Journal port Science Research
https://jpsr.uruk.edu.iq/index.php/jport
Volume 9, issue 2. 2026

Dental Treatment Accomplished for Children Attending Diagnostic and Pediatric Dental Clinic at College of Dentistry, Uruk University

Zainab A. Al-Dahan [a], Ahmed Adel Othman[b], Baydaa Yas [c]

[a] *Department of Pedodontics, orthodontics and Preventive Dentistry, College of Dentistry, Uruk University, Baghdad, Iraq*
[b] *Department of oral diagnosis, College of Dentistry, Uruk University, Baghdad, Iraq.*
[c] *Department of Pedodontics, orthodontics and Preventive Dentistry, College of Dentistry, Uruk University, Baghdad, Iraq.*

ARTICLE INFO

Keywords:

Pediatric dentistry; diagnosis, Dental caries; oral ulcers; Preventive care; Teaching dental clinic.

ABSTRACT

Background: Dental caries still the most prevalent chronic oral disease among children, that sometimes need complex rather than simple preventive therapy in developing countries. Assessing dental treatment trends in teaching clinics is essential to enhance children oral health. **Aim:** To assess distribution and frequency of dental treatments accomplished to children attending the Diagnostic and Pediatric Dental Clinic at Uruk University's College of Dentistry in Baghdad city. **Methods:** A retrospective cross-sectional design was accomplished using archived clinical records at diagnostic and pediatric dental clinics from two academic years (2023-2024 and 2024-2025). Children aged 3 to 14 years with complete records were encompassed. Dental procedures were divided into preventive, restorative, vital pulp therapy, extractions, and other therapies for oral ulcers. Data was examined with descriptive statistics (number and percentage). Chi-square test represent the inferential statistics. A p-value of < 0.05 was considered statistically significant.**Results:** The overall number of procedures reported was 4,189, up from 1,807 to 2,382 in the second academic year. Restorative treatments were the most common treatment (48.86% and 44.12%, respectively). followed by extraction that increased progressively (30.94% to 38.83%). Pulpotomy represent about one-fifth of treatments but reduced slightly in the next year. Fluoride prophylaxis represented the highest percentage of preventive therapy, while fissure sealant application increased in the next year. Overall, curative therapy exceeds preventive approachs. **Conclusion:** Pediatric dental services at diagnostic and pediatric dental clinics are mostly treatment-oriented, reflecting late presentation and a significant caries burden among youngsters. Although preventive techniques have improved, notably the use of fissure sealants, early diagnosis and prevention programs must be strengthened in order to shift care to minimally invasive dentistry and enhance pediatric oral health outcomes.

INTRODUCTION

Pediatric dentistry is a dynamic specialty that constantly integrates advances in diagnostic, preventive, and therapeutic procedures to maintain children's optimal oral health status. Recent advances have been reported not only in restorative and endodontic innovations but also minimally invasive and biologically oriented strategies designed to conserve primary teeth until exfoliation time (Jayaraman& Mallineni, 2025). Despite these advancements, dental caries remains one of the most prevalent chronic disease among children, affecting general health, nutrition, and quality of life. Caries progression, if untreated, frequently leads to pulpal inflammation, infection, and early tooth loss, necessitating complicated dental interventions as opposed to easy preventive measures (Montero-Copoya et al., 2024).

Globally, untreated dental caries in primary teeth impacts about 573 million children, corresponding to an age-standardized

E-mail address:
zeynebaldahan@gmail.com. [a]
ahmedadel@uruk.edu.iq [b]
drbaydaaumusama@gmail.com [c]

Corresponding* : *Baydaa Yas*

Received 31th January 2026 Accepted 21th March 2026

10.36371/port.2026.2.9

prevalence of 7.8%, as anticipated by means of the Global Burden of Disease study (Montero-Copoya et al., 2024). Numerous studies continually reported that dental pain or infection were the main reasons for dental visit rather than for routine preventive approach. In Brazil and Turkey, retrospective research revealed that over 70% of pediatric emergency visits were due to caries-related pain or pulpal infection (Çınar and Çoğulu, 2025; Shqair et al., 2012). Similar findings have been reported in Mexico, where pulpotomy combined with intermediate restorative ingredients and preformed metal crowns demonstrated a 98% clinical success rate for treating primary teeth with profound carious lesions (Montero-Copoya et al., 2024,). These patterns highlight the ongoing burden of late presentation and the prevalence of operative over preventive dental care in a variety of contexts.

