Dental Education in the Interior of a Brazilian State: Profile of Patients and Procedures Performed in a Teaching Clinic

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Abstract

Objective: This study aimed to identify the profile of adult patients treated at the Integrated Clinic of the UFVJM Dentistry course in Diamantina-MG between 2010 and 2019. **Methods:** A retrospective analysis was conducted using patient records from individuals who had completed treatment and were discharged. Only fully completed and legible records were included, while those that were incomplete, illegible, or related to ongoing treatments were excluded. Data collected encompassed gender, age, place of origin, race, comorbidities (such as diabetes and hypertension), treatment duration, start and end year of treatment, smoking habits, alcohol consumption, and the types of procedures performed, categorized into various treatment groups. **Results:** Out of 469 records analyzed, 414 met the inclusion criteria. The majority of patients were female (63.5%), predominantly of mixed race (46.3%), with an average age of 34.1 years, and most resided in Diamantina (84.7%). The highest number of treatment initiations occurred in 2018 (41.6%), which also had the most discharges (38.4%). The average treatment duration was 66.3 days. Radiography was the most frequently performed procedure (22.3%), while endodontic treatment was the least common (2%). A positive correlation was identified between age and the creation of removable prostheses. **Conclusion:** The predominant profile of patients treated at the clinic consists of young, mixed-race women, primarily residents of Diamantina, who tend not to smoke but frequently consume alcohol. These findings provide insights into the demographic and treatment needs of the population served by the clinic, informing potential improvements in patient care and educational approaches in the dentistry program.

Keywords: education, medical record, dentistry, dental clinic

1. Introduction

Although Brazil's Unified Health System (SUS) has been in place for over two decades, studies indicate that access to dental services remains a challenge for much of the population despite the well-known fact that oral health plays a transformative role in one's overall well-being. It is influenced by contextual, service-related, and individual factors (Fonseca & Da Fonseca e Meneghim, 2017; Teixeira et al., 2023). In this context, the importance of filling out the dental record, as well as the dental expert document, is fundamental, as omissions in filling it out can impact the quality and continuity of care. Furthermore, dental schools play an essential role in expanding access to oral care by providing an additional source of dental services (Roselino, Damasceno, & Figueiredo, 2019; Dias & De Assis Moura, 2022).

The Federal University of the Jequitinhonha and Mucuri Valleys (UFVJM) is located in the Jequitinhonha Valley, a region known for its low social indicators. Diamantina, a city in the state of Minas Gerais and home to UFVJM's dental program, has the highest Human Development Index (HDI) in the region, with a score of 0.716 (PNUD, 2010). However, the surrounding areas still face significant socioeconomic challenges. The construction of knowledge during undergraduate studies, especially teaching and learning about the proper completion of dental records, is essential to training professionals capable of providing qualified care (CNE, 2021).). UFVJM's dental clinic is highly sought after, especially since, in the Basic Health Units (UBS)—which provide free, government-funded dental care—not all the specialties necessary for comprehensive oral rehabilitation are available

(PORTARIA Nº 599, Ministério da Saúde). At the UFVJM dental school, students receive supervised training in a variety of specialties, including surgical, restorative, rehabilitative, periodontal, endodontic, and stomatological treatments (UFVJM, 2020).

According to the National Curriculum Guidelines (DCN), dental programs must go beyond technical training, fostering a humanistic and ethical approach while contributing to the transformation of the social reality in which they are embedded (CNE, 2021). Therefore, it is essential for students to learn how to investigate and understand the living conditions of their patients, aiming to provide comprehensive, high-quality care (De-Carli et al.,2019). Highlighting the teaching-learning process of undergraduate content is essential to ensure that professionals in training are able to provide ethical and responsible services (Conselho Nacional de Educação [CNE], 2021).

From this perspective, understanding the profile of the patients treated at UFVJM's dental clinics is crucial for identifying their needs, improving service planning, and understanding the most prevalent treatments in the practice of dental students in the region. The main objective of this study is to analyze the most common dental procedures performed and to identify the profile of adult patients treated in the integrated clinical disciplines of UFVJM's dental program in Diamantina, Minas Gerais, Brazil.

