

Oral health education materials for people with visual disabilities and people who are blind: magnified booklet, Braille booklet, and audio description

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Abstract

This study aimed to produce educational oral health materials to improve the communication between dentists and people with visual disabilities and people who are blind. A literature search was conducted on Google Scholar, SciELO, and Virtual Health Library by using the descriptors: Visually Impaired Persons, Health Promotion, and Health Education. Twenty English or Portuguese-written records published after 2010 were selected and reviewed to produce an easy-to-understand educational booklet on tooth brushing, dental caries, and periodontal medicine. A 10-page magnified booklet was printed on A3-size paper with a 14-point font size. Then, the booklet was transcribed to Braille and produced by a specialized company on A4-size and 120-gsm papers and finished with a plastic cover and black spiral. Next, the PDF file of the magnified booklet was loaded into an artificial intelligence app and converted into a female-narrated video. The video was imported to a music production platform to extract the audio description file (9 minutes and 46 seconds). Oral health education and motivation for oral self-care are important for the autonomy of visually impaired individuals. The production of educational materials such as magnified booklet, Braille booklet, and audio description on several dentistry topics seem efficient tools to provide adequate care to visually impaired patients.

Descriptors: Visually Impaired Persons. Health Promotion. Health Education.

Materiales educativos sobre salud bucal para personas con discapacidad visual y personas ciegas: folleto ampliado, folleto en braille y audiodescripción.

Resumen

Este estudio tuvo como objetivo producir materiales educativos sobre salud bucal para mejorar la comunicación entre dentistas y personas ciegas y con discapacidad visual. Se realizó una búsqueda bibliográfica en Google Académico, SciELO y la Biblioteca Virtual de Salud utilizando los descriptores: Personas con Discapacidad Visual, Promoción de la Salud y Educación para la Salud. Se seleccionaron y revisaron veinte registros escritos en inglés o portugués, publicados después de 2010, para producir un folleto educativo fácil de entender sobre cepillado dental, caries dental y periodontología. Se imprimió un folleto ampliado de 10 páginas en papel tamaño A3 con fuente de 14 puntos. Posteriormente, el folleto se transcribió a braille y fue producido por una empresa especializada en papel tamaño A4 de 120 g/m², con cubierta de plástico y espiral negra. A continuación, el archivo PDF del folleto ampliado se cargó en una aplicación de inteligencia artificial y se convirtió en un video narrado por una mujer. El video se importó a una plataforma de producción musical para extraer el archivo de audiodescripción (9 minutos y 46 segundos). La educación en salud bucodental y la motivación para el autocuidado bucal son importantes para la autonomía de las personas con discapacidad visual. La producción de materiales educativos, como folletos ampliados, folletos en braille y audiodescripción sobre diversos temas odontológicos, parece ser una herramienta eficaz para brindar una atención adecuada a los pacientes con discapacidad visual.

Descriptor: Personas con Discapacidad Visual. Promoción de la Salud. Educación para la Salud.

Materiais didáticos de saúde oral para pessoas com deficiência visual e pessoas cegas: cartilha ampliada, cartilha em Braille e audiodescrição

Resumo

Este estudo teve como objetivo produzir materiais educativos sobre saúde bucal para melhorar a comunicação entre dentistas e pessoas com deficiência visual e cegas. Foi realizada uma busca bibliográfica no Google Acadêmico, SciELO e Biblioteca Virtual em Saúde usando os descritores: Pessoas com Deficiência Visual, Promoção da Saúde e Educação em Saúde. Vinte registros escritos em inglês ou português publicados após 2010 foram selecionados e revisados para produzir um livreto educativo de fácil compreensão sobre escovação dentária, cárie dentária e medicina periodontal. Um livreto ampliado de 10 páginas foi impresso em papel tamanho A3 com fonte tamanho 14. Em seguida, o livreto foi transcrito para Braille e produzido por uma empresa especializada em papéis tamanho A4 e 120 g/m² e finalizado com capa plástica e espiral preta. Em seguida, o arquivo PDF do livreto ampliado foi carregado em um aplicativo de inteligência artificial e convertido em um vídeo narrado por mulheres. O vídeo foi importado para uma plataforma de produção musical para extrair o arquivo de audiodescrição (9 minutos e 46 segundos). Educação em saúde bucal e motivação para autocuidado bucal são importantes para a autonomia de indivíduos com deficiência visual. A produção de materiais educacionais como livreto ampliado, livreto em Braille e audiodescrição sobre diversos tópicos odontológicos parecem ferramentas eficientes para fornecer cuidados adequados a pacientes com deficiência visual.

Descritores: Pessoas com Deficiência Visual. Promoção da Saúde. Educação em Saúde.

