# ORAL HEALTH STATUS AMONG INDIVIDUALS WITH DISABILITIES: A CROSS-SECTIONAL STUDY OF DENTAL CARIES EXPERIENCE, PERIODONTAL HEALTH, AND DENTAL FLUOROSIS IN A ROMANIAN POPULATION

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ORAL HEALTH STATUS AMONG INDIVIDUALS WITH DISABILITIES: A CROSS-SECTIONAL STUDY OF DENTAL CARIES EXPERIENCE, PERIODONTAL HEALTH, AND DENTAL FLUOROSIS IN A ROMANIAN POPULATION (Abstract): Individuals with disabilities experience oral health inequalities because disability-related limitations and barriers to care may compromise prevention and treatment. This study evaluated dental caries experience, periodontal health, and dental fluorosis among individuals with disabilities in Iași, Romania. **Materials and methods:** This cross-sectional observational study included 107 participants aged 17-62 years with physical or locomotor, visual, auditory, intellectual, or psychological disabilities. Dental status was assessed using the Decayed, Missing, and Filled Teeth and Surfaces indices (DMFT and DMFS). Gingival and periodontal conditions were evaluated using the Sulcus Bleeding Index (SBI) and Community Periodontal Index of Treatment Needs (CPITN), while fluorosis was recorded using Dean's Index. Descriptive and comparative analyses were performed with SPSS version 26.0. **Results:** Mean DMFT was 9.75 ± 4.52 and mean DMFS was 14.38 ± 8.24, indicating considerable caries experience. Filled teeth and surfaces predominated, whereas tooth loss was limited. Participants with visual disabilities had the highest mean DMFT (11.75), while those with visual and intellectual disabilities had the highest DMFS values (15.25 and 15.00, respectively). Mean SBI was 13.72 ± 12.33. Only 20.6% of participants were periodontally healthy; calculus was the predominant CPITN finding (61.7%), bleeding occurred in 15.0%, and pockets up to 5 mm in 2.8%. Normal enamel was present in 94.4%, and no moderate or severe fluorosis was identified. **Conclusions:** Participants exhibited substantial caries experience and frequent periodontal treatment needs, dominated by calculus accumulation rather than advanced periodontal destruction. **Keywords:** ORAL HEALTH, DISABILITIES, DENTAL CARIES, PERIODONTAL STATUS, DENTAL FLUOROSIS.

## INTRODUCTION

Individuals with disabilities represent a heterogeneous and vulnerable population, often facing multiple barriers in accessing healthcare services, including dental care (1). Functional limitations, reduced manual dexterity, cognitive impairment, and dependency on caregivers may negatively influence the ability to maintain adequate oral hygiene, thereby increasing the risk of oral diseases (2,3). In addition, socioeconomic factors and limited access to specialized dental services further contribute to disparities in oral health status within this

population (4).

As the idea of oral health-related quality of life (OHRQoL) (5) demonstrates, good oral health is essential to general health and has a major influence on patients' daily lives. For a long time, people have thought that good oral health meant no health issues at all (7). Modern definitions, however, acknowledge that there are many facets to dental health and go beyond this (7). When people's oral cavity and orofacial structures are in good enough condition, they are able to eat, breathe, and speak normally, according to the World Health Organization (WHO). Psychosocial factors are also involved, including things like self-esteem, general health, and the capacity to engage in social and occupational interactions without experiencing pain, discomfort, or embarrassment (8).

Oral health is impacted by certain disorders that are linked to different types of impairments. People on the autism spectrum may experience increased sensitivity, which makes regular dental care difficult (9), and those with Down syndrome are at a higher risk of periodontal disease (10). Class II malocclusion and anterior open bite are more common in people with cerebral palsy (11). The risk of dental caries and other diseases is increased when people take medications that are typically provided for different disability, and one of these side effects is dry mouth (12).

Oral health in individuals with disabilities is frequently characterized by a higher prevalence of dental caries, periodontal diseases, and untreated oral conditions compared to the general population. These disparities are often compounded by delayed dental visits, insufficient preventive care, and difficulties in implementing effective oral hygiene practices. As a result, the burden of oral disease remains a significant concern, affecting not only functional and aesthetic aspects but also overall quality of life (13).

