

## Oral hygiene management in patients with visual sensory disabilities

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### Abstract

**Aim:** Oral hygiene maintenance is one of the most difficult tasks for visually impaired people. The aim of study was to investigate about knowledge on oral hygiene practices among patients with visual sensory disabilities by proposing an effective management in order to achieve and maintain oral health status of these patients. **Methods:** It was administered a questionnaire about oral health management to the patients with visual disabilities accessing to dental unit of "Mons. Di Liegro" Hospital of Gaeta.

**Results:** The survey covered a sample of 49 patients, aged between 14 and 95 years. More than half (66%) was blind (65% of cases with primary blindness and the remaining 35% with secondary blindness).

Only 32.65% brushed their teeth 3 times a day; 68% of the surveyed patients limited home oral hygiene procedures to toothbrush and toothpaste; 79% used manual toothbrush; 49% of respondents reported odontophobia (it was basically generated by pain) often due to bad experience during childhood. More than half declared a dental office attendance as needed.

**Conclusions:** This study showed as, although starting from a compromised oral health and inadequate knowledge of oral hygiene practices, visual impaired/ blind patients were able to achieve and maintain a good level of oral hygiene, using the most appropriate techniques and instruments.

**Keywords:** oral hygiene, oral health status, visual impairment, blindness.

### Introduction

The World Health Organization defines health as "a state of complete physical, mental and social wellbeing and not merely the absence of sickness or infirmity." The attainment of a state of optimal health is a fundamental right and a social objective to be pursued. Oral health is an inescapable component of overall health [1,2]. The handicap is a condition that leads to a limitation of the opportunity to take part in community life compared to the other "normal" individuals due to physical or social barriers [3]. Vision is the most important way to interpret the environment around us, and when this is impaired in

early childhood, it can have negative effects on physical, neurological, cognitive and emotional development [4].

WHO considers the visual impairment a priority issue at the international level. The most recent estimates indicate 285 million people with visual disabilities in the world: 39 million are blind, and 246 million have low vision [5]. In Italy 4.5 people per 1,000 inhabitants are visually impaired and in 2005 362,000 were blind [6]. They are not evenly distributed throughout the country. In the Region of Lombardy, for example, in a population of 9,917,714 individuals there are about 13,907 ones; in Sicily, there are 18,028 visually impaired people on 5,051,075 inhabitants; Lazio has 11,482 ones on a population of 5,728,688; Valle d'Aosta 260 of 128,230 inhabitants [7].

Oral health of disabled patients is frequently recognized as secondary importance to the debilitating disease, according to what is commonly referred to as a "halo effect" [8]. Clinical studies, in fact, show how visually impaired / blind patients generally have a state of compromised oral health [9], with a high prevalence of caries and / or periodontal problems [10]. The studies authored by Anaise in Israel, Shaw et al. in the UK, and Purohit et al. in southern India, show little care of the oral health. However, not a few discrepancies in the relevant scientific research data were detected [11]. The hypothesis is that the determinants of health, such as socio-economic or cultural conditions, influence this condition, beyond the disability [12,13]. In fact, the scientific literature shows that these patients often have limited knowledge about oral health.

Oral hygiene maintenance is one of the most difficult tasks for visually impaired people because they are not able to detect and recognize oral disease early and could not be able to act promptly, if not adequately informed. Unfortunately, the conventional methods of teaching oral hygiene management such as using visual aids and brochures agents do not help the blind subjects needing touch and hearing to learn [14]. For these reasons, communication used to educate for oral health should be amended to adapt it to their disabilities.

The aim of study was to investigate about knowledge on oral hygiene practices among patients with visual sensory disabilities by proposing an effective management in order to achieve and maintain oral health status of these patients.

## Materials and methods

The study took place between January and October 2015 in the Unit of Dentistry at "Monsignor Luigi Di Liegro " hospital of Gaeta, province of Latina. It was carried out a qualitative study by means of a questionnaire consisting of 45 questions, administered to subjects who received care for themselves or their family members with disabilities.

The survey was conducted through an interview "Face to Face" by a dental hygienist, for patients referring to the Unit. The administration benefited from a form created with Google Forms program that allowed to spread a link to click in order to gain access to the questionnaire. The link was connected to a Worksheet Google into which the completed forms flowed.

