Original Research

Sociodemographic and oral profile of people with disabilities at the clinic of the Faculty of Dental Medicine of the University of Lisbon

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ABSTRACT

Objectives: Analyze the flow of appointments at the Dental Hygiene Clinic for People with Disabilities at FMDUL, characterize their clients, and relate their dental health status with their main disability, level of dependency, difficulties in oral hygiene, and frequency of appointments.

Methods: This observational, analytical, cross-sectional study included a sample of 555 patients who attended the Dental Hygiene Clinic for People with Disabilities at FMDUL between 2015 and 2019. The decayed missing and filled teeth (DMFT) index, bleeding index, and debris index were collected from clinical records. Statistical analysis included the Kruskal-Wallis and Mann-Whitney tests with a significance level of 5%.

Results: During the study period, 3120 appointments were carried out. The DMFT index was 9.51(±7.49) and was higher in individuals with intellectual disabilities (p<0.001), in independent/autonomous individuals (p<0.001), and in those who attended the clinic for a longer time (p<0.001). Gingival bleeding was lower in autonomous individuals (p=0.013). More regular users had less bleeding and bacterial plaque, although without significant differences. The values of decayed teeth (p=0.02), bleeding (p<0.001), and bacterial plaque (p=0.004) were higher in uncooperative individuals.

Conclusions: The dental health indicators of individuals who attend the dental hygiene clinic are positive and are influenced by dependency on activities of daily living, autonomy in oral hygiene, and cooperation in the appointments. (Rev Port Estomatol Med Dent Cir Maxilofac. 2023;64(4):147-154)

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Perfil sociodemográfico e oral das pessoas com deficiência da clínica da Faculdade de Medicina Dentária da Universidade de Lisboa

R E S U M O

Palavras-chave:
Dependência
CPOD
Saúde oral
Higiene oral
Pessoas com deficiência

Objetivos: Analisar o fluxo das consultas das pessoas com deficiência realizadas na clínica universitária da FMDUL, caracterizar os seus clientes e relacionar o estado de saúde dentário com o tipo de deficiência principal, o nível de dependência, dificuldades na higiene oral e a frequência de consultas.

Métodos: Estudo observacional, analítico e transversal, com uma amostra de 555 indivíduos que frequentaram a consulta para pessoas com deficiência da FMDUL, entre 2015-2019. Os dados de índice de dentes cariados, perdidos e obturados (CPOD), índice de hemorragia e índice de depósitos foram recolhidos dos processos clínicos. A análise estatística incluiu os testes Kruskal-Wallis e Mann-Whitney com um nível de significância de 5%.

Resultados: Durante o período de estudo foram efetuadas 3120 consultas. O índice CPOD foi de 9,51 (±7,49) e era mais elevado nos indivíduos com deficiência intelectual (p<0,001), nos independentes/autónomos (p<0,001) e nos que frequentavam a consulta há mais tempo (p<0,001). A hemorragia gengival era menor nos indivíduos autónomos (p=0,013). Os indivíduos que frequentavam mais regularmente a consulta apresentaram menores valores de hemorragia e de placa bacteriana embora sem diferença significativa. Os valores de dentes cariados (p=0,02), de hemorragia (p<0,001) e de placa bacteriana (p=0,004) foram mais elevados nos indivíduos não cooperantes.

Conclusões: Os indicadores de saúde dentária dos indivíduos que frequentam a consulta de higiene oral são positivos e são influenciados pela dependência nas atividades de vida diária e autonomia na higiene oral, assim como pela cooperação na consulta. (Rev Port Estomatol Med Dent Cir Maxilofac. 2023;64(4):147-154)

Introduction

Approximately 15% of the global population currently suffers from a disability, and this number is increasing due to aging and the growing prevalence of non-communicable diseases.[1] "Disability" encompasses a wide range of conditions, particularly physical, developmental, psychological, sensory, behavioral, or emotional changes or conditions that require medical treatment, health care intervention and/or even specialized services or programs.[1] People with disabilities have a higher risk of developing oral pathologies due to having physical and/or mental limitations that make it difficult to perform their oral hygiene, following a diet rich in carbohydrates and soft foods, having chewing or swallowing problems associated with reduced maxillofacial motor function and, possibly, neglecting oral hygiene.[2,3]

In Portugal, oral health (OH) initiatives are scarce in terms of prevention, treatment, and maintenance and fail to give information to caregivers.[4] Moreover, just a few clinical centers provide dental care to people with disabilities. The most common reasons mentioned are the lack of professionals with specialized training, communication barriers, control of behavioral characteristics, and geographic aspects.[2,4,5] OH care for people with disabilities requires a level of specialization, specific knowledge, and adaptive techniques beyond those considered routine in the training base program of OH professionals.

