

Assessment of Dental Anxiety Using Braille Leaflet and Audio Dental Health Education Methods in Visually Impaired Children

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Abstract

Background: Dental anxiety is a patient's anxiety response to dentistry due to lack of education on dental health care; it often causes problems during dental check-ups. Visual impairment is a common term for individuals with sight disturbances. This condition affects the individual's access to dental health education, causing high anxiety and accompanying poor dental health. Aim: To compare dental health education approaches in visually impaired children using Braille Leaflet Dental Health Education (BLDHE) and Audio Dental Health Education (ADHE) methods. Methods: This is a clinical experimental study of 40 visually impaired children who were given neither BLDHE or ADHE. The Modified Dental Anxiety Scale (MDAS) questionnaire, in Braille, was used to measure dental anxiety. Results: Unpaired t-test statistical analyses showed a significant difference in dental anxiety among visually impaired children after receiving the ADHE method ($p < 0.05$) and no significant difference after receiving the BLDHE method ($p > 0.05$). Conclusion: BLDHE and ADHE, as non-face-to-face dental health education methods, are effective for decreasing dental anxiety in visually impaired children.

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Introduction

Patient anxiety during dental check-ups has become a moderate to severe challenge in everyday practice, since anxiety may affect overall dental treatment. Thus, anxiety itself may also exacerbate tooth damage and affect the outcomes of overall dental treatment.¹ Dental anxiety is described as a patient's anxiety responses towards subjects related to dentistry. There is also a relationship between dental anxiety, income, and education levels, in which higher dental anxiety is seen among people with lower income and education levels.²⁻⁴

Impaired vision is a general term used to describe an individual's disturbance or

obstruction of visual sense that results in three limitations: limitation in experience, limitation in discovery ability, and limitation in interacting with surroundings.⁵ Visual limitations experienced by visually impaired individuals affect their ability to obtain information, including health and dental examinations, thus resulting in higher anxiety among visually impaired patients, leading to undesirable oral health maintenance and, ultimately, lower oral health status.⁶⁻⁸ The American Association of Pediatric Dentistry has provided guide lines detailing how effective communication is a key in successful pediatric dental treatment. For children with limited or lost vision, communication can be applied through several media, such as written media in Braille, pictures, tactile media, olfactory media, and by auditory means. Thus, in order to provide information on oral and dental examinations to visually impaired patients, an approach using Braille and auditory media has been used in the present study.⁹

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The scoring of patients' dental anxiety prior to entering the dental examination room is very important for helping the dentist to manage the time and behavior of the patient, allows the dentist to act more carefully in treating the patient, and to be more aware of the patient's anxiety. According to the literature, there are several anxiety-scoring methods, including physiological ones (heart rate, skin response, blood pressure monitoring), direct self-report and behavior observation (the Frank scale), and Corah's Dental Anxiety Scale (CDAS); Wong and colleagues created a modified version of this, the Modified Dental Anxiety Scale (MDAS), using six simple anxiety questions to determine anxiety scores. The scores range as follows: 1 (little or no dental anxiety) to 5 (extreme dental anxiety) with 9–12 points indicating little dental anxiety, 13–14 points revealing moderate dental anxiety, and 15–20 denoting high dental anxiety (Figure 1).¹⁰

How do you feel about:					
Q1: Going to the dentist generally	1	2	3	4	5
Q2: Having your teeth looked at	1	2	3	4	5
Q3: Having your teeth scraped or polished	1	2	3	4	5
Q4: Having an injection in gums	1	2	3	4	5
Q5: Having a filling	1	2	3	4	5
Q6: Having teeth taken out	1	2	3	4	5

Likert scale:
1. would mean: relaxed/not worried
2. would mean: very slightly worried
3. would mean: fairly worried
4. would mean: worried a lot
5. would mean: very worried

Figure 1. Modified Dental Anxiety Scale (MDAS)¹⁰

Limitations of sight suffered by visually impaired children affect their ability to receive information, including information during dental and oral health visits, rendering many visually impaired individuals unable to optimally maintain their oral and dental health. Several studies have proven that visually impaired individuals, those either suffering from total blindness or low vision, generally have lower dental and oral health status than their sighted counterparts do. Communication forms that can be used with visually impaired children during health education and oral-dental examinations are often employed through Tell-Feel/Show-Do efforts.^{11,12}

This research was a clinical experimental study. It was conducted in October 2016 on 40 students of the National Special Needs School Type A, in Jakarta, Indonesia. The research was approved by both the Ethics Committee at the Faculty of Dentistry, Universitas Indonesia, Jakarta and the principal of the a fore mentioned school. All subjects were visually impaired children with the ability to read and write in Braille letters who had never visited a dentist before.

