	16 (23.9)	34 (43.0)	13 (22.0)	19 (27.5)	22 (28.2)	22 (28.9)	19 (27.1)	191 (28.2)
Up to 2 years	17 (44.7)	21 (29.6)	16 (22.9)	15 (22.4)	12 (15.2)	11 (18.6)	6 (8.7)	9 (11.5)	20 (26.3)	11 (15.7)	138 (20.4)
Up to 3 years	4 (10.5)	2 (2.8)	4 (5.7)	4 (6.0)	5 (6.3)	2 (3.4)	3 (4.3)	4 (5.1)	4 (5.3)	1 (1.4)	33 (4.9)
4 years or more	– (–)	– (–)	– (–)	– (–)	4 (5.1)	2 (3.4)	– (–)	2 (2.6)	1 (1.3)	1 (1.4)	10 (1.5)
Not apply	– (–)	1 (1.4)	– (–)	2 (3.0)	2 (2.5)	– (–)	– (–)	1 (1.3)	1 (1.3)	– (–)	7 (1.0)
Not informed	1 (2.6)	8 (11.3)	7 (10.0)	5 (7.5)	4 (5.1)	8 (13.6)	8 (11.6)	6 (7.7)	8 (10.5)	5 (7.1)	60 (8.9)
Postgraduate study											
Specialisation/residence	17 (44.7)	50 (70.4)	34 (48.6)	27 (40.3)	43 (54.4)	32 (54.2)	42 (60.9)	40 (51.3)	45 (59.2)	30 (42.9)	360 (53.2)
Specialisation and master and/or doctorate	11 (28.9)	9 (12.7)	8 (11.4)	14 (20.9)	11 (13.9)	8 (13.6)	16 (23.2)	16 (20.5)	8 (10.5)	10 (14.3)	111 (16.4)
Master and doctorate	6 (15.8)	6 (8.4)	22 (31.4)	16 (23.9)	15 (19.0)	13 (22.0)	8 (11.6)	17 (21.8)	14 (18.4)	21 (30.0)	138 (20.4)
Not apply	– (–)	1 (1.4)	– (–)	2 (3.0)	2 (2.5)	– (–)	– (–)	1 (1.3)	1 (1.3)	– (–)	7 (1.0)
Not informed	4 (10.5)	5 (7.0)	6 (8.6)	8 (11.9)	8 (10.1)	6 (10.2)	3 (4.3)	4 (5.1)	8 (10.5)	9 (12.9)	61 (9.0)
Total	38 (100.0)	71 (100.0)	70 (100.0)	67 (100.0)	79 (100.0)	59 (100.0)	69 (100.0)	78 (100.0)	76 (100.0)	70 (100.0)	677 (100.0)

TABLE 5 Perspective of professional performance after graduation

Variables	2010 *n* (%)	2011 *n* (%)	2012 *n* (%)	2013 *n* (%)	2014 *n* (%)	2015 *n* (%)	2016 *n* (%)	2017 *n* (%)	2018 *n* (%)	2019 *n* (%)	Total *n* (%)
Work pretension											
Exclusive public service	– (–)	3 (4.2)	1 (1.4)	1 (1.5)	1 (1.3)	– (–)	1 (1.4)	3 (3.8)	7 (9.2)	1 (1.4)	18 (2.7)
Exclusive private service	11 (28.9)	10 (14.1)	7 (10.0)	7 (10.4)	11 (13.9)	5 (8.5)	9 (13.0)	10 (12.8)	10 (13.2)	4 (5.7)	84 (12.4)
University (teaching and research)	– (–)	2 (2.8)	2 (2.9)	3 (4.5)	– (–)	1 (1.7)	2 (2.9)	1 (1.3)	– (–)	– (–)	11 (1.6)
Public and private service	19 (50.0)	36 (50.7)	34 (48.6)	34 (50.7)	41 (51.9)	35 (59.3)	36 (52.2)	39 (50.0)	37 (48.7)	37 (52.9)	348 (51.4)
University, public and private service	8 (21.1)	15 (21.1)	18 (25.7)	15 (22.4)	20 (25.3)	16 (27.2)	18 (26.1)	24 (30.8)	8 (10.5)	25 (35.7)	178 (23.3)
Dental industry	– (–)	– (–)	1 (1.4)	– (–)	– (–)	– (–)	– (–)	– (–)	– (–)	– (–)	1 (0.1)
Not informed	– (–)	5 (7.0)	7 (10.0)	7 (10.4)	6 (7.6)	2 (3.4)	3 (4.3)	1 (1.3)	3 (3.9)	3 (4.3)	37 (5.5)
Total	38 (100.0)	71 (100.0)	70 (100.0)	67 (100.0)	79 (100.0)	59 (100.0)	69 (100.0)	78 (100.0)	76 (100.0)	70 (100.0)	677 (100.0)

and community" (Student 241). The family approach is considered a unit of social production, a priority situation in the Brazilian National Health System.[7]