In addition to its teaching mission, the Faculty of Dental Medicine of the University of Lisbon (FMDUL) provides OH care to the community, including people with disabilities.[6] The Dental Hygiene Clinic for People with Disabilities at FMDUL University Clinics has been operating since 1987. It is specialized and focused exclusively on people with disabilities (mostly profound disabilities) and is the only clinic of its kind in the country. This clinic operates weekly, and there are about 450 appointments annually.

The aims of this study were to analyze the appointment flow of people with disabilities at FMDUL Dental Hygiene Clinic in order to characterize its clients and study their dental state by type of disability, level of dependency, oral hygiene difficulty, and frequency of appointments.

Material and methods

This observational, analytical, cross-sectional study had a non-probabilistic sample of individuals who attended the FMDUL Dental Hygiene Clinic for People with Disabilities. The study was authorized by the FMDUL Ethics Committee, following the international guidelines of the Declaration of Helsinki. Subsequently, authorization was requested from the Clinical Management Board of FMDUL to analyze the physical clinical records of the individuals who attended the appoint-

ment in a period of five years, between January 2015 and December 2019 (Figure 1).

One researcher collected data between January and March 2021 by analyzing each individual's clinical records. Data collected comprised sociodemographic data and general health data like main disability (rare diseases or syndromes were grouped into a single variable — "other pathologies") and comorbidities, medication, level of dependency, dental hygiene habits and difficulties performing it, and the number of appointments attended. The level of dependency was classified as independent (daily living activities without help), semi-dependent (difficulty in feeding, mobility, and hygiene), and dependent (every daily living activity with help). OH clinical data included the decayed, missing, and filled teeth (DMFT) index,[7] the simplified oral hygiene index (DI-S),[8] and the simplified gingival index (GI-S).[9] The medication was registered by the official Portuguese Pharmacotherapeutic Classification, corresponding to the "Anatomical Therapeutic Chemical Code" (ATC) of the World Health Organization.[10]

The data collection was statistically analyzed using the Statistical Package for the Social Sciences software program (IBM SPSS 26.0). Association tests were performed between dental health status and the variables under study. The Shapiro-Wilk test was used to assess the normality of continuous variables, and the Mann-Whitney and Kruskal-Wallis tests were used as non-parametric alternatives, with Bonferroni correction, for variables that did not follow a normal distribution. Significance was set at a p value ≤0.05.
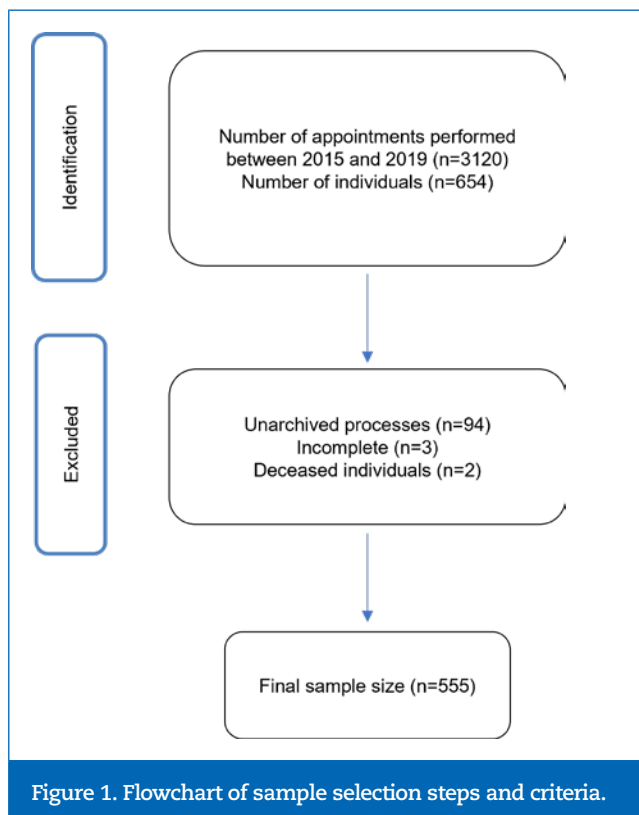

Figure 1. Flowchart of sample selection steps and criteria.

Results

Between 2015 and 2019, 3120 appointments were made to 654 individuals, averaging 624 appointments per year. In the period studied, there were 207 new individuals in the Dental Hygiene Clinic for People with Disabilities. Ninety-nine individuals were excluded due to missing charts, incomplete data, or death. Thus, the final study group included 555 individuals (Figure 1).