The American Academy of Pediatric Dentistry (AAPD) has recently issued clinical guidelines that emphasize the significance of vital pulp therapy (VPT) for profoundly carious yet vital primary teeth. High-confidence evidence supports the use of indirect pulp treatment (IPT) or calcium silicate cement pulpotomy (with materials such as mineral trioxide aggregate [MTA] or Biodentine®) over traditional methods such as formocresol or ferric sulfate pulpotomy, which have lower long-term success rates (Coll et al., 2024; Al-azzawi et al, 2024). These biologically conservative therapies reduce pulp exposure risks and help to protect the vitality and function of primary teeth. However, despite their shown usefulness, the application of such evidence-based protocols remains limited in many developing regions due to cost, material availability, and a lack of expert expertise.

Pediatric dental clinics apply various treatment methods which depend on both behavioral patterns and system-wide elements. Research conducted in Türkiye and Malaysia demonstrates that uncooperative children and patients with early childhood caries need deep sedation or general anesthesia because their treatment involves extensive restorative and extraction procedures which are the primary methods of care (Demirel et al., 2024; Ibrahim et al., 2023). Extraction procedures accounted for 20 to 25 percent while preventive treatments comprised less than 5 percent of dental procedures that Finnish and Spanish dentists performed under general anesthesia, which resulted in a 65 percent success rate that matched international treatment patterns between curative and preventive methods (Savanheimo et al., 2012; Pecci-Lloret et al., 2021). The results demonstrate that research must focus on particular geographic areas to develop better understanding about how different treatments are applied in pediatric dental clinics when they deliver their services. The existing research about dental treatments for children in Iraq presents limited information because no studies exist that display dental treatment patterns in pediatric dental facilities. The pediatric department at Uruk University's College of Dentistry provides comprehensive care to a diverse spectrum of children from Baghdad and neighboring areas, making it an ideal location for recording the kind and frequency of dental procedures performed in an academic clinic. The analysis of these treatment methods will facilitate trend identification which will assist in workload assessment and current evidence-based procedure evaluation while supporting development of educational strategies and preventive oral health programs for the local community.Despite extensive international literature on pediatric dental care, there is a clear lack of region-specific data describing treatment patterns in Iraqi teaching dental clinics. In particular, no previous studies have comprehensively evaluated the distribution of preventive and curative procedures or examined their changes across consecutive academic years within an academic clinical setting. This gap limits the ability to align clinical training, resource allocation, and public health strategies with actual local needs. Therefore, this study contributes by providing the first institutional analysis of pediatric dental treatment patterns at an Iraqi teaching clinic, offering baseline evidence to support improvements in preventive care strategies, dental education, and pediatric oral health planning.It was hypothesized a priori that curative procedures, particularly restorative and extraction treatments, would predominate over preventive services, reflecting delayed presentation and high caries burden in children.The study aims to evaluate both the distribution patterns and different types of dental treatments which The Pediatric Dental Clinic at Uruk University's College of Dentistry provide to their patients. The findings will help to establish a baseline for pediatric treatment advances in Iraq and drive the development of approaches to improve preventive and conservative care within dental education and public health frameworks.The novelty of this study lies in providing the first comprehensive, institution-based evaluation of pediatric dental treatment trends in Iraq, particularly within an academic clinical environment.The specific research question is what are the patterns and frequencies of dental treatments provided to children attending diagnostic and pediatric dental clinics at Uruk University?

METHODOLOGY

Study Design and Setting

The Diagnostic and Pediatric Dental Clinic at Uruk University's College of Dentistry in Baghdad conducted this retrospective cross-sectional descriptive study. The clinic functions as a dual-purpose facility which provides complete dental treatment services to children while training students. The study aimed to examine how frequently dental treatments were delivered to pediatric patients between two academic years which extended from 2023 to 2025.

