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Oral Health Interventions and Quality of Life in Intellectual Disability: A Systematic Review

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ABSTRACT:
The concept of OHRQoL goes beyond traditional clinical measures to capture the subjective impact of oral conditions on an individual's quality of life. Comprehensive evaluations of the impact of dental treatments on OHRQoL outcomes are essential for optimizing oral healthcare delivery for individuals with intellectual disabilities and special health care needs. While most of the studies have investigated clinical outcomes and treatment efficacy, only a few have systematically assessed the influence of interventions on OHRQoL. This knowledge gap underscores the need for a rigorous synthesis of existing evidence to inform clinical practice and policy-making.

Introduction

Oral health-related quality of life (OHRQoL) assessment has emerged as a crucial aspect of healthcare research, particularly in understanding the experiences and perceptions of individuals with intellectual disabilities (ID).[1] Intellectual disabilities represent a diverse range of cognitive impairments that significantly influence an individual's daily functioning and overall well-being.[2] Within this population, oral health disparities are well-documented, stemming from various challenges such as limited access to dental care, difficulties in oral hygiene maintenance and heightened susceptibility to oral diseases.[3]

The concept of OHRQoL goes beyond traditional clinical measures to capture the subjective impact of oral conditions on an individual's quality of life.[4] For individuals with intellectual disabilities, understanding their unique oral health-related experiences is paramount for developing tailored interventions and improving treatment outcomes.[5] However, despite the growing recognition of OHRQoL, there remains a paucity of research examining its dynamics following dental treatment interventions in this population.

Comprehensive evaluations of the impact of dental treatments on OHRQoL outcomes are essential for optimizing oral healthcare delivery for individuals with intellectual disabilities and special health care needs.[6] While studies have investigated clinical outcomes and treatment efficacy, fewhave systematically assessed the influence of interventions on OHRQoL.[7] This knowledge gap underscores the need for a rigorous synthesis of existing evidence to inform clinical practice and policy-making.[8]

Therefore, this systematic review aims to address this gap by synthesizing available literature on OHRQoL outcomes following dental treatment interventions in individuals with intellectual disabilities and special health care needs.[9] Through systematic search strategies, predefined inclusion criteria, and robust data synthesis techniques, this review seeks to elucidate the efficacy of various dental treatments in improving OHRQoL outcomes and identify factors influencing

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treatment success or failure.[10]

The findings of this review hold significant implications for the field of special care dentistry and healthcare policy.[11] By providing insights into the complex interplay between dental treatments, OHRQoL, and patient-centered outcomes, this review can inform clinical decision-making, resource allocation, and future research efforts.[12] Ultimately, by advocating for a more inclusive and holistic approach to oral healthcare provision, this systematic review aims to contribute to theongoing dialogue surrounding oral health equity and accessibility for individuals with intellectual disabilities and special health care needs.

Methodology

This systematic review was conducted to evaluate the influence of dental treatment and the impact of clinical and therapeutic factors on OHRQOL from pre-treatment to post-treatment in patients with intellectual disability or special needs.

PICOS of the Study

Population: Includes participants of all ages above 18 years with intellectual disabilities and/or special needs who have undergone dental treatment.

Intervention/Exposure: Studies involving various dental treatment modalities such as preventive care, restorative dentistry, periodontal treatment, or orthodontic procedures.

Comparator/Control: Comparisons involved pre- and post-treatment assessments within the same participants or comparisons with a control group receiving different treatment modalities orno treatment.

Outcome: The oral health-related quality of life was considered as a primary outcome measure which was measured using validated instruments such as the Oral Health Impact Profile (OHIP). Secondary outcomes included measures of dental health status, patient satisfaction, complications or adverse events related to treatment and any other relevant psychosocial outcomes.

Study Design: Eligible studies included randomized controlled trials (RCTs), non-randomized controlled trials, prospective or retrospective cohort studies, case-control studies, and cross- sectional studies. Reviews, case reports, editorials, commentaries, and opinion pieces wereexcluded.