The average age of individuals was 37.05 (±13.9), and most were male (311; 56%). The majority lived in the district of Lisbon (511; 92.3%), and 407 (73.3%) were institutionalized.

Cerebral palsy was the most prevalent pathology (177; 31.8%), followed by intellectual disability (114; 20.5%) (Figure 2). Epilepsy was the most reported comorbidity (152; 27.3%), followed by respiratory problems (83; 15%). Each individual took an average of 2.20 (±2.07) drugs, with predominance for the central nervous system group in 360 (64.9%) of the cases.
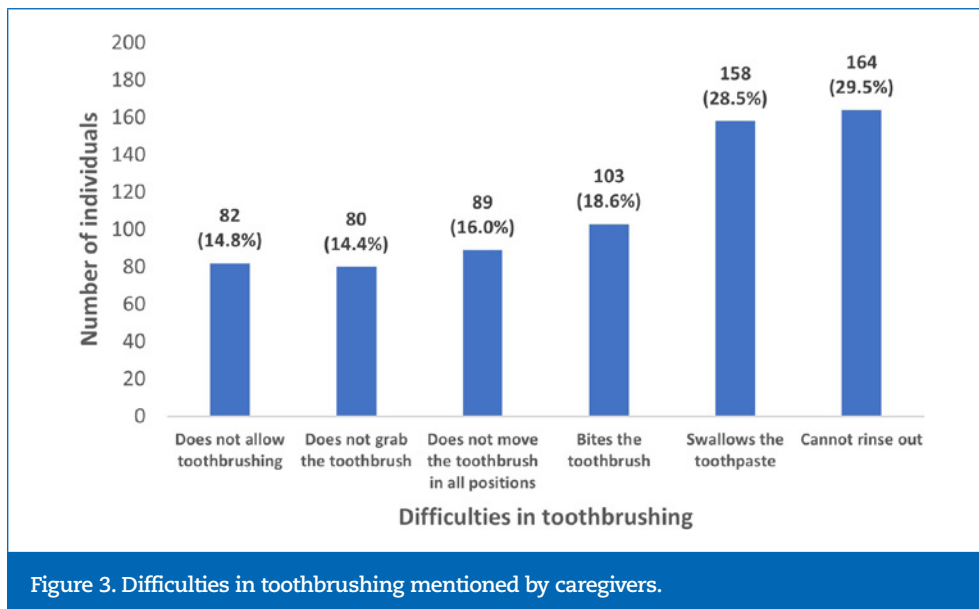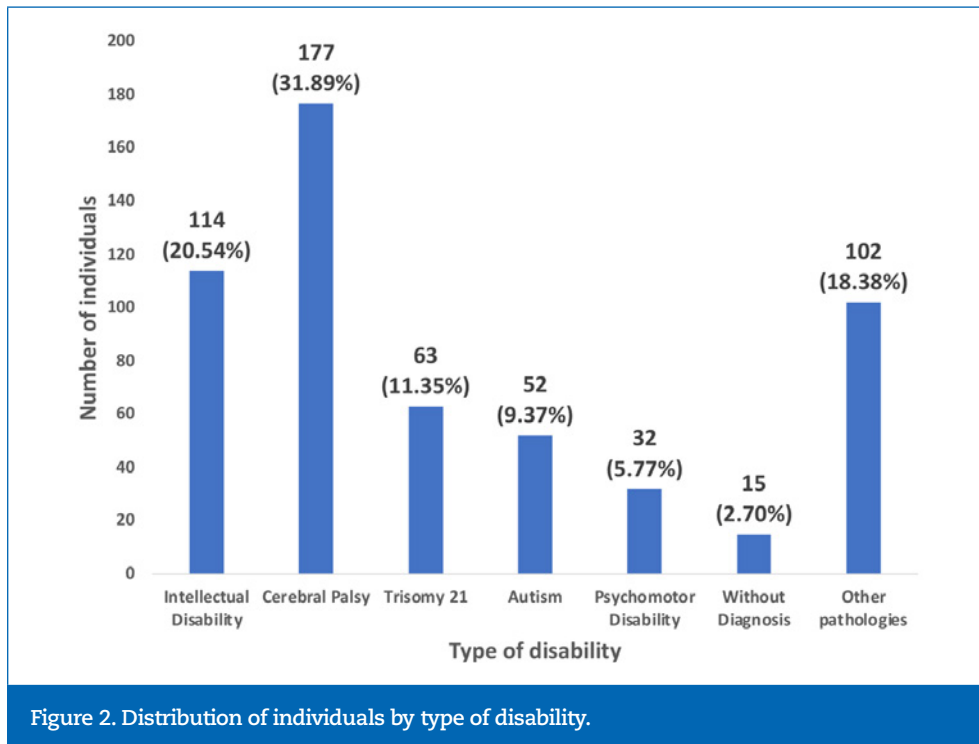
Regarding daily activities, 187 (34%) individuals were independent in activities of daily living (such as eating, bathing, and dressing), 104 (18.7%) did not communicate, 192 (34.6%) had difficulty speaking, and 135 (24.3%) used wheelchairs. In terms of diet and chewing difficulties, 89 (16.7%) individuals followed a soft or liquid diet, and 112 (21%) had poor chewing. The caregivers mentioned several difficulties regarding toothbrushing (Figure 3).