The assessment of oral status in individuals with disabilities requires a comprehensive approach, integrating clinical indices that reflect periodontal condition, caries experience, orthodontic treatment needs, and prosthetic status. Such evaluations provide essential information for understanding the distribution and severity of oral conditions and for identifying specific needs within different subgroups of disabilities (14, 15).

Despite the growing interest in oral health inequalities, data regarding the oral status of individuals with disabilities in specific regional populations remain limited. In Romania, and particularly in the northeastern region, there is a lack of comprehensive studies addressing the clinical oral health profile of this vulnerable group. Generating such data is essential for informing targeted preventive strategies and improving access to appropriate dental care services (16,17).

Therefore, the aim of the present study was to evaluate the oral status of individuals with disabilities from Iași, Romania, using a set of clinical indices and to identify the main characteristics of oral health within this population.

## MATERIALS AND METHODS

**Study Design and Ethical Approval.** This observational cross-sectional study was conducted to evaluate the oral health status of individuals with disabilities in Iași, Romania. The study included 107 participants presenting different categories of disabilities, including physical/locomotor, visual, auditory, intellectual, and psychological disabilities. Participants were recruited from specialized care centers and through direct

presentation for dental evaluation.

The study protocol was approved by the Research Ethics Committee of the Grigore T. Popa University of Medicine and Pharmacy, Iași, Romania (Approval No. 666/06.11.2025) and was conducted in accordance with the principles of the Declaration of Helsinki.

**Study Population.** The study population consisted of individuals with officially certified disabilities according to the Romanian Law No. 448/2006 regarding the protection and promotion of the rights of persons with disabilities. Participants were classified into five disability categories: physical/locomotor, visual, auditory, intellectual, and psychological disabilities.

**Inclusion criteria.** Participants were included in the study if they had an officially certified disability, in accordance with national legislation (Law No. 448/2006), as documented in the records presented at the time of clinical examination. Based on these official documents, participants were classified into the following categories: physical/locomotor, visual, auditory, intellectual, and psychological disabilities. Only patients who presented for dental evaluation within the Department of Oro-Dental Diagnosis during the study period and had complete clinical records available for analysis were considered eligible.

**Exclusion criteria**

Patients were excluded if clinical records were incomplete or lacked essential data required for analysis. Cases in which the available information did not allow the calculation of the selected clinical indices were also excluded. In addition, duplicate records and files containing inconsistent or unclear data were not considered.

**Data collection.** Dental status was assessed using the DMFT and DMFS indices, as recorded in the clinical files. These indices reflect caries experience based on the number of decayed, missing, and filled teeth (DMFT) and surfaces (DMFS), including their respective components.

Gingival inflammation was assessed using the Sulcus Bleeding Index (SBI), as recorded in the clinical files. The index is based on bleeding following gentle probing of the gingival sulcus, evaluated after approximately 30 seconds. Scores range from 0 to 4, reflecting the absence or presence and severity of gingival bleeding.

Periodontal status was assessed using the Community Periodontal Index of Treatment Needs (CPITN), as recorded in the clinical files. The index is based on the evaluation of gingival bleeding, calculus, and periodontal pocket depth, with scoring performed at the sextant level, recording the highest value observed. Scores range from 0 to 4, reflecting periodontal health, presence of bleeding, calculus, and increasing pocket depth, and are used to indicate the level of periodontal treatment need.

Dental fluorosis was assessed using Dean's Fluorosis Index, as recorded in the clinical files. The index is based on the clinical evaluation of enamel appearance, considering the most affected tooth, and reflects the presence and severity of fluorosis. Scores range from 0 to 4, indicating normal enamel, questionable changes, and increasing severity of fluorosis, up to severe structural defects.

Statistical analysis was performed using *SPSS software version 26.0* (IBM Corp., USA). Descriptive statistics, including means, standard deviations, frequencies, and percentages, were calculated for the studied variables. Associations between

types of disabilities and oral parameters were analyzed using comparative statistical tests, and statistically significant differences between groups were identified.

## RESULTS

### Characteristics of the Study Population

For the sample of 107 participants included in the study, age ranged from 17 to 62 years, with a mean of 31.26 years and a standard deviation of 12.88, indicating a relatively heterogeneous distribution with a predominance of young adult individuals.