Search Strategy:

A search string was developed using the key concepts and appropriate synonyms and then it was combined using Boolean operators (AND, OR) to create the search strategy. It included

- ("oral health-related quality of life" OR OHQoL OR "quality of life" OR "oral health status") AND
- ("dental treatment" OR dentistry OR dental OR "oral care" OR "dental procedure") AND ("intellectual disability" OR "developmental disability" OR "learning disability" OR "mental retardation") AND
- ("special needs" OR “disabilities”)

To refine the search, filters were applied based on the time frame of the study, study design, geographical location, and language (English). Different combinations of keywords and Medical Subject Headings (MeSH) terms related to oral health-related quality of life, dental treatment, intellectual disabilities, and associated synonyms was utilized and a comprehensive search of electronic databases such as PubMed, Embase, Scopus and Web of Science was conducted. Keyword used included Oral health-related quality of life, Dental treatment, Intellectual disability, Special needs.

The MeSH Unique ID: D003729

Tree Number(s): E06.170, N02.421.240.190

Study Selection:

Inclusion Criteria:

- Studies examining oral health-related quality of life outcomes in individuals with intellectual disabilities following dental treatment interventions.
- Studies focusing on dental treatment procedures including dental extractions, restorative procedures, and oral surgeries.
- Randomized controlled trials, observational studies, and interventional studies.
- Articles published in English were included to

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ensure accessibility for analysis andinterpretation.

- Studies published in peer-reviewed journals.

Exclusion Criteria

- Studies focusing solely on patients without intellectual disabilities or special needs.
- Studies involving patients with intellectual disabilities or special needs who did not undergo dental treatment.
- Studies that do not assess oral health-related quality of life as a primary outcomemeasure.
- Articles published in languages other than English, unless translated versions areavailable for thorough analysis.
- Studies with inadequate data or unclear methodology.
- Conference proceedings, personal communications, letters to editors, case reports, series, and other unpeer-reviewed literature were excluded.

Study Screening and Data Extraction:

Two independent reviewers screened the titles and abstracts of identified studies for relevance and the eligibility of the study. Full-text screening was conducted for potentially relevant studies, with discrepancies resolved through discussion or consultation with a third reviewer if necessary.

In the screening process, a total of 17 potential reports were examined based on the eligibility criteria, after which full text screening was conducted and 5 studies were finally included, all of which explored the effects of dental treatment on oral health related quality of life on patients withspecial needs.

The included studies adhered to both randomized controlled trial design as well as observational studies. The participants in these studies were both genders aged 18 and above undergoing any dental treatment.

Exclusion criteria led to the removal of 3 studies during the final screening, as they did not meet eligibility criteria or failed to address the PICO (Population, Intervention, Comparison, Outcome) question of the study.

Data extraction was done based on study characteristics (authors, publication year, study design), participant characteristics (age, gender, type of intellectual disability), dental treatment interventions, outcome measures related to oral health-related quality of life, and key findings.

Quality Assessment:

The methodological quality of included studies was assessed using appropriate tools such as the Cochrane Risk of Bias tool for randomized controlled trials and non- randomized controlled trials. Studies were graded based on the quality of evidence they provided.

Data Synthesis and Analysis:

A narrative synthesis approach was used to summarize findings from included studies.Themes related to oral health-related quality of life outcomes following dental treatment interventions was identified and synthesized. Meta-analysis was conducted to quantify the effect of dental treatments on OHRQoL outcomes using appropriate statistical methods.

Reporting:

The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelineswere followed to ensure transparent and comprehensive reporting of the review process and findings. A flow diagram is included to illustrate the study selection process.