During the last dental hygiene appointment, 187 (33.7%) individuals had not cooperated, requiring adaptive techniques such as head stabilization (172; 31%), limbs stabilization (115; 20.7%), the use of bite blocks (113; 20.4%), and/or velcro straps (6.1%).

The DMFT index, registered in 532 individuals at the last appointment, was 9.51 (±7.49), with a higher contribution from the missing teeth component (4.30±5.46), and about a half of the individuals were free from active caries (223; 46.9%). Individuals with intellectual disability showed the highest DMFT (11.31) as well as a higher value for decayed teeth (3.05) (p<0.001). Individuals with trisomy 21 had the highest number of missing teeth (5.36) (p<0.001). Regarding the GI-S and DI-S, no statistically significant differences were found between the main disabilities (Table 1).

The level of dependency in activities of daily living and the autonomy in toothbrushing were associated with DMFT (p<0.001) and missing (p<0.001) and filled components (p<0.001), with lower values in all these variables in the dependent individuals. The GI-S was only associated with toothbrushing autonomy, with the semi-dependent individuals presenting the highest result (p=0.013). The DI-S results did not yield statistical significance regarding the level of dependency (p=0.468) and toothbrushing autonomy (p=0.196) (Table 2). The individuals that presented a higher toothbrushing frequency had lower GI-S and DI-S means (p=0.03 and p=0.01, respectively), as well as less decayed teeth compared to those that never or rarely toothbrushed (p=0.008) (Table 2).

The DMFT mean was higher in individuals who attended the clinic for longer (p<0.001), but the decayed teeth component was lower in this group (p<0.001). No significant differences were found in the GI-S and DI-S, although the mean

Figure 2. Distribution of individuals by type of disability.

Figure 3. Difficulties in toothbrushing mentioned by caregivers.

values were lower in the group that came to 6-10 appointments in the last 5 years. The individuals who had attended the clinic for longer had the lowest DI-S mean but the highest GI-S mean.

The individuals who cooperated during the appointments had higher DMFT mean (p<0.001), missing teeth (p<0.001), and filled teeth (p<0.001) when compared to the uncooperative group. On the other hand, the decayed teeth (p=0.02), GI-S mean (p<0.001), and DI-S mean (p=0.004) were higher in the uncooperative group (Table 3).

Discussion

The present study aimed to characterize the individuals who attended the FMDUL Dental Hygiene Clinic for People with Disabilities between 2015 and 2019 and to analyze whether their main disability, level of dependency, oral hygiene difficulty, and frequency of appointments influenced their dental status.

Since 2010, when another study was made in the same university clinic,[5] the number of annual appointments in-

Table 1. Distribution of the mean decayed, missing, and filled teeth (DMFT) index, simplified gingival index (GI-S), and simplified oral hygiene index (DI-S) by type of disability.