INTRODUCTION

According to Sasaki (2009)¹, the responsibility for promoting inclusion lies with society itself, which must adapt to accommodate the diverse needs of its citizens by actively involving them in identifying barriers and developing solutions. The author proposes a comprehensive approach to accessibility, structured into six interdependent dimensions, architectural, communicational, methodological, instrumental, programmatic, and attitudinal, emphasizing that the absence of any one of them may compromise the effectiveness of the others. According to the 2022 Census conducted by the Brazilian Institute of Geography and Statistics (IBGE), approximately 14.4 million people, representing 7.3% of the population aged 2 years and older, reported having some type of functional disability. Among these, visual impairment, even when using glasses or contact lenses, was the most prevalent, affecting approximately 7.9 million individuals, which corresponds to 4.0% of the population in this age group². The Central-West and North regions have the highest percentages (33.3% and 32.7%, respectively) of people with visual disabilities and people who are blind, who face diverse challenges such as physical barriers, adaptation to educational process, social integration, and routine activities (dressing, eating, and personal hygiene)³. The Brazilian Law for the Inclusion of Persons with Disabilities (LBI – Law No. 13,146/2015) represents a significant advancement in the protection of the rights of people with disabilities in Brazil. Among its various provisions, the law guarantees the right to access assistive technologies, which are essential to promote autonomy and ensure full participation in society. This provision is particularly important for people with visual disabilities and people who are blind, as it enables the use of adaptive resources that facilitate their educational, social, and professional development⁴. In addition, these individuals usually do not have proper knowledge access, educational support, and specialized healthcare. Considering that speech and hearing of visually people with visual disabilities and people who are blind individuals are still preserved, their visual conditions must not represent the end of a full and productive life⁵.

Dentistry has been increasingly focusing on prevention, in which patients need to be educated and motivated⁶. However, dental care for people with visual disabilities and people who are blind is still underdeveloped in Brazil. Therefore, oral health education and promotion programs that improve the autonomy and self-care of these patients are increasingly necessary^{7,8}. Although people with visual disabilities and people who are blind not necessarily related to a low level of oral health, patients with low vision or blindness have difficulty conducting self-examinations to detect clinical signs of oral diseases and consequently follow preventive methods and healthy habits^{9,10}. Considering that bacterial plaque

accumulation is the main etiological factor of both caries and periodontal disease, its disorganization through adequate toothbrushing and flossing is still the most effective preventive method.

Individuals people with visual disabilities and people who are blind have difficulty performing adequate oral hygiene¹¹. The tactile sense must be explored to develop memory and create a spatial representation of objects¹². Thus, educational materials are important tools to promote, prevent, and maintain oral health. Several teaching resources have been developed to improve the education of people with visual disabilities and people who are blind such as the soroban (calculating tool), audiobooks, and Braille books. The Braille system makes the written word accessible through raised dots arranged regularly in quadrangular cell spaces and read through finger touching¹³.

Braille reading can favor oral health learning inside and outside the dental clinic; however, its combination with multisensory methods significantly improves oral health education of people with visual disabilities and people who are blind². Although individuals with low vision can also use the Braille system for reading and writing, magnified booklets are alternative educational methods for these individuals¹⁴.

Strengthening the relationship among dentists (or dental students) and people with visual disabilities and people who are blind through an easy-to-understand is expected to improve their knowledge of the main oral education topics and eliminate the need for a third person to mediate communication, which may ensure safer care without violating patients' privacy. Therefore, this study aimed to produce educational oral health materials (magnified booklet, Braille booklet, and audio description) to improve the communication between dentists and people with visual disabilities and people who are blind.

EXPERIENCE REPORT

A literature search was conducted on three scientific databases (Google Scholar, SciELO, and Virtual Health Library) by using the following DeCS health science descriptors: Visually Impaired Persons, Health Promotion, and Health Education.

Twenty out of 22 records were selected after applying the following inclusion criteria: English and Portuguese language, publication after 2010, and strict relation with the research subject.

After reviewing the scientific evidence reported in the 20 records, an easy-to-understand educational booklet on tooth brushing, dental caries, and periodontal medicine was written in Portuguese and saved as a PDF file. Each chapter encompassed one topic, which followed the chronological order of oral health issues to simplify the teaching-learning process for people with visual disabilities and people who are blind. A magnified booklet was produced by a conventional printing shop on A3-size paper with a 14-point League Spartan font size.

Then, the booklet was transcribed to Braille and produced by a specialized company on A4-size and 120-gsm papers and finished with a plastic cover and black spiral.

Next, the PDF file of the magnified booklet was loaded into an artificial intelligence app (www.getpeech.com) and converted into a female-narrated video. Next, the video was imported to a free online music production platform (www.bandlab.com) to extract the audio description file.