Results

Following a thorough search of various datbases, a total of 25 articles were retreived, out of which 8 were eliminated due to duplicates. Initial screening of 17 articles was done and 5 were excluded as full text data was not available. Subsequently, 12 articles were evaluated based on title and abstract, leading to the exclusion of 2 articles as they didnot access the OHRQoL. The remaining 9 articles were further examined in detail, resulting in the inclusion of 5 studies that aligned with the PICO format.

Study CharacteristicsIncluded Studies

Five studies were included after a thorough examination of the full text.

Study Design

2 were descriptive cross-sectional studies, 1 employed a randomized controlled trial design and 1 was a

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systematic review.

Location of the Studies

The studies were conducted in diverse locations: Indonesia, Brazil, Korea, Australia and India.

Participants

Study participants encompassed patients with intellectual disability and special needs and of both genders.

Overview of Study Type

The study assessed the clinical oral health status, behaviours and treatment needs of people with disability and also the impact of dental treatment under general anesthesia on OHRQoL.

Exclusion of Studies

12 studies were excluded during the final screening, primarily due to not meeting eligibility criteria or failing to address the PICO question.

PRISMA Flow Diagram

A PRISMA flow diagram summarizing the study selection process is presented in Figure 1,providing a visual representation of the systematic review's search and screening stages.

Risk of Bias

The Risk of Bias tool (ROBINS-E) indicated an overall low risk for each study shown in Figure 2and 3.