The questionnaire investigated cooperation degree, level of autonomy, kind of visual impairment, bad habits, self-evaluation of oral health at the present time and habits of oral health homecare, eventual problems of access to oral care and specific clinical oral diseases.

After questionnaire administration, we proceeded with the collection of personal data and medical history, in an appropriate form. Then the patients were visited in order to check their oral health status and guarantee to the

subjects achievement and maintenance of good oral hygiene, conquering the highest degree of autonomy in home care maneuvers. It was ensured a barrier free environment inside the dental Unit (see **Table 1**).

The operator adopted a focused approach based on effective communication and behavioral intervention (see **Table 2**) [15, 16].

They were introduced a number of techniques favoring some skills acquisition: prompting and fading; shaping and chaining; modeling; reinforcement techniques. These techniques were used either during professional treatment or during education and motivation to oral hygiene homecare procedures. The patient gradually received more and more complete instructions for the maintenance of oral hygiene based on correct brushing and most suitable devices to use. In order to provide self-assessment of oral hygiene techniques it has been taught to the patient how to take advantage of lingual sensitivity and Rosenberg's organoleptic tests [17] such as wrist lick test, floss test, spoon test. Normally these tests are used by clinicians but they really have an easy and functional application for the same patients. The participants were enrolled in the study after signing an informed consent previously approved by the institutional review board of territorial NHS facilities. The study protocol was conformed to the ethical guidelines of the 1975 Declaration of Helsinki.

## Results

The survey covered a sample of 49 patients, equally distributed between men and women, aged between 14 and 95 years. More than half (66%) was blind (65% of cases with primary blindness and the remaining 35% with secondary blindness).

Only 32.65% brushed their teeth 3 times a day, but the items about kind of aids used and frequency of daily oral hygiene found a very variable picture of habits (**Fig. 1**).

Manual toothbrush was used by 79% of respondents against 20% who used an electric toothbrush. There were no substantial differences between these two groups in the habit of using other tools to complete oral hygiene homecare (interdental brushes, floss). 30% of manual toothbrush users did not clean interproximal spaces. Electric toothbrush users were male for 71% of cases, having a medium-high education (mostly graduates), employed or students, and aged between 20 and 60 years. 68% of the surveyed patients limited home oral hygiene procedures to the toothbrush and toothpaste. Only two patients, because of their complete edentulism, adopted other methods for oral hygiene (gauze, prosthesis disinfectants). The lowest percentages in the sample interviewed about the use of dental floss and brush was in

age groups where limited mobility and age still played a significant role (especially elderly and younger) or where socioeconomic determinants acted. More than half declared a dental office attendance as needed (Fig. 2). 49% of respondents reported odontophobia (it was basically generated by pain) often due to bad experience during childhood (Fig. 3).

### Discussion and Conclusion

This study showed as, although starting from a compromised oral health and inadequate knowledge of oral hygiene practices, visual impaired/ blind patients were able

to achieve and maintain a good level of oral hygiene, using the most appropriate instruments and adopting healthy lifestyles. This was possible thanks to the approach aimed to solicit the other senses, together with behavioral intervention techniques for a perceptual and motor training and recourse to effective communication [18,19], used in dentistry in the approach with other forms of disability [20], and generally adopted for the teaching of basic activities for the visually impaired disabled [21].

With this study it was intended to represent differences among patients in terms of health needs and service expectations.

Table 1: Techniques used for space management of visually impaired patients

Techniques used for space management during dental practice with patients having visual sensory disabilities
Preparing tracks, signals and tactile maps for orientation
Provide a furniture free of sharp edges, with hidden openings, edges and soft material handles
Avoid the presence of pending and / or protruding obstacles
Avoid noise disturbances
Keep the lights low for patients with sensitivity and properly direct the light beam of the lamp
Working in synergy with dental team members
Do not crowd the operating room
Allow access to guiding dogs

More in particular, it has helped to adopt specific strategies for a non generalized management of special needs patient. Despite the visual impairment is one of the most disabling handicap, even at community health level, and although it is often associated to compromised oral health, with impaired oral health, in dentistry it does not imply the use of specialized facilities.

