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CLINICAL RESEARCH:

A Disability-Inclusive University-Based Oral Health Education Program for Adults with Cognitive Disabilities: Over a Decade of Experience in Special Care Dentistry

Programa universitario inclusivo de educación en salud bucodental para adultos con discapacidad cognitiva: más de una década de experiencia en odontología para personas con discapacidad

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ABSTRACT: To describe the development, structure, implementation, and long-term trajectory of a university-based, disability-inclusive oral health education program for adults with cognitive disabilities, including its educational strategies, clinical familiarization activities, participation patterns, and lessons learned from implementation. A retrospective descriptive study was conducted using institutional records, course reports, teaching materials, faculty and facilitator documentation, and previously collected qualitative evidence. The program, implemented from 2015 to 2025 within an inclusive higher education initiative in Costa Rica, followed a progressive educational sequence combining accessible theoretical instruction, practical oral hygiene activities, individualized support, and familiarization with the dental environment. Undergraduate and postgraduate dental students participated voluntarily as facilitators under faculty supervision. A total of 199 course enrollments were recorded over the study period, with uninterrupted delivery, including adaptation to a virtual format during 2020 and 2021. Implementation documentation reflected recurring participant engagement in supervised oral hygiene activities, varying individual support needs, and the use of adapted communication, repetition, demonstrations, and individualized assistance across successive cohorts. Previously collected participant perspectives described learning experiences related to oral structures, dental caries, toothbrushing, dental floss, and mouthwash use. Because standardized outcome measures and pre- and post-intervention assessments were not available, these findings are interpreted descriptively and do not establish program effectiveness. This long-term experience documents the sustained implementation of a disability-inclusive oral health education program integrating accessible education, practical self-care activities, individualized support, progressive familiarization with the dental environment, and supervised participation of dental students. The model may inform the development and adaptation of similar university- and community-based initiatives. Prospective studies using standardized participant- and student-level outcomes are needed to evaluate its effects on oral health behaviours, experiences with dental care, and professional education.

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KEYWORDS: Special care dentistry; Oral health education; Cognitive disability; Intellectual disability; Dental education; Health promotion.

RESUMEN: Describir el desarrollo, la estructura, la implementación y la trayectoria a largo plazo de un programa universitario inclusivo de educación en salud bucodental para personas adultas con discapacidad cognitiva, incluidas sus estrategias educativas, actividades de familiarización clínica, patrones de participación y lecciones derivadas de su implementación. Se realizó un estudio descriptivo retrospectivo basado en registros institucionales, informes del curso, materiales educativos, documentación docente y evidencia cualitativa recopilada previamente. El programa se implementó entre 2015 y 2025 en una iniciativa de educación superior inclusiva en Costa Rica y combinó enseñanza teórica accesible, actividades prácticas de higiene bucodental, apoyo individualizado y familiarización con el entorno odontológico. Estudiantes de grado y posgrado de Odontología participaron voluntariamente como facilitadores bajo supervisión docente. Durante el periodo se registraron 199 matrículas, con ejecución ininterrumpida y adaptación virtual durante 2020 y 2021. La documentación mostró participación recurrente en actividades supervisadas de higiene bucodental, diferentes necesidades de apoyo y uso de comunicación adaptada, repetición, demostraciones y asistencia individualizada. Las perspectivas de los participantes describieron aprendizajes relacionados con estructuras bucales, caries dental, cepillado, hilo dental y enjuague bucal. Al no disponerse de medidas estandarizadas ni evaluaciones pre y postintervención, los hallazgos se interpretan descriptivamente y no permiten establecer la efectividad del programa. Esta experiencia documenta la implementación sostenida de un programa inclusivo que integra educación accesible, autocuidado práctico, apoyo individualizado, familiarización progresiva con el entorno odontológico y participación supervisada de estudiantes de Odontología. El modelo puede orientar iniciativas similares en contextos universitarios y comunitarios. Se requieren estudios prospectivos con resultados estandarizados para evaluar sus efectos sobre las conductas de salud bucodental, las experiencias relacionadas con la atención odontológica y la formación profesional.

PALABRAS CLAVE: Odontología para personas con discapacidad; Educación en salud bucodental; Discapacidad cognitiva; Discapacidad intelectual; Educación odontológica; Promoción de la salud.

INTRODUCTION

People with intellectual and developmental disabilities (IDD), including adults with cognitive disabilities requiring adapted educational support, experience significant disparities in oral health status and access to dental care (1,2). These inequalities are influenced by multiple structural and individual barriers, including limited oral health literacy, communication challenges, dependence on caregivers, and insufficient professional training in the care of people with disabilities (1-3). Consequently, individuals with IDD frequently experience higher levels of untreated oral disease and reduced access to preventive dental services compared with the general population (4,5).