Study Population

The study population included all children patients who received dental care at the diagnostic and pediatric Dental Clinic over the indicated time period. Children aged 3 to 14 which is the age group most commonly treated in college diagnostic and pediatric clinics represented the only group that could qualify for the study.

The inclusion criteria consisted of:

1. Detailed records of the treatment that include demographic information, diagnosis, and descriptions of the procedures conducted.
2. children who attended for routine check-ups, follow-up appointments, or emergency visits

The exclusion criteria for the study were.:

1. Incomplete or illegible files that do not contain crucial clinical data.
2. Patients are referred by or to other specialized clinics, such as orthodontics or oral surgery.
3. Medically compromised children who were treated under hospital anesthesia or in other settings.
The sampling technique was comprehensive, including all eligible records available during the study period.

Data Collection and Variables

The course coordinator supervised the collection of patient information from the department's archived clinical logbooks. To protect confidentiality, each eligible record was assigned a code before data submission. The variables collected include treatment kinds for 2023-2024 and 2024-2025. The unit of analysis was the dental procedure. Each procedure was counted separately, and multiple procedures could be recorded for the same child. Combined procedures (e.g., pulpotomy with stainless steel crown) were classified and counted as separate entries.Treatments were split into primary classes based on international pediatric dentistry standards:
1. Preventive therapy include topical fluoride administration, fissure sealants, dentition and oral health evaluations, and nutritional assessments.
2.Restorative therapies include composites and glass ionomers.
Vital pulp therapy includes indirect pulp treatment, pulpotomy, or pulpectomy using appropriate drugs such calcium hydroxide, MTA, or Biodentine®.
4. Extractions: The removal of primary or permanent teeth owing to decay, movement, or infection.
5. Additional procedures include stainless steel crowns, space maintainers, emergency trauma management, and oral ulcers.
Any ambiguous entries were cross-checked with the original records.

Data management and statistical analysis.

The collected data was entered into Microsoft Excel and analyzed with IBM SPSS Statistics version 25.0 (IBM Corp., Armonk,
NY, USA). Descriptive statistics (numbers and percentages) were utilized to calculate the frequency of each treatment type using bar charts. Chi-square test represent the inferential statistics. Chi-square tests were used to compare the distribution of treatment categories between the two academic years for both pedodontic and preventive procedures. A p-value of < 0.05 was considered statistically significant.

Ethical Considerations:

The study was authorized by the Ethical Committee of the College of Dentistry at Uruk University (permission number: [233013]). This study did not require informed consent because the patient records were already anonymized. All data were kept secret and utilized only for research purposes.

RESULTS

The total of pedodontic treatment was 4,189 over the two academic years. Of these, 1,807 procedures were done during the academic year 2023-2024, whereas 2,382 procedures were performed during 2024-2025, indicating an overall increase in clinical workload.

Distribution of Pedodontic Treatment Types.

Table 1 summarizes the distribution of pedodontic treatments over the two successive academic years. During the 2023-2024 academic year, fillings accounted for 48.86 % (n = 883) of all procedures. Exodontia was the second most common treatment type, accounting for 30.94 % of cases (n = 559). Pulpotomy procedures made up 19.98 % (n = 361) of treatments. Other procedures, including as direct pulp capping, root canal therapy, and other therapies, accounted for less than 0.3 % of the overall workload.
A similar pattern was seen throughout the 2024-2025 academic year, however, the distribution of pedodontic treatment categories differed significantly between the two academic years ($\chi^2 = 32.11$, df = 5, $P < 0.001$), as shown in Table 1. Fillings remained the highly performed procedure (44.12 %, n = 1,051). Exodontia treatments incresed to 38.83 % (n=925). Pulpotomy decreased by 16.54 % (n=394). Direct pulp capping, root canal treatment, and oral ulcer management that accounted for 1% of total treatments. See Figures 1 and 3.