Each dental hygienist, at the office, focusing on prevention and implementing the most appropriate

approach ( from behavioral intervention techniques to the teaching of some self-made organoleptic tests) may accompany the visually impaired patient to maintain a good level of oral health autonomously, decreasing the number of complex and invasive interventions. This influences the overall well-being of the patient, whose oral health is an integral part, but also self-esteem promoting social integration and empowerment. Hence the importance of a targeted training and updating for dental hygienists, focusing on operator-patient communication.

Table 2. Techniques used for management of visually impaired patients in a dental office

Techniques implemented during dental practice	
<i>Bridging</i>	Patient holds in his hand the same object that the operator uses to stimulate knowledge through the residues senses.
<i>Chaining</i>	Decomposition of complex actions in individual abilities to perform in a behavioral chain
<i>Distraction</i>	The patient is distracted by a stressful situation with objects to hold, gentle touch and talking.
<i>Regressing Guide</i>	Expanding "hand in hand" technique. The operator initially guides the assisted hand, then his wrist and then the forearm, to give the patient gradual feeling of achieving self-efficacious movements.
<i>Exposure and Response Prevention-( ERP)</i>	Gradually the feared stimulus is associated with calming stimuli.
<i>Feedbacks</i>	Give and elicit feedbacks means having interactive signals with control function of receiving and understanding of the message and take the pulse of the patient's feelings.
<i>Hand in hand</i>	The operator's hand holds the patient's hand and guides it in the performance of an activity.
<i>Verbal and non-verbal positive reinforcement</i>	Incentive that motivates you have and repeat a certain behavior.
<i>Sequential brushing schemes</i>	Brushing of teeth surfaces is performed according to systematically repeated sequences.
<i>Self organoleptic tests</i>	organoleptic test series for self-assessment of oral hygiene
<i>Shaping</i>	Stimulus modulation; the patient is gradually approached to therapy by evaluating and respecting his collaborative chances from some preliminary actions.
<i>Tell-feel-do</i>	The operator explains to the patient what is about to turn, then the patient feels with the vicariant senses the instrument and then the clinician proceeds to action.
<i>Tongue assessment</i>	The patient is accustomed to self-evaluate hygiene condition of tooth surfaces by tongue wiping and exploiting the sensitivity.