Contemporary approaches to disability and health care increasingly emphasize disability inclusion, person-centered care, and the reduction of environmental and communication barriers rather than focusing exclusively on individual impairments. Within dentistry, disability-inclusive care involves accessible educational environments, individualized accommodations, respectful communication strategies, and functional adaptations that support autonomy, participation, and health equity (6,7). These principles are particu-

larly relevant to oral health promotion for adults with cognitive disabilities, for whom conventional educational approaches and unfamiliar clinical environments may represent additional barriers to participation in oral health care.

Addressing these disparities requires strategies that extend beyond traditional clinical treatment and promote oral health literacy, autonomy, and engagement in self-care. International organizations, including the World Health Organization, have emphasized the importance of accessible health promotion and the empowerment of people with disabilities (8). Educational interventions adapted to cognitive and communication needs may facilitate oral health knowledge and self-care behaviours (9). However, descriptions of structured and sustained programs that combine adapted oral health education, practical skill development, and progressive familiarization with the dental environment remain limited, particularly within university settings in Latin America.

Universities may provide a particularly suitable environment for developing such initiatives because they can integrate health promotion, community engagement, clinical resources, and professional education. In dental education, direct interaction with people with disabilities has also been associated with more positive student attitudes, improved communication skills, and greater confidence in caring for patients with special health care needs (10-12). Recent discussions in dental education have therefore emphasized disability-inclusive learning environments and institutional innovation as strategies for strengthening competencies related to accessibility, equity, and person-centered care (6). Nevertheless, sustained experiential opportunities involving people with disabilities remain insufficiently integrated into dental education.

In Costa Rica, the University of Costa Rica has developed inclusive higher education initiatives through the Institutional Program for the Inclusion of People with Cognitive Disabilities in Higher Education (PROIN), which provides adapted educational opportunities and support for adults with cognitive disabilities. In collaboration with PROIN, the Faculty of Dentistry established the Comprehensive Dental Care Project for People with Disabilities (PRACIOD), an outreach, educational, and clinical initiative aimed at promoting oral health, facilitating access to dental services, strengthening disability-inclusive dental education, and fostering awareness of disability within the academic community.

Within this institutional framework, the course "How to Maintain My Oral Health" was developed as a structured oral health education program combining accessible teaching strategies, individualized support, practical oral hygiene activities, and progressive familiarization with the dental environment. The program was designed to promote active participation and autonomy in oral self-care while providing a structured setting in which dental students could participate as supervised facilitators.

The aim of this study was to describe the development, structure, implementation, and long-term trajectory of this university-based disability-inclusive oral health education program for adults with cognitive disabilities, including its educational strategies, clinical familiarization activities, participation patterns, and lessons learned from its implementation.

MATERIALS AND METHODS

STUDY DESIGN AND SETTING

This study used a retrospective descriptive approach to document the development, structure, implementation, and long-term trajectory of the university-based oral health education program "How to Maintain My Oral Health." The program

was implemented from 2015 to 2025 within the Comprehensive Dental Care Project for People with Disabilities (PRACIOD) at the Faculty of Dentistry, University of Costa Rica, in collaboration with the Institutional Program for the Inclusion of People with Cognitive Disabilities in Higher Education (PROIN).

Rather than evaluating program effectiveness, the study was designed to systematically describe a long-standing institutional experience, including its educational structure, implementation across different academic periods and delivery formats, participation patterns, and documented experiences arising from its implementation. No prospective evaluation protocol, predefined effectiveness indicators, or standardized pre- and post-intervention outcome measures were used during the study period.

PARTICIPANTS AND INSTITUTIONAL CONTEXT

Participants were adults with cognitive disabilities enrolled in the Institutional Program for the Inclusion of People with Cognitive Disabilities in Higher Education (PROIN) at the University of Costa Rica. PROIN is a university-based inclusion initiative that provides adapted educational opportunities aimed at strengthening academic and social skills, promoting autonomy and participation, and facilitating inclusion within the higher education environment.

Admission to PROIN follows a structured institutional process. At the time of application, candidates are required to be between 18 and 35 years of age, have a cognitive disability, require a moderate level of support, and not be simultaneously enrolled in another regular or special education program. Additional eligibility criteria include personal autonomy in basic activities of daily living, functional verbal comprehension and expression, and the ability to engage in interpersonal interactions. For candidates without Down syndrome, documentation of cognitive disability issued by the Costa Rican Social Security Fund is required as part of the admission process.