2. Method

2.1 Study Type

This cross-sectional and retrospective study was carried out through the analysis of clinical records of patients who completed treatment and were discharged and treated at the Faculty of Dentistry of UFVJM, Campus I, in Diamantina, Minas Gerais, from 2010 to 2019.

2.2 Inclusion and Exclusion Criteria

Included in the study were complete dental records with all treatments finalized and discharges confirmed, regardless of the start date of care. Excluded were records of patients with ongoing treatments, incomplete or missing data, and those lacking the patient's signature.

2.3 Sample Size Calculation

The sample size was calculated based on prevalence studies, with a confidence level of 95% and a margin of error of 5%. The prevalence considered was 23% for endodontic procedures, following the study by Albuquerque et al. (2016), which presented a population and clinical context similar to the current study. Therefore, the sample size calculation determined that 426 records would need to be evaluated. A 10% increase was added to account for possible losses, resulting in a total of 469 records.

2.4 Data Collection

Data collection was performed by two researchers (GHTS and ABDM), who examined the profiles of adult patients treated in the integrated clinic of UFVJM's dental program. The data collection sessions were structured in 30-minute intervals, followed by 15-minute breaks to prevent fatigue and reduce errors. The data were entered directly into Google Forms to facilitate organization and analysis. During data collection, one researcher read the information from the records while the other recorded the data, with roles alternating to ensure quality control and minimize bias. The dental records were randomly investigated until they reached the sample size. Any excluded records were documented and accounted for at the end of the collection process.

2.5 Data Reliability

To ensure the consistency of the collected data, an inter-rater agreement analysis was conducted between the two researchers (Kappa: 0.759). This ensured that the inclusion and exclusion criteria were applied consistently and that data were recorded accurately.

2.6 Collected Variables

Data extracted from the dental records included the following variables: sex, age at the time of treatment, place of residence (categorized as Diamantina, another city within the Jequitinhonha Valley, or a city outside the Jequitinhonha Valley), race/ethnicity, comorbidities (diabetes, hypertension, renal disease, respiratory allergies, and joint diseases), smoking and alcohol consumption habits, treatment duration (in days), year of treatment initiation and conclusion, as well as the procedures performed. These procedures were grouped into the following categories: diagnosis, preventive, surgical, restorative dentistry, fixed prosthesis, removable prosthesis, periodontal, and endodontic.

2.7 Ethical Considerations

The project was approved by the UFVJM Human Research Ethics Committee, no. 3.9675.380. Because of the

retrospective nature of the study and the inability to update contact information, a waiver for obtaining a new Informed Consent Form was requested and approved.

3. Results

A total of 469 (100%) dental records were analyzed, of which 414 (88.3%) were included in the sample and 55 (11.7%) were excluded. The reasons for exclusion included incomplete records ($n = 7$, 1.5%) and the absence of treatment records ($n = 48$, 10.2%).

The sample predominantly consisted of female patients, with 263 records (63.5%). Most patients resided in Diamantina ($n = 350$, 84.7%), followed by patients from other cities in the Jequitinhonha Valley ($n = 48$, 11.6%), and a smaller number from areas outside the Valley ($n = 15$, 3.6%). The average patient age was 34.1 years ($\pm$ 16.8), with the age range spanning from 13 to 84 years. The average treatment duration was 66.3 days ($\pm$ 119.9), with a minimum treatment time of 1 day and a maximum of 920 days.

The most common procedure was radiography, with 860 radiographs performed, representing 22.3% of all procedures. The year with the highest number of patients completing their treatment was 2018, with 159 patients (38.4%) discharged (Table 1).

Radiographic procedures, fixed prostheses, removable prostheses, and endodontics showed a positive and statistically significant correlation with patient age ($p < 0.05$) and treatment duration ($p < 0.05$). In contrast, preventive treatments had a negative correlation with patient age ($p = 0.013$), indicating that younger patients received more preventive care (Table 2).

There was also a statistically significant association between patients' place of residence and the frequency of removable prostheses and endodontic procedures. Patients from cities outside Diamantina had a higher frequency of removable prosthesis ($p < 0.001$) and endodontic treatments ($p < 0.001$) compared to those from Diamantina (Table 3).