Distribution of Preventive Treatment Procedures

In 2023-2024, a total of 1,913 preventative procedures were reported. Prophylaxis plus fluoride application was the most performed preventative approach (31.52 %, n = 603), followed by oral health scoring (29.17 %, n = 558) and nutritional

assessment (26.66 %, n = 510). Prophylaxis alone accounted for 10.50% (n = 201), with fissure sealants accounting for 2.14% (n = 41). In 2024-2025, a total of 2,161 preventative approaches were recorded. Prophylaxis with fluoride was the most preferred preventive approach (29.38 %, n = 635). oral health scoring procedures accounted for 27.76% (n = 600), dietary evaluation for 24.06 % (n = 520), and prophylaxis alone for 11.75 percent (n = 254). There has been a huge increase in the use of fissure sealants. See Figures 2 and 4. Overall, clinical activity increased in 2024–2025 compared to 2023–2024; however, the statistically significant differences reported ($P < 0.001$) specifically reflect changes in the distribution of treatment categories rather than total procedure counts. As shown in Table 2.

Overall Treatment Trends

Overall, clinical activity increased in 2024-2025 compared to 2023-2024 with highly significant difference ($P <0.001$). Restorative treatment modality remained the most common approach; nevertheless, an elevation in exodontia and fissure sealant application was recorded in the latter academic year.

DISCUSSION

In line with the study aim of assessing the distribution of dental treatments, restorative and extraction procedures constituted the majority of clinical interventions in both academic years. This pattern suggests a predominance of treatment-oriented care, which may reflect late presentation of dental disease and high caries burden among children. These findings highlight the need to strengthen early detection strategies and promote minimally invasive, tooth-preserving approaches within both clinical practice and dental education. (Montero-Copoya et al., 2024; Al-Shukry et al, 2024; Shqair et al., 2012).

Restorative treatment was the most widely used modality of treatment in both years. According to surveys from university-based pediatric dental clinics in Mexico, Turkey, and Malaysia, restorative treatments are the most commonly used (Demirel et al., 2024; Ibrahim et al., 2023; Ameen et al, 2024). The high rate of restorative therapy suggests that cavitated carious lesions in children should be addressed surgically rather than prevented. Disparities persist in implementing suggested preventative practices and using preventive dental care.

A noteworthy finding of the current study is a considerable increase in tooth extraction procedures throughout the 2024–2025 academic year. This increase may indicate a higher proportion of advanced carious lesions or delayed access to care. This finding underscores the importance of implementing early preventive and interceptive strategies to reduce the need for irreversible treatments such as tooth extraction. Similar increases in extraction rates have been found in children with limited access to early dental care, where extractions remain a common outcome for severely damaged primary teeth (Savanheimo et al., 2012; Ibrahim et al., 2023).

The early loss of primary teeth causes mastication problems and speech development issues and occlusal instability, which makes immediate dental treatment essential. The two academic years recorded a major portion of dental treatments through pulpotomy procedures, which showed that juvenile dentistry patients had high rates of pulpal involvement. Previous research (Çınar and Çoğulu, 2025; Shqair et al., 2012) have identified pulpal inflammation as a leading cause of children dental visits. To maintain pulp vitality and extend the lifespan of primary teeth, current clinical guidelines propose biologically conservative treatments such as indirect pulp therapy and calcium silicate cement pulpotomy (Coll et al., 2024). The success of these techniques depends on their implementation during the initial stages of treatment.

Preventive dental services were also provided at the Pediatric Dental Clinic, with prophylaxis and fluoride application being the most commonly used preventive intervention. This study demonstrates adherence to routine caries prevention methods as indicated by worldwide pediatric dental guidelines. Importantly, the current study found a significant rise in fissure sealant application in the later academic year. The public health advantages of preventive service usage show identical results when healthcare workers and medical students acquire knowledge about the importance of caries prevention work (Pecci-Lloret et al., 2021; Obaid et al, 2024). The total amount of preventive treatments stayed below the amount of surgical procedures which matches the findings from other pediatric dental clinics situated in university settings (Savanheimo et al. 2012; Ismail et al, 2024). The total clinical workload increased during the two academic years. This increase might possibly reflect several factors, including expanded clinical capacity, increased utilization of university dental services, or possible changes in referral patterns.