Type of disability	DMFT Mean (±SD)	Decayed Mean (±SD)	Missing Mean (±SD)	Filled Mean (±SD)	GI-S Mean (±SD)	DI-S Mean (±SD)
TOTAL	9.51 (±7.49)	1.98 (±3.08)	4.30 (±5.46)	3.75 (±4.43)	1.08 (±0.69)	1.53 (±0.73)
Intellectual disability	11.31[acefg] (±7.63)	3.05[af] (±3.80)	5.36[aceg] (±6.23)	3.55 (±4.15)	1.05 (±0.74)	1.67 (±0.65)
Cerebral palsy	8.68[bcefg] (±7.04)	1.81[bcdef] (±2.84)	3.87[bcdef] (±4.77)	3.60 (±4.29)	1.03 (±0.73)	1.52 (±0.76)
Trisomy 21	10.94[abcefg] (±7.68)	1.29[bcdef] (±2.27)	5.92[abceg] (±6.71)	4.20 (±4.41)	1.13 (±0.58)	1.50 (±0.67)
Autism spectrum disorder	5.73[d] (±6.86)	0.64[cde] (±1.15)	2.90[def] (±5.20)	2.33 (±3.25)	1.07 (±0.70)	1.49 (±0.84)
Psychomotor disability	8.53[abcefg] (±5.47)	1.68[bcdef] (±3.15)	2.97[abcdef] (±3.29)	4.17 (±4.19)	1.02 (±0.66)	1.54 (±0.67)
Other pathologies	9.96[abcefg] (±8.14)	2.18[bcdefg] (±3.47)	3.63[bdef] (±5.01)	4.78 (±5.45)	1.18 (±0.68)	1.49 (±0.81)
Without diagnosis	11.08[abcefg] (±6.53)	2.69[afg] (±2.14)	6.15[acg] (±5.19)	1.92 (±2.75)	1.01 (±0.74)	1.39 (±0.67)
P value	0.001*	0.001*	0.001*	0.083	0.789	0.723

Kruskal-Wallis test with Bonferroni correction; *statistically significant. Values that share the same letter are not significantly different.

Table 2. Association between dependency level, autonomy, and frequency of toothbrushing and the mean decayed, missing, and filled teeth (DMFT) index, simplified gingival index (GI-S), and simplified oral hygiene index (DI-S).

	DMFT Mean (±SD)	P value	Decayed Mean (±SD)	P value	Missing Mean (±SD)	P value	Filled Mean (±SD)	P value	GI-S Mean (±SD)	P value	DI-S Mean (±SD)	P value
Dependency level												
Independent (n=187)	11.27[a] (±7.50)		2.29 (±3.26)		5.27[ab] (±5.94)		4.15[ab] (±4.19)		1.05 (±0.69)		1.48 (±0.69)	
Semi-dependent (n=179)	9.90[ab] (±7.23)	0.001*	1.77 (±2.82)	0.105	4.26[ab] (±5.47)	0.001*	4.31[ab] (±4.64)	0.001*	1.03 (±0.71)	0.306	1.53 (±0.67)	0.468
Dependent (n=184)	7.19[c] (±7.17)		1.84 (±3.14)		3.24[c] (±4.68)		2.70[c] (±4.33)		1.17 (±0.69)		1.60 (±0.85)	
Toothbrushing autonomy												
Autonomous (n=176)	11.29[a] (±7.54)		2.16 (±3.19)		5.08[a] (±6.24)		4.16[a] (±4.42)		0.95[ac] (±0.65)		1.45 (±0.62)	
Semi-dependent (n=322)	8.21[bc] (±7.22)	0.001*	1.76 (±2.86)	0.467	3.69[bc] (±4.79)	0.006*	3.28[bc] (±4.35)	0.008*	1.20[bc] (±0.69)	0.013*	1.62 (±0.80)	0.196
Dependent (n=57)	7.24[c] (±6.81)		2.27 (±3.60)		2.43[bc] (±3.66)		3.17[bc] (±4.27)		1.02[bc] (±0.75)		1.46 (±0.63)	
Toothbrushing frequency												
Never/rarely (n=65)	11.30 (±8.67)		3.69[a] (±4.45)		6.18 (±6.80)		2.15[a] (±3.89)		1.51[a] (±0.81)		2.01[a] (±0.74)	
1x/day (n=157)	8.98 (±7.01)	0.274	1.93[bc] (±3.22)	0.008*	3.70 (±4.52)	0.092	3.95[bc] (±4.68)	0.001*	0.93[bc] (±0.63)	0.03*	1.53[bc] (±0.72)	0.01*
2x/day (n=316)	9.36 (±7.45)		1.63[bc] (±2.50)		4.16 (±5.50)		3.89[bc] (±4.31)		1.10[bc] (±0.69)		1.49[bc] (±0.71)	

Kruskal-Wallis test with Bonferroni correction; *statistically significant; Values that share the same letter are not significantly different.

creased, despite the decreased number of first ones, probably owing to the increase of private clinics providing dental care treatments to this population group. On average, each individual attended one appointment per year. The recommendation for adults is to visit an OH professional twice a year. Nevertheless, this frequency should be based on the impact of routine visits on dental and periodontal health,[11] and the assessment of OH indexes.[12] Moreover, because people with disabilities

Table 3. Association between appointment frequency, date of the first appointment, behavior, and number of techniques and the mean decayed, missing, and filled teeth (DMFT) index, simplified gingival index (GI-S), and simplified oral hygiene index (DI-S).

