

Investigations of the main oral alterations in Apae students — lem with down syndrome: Influences and quality of life



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ABSTRACT

Down syndrome is a congenital anomaly caused by the presence of an extra chromosome in pair 21. Patients with this syndrome have some oral alterations, namely: low prevalence of caries, periodontal diseases, fissure tongue, hypotonic or protruding tongue, malocclusion, TMJ alteration, dental agenesis, among other oral alterations. It is an epidemiological study carried out on APAE students of the descriptive type of case series, applied with the objective of explaining a quantitative approach, using oral evaluation, questionnaires for data collection and analysis, so that it can provide an adequate diagnosis and treatment, aiming at a better quality of life for them. It is essential to carry out follow-up through a multidisciplinary team from childhood, which will provide continuous treatment of these patients, obtaining confidence and improving quality of life, enabling stimuli to improve cognitive development, acting in health promotion and disease prevention.

Keywords: Down syndrome, Periodontal diseases, Quality of life, Disease prevention, Chromosomes.

1 INTRODUCTION

John Longden Hayden Down was an English physician who in 1866 described for the first time Down Syndrome (DS), being called at first Mongolian idiocy, as it was believed to be like the Mongolian race and only after chromosomal studies, in 1959, it was called Down Syndrome (CARVALHO et al., 2010).

Currently, it is known that DS can present itself in three forms: trisomy 21, which represents 95% of cases, where the carrier has three chromosomes 21 instead of the usual two, with 47 chromosomes in all cells, with an extra chromosome. The second type of variant anomalies in DS is



translocation, which represents about 3%, which leads to the fusion of two chromosomes of the carriers. And the third type is mosaic, with an incidence of 2% and occurs when the carrier has both normal cells and cells with trisomy 21 (GONÇALVES et al. 2017).

In Brazil, according to the Live Births Information System – SINASC (2020), between 2013 and 2020, 250,655 children were born with anomaly or congenital defects, of which 7,844 were diagnosed with DS.

Some signs may be common in 45% of patients with DS, such as muscle hypotonia, single transverse palmar fold, sulcus between the hallux and the second toe, abundant skin on the neck, oblique palpebral fissure, and flattened face. When there is manifestation of three or more of these signs along with the presence of epicanthus, micrognathia, small nose or flattened nasal bridge, and dysplastic ears, they can be a means of diagnosing a newborn with DS (PINTO et al. 2016). In addition, other systemic changes that stand out are almond-shaped eyes, propensity to congenital heart disease, and increased susceptibility to infections (VILELA et al. 2018).

In the stomatognathic system, alterations can afflict the teeth, tongue, periodontium, maxilla, palate, mandible, occlusion and temporomandibular joint, in addition to oral manifestations, such as: mouth breathing, atretic maxilla, fissured tongue, hypotonic tongue, macroglossia, dental agenesis, periodontal disease, delayed tooth eruption, malocclusion, changes in tooth structure, candidiasis and bifid uvula (CARVALHO; RABELO, 2010).

Patients with DS may manifest with a fissured tongue, i.e., cracks up to 6 mm deep in the dorsal portion of the tongue (MELO et al., 2017). In addition, the tongue appears to be larger due to the small space in the oral cavity for its positioning, characterizing macroglossia as relative. These patients often keep their mouth open and their tongue protruded, making it appear visually enlarged, causing deleterious oral habits and malocclusion (VILELA et al. 2018).

Gonçalves et al. (2017) describe the presence of pseudopognathism, minor hard palate, and ogival palate in DS patients.

Carvalho et al., 2010 point out that patients with DS may present angular cheilitis due to muscle hypotonicity, which is described as an inflammation that leads to irritation and fissures in the mouth commissures due to excess saliva.

Pinto et al. (2016, p. 1047) cite some dental abnormalities that may be present in patients with DS, such as: "[...] hypodontia or oligodontia, conoid teeth, microteeth, enamel hypocalcification, fusion and twinning. [...] The eruption and exfoliation of the deciduous, like the eruption of the perms, are delayed."

The studies carried out by Hashizume; Moreira and Hilgert (2021) evaluated dental caries and associated factors in children with DS, and obtained similar results in the dental caries experience for children with DS and without the syndrome.



In the research conducted by Castilho and Marta (2010) on the incidence of dental caries in individuals with DS enrolled in the Comprehensive Care Program for Special Patients (PAIPE), it was observed that in that sample the rate of dental caries and the incidence of new lesions were low.