Table 1. Distribution of sociodemographic and clinical variables in the sample

Variable	n	%
Residence		
Urban area	383	94.6
Rural area	22	5.4
Race		
White	114	31.6
Mixed-race	167	46.3
Black	80	22.2
Hypertension		
Present	52	12.7
Absent	357	87.3
Diabetes		
Present	16	3.9
Absent	393	96.1
Other comorbidities		
Present	108	26.2
Absent	304	73.8
Smoking habit		
Present	63	15.3
Absent	349	84.7
Alcohol consumption		
Present	254	62.0
Absent	156	38.0
Year treatment started		
2010	1	0.2
2012	6	1.5
2013	12	2.9
2014	5	1.2
2015	10	2.4
2016	36	8.7
2017	76	18.4
2018	173	41.6
2019	95	23.0
Year treatment ended		
2011	1	0.2
2012	5	1.2
2013	12	2.9
2014	5	1.2
2015	10	2.4
2016	30	7.2
2017	64	15.5
2018	159	38.4
2019	128	30.9
Procedures performed		
Diagnosis/anamnesis/clinical exam	453	11.7
Radiographic	860	22.3
Preventive/fluoride/hygiene instruction	264	6.9
Surgery	285	7.4
Restorative dentistry	634	16.4
Fixed prosthesis	291	2.6
Removable prosthesis	539	14.0
Periodontics	448	11.6
Endodontics	77	2.0

Table 2. Correlation between age, treatment duration, and procedures performed

	Age at time		Treatment duration	
	r_s	p	r_s	p
Radiographic	0.169	0.001*	0.385	<0.001*
Preventive/fluoride/hygiene instruction	-0.123	0.013*	0.004	0.935
Surgery	-0.069	0.162	0.115	0.019
Restorative dentistry	-0.005	0.920	0.454	<0.001*
Fixed prosthesis	0.234	<0.001*	0.360	<0.001*
Removable prosthesis	0.520	<0.001*	0.447	<0.001*
Periodontics	-0.083	0.091	0.097	0.048*
Endodontics	0.144	0.003*	0.227	<0.001*

Note. r_s: Spearman's correlation coefficient. *Significant correlation.

Table 3. Association between the place of residence and procedures performed

	Diamantina		Other Cities		
	n	%	n	%	p
Radiographic	710	26.0	150	24.2	0.351
Preventive/fluoride/hygiene instruction	228	8.4	36	5.8	0.033*
Surgery	249	9.1	36	5.8	0.007*
Restorative dentistry	536	19.7	98	15.8	0.028*
Fixed prosthesis	233	8.5	58	9.4	0.511
Removable prosthesis	384	14.1	155	25.0	<0.001*
Periodontics	381	14.0	67	10.8	0.037*
Endodontics	5	0.2	19	3.1	<0.001*

Note. *Chi-square test. *Statistically significant.

4. Discussion

Income inequality, combined with the challenges faced by public health services in adequately meeting the population's needs, increases the demand for treatment at university dental clinics (Taranto & De Almeida Coelho, 2023). Understanding the profile of the users of these services is crucial for planning the teaching-learning process in Dentistry, as well as for proposing institutional policies and organizing clinical activities. This helps address the local and regional demands of patients while also fostering the development of skills and competencies necessary for dental students. This study aimed to identify the main dental procedures performed and the profile of adult patients treated in the integrated clinical disciplines of UFVJM's dental program.

Studies indicate a strong correlation between oral health conditions and patient profiles (Zucoloto, Maroco, & Campos, 2016). The higher prevalence of female patients in this study aligns with previous research, which reports that 54% to 70% of dental clinic patients are women (De Souza & De Oliveira E Marinho, 2021; Andrade Neta et al., 2021; Silva et al., 2019). This predominance may be linked to factors such as women's more significant concern with health and aesthetics, as well as cultural and social reasons, such as the typical role of women accompanying family members to health care services (Fagundes, 2021).

Regarding age, the average of 34.1 years found in this study is consistent with other research. For example, Xavier (2003) reported an average age of 31.3 years, while Dos Santos Silva et al. (2019) found that 55.5% of patients were between 30 and 49 years old. The high proportion of young adults in these studies might be explained by the difficulties older adults face in accessing dental services, especially given the mountainous terrain of Diamantina-MG, which can be a barrier to transportation (Pombo et al., 2019). However, this highlights the need for careful planning in the clinical disciplines to ensure students can treat older patients, as this is essential for learning to manage age-related clinical changes and the specific needs of patients over 60.