Candidates who meet the initial eligibility requirements subsequently participate in an interview process and, if selected to continue, complete a mandatory three-week introductory course (“Conociendo la U”). This course provides candidates with an opportunity to become familiar with the university environment while allowing the PROIN coordinating team to assess their participation, autonomy, interaction, and support needs within that setting. Candidates who successfully complete this process may then enroll in the educational activities offered through PROIN.

Participants in “How to Maintain My Oral Health” were PROIN students enrolled during the corresponding academic periods. From 2015 to 2022, the oral health course was offered as part of the educational opportunities available through PROIN. Beginning in 2023, it became a mandatory component for first-year PROIN students.

The oral health education program did not categorize participants according to specific diagnoses or additional classifications of support intensity. Instead, educational activities, communication strategies, and facilitator assistance were individualized according to participants’ functional abilities, communication preferences, learning pace, participation, and observed support needs throughout the course.

DATA SOURCES

Documentation generated during the implementation of the program between 2015 and 2025 was retrospectively reviewed. Sources included institutional and course records, annual reports,

participant enrollment records, teaching materials, educational resources, and documentation related to the organization and delivery of course activities.

These sources were used to reconstruct the development and implementation of the program, characterize its educational components, document changes in delivery over time, and describe participation across the study period.

Faculty documentation and records generated during course implementation also contained recurrent observations concerning participant engagement, performance of oral hygiene activities, familiarization with the dental environment, and interactions with facilitators. Because these observations were not collected using standardized instruments or predefined outcome measures, they were treated as descriptive implementation observations and were not interpreted as measures of program effectiveness.

PREVIOUSLY COLLECTED QUALITATIVE EVIDENCE

Participant perspectives included in the present study were derived from a previously conducted master's thesis examining oral health among adults with cognitive disabilities enrolled in PROIN (13). This qualitative evidence was collected in 2021 as part of a broader mixed-methods study and was not generated prospectively for the present descriptive study.

The qualitative component of the original study included semi-structured interviews with 21 PROIN participants. Participants were selected using criterion and purposive sampling, considering feasibility of contact, accessibility, and willingness to participate. Interviews explored participants' experiences and perceptions related to oral health, self-care practices, dental care, and barriers and facilitators affecting oral health. The original qualitative analysis followed a descriptive and interpretative approach, with discourse analysis used to examine participants' accounts. The textual material was coded into units of meaning and grouped into categories emerging from participants' narratives. Findings were subsequently interpreted in context and contrasted through triangulation with quantitative data and relevant theoretical evidence.

For the present study, previously collected qualitative evidence was used only as complementary contextual information to illustrate participants' perspectives relevant to the implementation of the oral health education program. No new analysis of the original qualitative dataset was performed. Representative testimonies included in the present manuscript were drawn from the previously conducted research and are explicitly identified and cited as secondary qualitative evidence.

DATA ORGANIZATION AND DESCRIPTIVE ANALYSIS

Information from institutional documentation was organized chronologically and thematically to describe the long-term trajectory of the program. Enrollment records were summarized descriptively by year and delivery format. No inferential statistical analyses were performed.

For reporting purposes, the available information was organized into the following descriptive dimensions: (1) program development and educational structure; (2) implementation and participation patterns over time; (3) documented observations arising during program implementation; (4) participant perspectives derived from previously collected qualitative evidence; and (5) the role of dental student facilitators within the educational model.

Because standardized outcome measures, predefined effectiveness indicators, and pre- and post-intervention assessments were not part of the historical implementation of the program, the present study does not attempt to establish effecti-

veness, quantify changes attributable to the intervention, or infer causal relationships. Observations are therefore reported descriptively and interpreted as part of the documented institutional experience.

ETHICS STATEMENT

The qualitative evidence incorporated into this study was derived from a previously approved master's thesis reviewed by the Scientific Ethics Committee of the University of Costa Rica (CEC-154-2021). Participants involved in the original qualitative study provided informed consent prior to participation.

Institutional records and educational materials used to describe the program were reviewed in accordance with institutional ethical and confidentiality standards. No personally identifiable information from institutional records is reported in the present manuscript. Written informed consent for the publication of identifiable photographs was obtained from the individuals depicted.