The 10-page magnified oral health booklet (Figure 1) begins with an orientation on the correct use of dental floss, followed by a description of toothbrush and toothpaste types for adequate toothbrushing. The second page explains the use of mouthrinses. The following pages encompass the topics: cleaning dentures, cleaning teeth with orthodontic braces, floss threader, single tufted brush, and interdental brushes.

The sixth page explains the diseases related to inadequate oral hygiene: caries lesion, gingivitis, periodontitis, and halitosis (Figure 2). Next, the following topics were explained: caries-inducing diet, detrimental effects of acidic foods on teeth, and the importance of periodontal medicine (relationship between systemic and oral health).

The 12-page dual-sided Braille booklet contained the same content of the magnified booklet (Figure 3). The audio description file of the oral health educational material had 9 minutes and 46 seconds.

Since most people with visual disabilities and people who are blind are unaware of the etiology and progression of oral diseases, adequate guidance (particularly on toothbrushing and flossing) is necessary; however, the lack of specific resources jeopardizes dental care⁹.

Oral health education for people with visual disabilities and people who are blind requires resources with tactile stimuli that meet different vision conditions⁵. Figueiredo et al. (2022)⁶ highlighted the efficiency of multisensory methods such as the combination of Braille material and audio description to improve oral health education since they allow greater

sensory exploration and the development of diverse perceptive capabilities. Paula (2020)¹⁵ observed that the use of a playful reading guide provided adequate instruction and learning on oral hygiene and contributed to the prevention of oral diseases in children with people with visual disabilities and people who are blind. Therefore, the educational materials produced in this study are expected to improve the oral health of people with visual disabilities and people who are blind, particularly in the geographic context of the Brazilian northern region.

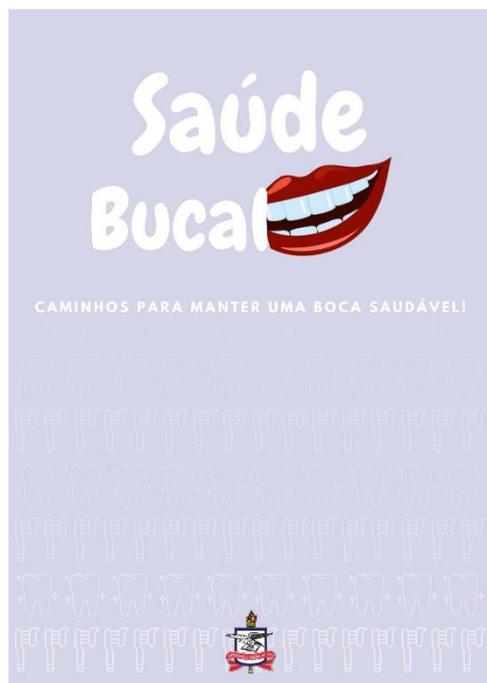


Figure 1. Cover of the magnified oral health booklet.



Figure 2. Page 6 of the magnified oral health booklet.



Figure 3. Visually impaired individual reading the Braille oral health booklet.

Braille is a tactile tool that allows sharing several oral health topics for individuals with low vision or blindness. Figueiredo et al. (2022)⁶ and Mahantesha et al. (2015)¹⁶ also reported the effectiveness of Braille material, audiobooks, and magnified booklets in motivating and educating patients with people with visual disabilities and people who are blind. Audio-descriptive materials and magnified booklets also figure as simple and effective tools to provide guidance and health promotion. Rocha et al. (2021)¹⁷ and Carlos (2022)¹⁴ observed that these alternative materials disseminate

information contained in traditional materials through a communication channel that allows listening, reading, and touching.

The educational materials produced in this study are expected to provide autonomy in oral health information for the largest possible number of individuals with people with visual disabilities and people who are blind. Luque e Martins (2022)¹² emphasized that technological pedagogical tools can establish communication with pre-established information; thus, people with visual disabilities and people who are blind can feel safer learning at their own pace. It is important to emphasize that learning about oral prevention stimulates self-care, which consequently may prevent oral diseases. Oro Cericato et al. (2013)³ highlighted that most patients only seek dental care after the onset of oral diseases; thus, playful educational materials that facilitate the understanding of oral health are essential, particularly for individuals with low vision or blindness.

Although the use of multisensory resources is essential to improve the teaching and learning of patients with people with visual disabilities and people who are blind, several improvements are still needed. The implementation of oral health education strategies for this population is mandatory for adequate dental care since meaningful learning must take into account the sensory integration of patients with low vision or blindness, and consequently lead to the development of autonomy and independence.

FINAL CONSIDERATIONS

Oral health education and motivation for oral self-care are important for the autonomy of people with visual disabilities and people who are blind. The production of educational materials such as magnified booklet, Braille booklet, and audio description on several dentistry topics seem efficient tools to provide adequate care to people with visual disabilities and people who are blind.

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