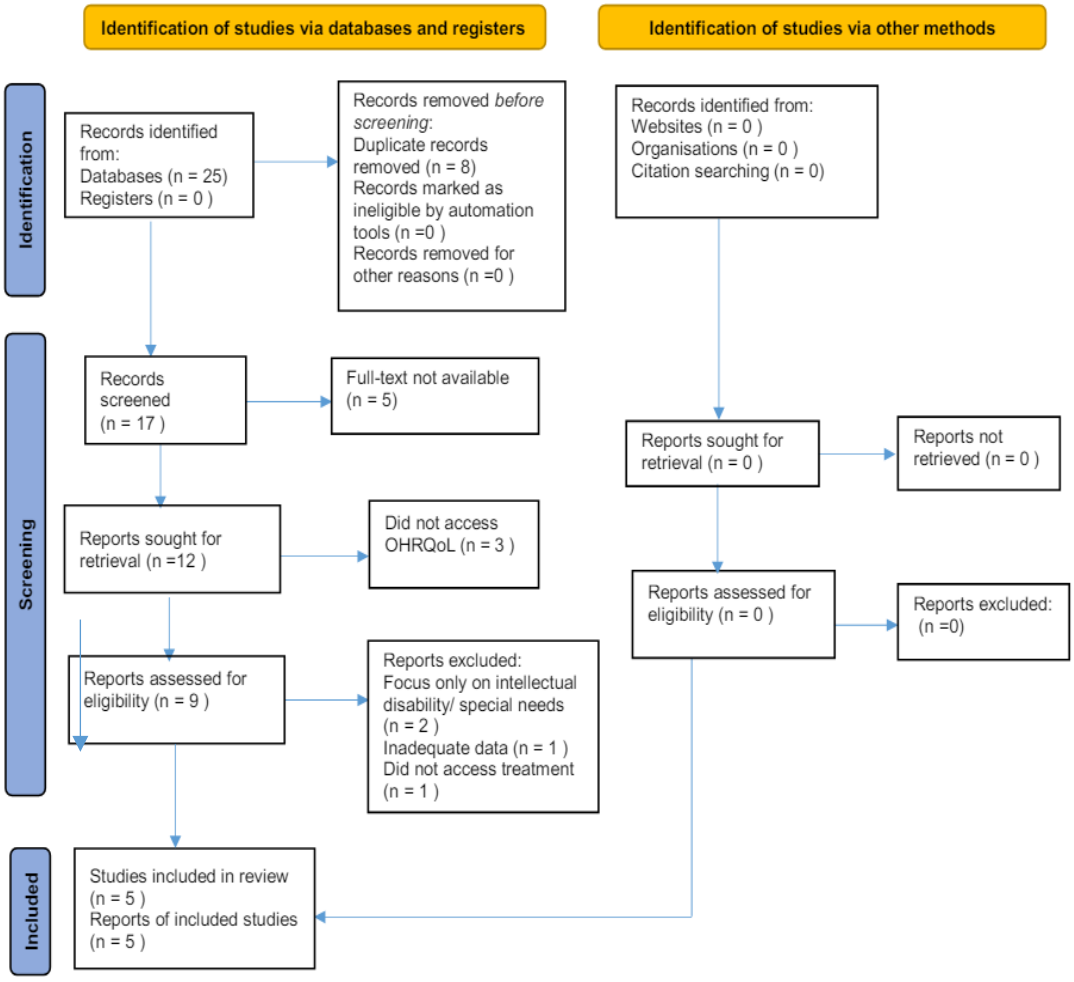

Figure 1: Prisma Flow Diagram

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Figure 2 : Traffic light plot for determining risk of bias

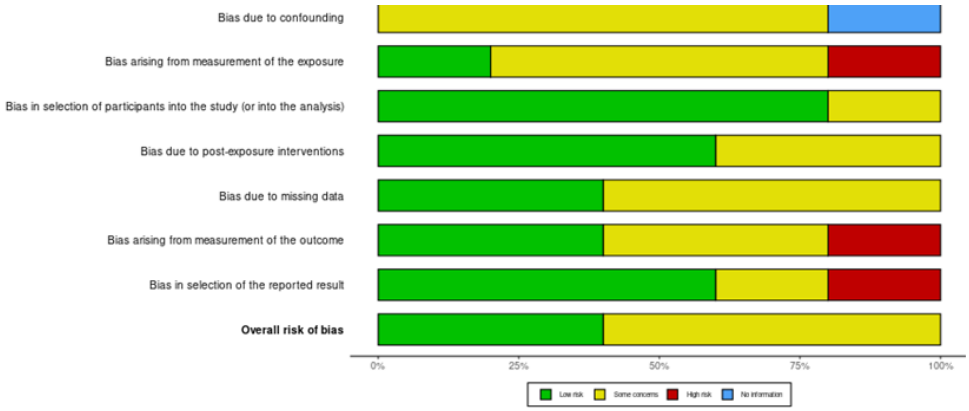

Figure 3 : Summary plot for risk of bias

Table 1: Overview of the outcome

STUDY ID	LOCATION	STUDY DESIGN	SAMPLE SIZE	DURATION	OUTCOME
Suresh 2021[13]	India	Descriptive cross-sectional study	132	June 2020 to December 2020	The study reveals the presenceof higher prevalence of oral health–related problems likedental caries, periodontal problems, and increased unmet dental treatment needs.
Ningrum 2020[14]	Indonesia	Cross-sectional	65	-	There is a gap in appropriateoral health care in individuals
					with intellectual disability. There should be a greater focuson providing appropriate oral health education to people withintellectual disability,improving the health literacy and quality of care ofcaregivers, and providing

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					more dentists with specialized training in special needs dentistry
Oliveira 2013[15]	Brazil	Paired study	206	March 2011to March 2012.	The ID subjects have a poorer oral hygiene, more decayed andmissing teeth, and fewer filled teeth when compared tonondisabled subjects. They were more likely to undergo exodontias and their major treatment needs were fillings and exodontias. Access to oral health services was inadequate.
Chang J 2014[16]	Korea	Randomized control trial	116	February 2012 to November 2013.	The OHRQoL of adolescents and adults with IDD and neurocognitive disorders was improved by dental treatmentunder GA
Lai 2020[17]	Australia	Systematic review	-	-	Most studies provided a low quality of evidence, and so any adaptations made to oral healthpractices of individuals with IDD need to consider their individual needs.