Pinto et al. (2016) describe that although the buffering capacity of saliva and the presence of bruxism reduce dental caries in patients with DS, in some studies it was found that some factors can overlap and trigger carious lesions.

Gonçalves et al. (2017) reported in a study conducted with 27 patients with DS, enrolled in the Teresópolis Down Syndrome Association (ASSIND), a low prevalence of caries and a high prevalence of periodontal disease.

The authors: Hashizume; Moreira and Hilgert (2021) show that patients with DS become more prone to periodontal diseases due to low immunity and the altered reaction of inflammation in the presence of plaques.

Barata (2010) reports that oral alterations in patients with DS can directly lead to implications for feeding, swallowing, chewing, phonation, posture and breathing, causing social impacts and problems with quality of life.

The Association of Parents and Friends of the Exceptional – APAE is an educational institution aimed at people with special needs, assisting in habilitation and rehabilitation services. It is made up of a team of several professionals that includes a speech therapist, dentist, psychologist, occupational therapist, physical educator and social worker. Their source of income is through the Unified Health System (SUS), social donations, agreements with the State, Municipality and taxpayers (RAMOS et al., 2006).

Epidemiological studies of the prevalence and severity of oral diseases and conditions are of great relevance, as they contribute to the planning of preventive and oral health care policies. Thus, it is evident that the performance of the dental surgeon from the first years of life of the DS patient is of paramount importance so that, through dental care, there is a routine of maintenance of the dentition, prevention of dental pathologies and, consequently, improvement in the quality of life.

The present study aims to carry out an epidemiological survey of oral alterations and impact on the quality of life of students treated at the APAE of Luís Eduardo Magalhães - BA. In addition, it is essential that the dental surgeon obtains knowledge about the main oral manifestations that affect patients with DS, in order to carry out their activities to designate a better treatment for these patients.

2 METHOD AND OBJECTIVE

This is an epidemiological study of the descriptive type of case series of applied nature with the explanatory objective of a qualitative-quantitative approach, using oral evaluation, questionnaire for data collection and analysis, in order to get closer to the subject. The place established for the



collection of data is the Association of Parents and Friends of the Exceptional – APAE in the municipality of Luís Eduardo Magalhães, State of Bahia. The study took place after the validation of the executive director of APAE, the Research Ethics Committee (CEP), the National Research Ethics Commission (CONEP), also informing parents or guardians about the study and, if they accepted, they would allow their children to participate in the research by signing a free and informed consent form.

The study aimed to identify, through data collection, the amount of oral alterations of congenital origin or poor oral hygiene and how it impacts the quality of life of APAE students with down syndrome. Thus, it will be possible to verify or refute the presence of the alterations reported in the literature in this sample, in order to provide a diagnosis and, consequently, an adequate treatment for a better quality of life.

All stages of the study were carried out with all students of the institution present on the day of the oral evaluation, however, only data from students with Down syndrome were used. Prior to the research, calibration sessions were conducted with the researchers.

To carry out the research, at first, the researchers carried out an interactive chat, recreational games, presentation of playful theatrical plays and guidance on oral hygiene with the use of macro models, in order to get to know and create a bond with the students of the institution.

Subsequently, in the following meetings, epidemiological surveys of oral health were carried out, through an oral evaluation of all students of the institution, with researchers calibrated in each classroom, using a popsicle stick and flashlight, evaluating the prevalence of carious lesions, periodontal disease, tooth absence and alterations in the teeth, tongue and temporomandibular joint (TMJ).

In addition, a questionnaire was applied both in person at the institution, and sent via Google Forms link to APAE's WhatsApp, which was forwarded to the students' parents or legal guardians via WhatsApp, containing questions such as: geographic distribution, socioeconomic conditions, information on oral care, frequency of brushing, monitoring during brushing, frequency of visits to the dentist, perceived changes in the mouth, complaints of pain or tenderness in the oral region, impact on life due to oral health, and perception of the importance of oral health.

With a qualitative-quantitative approach, we based ourselves on data collected only from students with down syndrome collected in clinical evaluations and questionnaires, applying statistical methods in the analysis process, in order to link the data to the interpretation. To answer questions such as: what are the most frequent oral alterations in patients with Down Syndrome (DS) at APAE? How do these oral alterations influence their quality of life?