The predominance of patients identified as mixed race reflects the demographic characteristics of the region. Studies in different parts of Brazil show significant variations in the predominant skin color of dental patients. For instance, Dos Santos Silva et al. (2019) reported that 55.5% of patients were melanoderma or feoderma (dark-skinned), while Melo et al. (2014) recorded 45% leucoderma (light-skinned) patients at the UNINCOR dental clinic in Belo Horizonte. The history of Diamantina, with its roots in gold and diamond mining during the colonial period, may explain the high prevalence of "pardo" individuals in the local population (Prefeitura de Diamantina; Mariano, 2015).

The low percentage of smokers (15.3%) observed in this study is consistent with existing literature, while the high

alcohol consumption rate (62%) contrasts with other studies, such as Andriola et al. (2015), which reported prevalences between 13% and 44.4%. The comorbidities identified, such as hypertension (12.7%) and diabetes (3.9%), also follow patterns seen in similar studies (Dos Santos Silva et al., 2019; Pereira et al., 2018). The alignment of these figures with the broader Brazilian population suggests that the patient sample is representative of the national context, positively contributing to the student's training experience.

The findings indicate that as patient age and treatment duration increase, so does the number of procedures performed, such as radiographs and both fixed and removable prostheses. This is consistent with literature indicating that tooth loss is a common condition among older adults (Suzuki et al., 2019). The need for dental prosthetics rises with age, explaining the higher demand for these procedures among older patients. The inverse relationship between age and preventive procedures suggests that younger patients are more likely to receive preventive care.

The significant association between endodontic procedures and removable prostheses with the patients' city of origin highlights a potential lack of these services in neighboring towns around Diamantina. UFVJM plays a crucial role in promoting oral health in the region, addressing a substantial portion of the demand that public services cannot meet while also providing essential training for students in these procedures. Domingos, Rossato, and Bellini (2014) similarly reported that 14.65% of their patients came from other cities, and Sanchez and Drummond (2011) noted that 46.3% of patients treated at UFMG's emergency service came from distant areas, reflecting the insufficiency of services in smaller towns across the state.

This study has some limitations, such as the absence of data on income and education in the patient records, as well as the lack of information regarding specialties like stomatology, orthodontics, and pediatric dentistry, which are taught separately at UFVJM. Another limitation is the possible negligence of students in filling out dental records, which represents a gap in the teaching-learning process, affecting the continuity and quality of care, in addition to compromising ethical and legal aspects (Andrade et al., 2021; De-Carli et al., 2019). Educational institutions can address this issue by implementing active methodologies, such as case discussions and simulations of filling out records under supervision, with constant feedback from teachers. Such an approach, in line with the National Curricular Guidelines, promotes ethical and humanistic training for health professionals (CNE, 2021). Emphasizing the importance of complete clinical documentation in medical records would strengthen the curriculum and encourage critical reflection on the role of this content in the academic training of future professionals (Santos, 2023).

Future studies should consider modernizing patient records by including socioeconomic data and implementing electronic health records, which would facilitate data collection and storage. This would enable more detailed analyses of the patient profile and support better planning for practical training in dental school.

This study provided a clear sociodemographic profile of the patients treated in the integrated clinical disciplines of UFVJM's dental course. It revealed that most patients treated by the students were young women, predominantly of mixed race, non-smokers, but with a significant prevalence of alcohol consumption. Additionally, the most frequently performed procedures included radiographic examinations, with most patients coming from Diamantina, Minas Gerais.

These findings are valuable for the development of institutional policies and strategic planning within the program. They allow for the adjustment of both theoretical and practical content provided to students and contribute to the continuous improvement of the clinic's services. The goal is to meet the local and regional oral health needs more effectively.

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Authors contributions

G.H.T.S., A.B.D.M., T.M.M.C., Y.G.G., J.C.R.G., F.S.L and D.W.D.O. were responsible for the conception and design of the study, data collection, data analysis, interpretation and drafted the manuscript. All authors critically reviewed and approved the final manuscript.

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The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Obtained.

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Data availability statement

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

Data sharing statement

No additional data are available.

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