Figure 1. kind of homecare oral hygiene and daily frequency

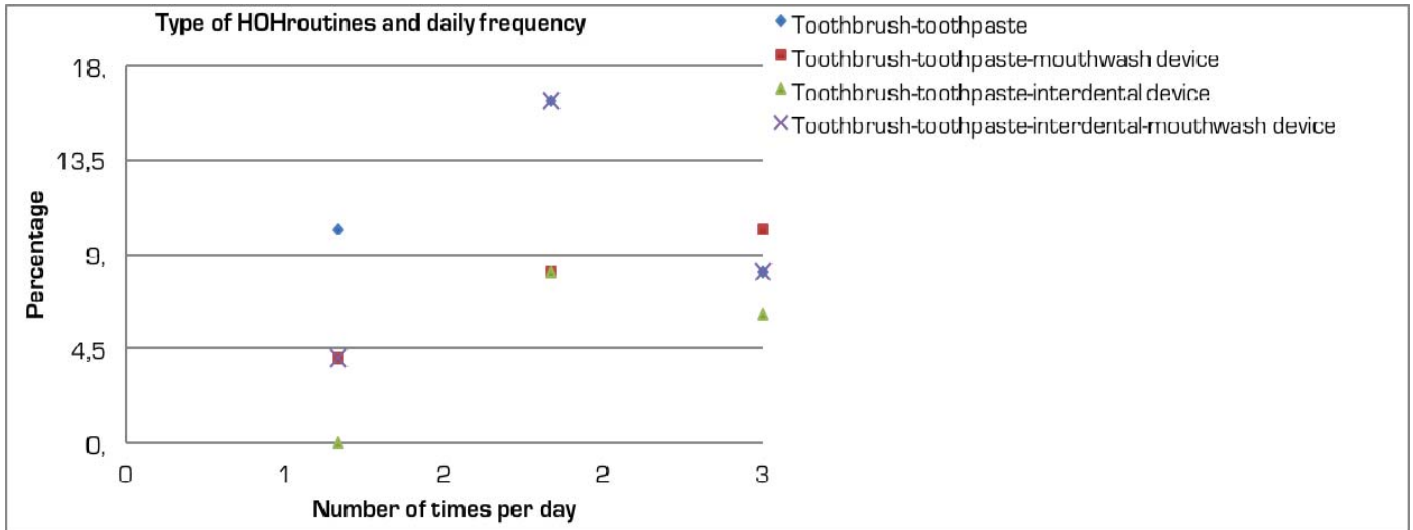


Figure 2. Frequency of dental office attendance (on the horizontal axis: 1 = never, 2 = rarely, 3 = as needed; 4 = 1 once a year; 5 = more than once a year)

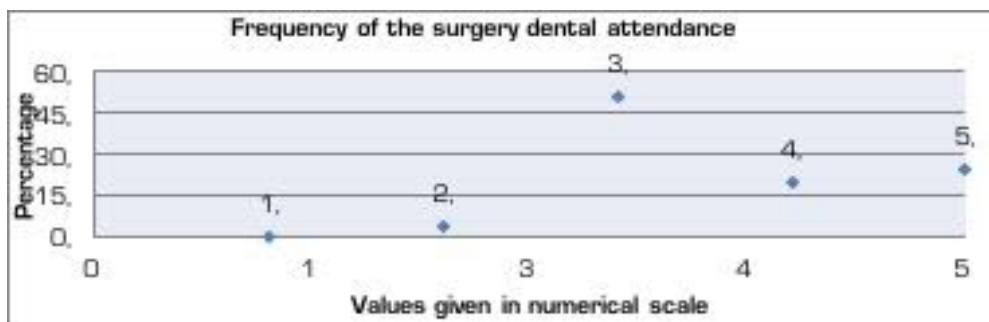
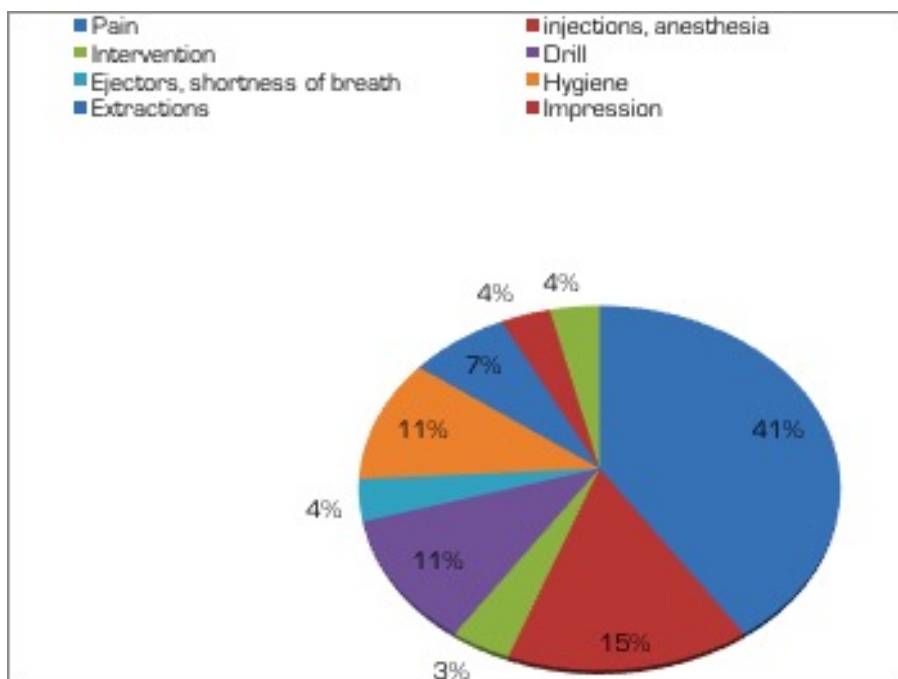