The research results present education-based knowledge which shows how dental students gain clinical experience through their studies while showing the need for dental students to learn both surgical methods and preventive dental care through minimally invasive techniques.

The present study provides important research findings; however, it also has several limitations. The retrospective design and reliance on clinical records may limit the availability of detailed diagnostic, behavioral, and socioeconomic information. Furthermore, the lack of stratified inferential analysis based on age or gender restricts the ability to identify demographic influences on treatment patterns. In addition, the data were obtained from a single teaching institution in Baghdad, which may limit the generalizability of the findings to all pediatric populations in Iraq. Another limitation is the absence of standardized caries indices (e.g., dmft/DMFT), which prevented quantification of disease severity and limited the ability to directly relate treatment patterns to caries burden. Despite these limitations, the large number of recorded procedures provides valuable baseline data for institutional planning and future multicenter studies. These findings have important implications for pediatric dental

practice and education. The predominance of treatment-oriented care highlights the need to strengthen early diagnosis and preventive strategies within clinical settings. Integrating minimally invasive and preventive approaches into undergraduate training may help shift practice patterns toward tooth-preserving care. Additionally, expanding preventive protocols, such as fissure sealant application and risk-based assessment, could contribute to reducing the burden of advanced dental disease among children.

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Table 1: *Distribution of treatment types in the pedodontic clinic for the years 2023-2024 and 2024-2025.*

Pedodontic Treatment (2023-2024)			**Pedodontic Treatment (2024-2025)**	
Type of treatment	**No.**	**%**	**No.**	**%**
Fillings	883	48.86	1051	44.12
Exodontia	559	30.94	925	38.83
Pulpatomy	361	19.98	394	16.54
Direct pulp capping	1	0.05	2	0.08
Root canal	1	0.05	4	0.17

treatment				
Oral ulcers	2	0.11	6	0.25
Total	1807	100	2382	100
Statistics	**Chi-square (χ^2) = 32.11**	df=5	**P-value<0.001**	

Table 2: *Distribution of preventive treatment types in the pedodontic clinic for the years 2023-2024 and 2024-2025.*

Preventive Treatment (2023-2024)			**Preventive Treatment (2024-2025)**	
Type of treatment	**No.**	**%**	**No.**	**%**
Prophylaxis+fluoride	603	31.52	635	29.38
Prophylaxis only	201	10.5	254	11.75
Scoring	558	29.17	600	27.76
Nutritional assessment	510	26.66	520	24.06
Fissure sealants	41	2.14	152	7.03
Total	1913	100	2161	100
Statistics	**Chi-square (χ^2) = 57.7**	df=4	**P-value<0.001**	