The gender distribution of the 107 participants shows a clear predominance of female subjects (70.1%) compared to male subjects (29.9%). This significant difference indicates a higher representation of females in the sample, which may influence the interpretation of the results and should be considered in the comparative analysis of the studied variables (tab. I).

TABLE I.

**Distribution of participants by gender**

| | | Frequency | % | Valid % | Cumulative % |
|---|---|---|---|---|---|
| Valid | Female | 75 | 70.1 | 70.1 | 70.1 |
| | Male | 32 | 29.9 | 29.9 | 100.0 |
| | Total | 107 | 100.0 | 100.0 | |

Regarding the area of residence, the vast majority of participants (92.5%) originated from urban areas, while only 7.5% were from rural areas. This unbalanced distribution highlights a predominantly urban sample, which may limit the generalizability of the results to rural populations and should be considered when interpreting the findings.

The analysis of participants' socio-economic status revealed a relatively balanced distribution between the "high" (40.2%) and "medium" (38.3%) categories, while 21.5% of subjects were classified as having a "low" socio-economic status. This structure suggests an adequate representation of the main socio-economic levels, with a slight predominance of individuals with a high socio-economic status, which may influence both access to healthcare services and the health-related attitudes and behaviors analyzed in this study.

Regarding the typology of disabilities, the distribution of participants shows a predominance of individuals with physical/locomotor disabilities (57.0%), followed by those with auditory (12.1%) and visual impairments (11.2%).

Similar proportions were observed for psychological disabilities (11.2%), while intellectual (mental) disabilities had the lowest representation (8.4%). This structure indicates a strong concentration of the sample on physical disabilities, while also reflecting a diversity of disability types, allowing for comparative analysis across multiple categories, with relevance for differences in integration and access to services (fig. 1).

The analysis of the frequency of dental check-ups among the 107 participants shows that the majority had recent visits to the dentist: 50.5% in the previous year and 42.1% in the current year. Only 7.5% reported having undergone a dental check-up many years ago, reflecting a low level of neglect in this regard. The observed distribution suggests good utilization of dental services, with a tendency to maintain regular contact with the dentist, which is favorable for the prevention and early detection of oral diseases.

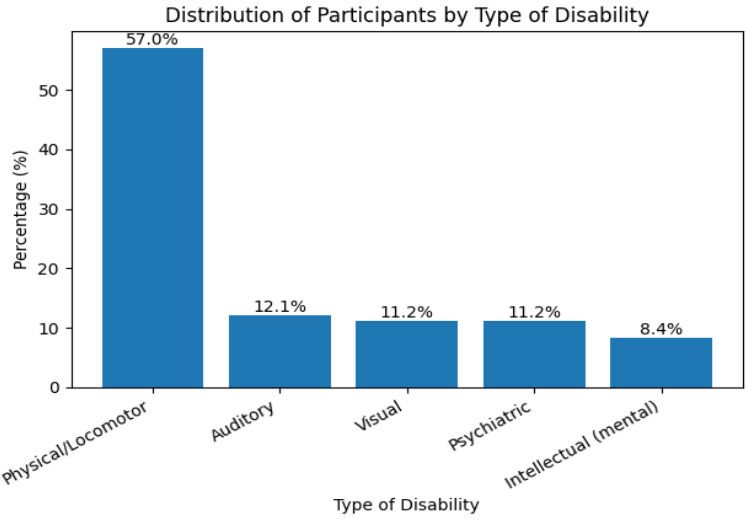


**Fig. 1.** Distribution of participants by disability

The analysis of the reasons for dental visits among the participants shows that nearly half of them (47.7%) sought curative treatment, while only 26.2% attended regular check-ups for preventive purposes. A smaller proportion reported pain as the main reason for the visit (10.3%), and 6.5% presented tooth extractions. Additionally, 9.3% of respondents indicated other types of treatments.

This distribution highlights a predominance of dental visits driven by treatment needs rather than preventive concerns, suggesting a behavior primarily oriented toward addressing existing problems rather than maintaining oral health through regular check-ups.