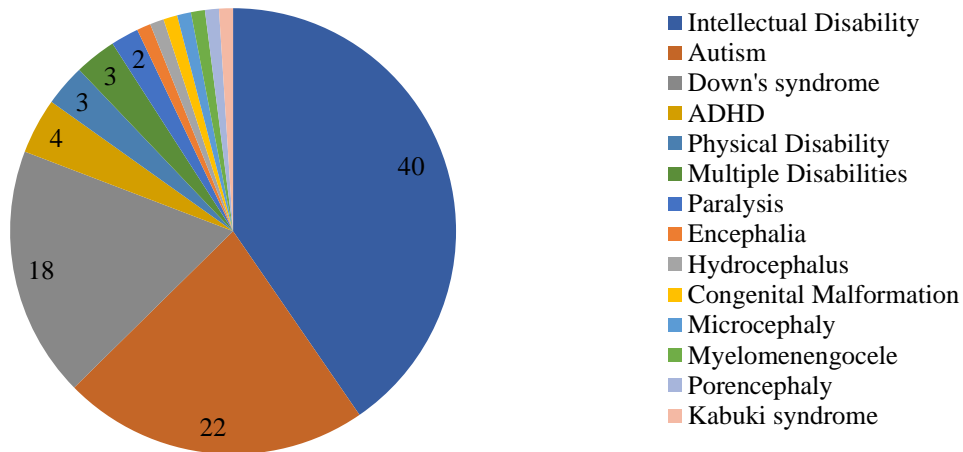
The results of the data collection were statistically analyzed, transforming them into graphs and tables for better understanding and construction. All statistical analyses were performed using Microsoft Excel spreadsheets.



3 RESULTS

APAE has an average of 250 students with different diagnoses, and of these, only 99 were present on the days when the oral evaluations were performed, as can be seen in Graph 1. However, the data tabulations were focused only on those with Down syndrome, which counted 18 students with ages ranging from 2 to 59 years.

Graph 1. Diagnoses of APAE students

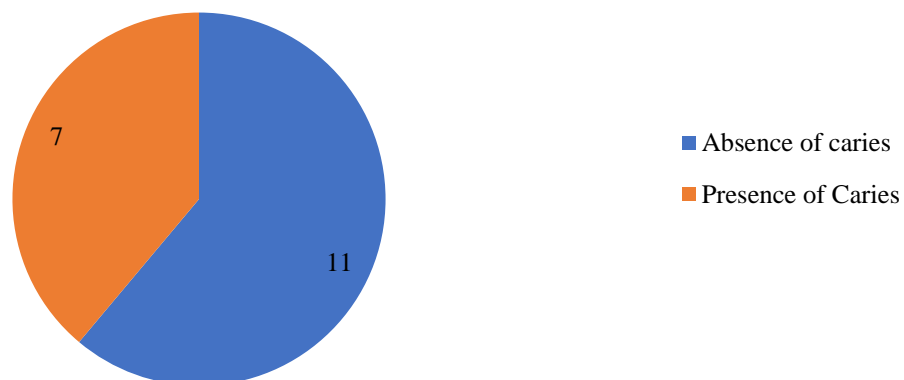


SOURCE: (AUTHORS, 2023).

With calibrated researchers, oral examinations were performed on students from the Association of Parents and Friends of the Exceptional (APAE de Luís Eduardo Magalhães) (LEM) to verify the incidence of oral alterations. Thus, it will be possible to verify or contest the presence of the alterations reported in the literature in this sample.

Of the 18 students with Down syndrome examined, 7 (38.9%) had caries and 11 (61.1%) did not. These results indicate that caries is not prevalent in this sample of students, as can be seen in Graph 2.

Graph 2. Carious lesion prevalence count

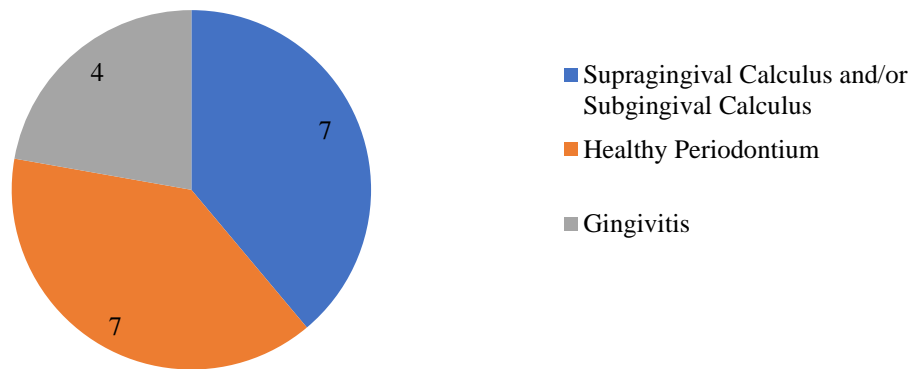


SOURCE: (AUTHORS, 2023).



