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Management and Demographic Evaluation of Endodont Treatment Cases Performed Under General Anesthesia

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Abstract

Background

The aim of this study was to evaluate the clinical and demographic characteristics of patients referred to the Department of Endodontics at Istanbul Beykent University who required endodontic treatment and were scheduled for dental treatment under general anesthesia, with a particular focus on their endodontic management and postoperative evaluation.

Methods

This retrospective study was conducted by reviewing the clinical records of 14 patients of different age groups who presented to the Department of Endodontics, Faculty of Dentistry, Istanbul Beykent University, between March 2024 and March 2026 for treatment and whose dental treatments were completed under general anesthesia. A total of 42 teeth that underwent endodontic treatment were included. Among patients who met the inclusion criteria, the relationships between sex, medical history, type of systemic condition, hospitalization status, percussion pain at the first-week follow-up, root canal filling quality, and the presence of panoramic radiographs were evaluated. Data were analyzed using IBM SPSS Statistics 27.0. Categorical variables were presented as frequencies and percentages. One-sample distributions were evaluated using the chi-square test, while associations between variables were assessed using the Fisher–Freeman–Halton exact test. Statistical significance was set at $p < 0.05$.

Results

The study included 14 patients and 42 teeth that underwent endodontic treatment under general anesthesia. The majority of the patients were female, and neurodevelopmental disorders were the most frequently identified condition in the medical history. Among the systemic conditions, dental phobia and cerebral palsy were the most frequently observed diagnoses. Among the treated teeth, molars constituted the largest proportion, followed by anterior and premolar teeth. At the first-week clinical evaluation, pain assessment could not be performed in a substantial proportion of cases due to communication limitations. The majority of root canal fillings were assessed as ideal, and panoramic radiographic records were available for most of the cases. No statistically significant differences were found between tooth-type distribution and sex or the presence of panoramic radiographs according to the medical history groups ($p > 0.05$).

Conclusion

Endodontic treatment performed under general anesthesia appears to be a feasible treatment approach for patients with difficulties in cooperation and communication. However, communication difficulties

may constitute an important limitation in the assessment of postoperative pain. The fact that the majority of root canal fillings were of ideal quality suggests that, with appropriate patient selection and treatment planning, endodontic treatment can be successfully performed under general anesthesia.

Background

General anesthesia is among the treatment options available for patients with special healthcare needs who are unable to cooperate and require extensive dental treatment (1). These approaches offer several advantages, including the ability to complete dental procedures within a single session and to facilitate treatment in cases where the patient's active participation is limited. Nevertheless, the potential risks associated with general anesthesia, particularly in relation to the patient's systemic health status, should be carefully considered (2, 3). Indeed, a substantial proportion of individuals with special healthcare needs have coexisting systemic conditions, which may increase the likelihood of various complications during anesthesia (4). Furthermore, neurological conditions involving the central nervous system, such as epilepsy, impaired motor control, paralysis, and spasticity, are frequently observed in this patient population. Therefore, a comprehensive assessment of the patient's underlying systemic and neurological conditions is of great importance before deciding to proceed with general anesthesia or sedation (5–6).

Endodontic procedures may require prolonged treatment sessions and a high level of patient cooperation, particularly to achieve adequate isolation, maintain a stable operative field, and ensure patient compliance throughout the procedure. These requirements may become particularly challenging in individuals with intellectual or developmental disabilities, neurological disorders, severe dental anxiety, or other conditions that impair their ability to tolerate conventional dental procedures. In such cases, general anesthesia (GA) may provide a controlled treatment environment that facilitates the completion of comprehensive endodontic treatment within a single treatment session, thereby reducing the need for repeated dental visits or additional anesthesia procedures. However, GA should not be considered a routine requirement for endodontic treatment; rather, it should be regarded as an important treatment modality for carefully selected patients in whom conventional treatment cannot be performed safely, predictably, or adequately due to inadequate cooperation or underlying medical and behavioral conditions. The decision to use GA should be individualized based on the patient's systemic health status, behavioral capacity, extent of dental disease, complexity of the required treatment, and the potential risks and benefits associated with anesthesia (7, 8).

This study aimed to evaluate the demographic, systemic, and clinical characteristics of patients undergoing endodontic treatment, together with the clinical and radiographic findings associated with treatment. Demographic characteristics, medical history, and underlying systemic diseases were assessed to provide an overview of the patients' general health status. In addition, the need for hospitalization during the treatment process and clinical findings observed following treatment were taken into consideration.