The expected financial return for 39.6% was 6–10 minimum wages; for 20.2% of students, it was 11–20 minimum wages, and more than 20 minimum wages for 6.6%. About 7.1% of students did not know how much they intended to earn after graduation.

4 | DISCUSSION

This 10-year study is the first to assess the profile of final-year dental students from a public university in Brazil relating to the different procedural transformations performed in this period. The complexity of the present prospective design resides in the diversity of policies implemented in Brazil within a particular historical, political, and social context. Over this past decade of monitoring, Brazilian dental students have been experiencing a curriculum adjusted to a context of strengthening the Brazilian National Health System, oral health policies, and changes in higher education. In this scenario, the inclusion of oral health teams in Primary Health Care (2000),[4] the implementation of National Curricular Guidelines for undergraduate courses in dentistry (2002)[9,10] and the Brazilian National Oral Health Policy (2004)[6,7] should be highlighted. It is possible to assume that all these changes have tailored the dental training according to the values and needs of the Brazilian National Health System. The training of future professionals in line with public health and education policies can qualify a workforce focused on the population's needs and improvements in health outcomes.[8,26,27]

Specifically, three policies need to be emphasised at the university where the study was conducted. The REUNI,[28] Affirmative Action Program, and SiSU[29] allowed the expansion of access of unprivileged individuals to higher education. These policies stimulated admission expansion for an evening dental education focusing on the student–worker profile. This initiative brought the possibility of changes in the sociodemographic-family profile of dental students.[30] The results obtained revealed that most dental students were female, single, and below the age of 25, which is in line with other studies carried out with dental students[31,32] and dentists[33] in Brazil and the international context.[34]

The predominance of women in the course confirms the feminisation of the profession in Brazil.[32,33,35] This trend has also been reported in Denmark,[36] the US,[37] and the UK.[38] A survey among Brazilian higher education students reinforces this result, showing that 70.1% of new students and 74.7% of graduates from dental courses in the country in 2018 were women.[39] The growing number of women choosing a dental career and the evident interest in a postgraduate education could suggest that women can achieve senior positions that men traditionally dominate.[40,41] The literature shows, however, an apparent disproportion in favour of men in leadership positions in dentistry, revealing that the more senior the position is, the greater the imbalance.[42]

The temporal analysis from 2010 to 2019 allowed us to identify trends of changes in the profile of dental students. In relation to the

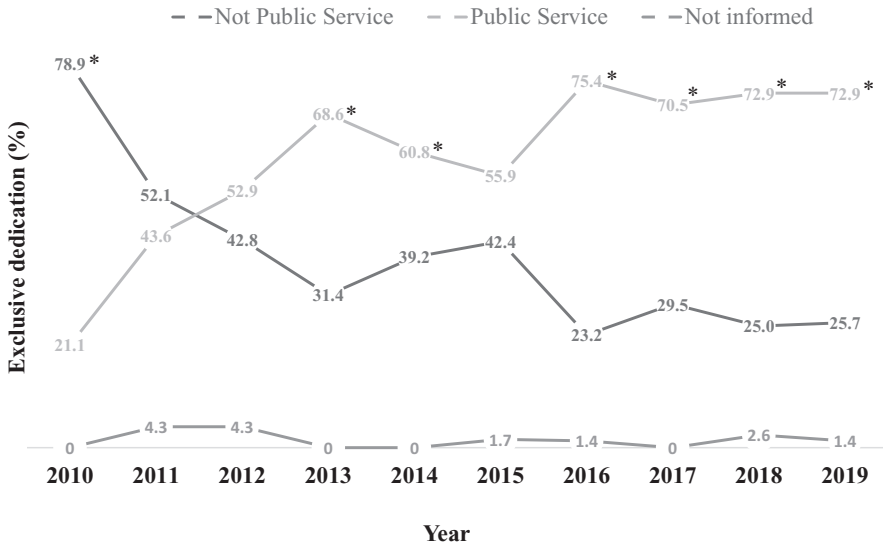

FIGURE 2 Pretension of a full-time position in the dental public service (Brazilian National Health System). *One-sample *T*-test, significant difference with Bonferroni correction ($p < .05$).