In the prevalence of periodontal disease, 7 students (38.9%) had supragingival and/or subgingival stones. In addition, 4 (22.2%) had gingivitis. On the other hand, 7 (38.9%) had healthy periodontal tissue, demonstrating a periodontium with no evidence of inflammation or bone loss, as can be seen in Graph 3.

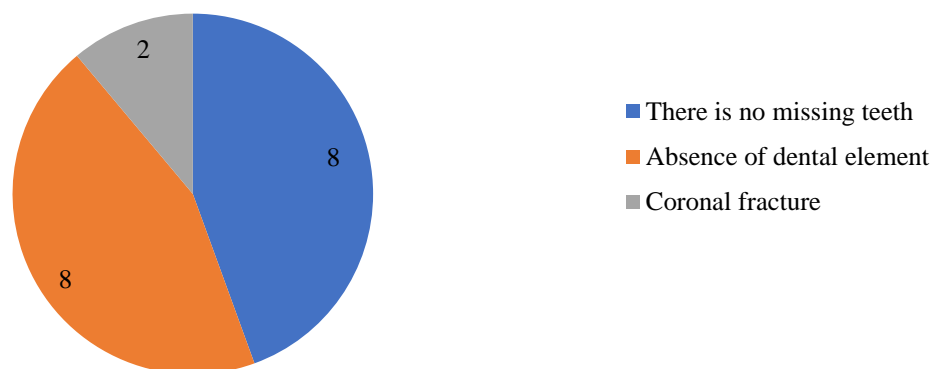
Graph 3. Prevalence count of periodontal disease



SOURCE: (AUTHORS, 2023).

In the count of tooth absence, 8 students (44.4%) had no missing teeth. On the other hand, 8 (44.4%) were affected without one or more elements, this indicates tooth loss due to a variety of causes, including ineffective oral hygiene or congenital anomalies. In addition, two (11.1%) had coronal fractures of one or more teeth, suggestive of trauma or previous injury. As can be seen in Graph 4.

Graph 4. Count of missing teeth

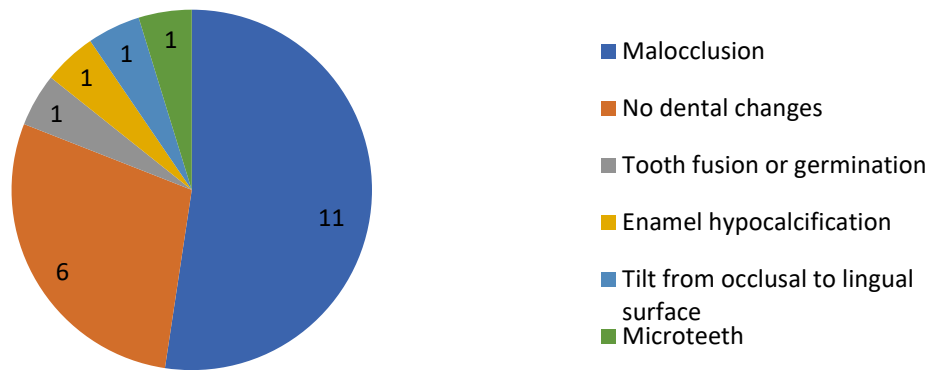


SOURCE: (AUTHORS, 2023).

In the count of dental alterations, 11 students (55%) had malocclusion. In addition, 6 (30%) did not present significant dental alterations. Among the less frequent dental diseases, each one was observed in only one student: dental fusion or germination, enamel hypocalcification, tooth with inclination of the occlusal face to the lingual and microtooth, as can be seen in Graph 5.