To evaluate the clinical and radiographic aspects of endodontic treatment, the presence of percussion pain during the early postoperative period was assessed. Radiographic evaluation included the quality of root canal obturation and the patients' ability to undergo panoramic radiographic evaluation before and after treatment.

Within this context, the combined assessment of patients' general and systemic characteristics with the clinical and radiographic findings following endodontic treatment was intended to identify patient- and treatment-related factors that may influence treatment outcomes (9, 10).

Methods

This retrospective study was conducted at the Department of Endodontics, Faculty of Dentistry, Istanbul Beykent University. The study protocol was reviewed and approved by the Non-Interventional Clinical Research Ethics Committee of Istanbul Beykent University.

In this study, the clinical and demographic records of patients who presented to the Department of Endodontics, Faculty of Dentistry, Istanbul Beykent University, between March 2024 and March 2026 and whose dental treatments were completed under general anesthesia (GA) were retrospectively reviewed. The primary aim of the study was to evaluate the demographic and systemic characteristics of patients who underwent endodontic treatment under general anesthesia, to examine the clinical and radiographic findings associated with the endodontic treatments performed, and to determine the clinical findings observed following treatment.

Within the scope of the study, the clinical records of patients who underwent dental treatment under general anesthesia at Istanbul Beykent University Faculty of Medicine Hospital and who required endodontic treatment were evaluated. A total of 14 patients and 42 endodontically treated teeth were included in the study. The patients belonged to different age groups. Based on the available records, the primary reasons for performing dental treatment under general anesthesia were inadequate patient cooperation, communication difficulties, behavioral characteristics, systemic or neurological conditions, and the need for comprehensive dental treatment.

The associations among sex, medical history, presence of systemic disease, hospitalization status, treated tooth group, percussion pain during the first postoperative week, root canal filling quality, and the presence of panoramic radiographs were evaluated.

The teeth treated under general anesthesia were categorized into three groups: anterior teeth, premolars, and molars. The number of endodontic treatments performed for each patient and the distribution of the treated teeth were recorded.

For the clinical evaluation of the endodontic treatments, early postoperative findings were considered. The presence or absence of percussion pain was evaluated during the first postoperative week. However, in some patients, subjective pain assessment could not be reliably performed due to communication

difficulties and inadequate cooperation. Such cases were recorded separately as cases in which pain assessment could not be performed.

Preoperative and postoperative radiographic records of the patients were reviewed. In the radiographic evaluation, the availability of panoramic radiographs was initially assessed. The presence of panoramic radiographic records was recorded for the purposes of treatment planning and overall assessment of the patients' dental status.

The root canal fillings of the endodontically treated teeth were evaluated radiographically. The quality of the root canal fillings was assessed based on the criteria of appropriate filling length, homogeneous filling within the root canal, adequate filling of the canal space, and achievement of a radiographically acceptable obturation. Based on the clinical records and available radiographic images, root canal fillings were classified as either ideal or non-ideal.

In the early postoperative clinical evaluation, particular emphasis was placed on percussion pain. During the first-week follow-up, the available clinical records regarding the patients' pain status were reviewed. In some patients, subjective pain assessment was not possible due to communication difficulties or inadequate cooperation; therefore, these cases were recorded as a separate category.

This evaluation aimed to retrospectively determine the early postoperative clinical findings associated with endodontic treatments performed under general anesthesia.

The data obtained from the study were analyzed using IBM SPSS Statistics version 27.0 (IBM Corp., Armonk, NY, USA). Categorical variables were expressed as numbers (n) and percentages (%).

The chi-square test was used to evaluate the distribution of categorical variables within the study population. The Fisher–Freeman–Halton exact test was used to evaluate associations between two or more categorical variables.

A p-value of < 0.05 was considered statistically significant. The findings were interpreted considering the retrospective design of the study and its limited sample size.

Results

The distribution of the study parameters is presented in Table 1. Neurodevelopmental disorders constituted the most common medical history category (57.1%), followed by healthy individuals (28.6%) and patients with other medical conditions (14.3%). (Fig. 1).