**Dental Caries Experience.** The descriptive analysis of the DMFT index and its components in the group of 107 participants revealed a mean DMFT score of 9.75 ± 4.523, with values ranging from 4 to 23. The DT (Decayed Teeth) component showed a mean value of 3.64 ± 3.522, reaching a maximum of 17, indicating the active presence of dental caries in a considerable proportion of the study population. The MT (Missing Teeth) component had a relatively low mean value of 0.43 ± 0.912, with values ranging from 0 to 5, suggesting limited tooth loss within the sample. In contrast, the FT (Filled Teeth) component recorded a mean value of 5.49 ± 3.825, with a maximum of 19, reflecting a high utilization of restorative dental treatments. Overall, these findings indicate that active carious lesions remain a relevant oral health concern, while the substantial number of restored teeth suggests good access to and utilization of dental care services. This pattern highlights both the need for continued preventive measures and the population's engagement in curative dental treatment (tab. II).

The mean DMFT values revealed noticeable differences among disability categories. The highest mean DMFT score was observed in individuals with visual disabilities (11.75), indicating a greater cumulative burden of dental caries. This was followed by participants with physical/locomotor disabilities (9.79) and hear-

ing disabilities (9.77), which showed very similar values. The lowest mean DMFT scores were recorded among individuals with psychological disabilities (8.67) and intellectual disabilities (8.22). These findings suggest that the type of disability may influence oral health status and caries experience, potentially reflecting differences in access to dental care, degree of independence in performing oral hygiene procedures, and the level of caregiver support available for maintaining oral health.

TABLE II.
**Descriptive Statistics of the DMFT Index and Its Components (Decayed Teeth, Missing Teeth, and Filled Teeth)**

| | N | Minimum | Maximum | Mean | Std. Deviation |
|---|---|---|---|---|---|
| DMFT | 107 | 4 | 23 | 9.75 | 4.523 |
| DT | 107 | 0 | 17 | 3.64 | 3.522 |
| AT | 107 | 0 | 5 | .43 | .912 |
| FT | 107 | 0 | 19 | 5.49 | 3.825 |
| Valid N (listwise) | 107 | | | | |

**Dental Caries Experience at Surface Level.** The descriptive analysis of the DMFS index and its components revealed considerable variability within the study population of 107 participants. The mean DMFS value was 14.38 ± 8.240, ranging from 4 to 48, indicating a substantial burden of both dental caries and restorative treatment, with marked differences among individuals. Regarding the distribution of affected tooth surfaces, the mean number of decayed surfaces was 4.79 ± 4.800, with values ranging from 0 to 24, reflecting the presence of both participants without active carious lesions and individuals with extensive disease involvement. Missing tooth surfaces showed a mean value of 1.82 ± 3.595, ranging from 0 to 15, suggesting a moderate degree of tooth loss within the sample. In contrast, filled surfaces presented the highest mean value, reaching 7.96 ± 6.757, with a maximum of 38, indicating a substantial utilization of restorative dental care. Overall, these findings characterize an oral health profile marked by a high cumulative caries experience, accompanied by a considerable number of restored tooth surfaces, highlighting the ongoing need for preventive strategies and oral health education (tab. III).

TABLE III.
**Descriptive Statistics of the DMFS Index and Its Components**

| | N | Minimum | Maximum | Mean | Std. Deviation |
|---|---|---|---|---|---|
| DMFS | 107 | 4 | 48 | 14.38 | 8.240 |
| Decay surfaces | 107 | 0 | 24 | 4.79 | 4.800 |
| Absent surfaces | 107 | 0 | 15 | 1.82 | 3.595 |
| Filled surfaces | 107 | 0 | 38 | 7.96 | 6.757 |
| Valid N (listwise) | 107 | | | | |

The mean DMFS values indicated a substantial burden of dental caries across all disability categories, although moderate differences were observed between groups. The highest mean DMFS scores were recorded among individuals with

visual disabilities (15.25) and intellectual disabilities (15.00), suggesting a greater severity of cumulative caries experience. Participants with physical/locomotor disabilities (14.62) and hearing disabilities (14.31) showed comparable intermediate values. In contrast, individuals with psychological disabilities exhibited the lowest mean DMFS score (11.92), indicating a lower level of disease burden relative to the other groups. These findings suggest that the type of disability may influence the severity of dental caries, potentially reflecting differences in access to dental care, availability of social support, and the ability to maintain adequate oral hygiene practices**.**

**Sulcus Bleeding Index (SBI).** The mean SBI value was 13.72 ± 12.33, with recorded values ranging from 0% to 84%. This wide range indicates considerable variability in gingival health among participants (tab. IV).