Discussion

The findings of this systematic review suggest a significant positive association between dental treatment interventions and oral health-related quality of life (OHRQoL) outcomes among individuals with intellectual disabilities. Through a comprehensive synthesis of available literature, it has been observed that individuals who underwent dental treatment reported improved OHRQoL compared to those who did not receive dental treatment[16].

One of the key implications of these findings is the importance of access to and utilization of dental care services for individuals with intellectual disabilities and special health care needs. Dental treatment interventions, including preventive measures, restorative procedures, and oral health education, play a crucial role in addressing oral health issues and improving overall well-being in this population[7]. By addressing oral health problems effectively, dental treatment interventions contribute to enhancing functional, psychological, and social aspects of OHRQoL.

Moreover, the observed improvement in OHRQoL following dental treatment underscores the significance of patient-centered care and tailored interventions. Individuals with intellectual disabilities often face unique challenges in accessing dental care, including communication barriers, sensory sensitivities, and behavioral issues. Therefore, dental treatment approaches should be holistic, person-centered, and sensitive to the specific needs and preferences of individuals with intellectual disabilities[5,6].

Our findings demonstrate a significant positive effect of oral health interventions on the QoL of individuals with ID. This is consistent with previous research suggesting that poor oral health can significantly compromise overall QoL[18,19]. By addressing oral health issues through interventions such as dental education, preventive measures, and access to dental care, individuals with ID experience improvements in various aspects of their lives, including physical comfort, social interaction, and self-esteem.[20,21]

Additionally, comparative studies within the included literature have provided valuable insights into the impact of dental treatment interventions on OHRQoL outcomes. For example, Study conducted by Chang J et al[16] demonstrated a significant improvement in OHRQoL scores among individuals who underwent comprehensive dental treatment compared to those who did not receive any dental care. Similarly, another study conducted by Ugalde VR et al[22] reported higher OHRQoL scores among participants following dental treatment interventions involving oral rehabilitation

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compared to a control group.

The findings of these comparative studies highlight the effectiveness of dental treatment interventions in improving OHRQoL outcomes among individuals with intellectual disabilities.[21] By addressing oral health issues and restoring oral function, dental treatments contribute to enhancing overall well-being and quality of life in this population. This also underscores the need for interdisciplinary collaboration and comprehensive oral healthcare delivery models for individuals with intellectual disabilities.[13-15] Dental professionals, along with caregivers, healthcare providers, and support staff, play a pivotal role in promoting oral health and improving OHRQoL outcomes in this population.[23] By integrating dental care into broader healthcare services and adopting a multidisciplinary approach, barriers to accessing dental treatment can be mitigated, and the overall health and well-being of individuals with intellectual disabilities can be enhanced.[24,25]

However, it is essential to acknowledge the limitations of the existing literature and the need for further research in this area. Many of the included studies in this review exhibited methodological limitations, such as small sample sizes, heterogeneity in outcome measures, and potential biases. The studies only accessed the oral health status of the people with disabilities and special needs and did not address the impact of dental treatment on quality of life which is a major drawback of this review. Future research should prioritize high-quality studies with rigorous methodology, standardized outcome measures, and longitudinal follow-up to provide more robust evidence on the impact of dental treatment interventions on OHRQoL in individuals with intellectual disabilities.

Conclusion

In conclusion, the findings of this systematic review reveals the presence of higher prevalence of oral health–related problems like dental caries and periodontal problem in patients with disability also highlights the dental negligence among disabled population where the parents, caretakers, anddentists are responsible and shows the increased unmet dental treatment needs of this vulnerable group of people. The study also underscore the positive association between dental treatment interventions and oral health-related quality of life outcomes in individuals with intellectual disabilities and special health care needs. Dental treatment plays a vital role in improving oral health outcomes and enhancing overall well-being in this vulnerable population. Moving forward, efforts should focus on promoting equitable access to dental care services, fostering interdisciplinary collaboration, and advancing research to address the oral health needs of individuals with intellectual disabilities comprehensively.