Table 1
Distribution of study parameters

Parameter	Category	n	%
Sex	Male	5	35.7
	Female	9	64.3
Medical history	Neurodevelopmental disorders	8	57.1
	Healthy individuals	4	28.6
	Other	2	14.3
Medical condition	Dental phobia	3	21.4
	Cerebral palsy	3	21.4
	Intellectual disability	2	14.3
	Allergy (hypersensitivity)	1	7.1
	Bipolar disorder	1	7.1
	Cornelia de Lange syndrome	1	7.1
	Epilepsy	1	7.1
	Autism spectrum disorder	1	7.1
	Pronounced gag reflex	1	7.1
Hospitalization	Yes	1	7.1
	No	13	92.9
Pain on percussion (week 1)	Present	2	14.3
	Absent	5	35.7
	Unable to report pain	7	50.0
Root canal filling quality	Ideal	8	57.1
	Underfilled	2	14.3
	Panoramic radiograph could not be obtained	4	28.6
Panoramic radiograph	Available	10	71.4
	Unavailable	4	28.6
Percentages are based on 14 participants.			

In this study, 64.3% of the cases were female and 35.7% were male. When the cases were evaluated according to their medical history, the most frequently encountered conditions were dental phobia (21.4%) and cerebral palsy (21.4%). Intellectual disability was observed in 14.3% of the cases, while allergy (hypersensitivity), bipolar disorder, Cornelia de Lange syndrome, epilepsy, autism spectrum disorder, and a pronounced gag reflex were each observed in 7.1% of the cases.

The vast majority of the cases (92.9%) had no history of hospitalization, whereas a history of hospitalization was present in only one case (7.1%). In the first-week postoperative clinical evaluation, percussion pain was absent in 35.7% of the cases, present in 14.3%, while 50% of the cases were unable to report pain due to communication or cooperation difficulties. This finding indicates that early postoperative pain assessment in patients treated under general anesthesia may be substantially affected by limitations in communication and patient cooperation.

In the radiographic evaluation, panoramic radiographs were available in 71.4% of the cases, whereas panoramic radiographs could not be obtained in 28.6%. Evaluation of root canal fillings showed that 57.1% of the fillings were considered ideal, while inadequate root canal fillings were observed in 14.3% of the cases. In 28.6% of the cases, root canal filling quality could not be assessed because panoramic radiographs were unavailable.

Regarding the distribution of the teeth that received endodontic treatment, molars accounted for the highest proportion (38.1%), followed by anterior teeth (35.7%) and premolars (26.2%). No statistically significant difference was found in the distribution of tooth groups ($p = 0.607$) (Table 2).

Table 2
Distribution of tooth types

Tooth type	**n**	**%**
Anterior	15	35.7
Premolar	11	26.2
Molar	16	38.1
p = 0.607 (chi-square goodness-of-fit test).		

When sex distribution was evaluated according to medical history groups, no statistically significant difference was found among the groups ($p > 0.05$) (Table 3). Similarly, no statistically significant association was observed between medical history groups and the presence of panoramic radiographs ($p > 0.05$) (Table 4). The availability of panoramic radiographs was 75% among healthy individuals, 75% among patients with neurodevelopmental disorders, and 50% in the other group.

Table 3
Sex distribution by medical history group

Sex	Medical history		
	Healthy individuals	Neurodevelopmental disorders	Other
Male	1 (25%)	4 (50%)	0 (0%)
Female	3 (75%)	4 (50%)	2 (100%)
p = 0.441 (Fisher–Freeman–Halton exact test).			
Values are presented as n (column %).			

Table 4
Availability of panoramic radiographs by medical history group

Panoramic radiograph	Medical history		
	Healthy individuals	Neurodevelopmental disorders	Other
Available	3 (75%)	6 (75%)	1 (50%)
Unavailable	1 (25%)	2 (25%)	1 (50%)
p = 1.000 (Fisher–Freeman–Halton exact test).			
Values are presented as n (column %).			

Discussion

This retrospective study provides insight into the demographic, clinical, and perioperative characteristics of patients undergoing dental procedures under general anesthesia in a university hospital setting. All procedures were performed under general anesthesia.

This study highlights that treatment needs in patients with special healthcare needs who undergo endodontic treatment under general anesthesia may not be adequately explained by diagnostic characteristics alone. In this patient population, the combined consideration of demographic and systemic characteristics, age, treatment extent, and associated clinical and radiographic findings may contribute to a more comprehensive understanding of treatment patterns. In particular, the fact that dental treatment performed under general anesthesia may involve multiple teeth and different treatment modalities indicates that the overall treatment burden should be considered not only in relation to diagnostic categories but also in conjunction with the patient's age and individual clinical characteristics (7, 11).