TABLE IV.

**Descriptive Statistics of the SBI Index in the Study Population**

| | N | Minimum | Maximum | Mean | Std. Deviation |
|---|---|---|---|---|---|
| SBI | 107 | .00 | 84.00 | 13.7280 | 12.33135 |
| Valid N (listwise) | 107 | | | | |

The highest SBI values were observed among individuals with visual disabilities (16.29) and physical/locomotor disabilities (14.78), suggesting increased gingival inflammation in these groups. Participants with psychological disabilities also exhibited elevated SBI scores (13.88). Lower values were observed among individuals with auditory disabilities (10.19) and intellectual disabilities (8.10).

Although the overall mean SBI indicated a relatively low level of gingival bleeding, the large variability observed suggests that a subset of participants experienced substantial periodontal inflammation and may require targeted preventive and therapeutic interventions.

**Community Periodontal Index of Treatment Needs (CPITN).** Analysis of CPITN scores revealed that only 20.6% of participants presented a healthy periodontal status. Gingival bleeding on probing was recorded in 15.0% of individuals, while the majority of participants (61.7%) exhibited supra- or subgingival calculus deposits.

Periodontal pockets up to 5 mm were identified in only 2.8% of cases, indicating a relatively low prevalence of advanced periodontal destruction within the study population (tab. V).

TABLE IV.

**Distribution of CPITN Scores in the Study Population**

| CPITN Score | Frequency (n) | Percentage (%) |
|---|---|---|
| Healthy | 22 | 20.6 |
| Bleeding on Probing | 16 | 15.0 |
| Supra- and Subgingival Calculus | 66 | 61.7 |
| Periodontal Pocket up to 5 mm | 3 | 2.8 |
| **Total** | **107** | **100.0** |

The distribution of CPITN scores varied according to disability category. Individuals with visual disabilities showed the highest proportion of calculus accumulation (91.7%). Participants with psychological disabilities exhibited a high prevalence of bleeding on probing (33.3%), while individuals with intellectual disabilities demonstrated the most unfavorable periodontal profile, including the highest proportion of periodontal pockets (11.1%) (fig. 2).

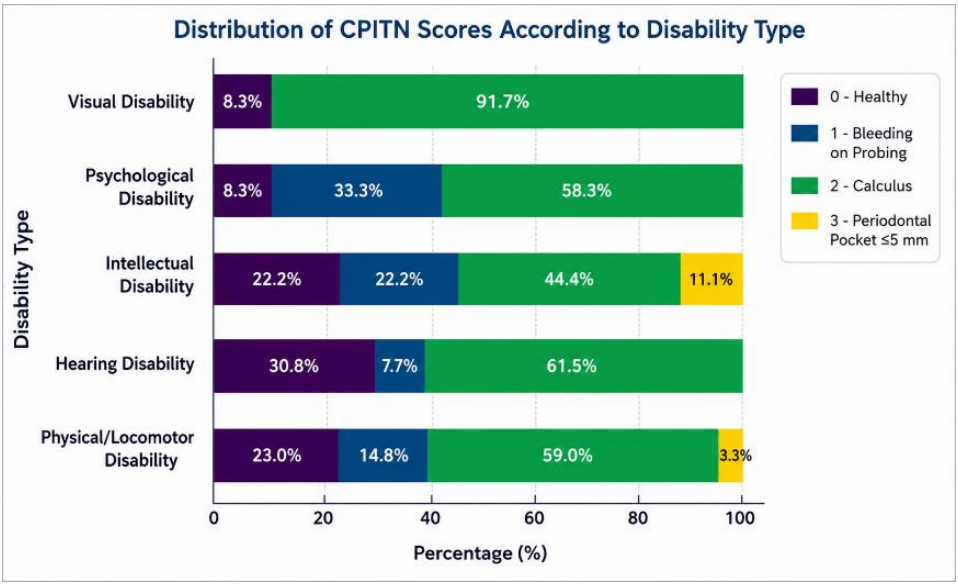


**Fig. 2**. Distribution of CPITN scores according to disability type

These findings indicate that calculus accumulation and inadequate plaque control represent the primary periodontal challenges among individuals with disabilities, whereas advanced periodontal disease remains relatively uncommon.