PROGRAM DESCRIPTION

EDUCATIONAL STRUCTURE AND RATIONALE

The course "How to Maintain My Oral Health" is a structured university-based oral health education program delivered over a 17-week academic period through weekly two-hour sessions. The program was designed to provide an accessible and supportive learning environment in which adults with cognitive disabilities could progressively develop oral health knowledge, practice self-care skills, and become familiar with the dental environment.

The educational model follows a progressive sequence moving from conceptual understanding to clinical familiarization and supervised practical experience. This sequence was designed to make oral health concepts and dental procedures more understandable and predictable before participants were expected to perform self-care activities or engage directly with the clinical environment.

The initial theoretical component therefore includes basic dental anatomy as a foundation for identifying oral structures and understanding subsequent concepts related to dental caries, periodontal conditions, oral hygiene, and preventive care. Rather than emphasizing memorization of technical terminology, these concepts are introduced through concrete, visual, and interactive activities intended to facilitate recognition and understanding of the mouth and its care.

The program integrates visual supports, structured routines, simplified and adapted communication, interactive demonstrations, practical activities, repetition, and individualized assistance. These strategies are adjusted according to participants' communication, learning pace, functional abilities, and support needs.

PROGRAM PHASES

The program is organized into four sequential phases: theoretical learning, clinical familiarization, supervised practical activities, and evaluation and closure (Table 1).

During the theoretical phase (weeks 1-8), participants are introduced to basic oral health concepts through visual guides, interactive activities, narrated educational materials, demonstrations, and hands-on learning resources (Figure 1 and Figure 2). Dental anatomy is introduced to provide a concrete framework for subsequently discussing dental caries, periodontal conditions, oral hygiene, and preventive practices.

During the clinical familiarization phase (weeks 9-11), participants are progressively introduced to the dental environment through guided visits, demonstrations of oral hygiene procedures, introduction to dental floss, and simula-

tions using dental models (Figure 3). This gradual exposure is intended to increase familiarity and predictability before more direct participation in clinical activities.

The supervised practical phase (weeks 12-15) focuses on individualized practice of oral hygiene skills. Participants use plaque-disclosing solutions, practice toothbrushing and other hygiene procedures with facilitator support, and receive individualized guidance according to their abilities and support needs (Figure 4).

The final phase (weeks 16-17) includes reinforcement and practical review of the oral hygiene procedures addressed throughout the course, together with an oral examination and professional prophylaxis.

Table 1. Structure of the course "How to Maintain My Oral Health".

Phase	Weeks	Main purpose	Key activities
Theoretical learning	1-8	Introduce basic oral health concepts through accessible and adapted educational strategies.	Visual guides; interactive activities; narrated educational materials; dental models; hands-on learning activities.
Clinical familiarization	9-11	Promote progressive familiarity with the dental environment and oral hygiene procedures.	Guided visits to dental clinics; demonstrations of toothbrushing techniques; introduction to dental floss; simulations using dental models.
Supervised practical activities	12-15	Provide opportunities to practice individualized oral hygiene skills with facilitator support.	Plaque-disclosing solution; supervised toothbrushing; individualized guidance; adapted oral motor activities.
Reinforcement and closure	16-17	Reinforce previously addressed oral hygiene concepts and practices and complete the clinical component of the course.	Practical review of oral hygiene techniques; oral examination; professional prophylaxis.

Source: Authors' elaboration based on the implementation of the course (2015-2025).

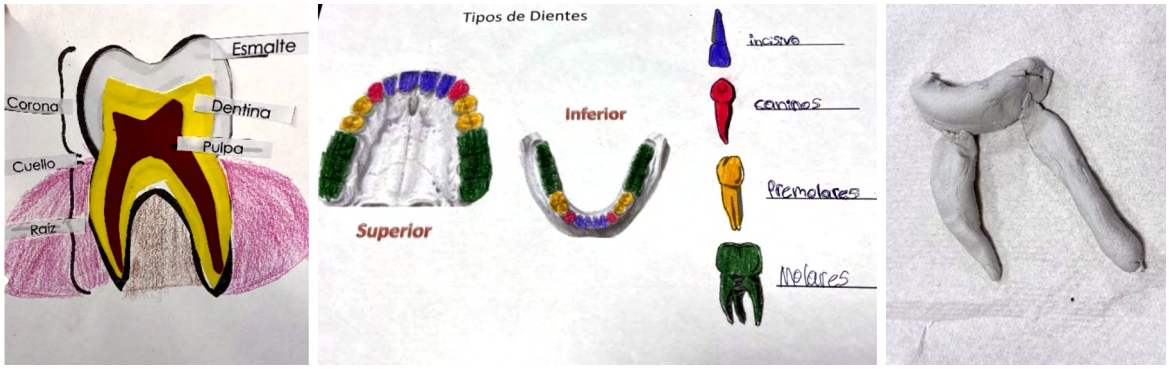

Figure 1. Examples of activities used during the theoretical phase to introduce basic dental anatomy through visual and hands-on learning strategies: (A) tooth structures, (B) tooth types, and (C) crown and root modeling.