Notes: *One-Sample T-Test, significant difference with Bonferroni correction (p<0.05).

city/state of origin, it was observed that as of the year 2014, most students reported not having the state capital city as their city of origin, suggesting a more democratised access to the university by students living outside the capital city. However, whether the students return to their hometowns after completing the course, reducing the imbalance in the distribution of dentists between larger cities and rural areas, as expected by the government, is yet to be determined. The information presented here may also provide valuable guidance for policymakers in other countries willing to develop public policy and funding plans to address student permanence in institutions far from their origin.

The students' family characteristics are also highlighted. Parents' high level of education is a hallmark of dental students in the country,[43] which reinforces the family influence on young people to achieve higher levels of education. Students whose parents have completed higher education are more familiar with the university culture, leading to better conditions for achieving good performance and taking advantage of academic opportunities.[44] Parental educational level can also be related to the family's socioeconomic status. Well-educated parents can afford their children to be fully dedicated to their education during high school and university without sharing time with work, allowing them to enter a higher education course at a young age.[43]

In our study, students who completed the course between 2018 and 2019 showed families whose parents had less education (2019) and lower income (20182019) compared with students from 2010 to 2017. It is a finding that can be explained by implementing public policies for expanding access to higher education in the country (REUNI, Affirmative Action Program, and SiSU), which should be monitored in the coming years. REUNI provided the opportunity to expand vacancies for evening dental education. In 2012 with the gradual approval of Quota Law, which reserved university spots for students from low socioeconomic positions, this university implemented affirmative actions for social and racial issues for admission to its courses. From 2013, students could enter university using the SiSU[45] using their high school grades without submitting themselves to selection processes specific to each university. These actions aimed to expand the population's access to public higher education, explaining, thus, our findings.

Among the different reasons students chose dentistry, the balance between personal and professional lives was perceived as essential. A result differs from another study from our group in 2002 at this same university, when 47% of students reported that they chose dentistry because it is a liberal profession and 28% because of their aptitude.[46]

At the end of the course, the students were satisfied with their professional choice and university education. Satisfaction is associated with the student's perception of the education, especially concerning the faculty's curricular structure.[47] Educations that do not meet students' expectations lead to lower performance, failure, and even drop-out of the course,[48] which was not observed in this study. Additionally, alongside their studies, most students performed extracurricular activities such as academic tutoring, scientific initiation, and/or extension programs (with remuneration). Such nonmandatory activities and higher education training are of utmost importance for students' personal and professional lives.[49]

Regarding postgraduate studies, our findings reinforce the intention of dental students to continue their studies after undergraduate.[31] It is noteworthy that the areas of interest are changing according to the curricula experienced by the students. A study carried out at this same university, with a curriculum before the National Curricular Guidelines, identified Orthodontics, Paediatric Dentistry, and Surgery as the areas of greatest interest.[50] In 2011, a study also carried out at the same university with dental students from the 1st to the 10th semester who experienced the modified curriculum showed a preference for the areas of Prosthesis and/or Implantology, Surgery, and Orthodontics, while Public Health was the eighth-most cited area.[51] In this investigation, the two areas of greatest interest remained Prosthesis and/or Implantology and Surgery, calling attention to Public Health as the third most cited

option overall and the most cited among students who completed the course in 2018 and 2019. This growth of preference for Public Health Dentistry may reflect the curriculum emphasis on interdisciplinary training in line with the principles of universality, equity, and integrality of the Brazilian National Health System[52] with activities since the first semester based on the teaching-service-community integration combined with internships in public health services.[9,20,53]