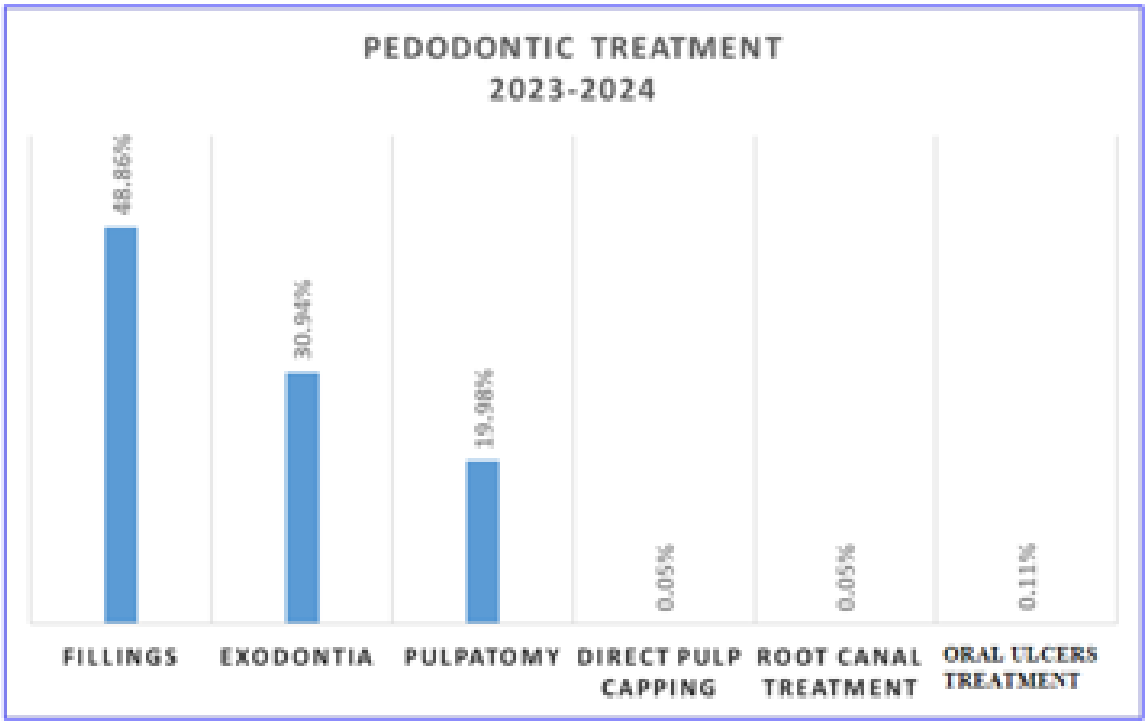

Figure 1: *Percentages of pedodontic treatment types for the year 2023-2024.*

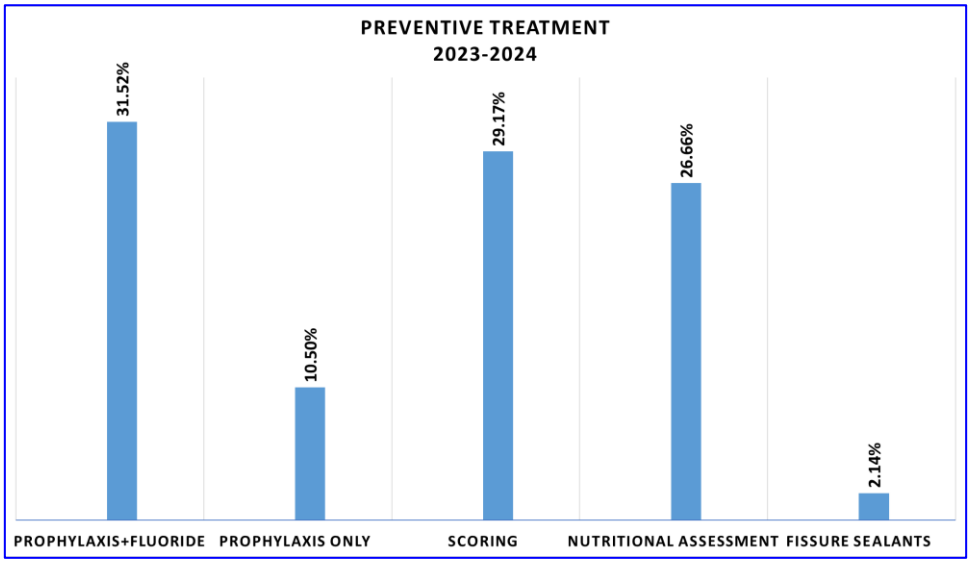

Figure 2: *Percentages of preventive treatment types for the year 2023-2024.*