Figure 2. Examples of adapted educational activities and visual learning materials used to introduce dental anatomy, dental caries, and periodontal conditions through interactive and hands-on teaching strategies.

Figure 3. Clinical familiarization activities involving guided exposure to the dental environment and demonstrations of oral hygiene procedures.

Figure 4. Examples of supervised practical and clinical activities: (A) use of plaque-disclosing solution, (B) individualized oral hygiene practice with facilitator support, and (C) oral examination and professional prophylaxis.

ROLE OF DENTAL STUDENT FACILITATORS

Undergraduate and postgraduate dental students participated voluntarily as facilitators under faculty supervision. Undergraduate facilitators were recruited from the third through sixth years of the dental curriculum, while postgraduate facilitators included residents enrolled in the Pediatric Dentistry program. Participation was not a curricular requirement. Students were invited to collaborate through announcements made during dental courses and through institutional email, and participation was limited to those who voluntarily expressed an interest in the project.

Undergraduate participation was offered from the third year onward because, by this stage of the dental curriculum, students had already received instruction in oral health education and acquired basic clinical experience relevant to the activities conducted within the program, including oral hygiene instruction and professional prophylaxis.

No disability-specific training or formal preparatory course was required before participation. This approach was intentional and reflected the program's inclusive philosophy: interaction with adults with cognitive disabilities was approached as person-to-person engagement rather than as an encounter requiring a predetermined set of behaviors based on disability status. Students participated directly in educational and practical activities under faculty supervision, adapting communication and assistance in response to each participant's individual characteristics, preferences, and support needs as these emerged during interaction.

During the program, student facilitators supported educational and practical activities, oral hygiene instruction, communication, clinical familiarization, and supervised preventive procedures. Facilitators were encouraged to communicate directly with participants, promote active participation and autonomy, and provide individualized assistance when needed without unnecessarily replacing tasks that participants were able to perform independently.

Student involvement was therefore an integral component of the program and provided direct experiential exposure to disability-inclusive oral health education and special care dentistry. However, because student participation was voluntary and no standardized assessment of student learning, attitudes, or competencies was conducted, educational outcomes among student facilitators were not evaluated in the present study.

ADAPTATION DURING THE COVID-19 PANDEMIC

During 2020 and 2021, the course was adapted to a virtual format because of restrictions on in-person university activities associated with the COVID-19 pandemic. Educational sessions were conducted remotely, and materials and supplies required for course activities were distributed to participants in advance. The adapted format allowed the educational component of the program to continue during these two academic years. In-person delivery resumed in 2022.

RESULTS

PARTICIPATION AND PROGRAM CONTINUITY

Since its implementation in 2015, "How to Maintain My Oral Health" has been offered continuously within PROIN. Between 2015 and 2025, 199 course enrollments were recorded, corresponding to a mean of 18.09 enrollments per year (Table 2). Annual enrollment ranged from 9 in 2017 to 30 in 2024.

Program continuity was maintained during the COVID-19 pandemic through adaptation to virtual delivery in 2020 and 2021, when 19 and 12 enrollments were recorded, respectively. In-person activities resumed in 2022. Enrollment subsequently

increased to 23 in 2023 and 29 in 2025, coinciding with the incorporation of the course as a mandatory component for first-year PROIN students.

Across the study period, nine annual cohorts were delivered in person and two virtually, documenting uninterrupted course delivery across different institutional and educational circumstances.

DOCUMENTED OBSERVATIONS DURING PROGRAM IMPLEMENTATION

Faculty and facilitator documentation generated across successive course cohorts described recurrent patterns of participant engagement during practical oral hygiene and clinical familiarization activities. Participants were documented engaging in toothbrushing practice, using dental floss with varying levels of assistance, following structured oral hygiene sequences, and participating in individualized practical activities with facilitator support.

Documentation from the clinical familiarization phase also reflected variability in the level of assistance required when participants interacted with dental instruments, entered clinical spaces, or participated in routine dental procedures. Repeated exposure, structured explanations, demonstrations, and individualized facilitator support were recurring strategies used to accommodate these differences throughout the course.