Along with curricular changes, health policies have promoted advances in the reorientation of Brazilian healthcare practices. Examples of these policies are the expansion of Primary Health Care, with the inclusion of the Oral Health Team,[5] and the implementation of the National Oral Health Policy, which made oral health one of the top four priority areas of the Brazilian National Health System, with funding for oral health teams and the implementation of medium and high complexity services and procedures.[4,6] The funding for oral health teams and implementation of more complex services strengthened oral health care in the National Health System.[4–6] The implementation of the National Curricular Guidelines for dentistry courses in Brazil determined that dental training should be aligned with the needs of the Brazilian National Health System, impacting the curriculum and professional choices of graduates in the country, which can be confirmed in this study. Our study showed a statistically significant association in the wish for a full-time position in the Brazilian National Health System by more than half of the graduates from 2010 to 2019. This finding contrasted with results from 2002 when 62% of the students at this university were interested in working exclusively in the private service (individual or shared office and clinics).[46]

The observed trend of job preference for the public service also suggests awareness about Brazil's labour market, in which the exclusive liberal model is possibly highly competitive. At the same time, the Brazilian National Health System is seen as the largest employer of health professionals in Brazil.[10] Most students intended to work in both the public service and the private sectors, and the main reason was the financial stability resulting from the former. Despite these significant changes, it is necessary to accompany these professionals after completing dental education. Also, in the medium and long-term, it is of utmost relevance to assess whether, despite the interest and qualification for work in the Brazilian National Health System, there are possibilities of insertion/employment in the public service for dentists in Brazil.[54]

The study has strengths and limitations. The pioneering character of this 10-year follow-up of final-year dental students with a high response rate should be highlighted. However, care must be taken in the external validity of our results. Our findings were determined within a historical, political, and social context. Firstly, the perspective of professional performance after graduation is culture-dependent. Some factors such as choice by profession, academic performance, and course evaluation are related to sociodemographic and family context and could not be generalisable to other societies. Secondly, this study was conducted in a public university in Southern Brazil that implemented policies favouring access to higher education and whose curriculum has been planned to follow the Brazilian public health system. Direct comparisons with private settings are limited.

Despite the limitations, this study provides essential findings to students, researchers, and policy-makers due to changes in the characteristics of the new student profile, which demonstrated a transition trend to a new educational model. The results may be effective in evaluating the reach of existing policies in the current scenario and demonstrating their potential to contribute to the reduction of inequalities in dental education. These findings also serve as important guidance for other countries to emulate similar efforts in promoting social support to the students based on public health and higher education policies, ensuring the democratisation of access to higher education.

5 | CONCLUSION

This study identifies important trends in the profile of final-year dental students from a public university concerning their city of origin, parents' education, family income, postgraduate education, and job expectation toward public health. These results relate to the public health and higher education policies implemented in the country, such as National Curricular Guidelines, Brazilian National Oral Health Policy, REUNI, Affirmative Action Program and SiSU. Despite this favourable context, Brazil is amidst a political and ethical governmental crisis, a period of few stimuli to the aforementioned public policies, which may compromise the advances achieved reflected in this study in the future. However, for these trends to be consolidated, public policies must be strengthened and preserved.

The temporal trends of the profile must be interpreted in the light of public health policies and government actions that took place during the period under study. Determining the profile of final-year dental students allows us to understand the particularities of this specific context for the construction and strengthening of educational management strategies, which aim to reduce inequalities in dental education, expand access to higher education and fulfil the guarantee of the right to education.

AUTHOR CONTRIBUTIONS

RFCT and JMSL contributed to the research planning and conception. FVB significantly contributed to the project elaboration. FVB, TOO, JMSL, FRML, GGN and RFCT substantially contributed to the analysis and interpretation of the data; and the critical review of the content; and participated in the approval of the final version of this manuscript.

ACKNOWLEDGEMENTS

We appreciate the collaboration and support of the management of the UFRGS Faculty of Dentistry during the execution of the study.

FUNDING INFORMATION

This study was financed in part by the UFRGS – scholarship.

CONFLICT OF INTEREST

The authors have declared no conflicts of interest in connection with the manuscript.

DISCLOSURES

Poster presentations of parts of this project were showcased in the 2021 Brazilian Dental Education Association (ABENO) - Annual Session, 2021.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

How to cite this article: Bitencourt FV, Olsson TO, Lamers JMd, Leite FRM, Nascimento GG, Toassi RFC. Impact of public health and higher education policies on the profile of final-year Brazilian dental students: Challenges and future developments. *Eur J Dent Educ*. 2023;27:547-559. doi: 10.1111/eje.12840