		DMFT		Decayed		Missing		Filled		GI-S		DI-S	
		Mean (±SD)	P value	Mean (±SD)	P value	Mean (±SD)	P value	Mean (±SD)	P value	Mean (±SD)	P value	Mean (±SD)	P value
Number of appointments in 5 years††	1-5	9.02 (±7.97)		2.57[a] (±3.62)		4.26 (±5.78)		2.61[a] (±3.78)		1.12 (±0.75)		1.60 (±0.79)	
	6-10	10.09 (±6.80)	0.064	1.17[bc] (±1.78)	0.001*	4.16 (±4.93)	0.262	5.27[bc] (±4.87)	0.001*	1.03 (±0.64)	0.471	1.46 (±0.70)	0.09
	11 or more	10.27 (±6.93)		0.81[bc] (±1.42)		5.34 (±5.40)		4.67[bc] (±4.27)		1.20 (±0.75)		1.71 (±0.61)	
1st appointment date	2009-2019	8.65[ab] (±7.52)		2.27[a] (±3.37)		3.94[a] (±5.31)		2.58[a] (±3.72)		1.03 (±0.71)		1.55 (±0.75)	
	1998-2008	9.88[ab] (±7.67)	0.001*	1.31[bc] (±2.18)	0.02*	4.83[abc] (±6.22)	0.03*	4.81[b] (±4.32)	0.001*	1.12 (±0.66)	0.384	1.56 (±0.73)	0.735
	1987-1997	13.30[c] (±5.65)		1.02[bc] (±1.56)		5.40[bc] (±4.62)		8.10[c] (±5.06)		1.15 (±0.69)		1.47 (±0.71)	
Behavior at the appointment†	Cooperative	10.78 (±7.31)		2.04 (±3.09)		4.62 (±5.54)		4.34 (±4.57)		0.98 (±0.68)		1.46 (±0.69)	
	Uncooperative	6.97 (±7.27)	0.001*	1.77 (±3.08)	0.02*	3.20 (±5.02)	0.001*	1.68 (±3.20)	0.001*	1.34 (±0.69)	0.001*	1.74 (±0.80)	0.004*
Number of adaptive techniques used in the appointment††	0	10.71[ab] (±7.31)		2.06 (±3.01)		4.69[ade] (±5.63)		4.51[ab] (±4.63)		0.99[ab] (±0.67)		1.46[abcd] (±0.69)	
	1	10.37[ab] (±8.08)		2.12 (±3.46)		5.47[bcde] (±5.36)		3.39[abcd] (±4.19)		1.13[abcd] (±0.60)		1.77[abcde] (±0.65)	
	2	6.03[cde] (±6.70)	0.001*	1.89 (±3.40)	0.121	2.84[bcde] (±4.77)	0.001*	1.85[bcde] (±3.03)	0.001*	1.31[bcde] (±0.74)	0.001*	1.54[abcd] (±0.78)	0.010*
	3	7.25[cd] (±7.39)		1.80 (±3.21)		3.44[abcde] (±5.32)		2.30[bcde] (±3.87)		1.30[bcde] (±0.69)		1.79[abcde] (±0.90)	
	4	3.38[ce] (±4.36)		1.10 (±2.34)		1.75[abcde] (±2.71)		0.70[cde] (±1.87)		1.82[cde] (±0.68)		2.14[bde] (±0.84)	

† Mann-Whitney test; †† Kruskal-Wallis test with Bonferroni correction; *statistically significant. Values that share the same letter are not significantly different

face difficulty in maintaining effective control of the oral biofilm and have cognitive, physical, and behavioral limitations that influence cooperation in appointments, they may have a greater risk of developing oral diseases,[13] which justifies shorter maintenance intervals.

The institutionalized individuals had a higher frequency of appointments, as in the study by Bizarra,[14] but lower than described in a systematic review with people with intellectual disabilities.[15] The institutions choose the FMDUL University Clinics for their clients' dental treatments, and this agrees with international studies that indicate that this population seeks community or hospital services more frequently.[16,17]

Since most individuals were residents of the Lisbon area, they were closer to the University Clinics, which can facilitate access to dental treatments. However, the aging of this population and of their parents/caregivers poses difficulties. Additionally, 33.5% of the individuals were dependent, sometimes requiring the help of more than one person to accompany them to the appointment. Also, approximately a quarter of this population used a wheelchair, with an increase since 2010.[5]

For individuals from other districts of the country, it becomes more expensive to come to the clinic using their own car or, when there are no other options, by requesting ambulance services that must be paid.