During supervised practical sessions, plaque-disclosing solutions provided a visual resource for identifying areas requiring additional attention during toothbrushing and allowed facilitators to provide individualized guidance. Across cohorts, faculty documentation consistently emphasized the need to adapt instruction, repetition, communication, and practical assistance to individual learning pace and functional abilities.

Because these observations were not collected using standardized assessment instruments, predefined indicators, or pre- and post-intervention measures, they are presented as descriptive implementation findings rather than evidence of effectiveness or participant-level change.

PARTICIPANT PERSPECTIVES RELATED TO THE ORAL HEALTH EDUCATION EXPERIENCE

Previously collected qualitative evidence provided complementary information regarding participants' experiences with the oral health course. During the 2021 qualitative study, participants who had previously attended "How to Maintain My Oral Health" were specifically asked what they had learned during the course. Participants identified learning related to oral structures, dental caries, toothbrushing, dental floss, and mouthwash use (Table 3).

Their accounts illustrate both conceptual and practical dimensions of the educational experience. Some participants emphasized understanding oral structures and dental caries, whereas others described learning or improving practical oral hygiene procedures. These perspectives correspond to the progression of the course from adapted theoretical instruction to supervised self-care activities.

These testimonies are presented as contextual qualitative evidence of participants' perceptions of their educational experience and should not be interpreted as standardized measures of learning or as evidence of effectiveness attributable to the program.

Table 2. Participation of PROIN students in the course "How to Maintain My Oral Health" (2015-2025).

Year	Number of enrollments	Delivery mode
2015	21	In-person
2016	13	In-person
2017	9	In-person
2018	12	In-person
2019	20	In-person
2020	19	Virtual
2021	12	Virtual
2022	11	In-person
2023	23	In-person
2024	30	In-person
2025	29	In-person
Total	199	—

Source: PROIN enrollment records, University of Costa Rica (2015-2025).

Table 3. Selected participant perspectives on learning experiences in the course "How to Maintain My Oral Health".

Participant testimony*	Educational dimension illustrated
"I learned to brush my teeth, use dental floss and mouthwash, and how to use toothbrushes and mouthwashes." (PROIN participant 9)	Oral self-care skills
"At first, I did not know how to brush my teeth properly. There, the teacher taught us how to use dental floss and mouthwash." (PROIN participant 18)	Acquisition of practical oral hygiene skills
"The parts… learning about the cheeks and the parts of the mouth." (PROIN participant 11)	Recognition of oral structures
"What I learned the most was about dental caries and what is inside the tooth." (PROIN participant 12)	Understanding of dental anatomy and oral disease

* Testimonies were collected during the qualitative component of the 2021 study among PROIN participants who had previously attended the oral health course and were translated from Spanish for the present manuscript. Source: Garita Herrera & Torres Montoya (13).

DISCUSSION

A sustained model of disability-inclusive oral health education.

This study describes the development and long-term implementation of a university-based oral health education program for adults with cognitive disabilities within an inclusive higher education setting. The principal contribution of this experience lies not in demonstrating intervention effectiveness, but in documenting a sustained educational model that combines adapted oral health education, practical self-care activities, progressive familiarization with the dental environment, individualized support, and participation of dental students as facilitators.

The continuity of the program from 2015 to 2025 represents an important feature of this

experience. Rather than functioning as an isolated educational activity, "How to Maintain My Oral Health" became progressively integrated into the educational opportunities offered through PROIN and, beginning in 2023, became a mandatory component for first-year participants. Continuity was also maintained during the COVID-19 pandemic through temporary adaptation to virtual delivery. Together, these characteristics document the sustained integration of oral health education within a broader institutional inclusion initiative and its adaptation to changing circumstances.

People with intellectual and cognitive disabilities continue to experience substantial disparities in oral health and access to preventive dental services (1,2,4,5,9,16,17). These disparities arise from interacting individual, environmental, educational, and health-system barriers and therefore cannot be addressed solely through conventional clinical treatment. Accessible oral health education may represent one component of a broader strategy to promote participation in self-care and facilitate engagement with preventive dental services (8,9,14,15). Within this context, the present experience illustrates how oral health promotion can be incorporated into an existing university-based inclusion program rather than delivered exclusively within traditional dental care settings.

FROM ACCESSIBLE EDUCATION TO PRACTICAL PARTICIPATION

A distinctive characteristic of the program is its progressive educational sequence. Participants first engage with basic concepts of dental anatomy, oral diseases, and prevention through visual, interactive, and hands-on activities before progressing to clinical familiarization and supervised oral hygiene practice. This sequence was intended to make oral health concepts and dental procedures more concrete and predictable and to provide opportunities for participants to engage with them at an individualized pace.