In this study, sex was also evaluated as a demographic characteristic among patients undergoing dental treatment under general anesthesia. Previous studies have reported a higher proportion of male patients among individuals receiving dental treatment under general anesthesia, particularly those with special

healthcare needs. In a retrospective study of 710 patients with special healthcare needs, 52.5% of the patients were male and 47.5% were female (12). Similarly, in a large retrospective study evaluating 2,458 dental treatment episodes performed under general anesthesia, males accounted for 60.0% of the overall cohort and 61.3% of patients with disabilities (13).

When the medical history was evaluated, 57.1% of the patients in our study had neurodevelopmental disorders, 28.6% were otherwise healthy individuals without any systemic disease, and 14.3% had other medical conditions. The predominance of neurodevelopmental disorders in our study is consistent with the literature on patients with special healthcare needs receiving dental treatment under general anesthesia. In particular, a retrospective study evaluating 184 patients who underwent endodontic treatment under general anesthesia reported that 62% of the patients had special healthcare needs, with neurodevelopmental and neurological conditions such as autism, cerebral palsy, syndromes associated with intellectual disability, and epilepsy being prominent in this group (14).

When individual systemic conditions were evaluated, dental phobia and cerebral palsy were the most frequently observed conditions in our study, each accounting for 21.4% of the cases, followed by intellectual disability at 14.3%. Allergy/hypersensitivity, bipolar disorder, Cornelia de Lange syndrome, epilepsy, autism spectrum disorder, and a pronounced gag reflex were each observed in 7.1% of the cases. The relatively high prevalence of dental phobia in our study is consistent with previous literature regarding indications for general anesthesia. In a review examining indications for general anesthesia in patients with special healthcare needs, Dougherty reported that dental phobia accounted for 21.4% of referrals for treatment under general anesthesia (15).

The finding that cerebral palsy accounted for 21.4% of the cases in our study is also in accordance with previous reports. In a study evaluating patients with special healthcare needs who underwent endodontic treatment under general anesthesia, cerebral palsy represented an important clinical condition among the indications for general anesthesia, while epilepsy and various neurodevelopmental and genetic syndromes were also frequently reported (14). Overall, the diagnostic diversity observed in our study supports the view that the need for dental treatment under general anesthesia cannot be explained by a single disease or diagnostic category. Rather, neurological, developmental, psychiatric, behavioral, and dental factors should be considered together with the individual characteristics and treatment needs of each patient.

In our study, 92.9% of the cases had no history of hospitalization, whereas a history of hospitalization was present in only one case (7.1%). Although previous studies have reported that various systemic and neurological conditions are common among patients with special healthcare needs receiving dental treatment under general anesthesia, these conditions are not necessarily associated with a history of hospitalization (12, 16). Therefore, the low prevalence of a history of hospitalization in our study should be considered a descriptive finding that needs to be evaluated independently of the patients' systemic characteristics.

Although studies evaluating postoperative pain following dental treatments performed under general anesthesia are available, evidence specifically addressing percussion sensitivity after endodontic treatment appears to be limited. A previous study evaluating patients who underwent endodontic treatment under general anesthesia investigated postoperative pain and various postoperative complications; however, percussion sensitivity was not assessed as a separate parameter. In the present study, percussion pain was detected in 14.3% of the cases at the first-week follow-up, whereas 35.7% had no percussion pain and 50% were unable to report pain. Postoperative pain following endodontic treatment is multifactorial and may be influenced by patient-related factors as well as pulpal and periapical conditions and technical aspects of root canal treatment (14). Moreover, pain assessment may be particularly challenging in patients with special healthcare needs because conventional self-reported pain scales cannot always be reliably applied, and behavioral pain assessment methods may therefore be required (14). Accordingly, the presence of percussion pain in a limited proportion of the present cohort should be interpreted together with the high proportion of patients who were unable to communicate pain reliably. These findings highlight the potential value of combining patient-reported symptoms with objective clinical findings when evaluating postoperative outcomes in patients with limited communication abilities.

The finding that 50% of the cases in our study were unable to report pain at the first-week assessment is particularly noteworthy. The assessment of postoperative pain in patients undergoing endodontic treatment under general anesthesia can be challenging depending on the patient's age, level of cooperation, and ability to verbally express pain (17). Therefore, the high proportion of cases unable to report pain in our study highlights the importance of using objective clinical findings together with standardized pain assessment methods in special patient populations treated under general anesthesia.