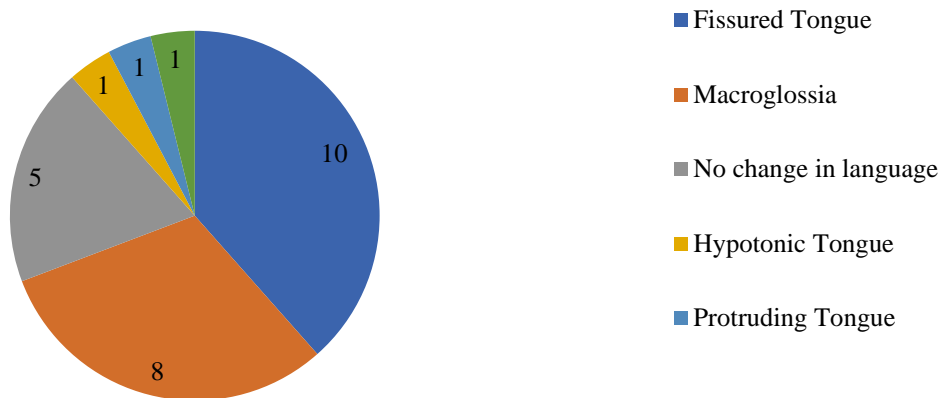
Graph 5. Count of dental changes



SOURCE: (AUTHORS, 2023).

In the count of language alterations, 10 students (40%) had a cleft tongue. In addition, 8 (32%) had macroglossia. On the other hand, 5 (20%) did not present any significant language alteration. Each of the following alterations was observed in only one student: hypotonic tongue, protruding tongue and hyperplastic tissue in the tongue, as can be seen in Graph 6.

Graph 6. Count of changes in the language

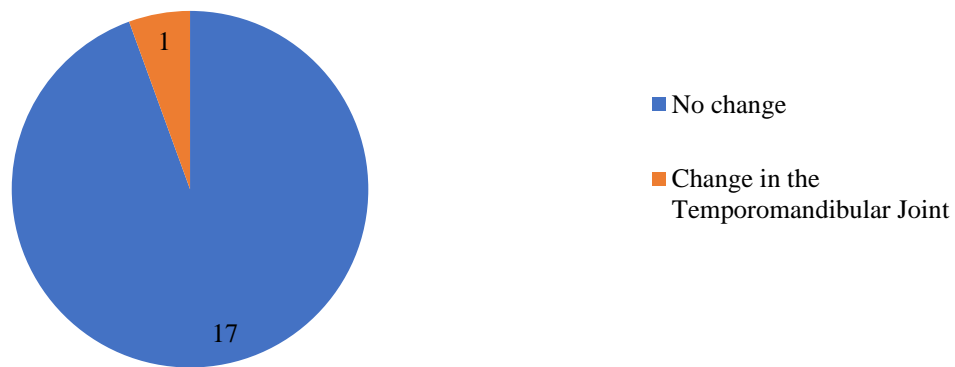


SOURCE: (AUTHORS, 2023).

In the TMJ alteration count, 17 students (94.4%) did not present alterations in their temporomandibular joints. On the other hand, one student (5.6%) presented joint alterations characterized by symptoms such as pain, joint noise and limited mandibular function, as can be seen in Graph 7.



Graph 7. Count of changes in the ATM



SOURCE: (AUTHORS, 2023).

On the other hand, 8 responses were recorded for the questionnaires applied to the parents or legal guardians of students with down syndrome, as can be seen in Table 1.

Table 1 – Questions asked to parents or guardians

Question	Answers
1. Are you a resident of the municipality of Luís Eduardo Magalhães?	7 Urban area of the municipality 1 in the countryside
2. What is the monthly income of everyone in your family?	5 family income of 1 to 2 minimum wages. 1 family income of 2 to 3 minimum wages. 1 family income of 3 to 5 minimum wages. 1 did not fit into any of the options provided.
3. Has your child received information about tooth brushing, diet, fluoride application, and preventing cavities and bleeding gums?	5 parents stated that their children received the information. 3 parents answered that their children did not receive the information.
4. How often does your child brush their teeth each day?	1 parent indicated that his child brushes more than three times a day. 2 parents reported that their children brush less than three times a day. 1 father stated that his son does not brush daily. 4 parents responded that their children brush three times a day.
5. Do you accompany your child when brushing?	3 parents do not accompany their children in brushing. 5 parents accompany their children in brushing.
6. How often do you take your child to the dentist?	3 parents take their children to the dentist only when there is pain or discomfort. 1 father takes his child to the dentist more than six months. 4 parents take their children to the dentist less than six months.