The inclusion of basic dental anatomy may be particularly relevant within this sequence. Rather than being taught as technical content, recognition of teeth and oral structures provides a concrete foundation for subsequently discussing dental caries, periodontal conditions, oral hygiene, and preventive practices. Previously collected participant perspectives included in the present study illustrate that participants recalled both conceptual content, such as oral structures and dental caries, and practical content related to toothbrushing, dental floss, and mouthwash use. These accounts should not be interpreted as standardized evidence of learning; however, they provide contextual support for the relevance of combining conceptual and practical components within accessible oral health education.

The program also emphasized individualized assistance rather than a uniform instructional approach. Participants differed in communication preferences, learning pace, functional abilities, and the amount of assistance required during practical activities. Accordingly, repetition, visual resources, demonstrations, communication, and facilitator assistance were adapted during interaction rather than determined exclusively by diagnostic labels. This approach is consistent with contemporary disability-inclusive and person-centered perspectives, which emphasize the removal of environmental and communication barriers and the provision of support according to individual needs (6,7).

Importantly, promoting autonomy within this model did not imply expecting all participants to perform oral hygiene procedures independently. Instead, the educational approach sought to identify what each participant could perform independently and where assistance remained appropriate. This distinction is relevant in populations with heterogeneous support needs, because autonomy may involve meaningful participation and supported decision-making rather than complete independence in every self-care activity.

PROGRESSIVE FAMILIARIZATION WITH THE DENTAL ENVIRONMENT

The integration of progressive clinical familiarization represents another relevant component of the program. People with disabilities may encounter barriers to dental care related not only to service availability but also to communication difficulties, previous experiences, unfamiliarity with dental procedures, and fear or anxiety associated with the clinical environment (16,17). For this reason, the program incorporated guided exposure to clinical spaces, instruments, oral hygiene procedures, and routine preventive care before and during supervised practical activities.

Within the program, clinical familiarization was not conceived as a formal behavioral intervention or as a treatment for dental anxiety. Rather, it provided repeated opportunities for participants to encounter elements of the dental environment in an educational and supportive context. Structured explanations, demonstrations, predictable routines, and repeated interaction with facilitators were used to increase familiarity with what occurs during dental care.

This distinction is important because the present study did not use validated measures of dental anxiety or behavioral acceptance and therefore cannot establish that familiarization reduced anxiety or improved subsequent dental attendance. Nevertheless, incorporating familiarity and predictability into oral health education may be particularly relevant for individuals who experience communication or environmental barriers when accessing dental care. Future studies should specifically evaluate whether this component influences dental anxiety, acceptance of preventive procedures, or subsequent use of oral health services.

DENTAL STUDENTS AS FACILITATORS: LEARNING THROUGH DIRECT INTERACTION

The participation of undergraduate and postgraduate dental students represents an additional characteristic of the model. Students participated voluntarily and entered the program after acquiring foundational curricular experience in oral health education and basic preventive clinical procedures. No disability-specific preparatory training was required before participation. Instead, students interacted directly with PROIN participants under faculty supervision and adapted their communication and assistance according to the characteristics and support needs that emerged during those interactions.

This approach reflects an important principle of the program: disability status was not treated as requiring a predetermined way of communicating or interacting with an individual. Participants were approached first as individuals, while accommodations and support were introduced when required. Such an approach does not disregard disability-related needs; rather, it avoids assuming that a diagnostic label alone determines a person's abilities, communication preferences, or required support.

Direct interaction with people with disabilities has been identified as an important component of dental education and may provide opportunities for students to encounter communication, accessibility, and person-centered care in authentic settings (10-12). Previous literature has also identified insufficient preparation and confidence regarding care for people with disabilities as continuing challenges within dental education (11,12,18). University-based initiatives that create sustained opportunities for interaction may there-

fore complement formal curricular teaching in special care dentistry.

However, the present study did not formally assess changes in student attitudes, empathy, communication skills, confidence, or clinical competencies. Consequently, no conclusions can be drawn regarding the educational effectiveness of student participation. The relevance of the facilitator model in the present study lies instead in demonstrating how dental students can be incorporated into disability-inclusive oral health education while simultaneously receiving direct experiential exposure to people with cognitive disabilities.