Figure 3. Causes of odontophobia in the respondents answers



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## References

- Peter S, editor. Introduction to public health dentistry. In: Essentials of Preventive and Community Dentistry. 2 nd ed. New Delhi: Sudhir Kumar Arya, Arya Medi Publishing House; 2003. p. 120.
- Sandeep V, Vinay C, Madhuri V, Rao VV, Uloopi KS, Sekhar RC. Impact of visual instruction on oral hygiene status of children with hearing impairment. *J Indian Soc Pedod Prev Dent* 2014;32:3943.
- Raj S. Living with a disability: A perspective on disability in people living with schizophrenia. *Int J Psychosoc Rehabil* 2013;18:11523.
- WHO, Global data on visual impairments 2010. Geneva, 2012 (<http://www.who.int/blindness/GLOBALDATAFINALforweb.pdf?ua=1>).
- Relazione al Parlamento sullo stato d'attuazione delle politiche inerenti la prevenzione della cecità, educazione e riabilitazione visiva (L. 284/97 art. 2 c. 7). Roma, settembre 2014, p. 4. ([http://www.salute.gov.it/imgs/C\\_17\\_pubblicazioni\\_225\\_allegato.pdf](http://www.salute.gov.it/imgs/C_17_pubblicazioni_225_allegato.pdf)).
- [http://www.salute.gov.it/portale/temi/p2\\_6.jsp?lingua=italiano&id=2389&area=prevenzioneIprovisione&menu=prevenzione](http://www.salute.gov.it/portale/temi/p2_6.jsp?lingua=italiano&id=2389&area=prevenzioneIprovisione&menu=prevenzione).
- Kumar RV, Fareed N, Shanthi M. The effectiveness of oral health education program with and without involving self-maintainable oral hygiene skills among the visually impaired children. *Int J Sci Study* 2013;1:519.
- Stiefel DJ. Dental care considerations for disabled adults. *Spec Care Dentist* 2002;22(3 Suppl):26S39S.
- Van Palenstein Helderma WH, Munck L, Mushendwa S, van't Hof MA, Mrema FG. Effect evaluation of an oral health education programme in primary schools in Tanzania. *Community Dent Oral Epidemiol* 1997;25:296300.
- Lim LP, Davies WI, Yuen KW, Ma MH. Comparison of modes of oral hygiene instruction in improving gingival health. *J Clin Periodontol* 1996;23:6937.
- Rodrigues JA, dos Santos PA, Baseggio W, Corona SA, PalmaDibb RG, Garcia PP. Oral hygiene indirect instruction and periodic reinforcements: Effects on index plaque in schoolchildren. *J Clin Pediatr Dent* 2009;34:314.
- Leal SC, Bezerra AC, de Toledo OA. Effectiveness of teaching methods for toothbrushing in preschool children. *Braz Dent J* 2002;13:1336.
- Nowak AJ, editor. Dental care for the handicapped patient Past, present, future. In: Dentistry for the Handicapped Patient. 1 st ed. St. Louis, MO: C V Mosby; 1976. p. 320.
- Winstanley ML. A synopsis of the project to evaluate the use of a Braille text and tactile aids when teaching dental health to blind children. *Br Dent Surg Assist.* 1983;42:20–3.
- Rosenberg M, McCulloch CA. (1992). Measurement of oral malodor: current methods and future prospects. *J Periodontol* 1992;63:776-82.
- Rosenberg M et al. Study on the Organoleptic Intensity Scale for Measuring Oral Malodor. *J Dent Res* 2004; 83(1): 81-85.
- Scardina G.A. et al. Mantenimento della salute orale nei pazienti non vedenti: valutazione dell'efficacia dei programmi di istruzione. *Ig Sanità Pubbl.* 2008 Jul-Aug;64(4):509-16.
- Rönnberg J, Borg E. A review and evaluation of research on the deaf-blind from perceptual, communicative, social and rehabilitative perspectives. *Scand Audiol.* 2001;30(2):67-77.
- Levrini L. et al. (2012). Educazione al dialogo nella professione dell'Igienista Dentale: utilizzo del role playing quale metodo di apprendimento. *Rivista Italiana di Igiene Dentale, Mag-Ago* 2012; 8(2):73-77.
- Chalmers J.M. behavior management and communication strategies for dental professionals when caring with patient with dementia. *Special Care in Dentistry* 2000; 20(4):147-154.
- Ivy S.E, Hatton D. Teaching skill acquisition to individuals with blindness: a systematic review of response-prompting Procedures. In: Hatton DD. ed: Current issue in the education of Students with visual impairments (International review of Reseach in developmental disabilities) 2014.