Regarding the distribution of tooth types receiving endodontic treatment, molar teeth constituted the largest proportion of treated teeth (38.1%), followed by anterior teeth (35.7%) and premolars (26.2%). However, no statistically significant difference was observed among tooth types ($p = 0.607$). Previous studies evaluating endodontic treatment performed under general anesthesia have also considered tooth type as a clinically relevant treatment-related variable. Uysal et al., in a retrospective study of 184 patients who underwent endodontic treatment under general anesthesia, classified endodontically treated teeth according to anterior, premolar, and molar groups (14). Furthermore, Alsaleh et al. demonstrated that tooth type may influence the technical quality of endodontic treatment, with molars showing lower rates of satisfactory radiographic treatment quality than other tooth types (18). Although molars were numerically the most frequently treated teeth in the present study, the absence of a statistically significant difference indicates that endodontic treatment need was not concentrated in a particular tooth group. Given the limited sample size, however, the distribution of treated tooth types should be interpreted cautiously.

The radiographic quality of root canal fillings represents an important aspect of endodontic treatment performed under general anesthesia. In the present study, root canal fillings were considered ideal in 57.1% of the cases and incomplete in 14.3%, while radiographic evaluation could not be performed in

28.6% of the cases because panoramic radiographs could not be obtained. Alsaleh et al. reported satisfactory radiographic quality in 63% of permanent teeth treated endodontically under general anesthesia and found no difference in overall technical quality compared with treatment performed under local anesthesia (18). Similarly, Linas et al. emphasized that endodontic procedures performed under general anesthesia can meet conventional academic standards and that restorative and endodontic care provided under general anesthesia should be evaluated according to the same quality criteria as treatment performed under local anesthesia (19). These findings support the feasibility of achieving acceptable endodontic treatment quality under general anesthesia. However, the inability to obtain postoperative radiographic records in a proportion of patients in the present study limited the assessment of root canal filling quality and should be considered when interpreting these findings.

Another clinically relevant finding of the present study was that panoramic radiographs were available in 71.4% of the cases, whereas they could not be obtained in 28.6%. Difficulties in obtaining adequate clinical and radiographic records have also been reported in patients with special healthcare needs. Cortezo et al. reported that more than half of patients with severe intellectual disability were unable to tolerate clinical or radiographic examinations (20). Similarly, difficulties in obtaining diagnostically acceptable dental radiographs have been associated with limited cooperation, communication difficulties, and an inability to understand instructions in patients with autism spectrum disorder (21). In the present study, however, the availability of panoramic radiographs did not differ significantly according to medical history ($p = 1.000$). This finding suggests that the inability to obtain panoramic radiographs cannot be attributed solely to the presence of neurodevelopmental disorders. Furthermore, the absence of radiographic records in some patients may limit both comprehensive dental assessment and the evaluation of radiographic outcomes, including root canal filling quality.

Conclusion

Within the limitations of this retrospective study, patients undergoing endodontic treatment under general anesthesia represented a heterogeneous population with varying medical and behavioral characteristics. Neurodevelopmental disorders were the most common medical history category, although otherwise healthy individuals requiring general anesthesia were also represented. Endodontic treatment was distributed across anterior, premolar, and molar teeth without a significant difference among tooth groups. Most evaluable root canal fillings were classified as ideal; however, the inability to obtain panoramic radiographs in some patients limited radiographic assessment. In addition, postoperative evaluation was affected by communication and cooperation difficulties, as half of the patients were unable to reliably report pain during the first-week follow-up. These findings highlight the importance of individualized clinical and radiographic assessment when evaluating endodontic treatment performed under general anesthesia, particularly in patients with limited cooperation or communication abilities. Larger prospective studies are needed to further evaluate clinical and radiographic outcomes in this patient population.

Declarations

Consent to participate

Informed consent to participate in the study was obtained from all participants or their legal guardians, as appropriate

Ethics approval

This retrospective study was approved by the Non-Interventional Clinical Research Ethics Committee of Istanbul Beykent University. The study was conducted in accordance with the Declaration of Helsinki. Clinical trial number: not applicable.

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No funding was received for this study.