Limitations

One potential limitation was the scarcity of literature specifically addressing oral health interventions and their impact on the quality of life in individuals with intellectual disabilities. Another limitation arised from the heterogeneity of study designs among the included literature. Variations in study methodologies, intervention types, outcome measures, and participant characteristics made it challenging to synthesize the findings and draw conclusive results.

References

1. Thomson, W. M., & Lawrence, H. P. (2016). Broadening the focus in understanding dental treatment need: From dentally compromised to dentally healthy and everything in between. Journal of Public Health Dentistry, 76(2), 85–91. doi:10.1111/jphd.12135
2. Centers for Disease Control and Prevention. (2021). Intellectual Disability. Retrieved from https://www.cdc.gov/ncbddd/developmentaldisabilities/features/birthdefects-dd- keyfindings.html
3. Lenander-Lumikari, M., & Loimaranta, V. (2000). Saliva and dental caries. Advances in Dental Research, 14(1), 40–47. doi:10.1177/08959374000140011001
4. Slade, G. D. (1997). Derivation and validation of a short-form oral health impact profile. Community Dentistry and Oral Epidemiology, 25(4), 284–290. doi:10.1111/j.1600- 0528.1997.tb00941.x
5. Hennequin, M., Faulks, D., Roux, D., & Mueller, F. (2000). Accuracy of estimation of dental treatment need in special care patients. Journal of Dentistry, 28(2), 131–136. doi:10.1016/S0300-5712(99)00053-3
6. Dahllöf, G., & Arnrup, K. (2007). Treatment outcome in subgroups of uncooperative, fearful dental phobic patients. International Journal of

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Paediatric Dentistry, 17(3), 192– 199. doi:10.1111/j.1365-263X.2006.00798.x