**Dental Fluorosis.** Assessment using the Dean Fluorosis Index demonstrated a very low prevalence of dental fluorosis within the study population. Most participants (94.4%) presented clinically normal enamel without signs of fluorosis.

Questionable fluorosis was identified in 1.9% of participants, while very mild and mild fluorosis was observed in 0.9% and 2.8% of cases, respectively. No moderate or severe forms of fluorosis were recorded.

These findings indicate that excessive fluoride exposure does not represent a significant oral health concern in the investigated population. The few fluorosis cases identified were limited to mild forms and were unlikely to have substantial functional or aesthetic consequences.

## DISCUSSION

The present study evaluated dental caries experience, periodontal status, and dental fluorosis among individuals with disabilities from Iași, Romania. The results showed a considerable burden of oral disease, with a mean DMFT value of 9.75 and a mean DMFS value of 14.38. These find-

ings indicate that dental caries experience remains an important oral health problem in this population.

The mean DMFT value observed in the present study was higher than that reported by Shukla *et al.* (18) who evaluated 258 mentally challenged individuals in North India and found an overall mean DMFT score of 3.08, with the highest DMFT value observed in individuals with Down syndrome (3.6 ± 2.63). However, both studies support the idea that disability type may influence oral health status and dental caries experience.

Our findings are also consistent with the large comparative study by Lee *et al.* (19) who analyzed oral health status in disabled and non-disabled individuals in Korea using propensity score matching. They reported that individuals with disabilities had significantly higher DMFT, decayed teeth, and missing teeth values, and fewer filled teeth than non-disabled controls (19). In contrast, the present study showed a relatively high filled component within the DMFT index, which may suggest that part of the investigated population had access to restorative dental care.

The elevated caries burden observed in this study is further supported by Morgan *et al.* (20) who analyzed clinical data from 4732 adults with intellectual and developmental disabilities and reported a high burden of oral disease and treatment needs. The comparison with Morgan *et al.* (20) is particularly relevant because both studies address vulnerable populations with disability-related barriers to oral healthcare, although the sample size and healthcare context differ substantially.

Altun *et al.* (21) also evaluated the oral health status of disabled individuals attending special schools and assessed DMFT indices and oral hygiene status. Their study supports the observation that individuals with disabilities frequently present increased dental treatment needs and difficulties in maintaining adequate oral hygiene (21). Compared with their school-based population, the present study included a broader age range and multiple disability categories, which may explain the higher cumulative caries experience recorded here.

The high DMFT and DMFS values observed in the present study are in line with the systematic review by Pecci-Lloret *et al.* (22) which reported that patients with special needs often show high caries prevalence in permanent dentition. That review found particularly high caries prevalence in patients with intellectual disabilities, with values reaching 89.4% and 95.5% in some included studies. These data support the interpretation that individuals with special needs remain at increased risk of dental caries and require targeted preventive strategies.

Periodontal assessment in the present study showed a mean SBI value of 13.72%, indicating gingival inflammation in part of the sample. CPITN analysis revealed that only 20.6% of participants had healthy periodontal status, while 61.7% presented supra- or subgingival calculus. Periodontal pockets up to 5 mm were observed in only 2.8% of participants. Therefore, the main periodontal issue in this population appears to be calculus accumulation and gingival inflammation rather than advanced periodontal destruction.

These periodontal findings are consistent with Anders and Davis (23) who concluded in their systematic review that people with intellectual disabilities general-

ly have poorer oral hygiene and higher prevalence and severity of periodontal disease. Their conclusions support the interpretation that periodontal vulnerability in individuals with disabilities is strongly related to oral hygiene limitations, dependence on caregivers, and reduced access to preventive periodontal care (23).