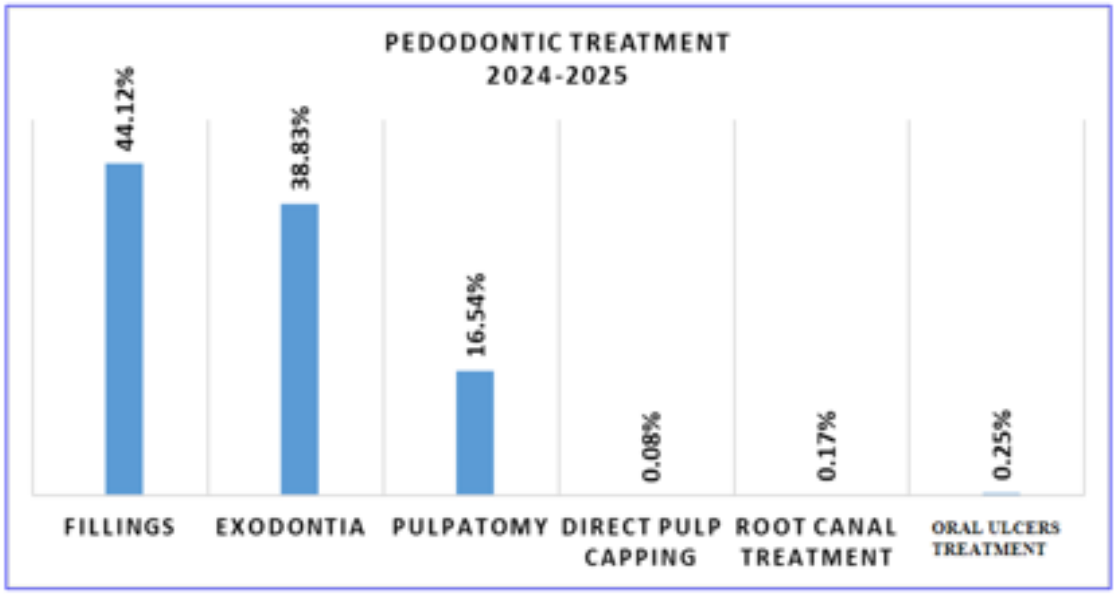

***Figure 3**: Percentages of pedodontic treatment types for the year 2024-2025.*

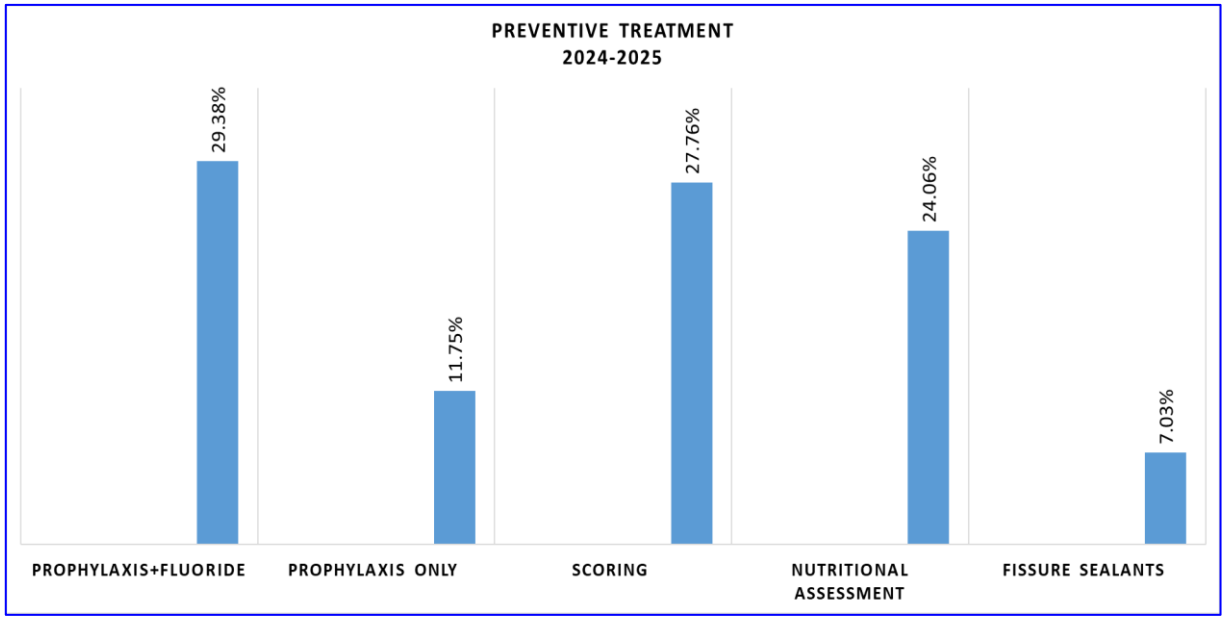

***Figure 4:** Percentages of preventive treatment types for the year 2024-2025.*