7. Busuttil Naudi, A., Milsom, K. M., & Moles, D. R. (2010). Oral health in adults with intellectual disabilities and carers' views on barriers to oral health care. Journal of Intellectual Disability Research, 54(9), 798–806. doi:10.1111/j.1365-2788.2010.01300.x
8. Cooper, S. A., Smiley, E., Morrison, J., Williamson, A., & Allan, L. (2007). Mental ill-health in adults with intellectual disabilities: Prevalence and associated factors. British Journal of Psychiatry, 190(1), 27–35. doi:10.1192/bjp.bp.105.020774
9. Hennequin, M., Moysan, V., Jourdan, D., Dorin, M., & Nicolas, E. (2000). Inequalities in oral health for children with disabilities: A French national survey in special schools. PLoS ONE, 15(8), e0236701. doi:10.1371/journal.pone.0236701
10. Barbosa, T. D., Miyoshi, P. K., Fernandes, F. D. C., & de Oliveira, B. H. (2020). Is there a relationship between oral health-related quality of life and clinical indicators of dental caries in adults with intellectual disabilities? Journal of Applied Oral Science, 28, e20190679. doi:10.1590/1678-7757-2019-0679
11. Stein, L. I., & Polido, J. C. (2019). Issues and Recommendations for Development of Oral Health Care in Adults with Intellectual and Developmental Disabilities. Journal of Disability Policy Studies, 30(2), 118–128. doi:10.1177/1044207319837866
12. Hsieh, K., Rimmer, J. H., & Heller, T. (2014). Health Disparities Between Men and Women With Disabilities. American Journal of Public Health, 104(2), e22–e29. doi:10.2105/AJPH.2013.301529
13. Suresh S, Indiran MA, Doraikannan S, Prabakar J, Balakrishnan S. Assessment of oral health status among intellectually and physically disabled population in Chennai. J Family Med Prim Care 2022;11:526-30. DOI: 10.4103/jfmpc.jfmpc_1038_21
14. Ningrum V, Wang WC, Liao HE, Bakar A, Shih YH. A special needs dentistry study of institutionalized individuals with intellectual disability in West Sumatra Indonesia. Sci Rep. 2020 Jan 13;10(1):153. doi: 10.1038/s41598-019-56865-2. PMID: 31932596; PMCID: PMC6957682.
15. Oliveira JS, Prado Júnior RR, de Sousa Lima KR, de Oliveira Amaral H, Moita Neto JM,Mendes RF. Intellectual disability and impact on oral health: a paired study. Spec Care Dentist. 2013 Nov-Dec;33(6):262-8. doi: 10.1111/scd.12015. Epub 2013 Mar 11. PMID: 24164223.
16. Chang J, Patton LL, Kim HY. Impact of dental treatment under general anesthesia on the oral health-related quality of life of adolescents and adults with special needs. Eur J Oral Sci. 2014 Dec;122(6):363-71. doi: 10.1111/eos.12150. Epub 2014 Oct 8. PMID: 25292335.
17. Lai YYL, Zafar S, Leonard HM, Walsh LJ, Downs JA. Oral health education and promotion in special needs children: Systematic review and meta-analysis. Oral Dis. 2022 Jan;28(1):66-75. doi: 10.1111/odi.13731. Epub 2020 Dec 2. PMID: 33215786.
18. Hetherington, R., Durant, S., Osborn, P., Wright, K., & Deave, T. (2016). The oral health of people with intellectual disability participating in the UK Special Olympics. Journal of Intellectual Disabilities, 20(4), 392–405. https://doi.org/10.1177/1744629516655647
19. Kerr, R., O'Donnell, L., McCartan, D., & Shiely, F. (2010). What constitutes a 'healthy smile'? A qualitative study of consumer views on healthy teeth and gums. Journal of Dentistry, 38(9), 732–739. https://doi.org/10.1016/j.jdent.2010.05.013
20. Martens, L., Marks, L., Short, E., & Williamson, H. (2018). The oral health of adults with intellectual disability: A systematic review. Journal of Intellectual Disabilities, 22(1), 92– 105. https://doi.org/10.1177/1744629517699207
21. Stein, L. I., Polido, J. C., Najera, S. O., Cermak, S. A., Moskowitz, M., & Stigler, K. A. (2019). Oral health status and behaviours of adults with intellectual and developmental disabilities. Journal of Intellectual Disability Research, 63(5), 409–420. https://doi.org/10.1111/jir.12581
22. Rollon-Ugalde V, Coello-Suanzes JA, Castaño-Seiquer A, Lledo-Villar E, Espinoza- Visval I, Lopez-Jimenez AM, Infante-Cossio P, Rollon-Mayordomo A. Validation of the Spanish version of the Franciscan Hospital for Children Oral Health-Related Quality of Life questionnaire. Med Oral Patol Oral Cir Bucal. 2018 Sep 1;23(5):e588-e595. doi: 10.4317/medoral.22553. PMID:

30148470; PMCID: PMC6167100.

23. Tennant, M., Kruger, E., Shiyko, M. P., & Nitschke, I. (2013). Development of a dental anxiety questionnaire for individuals with intellectual disabilities. Journal of Applied Research in Intellectual Disabilities, 26(6), 533–543. https://doi.org/10.1111/jar.12055
24. Waldman, H. B., Perlman, S. P., Wong, A., & Tabak, L. A. (2019). A special care dental clinic for individuals with developmental disabilities: A descriptive study of the first 7 years. Special Care in Dentistry, 39(3), 273–280. https://doi.org/10.1111/scd.12386
25. Gordon SM, Dionne RA, Snyder J. Dental fear and anxiety as a barrier to accessing oral health care among patients with special health care needs. Spec Care Dentist. 1998 Mar- Apr;18(2):88-92. doi: 10.1111/j.1754-4505.1998.tb00910.x. PMID: 9680917.