7. Have you noticed any changes in your child's mouth?	1 father reported small mouth, large tongue, sharp and crowded teeth 1 father reported caries 1 father reported inflamed gums 1 father reported gingivitis and smaller space in the mouth. 4 parents did not notice any changes in the mouth.
8. Does your child complain of any pain or tenderness in the oral area?	6 parents answered that their children have no complaints of pain or tenderness. 2 parents mentioned that their children have pain or tenderness in the oral region.
9. Has oral health affected your child's life in any way?	2 parents reported difficulty chewing. 1 father reported speech difficulties. 5 parents responded that oral health did not affect their children's lives.
10. Do You Think Oral Health Is Important?	All 8 parents consider oral health to be important.

SOURCE: (AUTHORS, 2023).

These responses provide a comprehensive picture of the data obtained through a survey of parents or guardians and APAE students with down syndrome, and may contribute to a better understanding of the oral health needs of this sample, as well as highlight areas that require additional attention and support to promote better oral health and quality of life.

4 DISCUSSION

According to Nakamura et al. (2015), during the care of patients with disabilities, unfortunately nothing can be exact or there can be a pre-definition. In the care of these patients, there may be, in most cases, variations, even if in patients with the same disability. This would be no different with Down syndrome.

In studies conducted by Berthold et al. (2004), it can be stated that patients with Down syndrome have craniofacial anomalies of dental interest. The studies by Vilela et al. (2018), Gonçalves et al. (2017), Carvalho and Rabelo (2010), Melo et al. (2017), may manifest cleft tongue, which may appear to be larger, characterizing macroglossia, deleterious oral habits and malocclusion, pseudo-prognathism, hard palate minor and ogival in patients with DS, angular cheilitis, and fissures in the commissures. During the evaluations of this study, 10 students had cleft tongue and 8 had macroglossia. In only one patient, hypotonic tongue, protruding tongue, and hyperplastic tissue on the tongue can be observed.

Pinto et al. (2016) also mention some dental abnormalities such as oligodontia, conoid teeth, microteeth, enamel hypocalcification, fusion and twinning. The researchers of this study noted that the patients had gingivitis (4 patients) and supragingival or subgingival stones (7 patients). In the absence



of teeth, 8 were affected without one or more elements, and lack of oral hygiene is suggestive. Still dealing with dental alterations, the least frequent were tooth fusion or germination, enamel hypocalcification, tooth with inclination of the occlusal surface to the lingual and microtooth.

There is still concern about tooth decay. Castilho and Marta (2010) and Hashizume; Moreira and Hilgert (2021). Hashizume; Moreira and Hilgert (2021) also describe that immunological disorders present in DS can lead to dental problems, which in the work of Gonçalves et al. (2017) no longer had the same prevalence, given that they had a low rate in caries. In the present study, the absence of caries prevailed, absent in 11 of the patients evaluated.

Barata (2010), on the other hand, argues in his work that all these oral alterations can compromise feeding, swallowing, chewing, phonation, posture and breathing. In the case of TMJ alterations, one patient presented joint alterations characterized by symptoms such as pain, joint noise, and limited mandibular function.

After starting the care of the patients assisted by APAE – LEM, a questionnaire-interview with the parents was carried out, where we sought to understand a little of the oral history and how the socioeconomic quality of each student could interfere with oral health. Eight parents and guardians completed the questionnaire, and it was possible to conclude some points:

- All caregivers considered the quality of oral health to be extremely important, but only 4 caregivers took patients to the dentist for less than 6 months
- Regarding oral hygiene, only 1 guardian reported that their child does not brush daily and 5 parents accompany their children at the time of chewing.
- Half of the caregivers who underwent the evaluation noticed dental alterations and 2 emphasized that there would be sensitivity or oral pain
- Still in the course of the evaluation, 2 reported that there would be alterations in mastication and 1 reported that there would be speech alterations
- In terms of socioeconomic character, only 1 student lives in the rural area, 5 have an income of 1 to 2 minimum wages, 1 of 2 of 3 minimum wages, 1 of 3 to 5 minimum wages, and only one did not fit the requirements proposed by the researchers.

5 FINAL THOUGHTS

It is essential that dentists understand Down syndrome and its oral alterations, in order to contribute to the reduction of the impacts of the syndrome present in these APAE patients, such as the high prevalence of periodontal diseases, agenesia, malocclusion and cleft tongue. Therefore, it is essential to need follow-up through a multidisciplinary team from childhood, which will provide continuous treatment of these patients, obtaining confidence and improving quality of life, also enabling stimuli to improve cognitive development, acting in health promotion and disease prevention.



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