Author Contribution

1-H.G.S. Havva Gözde SENH.G.S. conceived and designed the study, collected and analyzed the data, performed the statistical analysis, interpreted the results, and wrote the manuscript. H.G.S. also reviewed and approved the final version of the manuscript and takes responsibility for the overall integrity of the work.

Data Availability

The datasets generated and/or analyzed during the current study are not publicly available due to the inclusion of patient-related information and ethical restrictions. However, they are available from the corresponding author upon reasonable request, subject to approval by the relevant ethics committee.

References

1. Vargas Román MP, Rodríguez Bermudo S, Machuca Portillo G. Dental treatment under general anesthesia: a useful procedure in the third millennium? (I). Med Oral. 2003;8(2):129–35.
2. Stratmann G. Review article: neurotoxicity of anesthetic drugs in the developing brain. Anesth Analg. 2011;113(5):1170–9. 10.1213/ANE.0b013e318232066c.
3. Sun L. Early childhood general anaesthesia exposure and neurocognitive development. Br J Anaesth. 2010;105(Suppl 1):i61–8. 10.1093/bja/aeq302.
4. Enever GR, Nunn JH, Sheehan JK. A comparison of post-operative morbidity following outpatient dental care under general anaesthesia in paediatric patients with and without disabilities. Int J

Paediatr Dent. 2000;10(2):120–5.

5. Yang Y, Wang C, Xiang Y, et al. Editorial: mental disorders associated with neurological diseases. Front Psychiatry. 2020;11:196. 10.3389/fpsyt.2020.00196.
6. Bedir F, Atıcı Bedir MG, Karadaş M. Evaluation of dental treatments in adult patients with special needs: a retrospective study. Curr Res Dent Sci. 2025;35(4):259–63. 10.17567/currresdentsci.1811567.
7. El-Sayed S, Petrovic J, Frese C, Sekundo C. Single-visit endodontic treatment under general anaesthesia in adult and adolescent patients with special needs: a systematic review. Odontology. 2025;113(2):531–41. 10.1007/s10266-024-01030-z.
8. Alsalleeh F, Albishry FY, Aleyiydi AS, Aldossari FS, Alharbi NH, Alghofaily M, et al. Outcomes of nonsurgical endodontic treatment under general anesthesia in special health care needs: an observational study. BDJ Open. 2024;10(1):36. 10.1038/s41405-024-00224-5.
9. Laukkanen E, Vehkalahti MM, Kotiranta AK. Impact of systemic diseases and tooth-based factors on outcome of root canal treatment. Int Endod J. 2019;52(10):1417–26. 10.1111/iej.13143.
10. Piñas-Alonzo R, Bello R, Hernández A, Lacerda MFLS, Vinuesa-Maqueda C, Pérez-Ron O, et al. Clinical outcomes and prognostic factors in endodontic treatment: a systematic review from 2002–2022. Br Dent J. 2025. 10.1038/s41415-025-8639-x.
11. Çatmabacak ED. Dental procedure profiles under general anesthesia in special care patients. BMC Oral Health. 2026. 10.1186/s12903-026-09931-x.
12. Akpinar H. Evaluation of general anesthesia and sedation during dental treatment in patients with special needs: a retrospective study. J Dent Anesth Pain Med. 2019;19(4):191–9. 10.17245/jdapm.2019.19.4.191.
13. Shin S. Retrospective analysis of a decade of general anesthesia for dental treatment in patients with disabilities at a regional university dental hospital in South Korea. J Dent Anesth Pain Med. 2025;25(1):67–76. 10.17245/jdapm.2025.25.1.67.
14. Uysal BC, Ozkan HD, Kocaturk O. Postoperative evaluation of special needs and healthy patients with endodontic treatment under general anesthesia: a retrospective research. BMC Oral Health. 2024;24(1):794. 10.1186/s12903-024-04584-0.
15. Dougherty N. The dental patient with special needs: a review of indications for treatment under general anesthesia. Spec Care Dentist. 2009;29(1):17–20. 10.1111/j.1754-4505.2008.00057.x.
16. Peretz B, Spierer A, Spierer S, Rakocz M. Dental treatment of patients with systemic diseases compared to patients with developmental disabilities under general anesthesia. Spec Care Dentist. 2012;32(1):21–5. 10.1111/j.1754-4505.2011.00226.x.
17. Wong AW, Zhang S, Li SK, Zhu X, Zhang C, Chu CH. Incidence of post-obturation pain after single-visit versus multiple-visit non-surgical endodontic treatments. BMC Oral Health. 2015;15:96. 10.1186/s12903-015-0082-y.
18. Alsaleh I, Cousson PY, Nicolas E, Hennequin M. Is endodontic treatment performed under general anaesthesia technically acceptable? Clin Oral Investig. 2012;16(6):1599–606. 10.1007/s00784-011-