Regarding the adaptive techniques used, there was an increase in the use of the stabilization head technique and the bite blocks compared to 2010.[5] This increase might be justified by the 207 new clients, who could not yet feel confident in the clinical environment, or maybe because individuals were older or had suffered worsening of their clinical condition over time.

Estimations indicate that 74.3% of the Portuguese population brushes their teeth twice or more daily.[14] Comparatively, in the present study, there was a twice-daily toothbrushing frequency in 56.9% of the patients, a higher value than in 2010. The toothbrushing autonomy dropped to 37.6%, which was expected considering the increased number of dependent individuals and their aging.[5]

The DMFT value found agrees with other studies on people with disabilities[18-20] and with the national study on the prevalence of oral diseases in Portugal.[21] These results show that

despite the barriers and added difficulties in accessing dental treatments this group faces, their OH can be similar to that of the general population.

The tooth loss in this population is high since extraction can be the treatment of choice in urgent/painful situations due to the lack of cooperation from the individuals during appointments. In addition, oral rehabilitation is very limited in this population.[5,14,19,22,23]

Other studies report that the filled teeth contribute less to the total value of DMFT, which reflects that restorative strategy is not the treatment choice in this population.[24,25] It should be emphasized that the component of decayed teeth was lower than the filled teeth in this study, which is only possible because there is an organized service for dental treatment. Compared to 2010, the mean of decayed teeth decreased, and the mean of filled teeth rose. These results might indicate that the appointment is effective in preventing and controlling dental caries and that more dental treatments are being performed when needed.[5]

Studies in people with disabilities describe inflammation and gingival bleeding related to poor control of oral biofilm levels.[22,26] In this study, the GI-S and DI-S means were lower than the previously recorded, possibly because the study sample includes individuals who had already attended this appointment in 2010 and improved their oral hygiene habits through follow-up.[5] Even so, the GI-S and DI-S were higher in individuals who had attended appointments for more years, demonstrating that even with follow-up appointments, under maintenance, some oral problems persist.[11] The individuals who required help for toothbrushing and were uncooperative in the appointment showed a higher value of gingival bleeding, which reflects the importance of motor skills in the maintenance of OH.[27]

Awareness of this population's oral hygiene difficulties is important to identify ways to control oral biofilm and the diseases resulting from its presence. It is crucial to insist on OH education for the caregivers and training of students in the OH field on providing care for people with disabilities.[18,19]

The limitations of this study were the irregular completion of the clinical charts or the fact they were not archived, maybe due to difficulties during the appointment, making the collection or updating of some data impossible.

Conclusions

The study of the individuals who attended the Dental Hygiene Clinic for People with Disabilities indicates that the OH indicators are positive. However, the results are influenced by the dependency on activities of daily living and autonomy in performing oral hygiene, as well as by the cooperation in the appointment. Thus, it is important to promote this service of FMDUL for people with disabilities, which continues to be a fundamental resource for this population and essential in preventing oral diseases and maintaining their OH.

Conflict of interest

The authors have no conflicts of interest to declare.

Ethical disclosures

Protection of human and animal subjects. The authors declare that the procedures followed were in accordance with the regulations of the relevant clinical research ethics committee and with those of the Code of Ethics of the World Medical Association (Declaration of Helsinki).

Confidentiality of data. The authors declare that they have followed their work center protocols on access to patient data and for its publication.

Right to privacy and informed consent. The authors declare that no patient data appear in this article.

CRediT authorship contribution statement

Ana Margarida Pinto: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Writing – original draft. **Fátima Bizarra:** Conceptualization, Formal analysis, Investigation, Methodology, Supervision, Visualization, Writing – review & editing. **Sandra Ribeiro Graça:** Formal analysis, Methodology, Supervision, Visualization, Writing – review & editing.

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REFERENCES

1. World Health Organization. World Report on Disability 2011. Geneva: World Health Organization; 2011.
2. Rosa SV, Moysés SJ, Theis LC, Soares RC, Moysés ST, Werneck RI, et al. Barriers in Access to Dental Services Hindering the Treatment of People with Disabilities: A Systematic Review. Int J Dent. 2020;2020:9074618.
3. Lawton L. Providing dental care for special patients: tips for the general dentist. J Am Dent Assoc. 2002;133:1666-70.
4. Esteves MG, Mendes S, Bernardo M. Estado de saúde oral duma população institucionalizada com deficiência profunda. Rev Port Estomatol Med Dent Cir Maxilofac, 2017;58:146-52
5. Bizarra MF, Graça SR. O perfil do paciente da consulta para pessoas com necessidades especiais da FMD-UL. Rev Port Estomatol Med Dent Cir Maxilofac, 2010;51:69-74.
6. Faculdade de Medicina Dentária da Universidade de Lisboa. Clínica Universitária - Serviços de apoio à comunidade. Available from: https://www.fmd.ulisboa.pt/clinica-universitaria/. Accessed 9 November 2021.
7. World Health Organization. Oral Health Surveys: Basic Methods 4th ed. Geneva: World Health Organization, 1997.
8. Greene JC, Vermillion JR. The simplified oral hygiene index. J Am Dent Assoc. 1964;68:7-13.
9. Löe H. The Gingival Index, the Plaque Index and the Retention Index Systems. J Periodontol. 1967;38:610-6.
10. INFARMED – Autoridade Nacional do Medicamento e Produtos de Saúde IP. Documentação e Informação. Lista de