INSTITUTIONAL RELEVANCE AND POTENTIAL TRANSFERABILITY

The relationship among PROIN, PRACIOD, and the Faculty of Dentistry is central to understanding the sustainability of the program. PROIN provides an established inclusive educational environment and a population already participating in university-based learning, while PRACIOD and the Faculty of Dentistry contribute oral health expertise, educational resources, clinical facilities, faculty supervision, and student facilitators. The program therefore operates through collaboration between an inclusion initiative and an academic dental setting rather than as an isolated oral health intervention.

This institutional integration may represent one of the most transferable aspects of the experience. Replication would not necessarily require an identical 17-week course or the same institutional structure. Instead, potentially transferable components include collaboration with disability or community organizations, accessible educational materials, progressive movement from conceptual learning to practical activities, individualized support, familiarization with the dental environment, and supervised involvement of dental students.

At the same time, transferability should be considered in relation to local resources, educational systems, participant characteristics, and available support structures. The present program was developed within a public university with an established inclusion initiative and therefore benefited from institutional conditions that may not be available in all settings. Adaptation rather than direct replication may consequently be necessary when implementing similar approaches elsewhere.

STRENGTHS AND LIMITATIONS

A principal strength of this study is the documentation of a program sustained over more than a decade within a university-based inclusion initiative. The availability of institutional enrollment records, educational materials, documentation across successive cohorts, and previously collected participant perspectives allowed the program to be described from complementary sources. The study also provides detailed information on the educational sequence, adaptations, clinical familiarization activities, and role of student facilitators, which may assist other institutions interested in developing disability-inclusive oral health education initiatives.

Several limitations must nevertheless be acknowledged. The retrospective descriptive design was based primarily on documentation generated during routine program implementation rather than on a prospectively designed evaluation framework. Standardized measures of oral health knowledge, oral hygiene performance, dental anxiety, self-efficacy, clinical outcomes, or access to dental care were not collected systematically across cohorts. Consequently, the study cannot determine whether

participation resulted in measurable changes in these outcomes or establish causal relationships between the program and participant experiences.

Faculty and facilitator observations were not recorded using a standardized observational instrument and may therefore be affected by observer subjectivity and variability in documentation across years. Similarly, the qualitative participant perspectives incorporated into the present study were obtained previously from a subgroup of PROIN participants as part of a separate qualitative investigation (13) and were used here only as complementary contextual evidence. They should not be interpreted as a longitudinal evaluation of the program or as representative of all individuals who participated between 2015 and 2025.

The use of enrollment counts also does not necessarily represent the number of unique individuals exposed to the program, because some participants may have enrolled more than once during the study period. Finally, dental student participation was voluntary, and no systematic information on student outcomes was collected; therefore, the educational effects of facilitator participation cannot be evaluated from the present data.

Future research should build upon this institutional experience using prospective evaluation designs and validated measures. Assessments of oral health knowledge and self-care skills before and after participation, standardized measures of dental anxiety and participant experience, and longer-term follow-up of oral health behaviours and dental service use would help determine whether the components described here translate into measurable outcomes. Evaluation of dental student attitudes, communication skills, and competencies before and after participation would also allow the educational implications of the facilitator model to be examined more rigorously.

CONCLUSION

This long-term institutional experience demonstrates the sustained implementation of a disability-inclusive oral health education program for adults with cognitive disabilities within a university setting. The program integrates accessible theoretical education, practical oral hygiene activities, individualized support, progressive familiarization with the dental environment, and supervised participation of dental students within a structured educational sequence.

The experience highlights the potential role of collaboration between university inclusion initiatives and dental schools in creating accessible oral health promotion opportunities while providing dental students with direct exposure to disability-inclusive care. Rather than establishing program effectiveness, this study provides a detailed and potentially transferable model of implementation that may inform the development and adaptation of similar initiatives in other educational and community settings. Prospective studies incorporating standardized participant- and student-level outcomes are needed to evaluate the effects of these approaches on oral health behaviours, experiences with dental care, and professional education.

DECLARATIONS

AUTHOR CONTRIBUTION STATEMENT: Conceptualization and design: A.G.F.; Literature review: A.G.F. and A.G.H.; Methodology and validation: A.G.F. and A.G.H.; Formal analysis: A.G.F. and A.G.H.; Research and data collection: A.G.F. and A.G.H.; Resources: A.G.F. and A.G.H.; Data analysis and interpretation: A.G.F. and A.G.H.; Original draft preparation and writing: A.G.F. and A.G.H.; Writing, review, and editing: A.G.F. and A.G.H.; Supervision: A.G.F.; Project administration: A.G.F.; Funding acquisition: Not applicable for this study.

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