The predominance of calculus accumulation in our study is also comparable to the findings of Shukla *et al*. (18) who reported that CPITN code 2 was the dominant periodontal finding in mentally challenged individual. This pattern is similar to our results, where calculus was the most frequent CPITN finding and periodontal pockets were uncommon.

Solanki *et al*. (24) evaluated dental caries and periodontal status among mentally handicapped institutionalized children and reported that none of the subjects had healthy periodontal status, while dental caries was found in 79.2% of participants. Although their study population consisted of children and is therefore not directly comparable to our mixed-age sample, their findings reinforce the frequent coexistence of caries burden and periodontal vulnerability in individuals with disabilities.

Ward *et al*. (25) in a systematic review of oral health among adults with intellectual disabilities, reported that adults with intellectual disabilities continue to experience poor oral health, including tooth loss, periodontal problems, and untreated dental caries. Their review supports the broader relevance of our findings and confirms that oral health inequalities remain persistent in adults with disabilities despite improvements in dental care provision (25).

Dental fluorosis was uncommon in the present study. Normal enamel was observed in 94.4% of participants, while only questionable, very mild, and mild forms were identified. No moderate or severe fluorosis was recorded. These findings indicate that dental fluorosis does not represent a major oral health problem in this population. In contrast to caries and periodontal findings, fluorosis appears to have limited clinical relevance in the investigated group.

This study has several limitations. First, its cross-sectional design does not allow causal relationships to be established between disability type and oral health outcomes. Second, the study was conducted in a single regional population from Iași, Romania, which may limit the generalizability of the findings. Third, the distribution of disability categories was unequal, with a predominance of individuals with physical/locomotor disabilities. Fourth, the sample was predominantly urban, which may not fully reflect the oral health status of individuals with disabilities from rural areas. Finally, although standardized clinical indices were used, no longitudinal follow-up was performed to evaluate disease progression or the impact of preventive interventions.

## CONCLUSIONS

Individuals with disabilities in this Romanian population presented a considerable burden of oral disease, reflected by elevated DMFT and DMFS values and frequent periodontal treatment needs. Dental caries experience was substantial across disability categories, while CPITN findings showed that calculus accumulation represented the main periodontal problem. Advanced periodontal involvement was uncommon, and dental fluorosis was rare, limited to minor forms without moderate or severe cases.

These findings indicate that oral healthcare strategies for individuals with disabilities should prioritize caries prevention, regular professional prophylaxis, periodontal monitoring, and individualized oral hygiene support. Targeted preventive programs may help reduce oral health inequalities and improve long-term oral health outcomes in this vulnerable population.

## CONFLICT OF INTEREST AND FUNDING

The authors declare that there is no conflict of interest, and they received no specific funding regarding this scientific research.

## REFERENCES

1. Chimienti M, Morlino G, Ndreca D, *et al*. Barriers to accessing healthcare for people with disabilities: a systematic review. *Front Public Health* 2026;14: 1765145.
2. Vahdati A, Khadivi G, Ghorbani Z, Vahdati Helan E, Ranjbar A, Azimi S. Accessibility of special care dentistry across countries: a scoping review. *Healthcare (Basel)* 2024; 12(23): 2376.
3. Gallagher JE, Fiske J. Special care dentistry: a professional challenge. *Br Dent J* 2007; 202(10): 619-629.
4. Nagda R, Le T, Lin B, Tanbonliong T. Oral hygiene practice and home-care challenges in children with autism spectrum disorder in San Francisco: cross-sectional study. *Spec Care Dentist* 2024; 44(3): 837-844.
5. da Fonseca MA, Hong C. Improving Oral Health for Individuals with Special Health Care Needs. *Pediatr Dent* 2007; 29(2): 98-104.
6. Tesini DA. An annotated review of the literature of dental caries and periodontal disease in mentally retarded individuals. *Spec Care Dentist* 1981; 1(2): 75-87.
7. Heaton LJ, Mancl LA, Grembowski D, Armfield JM, Milgrom P. Unmet dental need in community-dwelling adults with mental illness: results from the 2007 Medical Expenditure Panel Survey. *J Am Dent Assoc* 2013;144(3): e16-e23.
8. Agarwal B, Srivastava S, Shekhar A, Arora K, Singh M, Kumar L. Estimating the magnitude of different barriers to dental care for special needs patients: a systematic review. *Natl J Maxillofac Surg* 2024;15(2): 188-198.
9. Balkaran R, Esnard T, Perry M, Virtanen JI. Challenges Experienced in the Dental Care of Persons with Special Needs: A Qualitative Study among Health Professionals and Caregivers. *BMC Oral Health* 2022; 22: 116.
10. Islam K, Gilmour H. Access to Specialized Health Care Services among Older Canadians. *Health Rep* 2024; 35(3): 18-32.
11. Krishnan L, Iyer K, Kumar PM. Barriers to Utilisation of Dental Care Services among Children with Special Needs: A Systematic Review. *Indian J Dent Res* 2020; 31(3): 486-493.
12. da Rosa SV, Moysés SJ, Theis LC, Soares RC, Moysés ST, Werneck RI, Rocha JS. Barriers in Access to Dental Services Hindering the Treatment of People with Disabilities: A Systematic Review. *Int J Dent* 2020; 2020: 9074618.
13. Lim MAWT, Liberali SAC, Borromeo GL. Utilisation of Dental Services for People with Special Health Care Needs in Australia. *BMC Oral Health* 2020; 20(1): 360.
14. Mac Giolla Phadraig C, McCallion P, *et al.* Total tooth loss and complete denture use in older adults with intellectual disabilities in Ireland. *J Public Health Dent* 2015; 75(2): 101-108.