Publicações do INFARMED. Não Periódicas. Vademecum. Available from: https://www.infarmed.pt/web/infarmed/institucional/documentacao_e_informacao/publicacoes/lista-publicacoes/ Accessed 26 April 2021.

11. Clarkon JE, Pitts NB, Goulao B, Boyers D, Ramsay C, Floate R, et al. Risk-based, 6-monthly and 24-monthly dental check-ups for adults: the INTERVAL three-arm RCT. Health Technol Assess. 2020,24:1-138.

12. Haukka A, Heikkinen AM, Haukka J, Kaila M. Oral health indices predict individualised recall interval. Clin Exp Dent Res. 2020;6:585-95.

13. Finkelman MD, Stark PC, Tao W, Morgan JP. Relationship between duration of treatment and oral health in adults with intellectual and developmental disabilities. Spec Care Dentist. 2014;34:171-5.

14. Bizarra MFP. Estado de Saúde Oral das Pessoas com Paralisia Cerebral no Distrito de Lisboa. 2015. PhD Thesis. Universidade de Lisboa (Portugal).

15. Wilson NJ, Lin Z, Villarosa A, George A. Oral health status and reported oral health problems in people with intellectual disability: A literature review. J Intellect Dev Disabil. 2019;44:292-304.

16. Prabhu NT, Nunn JH, Evans DJ, Girdler NM. Access to dental care: parents' and caregivers' views on dental treatment services for people with disabilities. Spec Care Dentist. 2010;30:35-45.

17. Kenney MK, Kogan MD, Crall JJ. Parental perceptions of dental/oral health among children with and without special health care needs. Ambul Pediatr. 2008;8:312-20.

18. Al-Allaq T, Debord TK, Liu H, Wang Y, Messadi DV. Oral health status of individuals with cerebral palsy at a nationally recognized rehabilitation center. Spec Care Dentist. 2015;35:15-21.

19. Morgan JP, Minihan PM, Stark PC, Finkelman MD, Yantsides KE, Park A, et al. The oral health status of 4,732 adults with intellectual and developmental disabilities. J Am Dent Assoc. 2012;143:838-46.

20. Pradhan A, Slade GD, Spencer AJ. Factors influencing caries experience among adults with physical and intellectual disabilities. Community Dent Oral Epidemiol. 2009;37:143-54.

21. Direção Geral de Saúde. III Estudo Nacional de Prevalência das Doenças Orais. 2015. Available form: . Accessed 9 November 2021.

22. Couto P, Pereira PA, Nunes M, Mendes RA. Characterization of oral health in a Portuguese population with mild intellectual disability. Spec Care Dent. 2019;39:298-305.

23. AlBaker AM, AlBaqami FF, AlHarbi TM, AlAmri MD, Baskaradoss JK. Oral Health Status and Oral Health-related Quality of Life among Hospitalized and Nonhospitalized Geriatric Patients. J Contemp Dent Pract. 2017;18:228-34.

24. Diab HA, Salameh Z, Hamadeh GN, Younes G, Ayoub F. Oral Health Status of Institutionalized Individuals with Intellectual Disabilities in Lebanon. J Oral Maxillofac Res. 2017;8:e4.

25. Oliveira JS, Júnior RRP, Lima KRS, Amaral HO, Neto JMM, Mendes RF. Intellectual disability and impact on oral health: a paired study. Spec Care Dentist. 2013;33:262-8.

26. Ward LM, Cooper SA, Hughes-McCormack L, Macpherson L, Kinnear D. Oral health of adults with intellectual disabilities: a systematic review. J Intellect Disabil Res. 2019;63:1359-78.

27. Ruviére DB, Queiroz AM, Serrano KVD, Freitas AC, Silva FWGP, Filho PN. Toothbrushing in patients with neurological and/or motor disorders. Odontol Clín-Cient 2010;9:135-7.