0663-3.
19. Linas N, Faulks D, Hennequin M, Cousson PY. Conservative and endodontic treatment performed under general anesthesia: a discussion of protocols and outcomes. Spec Care Dentist. 2019;39(5):453–63. 10.1111/scd.12410.
20. Cortezo V, Cobo-Vázquez CM, Rayo A, Martín FM, Hernán T, Paredes VM, et al. Dental treatment under general anesthesia in patients with severe intellectual disability at the Gregorio Marañón General University Hospital: a 10-year retrospective study. Quintessence Int. 2023;54(1):78–86. 10.3290/j.qi.b3512031.
21. Dailey JC, Brooks JK. Autism spectrum disorder: techniques for dental radiographic examinations. J Dent Hyg. 2019;93(6):35–41.

Figures

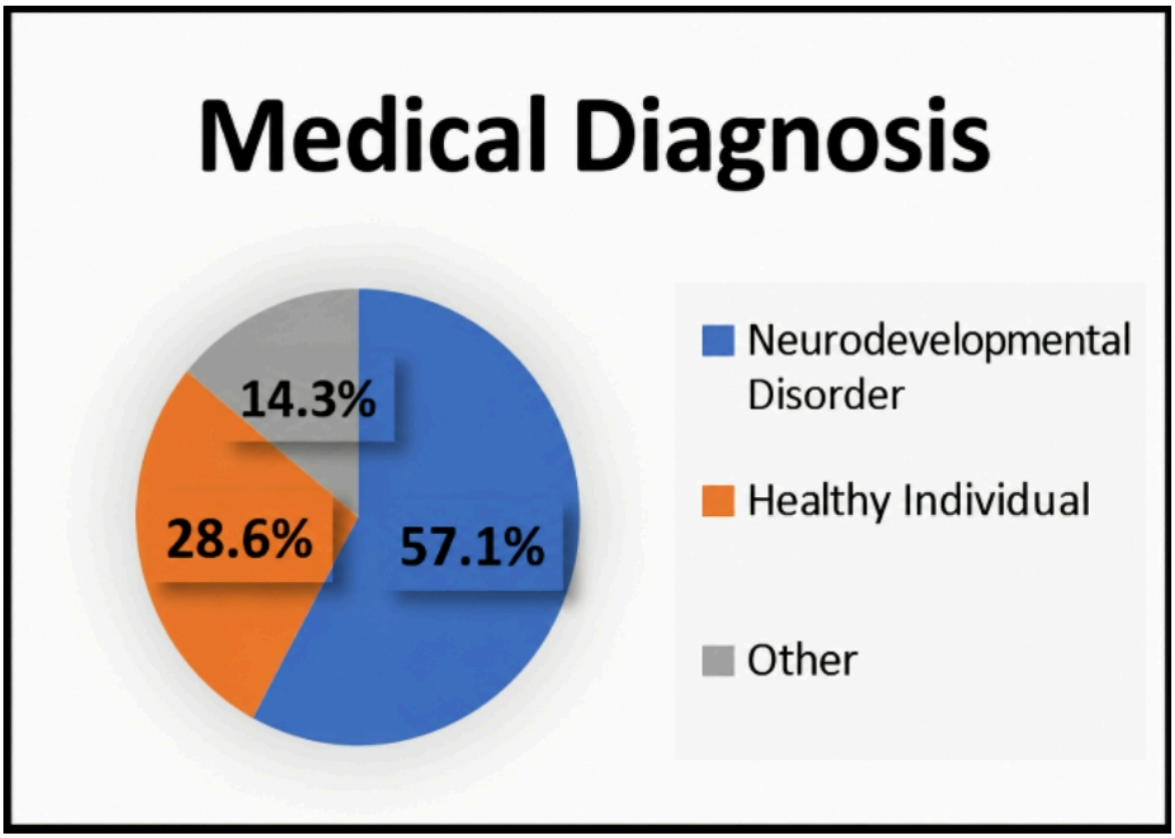


Figure 1

Distribution of medical history