15. Bida FC, Butnaru O, Diaconu DA, Tatarciuc M. The Decision-Making Process behind Removable Prosthesis: A Therapeutic and Design Perspective. *Med-Surg J-Rev Med Chir Soc Med Nat Iasi* 2024; 128(4): 870-879.
16. Condessa AM, Lucena EHGD, Figueiredo N, Goes PSA, Hilgert JB. Specialized Dental Care for People with Disabilities in Brazil: Profile of the Dental Specialty Centres, 2014. *Epidemiol Serv Saude* 2020; 29(5): e2018154.
17. Gavina VP, Alves NS, Alves FR, Cortellazzi KL, Silveira FM, Assaf AV. Oral Health for Patients with Special Needs: Evaluative Research of the Dental Specialties Centres. *Port J Public Health* 2019; 36(2): 81-94.
18. Shukla D, Bablani D, Chowdhry A, Jafri Z, Ahmad N, Mishra S. Oral Health Status and Dental Caries Experience in Mentally Challenged Individuals. *Ann Public Health Res* 2014; 1(2): 1008.
19. Lee JY, Lim KC, Kim SY, Paik HR, Kim YJ, Jin BH. Oral Health Status of the Disabled Compared with That of the Non-Disabled in Korea: A Propensity Score Matching Analysis. *PLoS One* 2019; 14(1): e0208246.
20. Morgan JP, Minihan PM, Stark PC, *et al*. The Oral Health Status of 4,732 Adults with Intellectual and Developmental Disabilities. *J Am Dent Assoc* 2012; 143(8): 838-846.
21. Altun C, Guven G, Akgun OM, Akkurt MD, Basak F, Akbulut E. Oral Health Status of Disabled Individuals Attending Special Schools. Eur J Dent. 2010; 4(4): 361-366.
22. Pecci-Lloret MP, Guerrero-Gironés J, López-González B, Rodríguez-Lozano FJ, Oñate-Sánchez RE, Oñate-Cabrerizo D. Special Care Patients and Caries Prevalence in Permanent Dentition: A Systematic Review. *Int J Environ Res Public Health* 2022; 19(22): 15194.
23. Anders PL, Davis EL. Oral Health of Patients with Intellectual Disabilities: A Systematic Review. *Spec Care Dentist* 2010; 30(3): 110-117.
24. Solanki J, Gupta S, Arya A. Dental Caries and Periodontal Status of Mentally Handicapped Institutionalized Children. *J Clin Diagn Res* 2014; 8(7): ZC25-ZC27.
25. Ward LM, Cooper SA, Hughes-McCormack L, Macpherson LMD, Kinnear D. Oral Health of Adults with Intellectual Disabilities: A Systematic Review. *J Intellect Disabil Res* 2019; 63(11): 1359-1378.