Information regarding the research was provided to the children's parents through verbal and written means. Validity tests were done for Audio-Dental Health Education (ADHE), Braille-Leaflet-Dental Health Education (BLDHE), and Modified Dental Anxiety Scale (MDAS).¹⁰

Respondents were divided into two groups: the first group was provided information through ADHE, and the second group was provided information through BLDHE. A room was prepared for delivering the dental health education and set under conditions similar to those of an actual dental clinic. Each room was prepared for each group. Respondents were instructed to complete a questionnaire (the MDAS) before receiving dental health education in Braille. Group I was given ADHE, and Group II was given BLDHE.

Both versions contained information about dental health and an introduction to the dental clinic setting. Group I received ADHE, which was followed by the recording of respondents' dental and oral health status, while Group II was informed via BLDHE, followed by a recording of their dental and oral health status. Respondents were next instructed to complete the MDAS questionnaire, a Braille instrument for reporting their anxiety after dental education. The data were compared using paired and unpaired t-tests, and the significance level value was determined to be $p < 0.05$. Statistical tests were conducted with SPSS version 20.

Results

Data on participants' anxiety scores before and after receiving information in the ADHE group were analyzed with a paired t-test. The results showed that the difference was significant ($p < 0.05$). Data on anxiety scores before and after receiving information in the BLDHE group were also analyzed with paired a t-test.

The results in this case were not significant ($p > 0.05$). This indicated that there was no significant difference in the dental anxiety levels among visually impaired children before and after dental health education via the BLDHE method (see Table 1).

Table 1. Anxiety scores differences before and after applying the ADHE and BLDHE methods

Variable	Groups		P
	Anxiety scores before N=20 Mean \pm sd	Anxiety scores after N=20 Mean \pm sd	
Audio-DHE	7.850 \pm 1.456	6.250 \pm 1.164	0.002
Braille	7.700 \pm 1.301	7.250 \pm 1.332	0.297

The difference between anxiety scores before and after the BLDHE and ADHE methods was analyzed using an unpaired t-test. The results of the anxiety scores before applying these methods were not significant ($p > 0.05$). The results were different, however, after their application ($p < 0.05$). This indicates that there was a significant statistical difference after participants received dental health education via the BLDHE and ADHE methods (see Table 2).

Table 2. Anxiety scores differences before and after applying the ADHE and BLDHE methods

Variable	Groups		P
	Audio N=20	Braille- Leaflet N=20	
Anxiety Scores Before Mean \pm std	7.850 \pm 1.456	7.700 \pm 1.301	0.737
Anxiety Scores After Mean \pm std	6.250 \pm 1.164	7.250 \pm 1.332	0.016**

Discussion

Significant differences in anxiety scores before and after using the ADHE method, as shown in Table 1, were supported by the

previous literature that has explained that a loss of vision does not significantly influence language comprehension, use, and/or deficiency. In general, visually impaired children do not differ significantly from typical children on verbal intelligence tests and in terms of linguistic development. Auditory perception is more prominent than visual perception as a language learning medium in this population, as noted by studies that reveal visually impaired children to be relatively unhindered in linguistic functioning.

Further, visually impaired children are generally more motivated compared to typical children focusing language, since it is their main way of communicating with others, despite the words they use not correlating with some actual experiences or having no meaning to the children themselves. If visually impaired children experience obstacles in their linguistic development, it is not solely due to their impaired vision, but more to how others treat them. Visual impairment hinders neither information processing nor the understanding of linguistic norms.¹³

Differences in the anxiety scores of visually impaired children before and after dental health education through the BLDHE method were also observed, though the results were not statistically significant (Table 1). According to the literature, Braille fluency requires the development of one's tactile ability to differentiate and comprehend Braille letters, the ability to use the fingers, control over movements of the hands and fingers, and deliberate finger touches. Respondents selected for research all had Braille fluency and were expected to have similar tactile abilities. Subjects were expected to be homogenous.

The Braille letter comprehension process includes palpation and tactile sensory skill, which affects cognitive components. A child's cognitive ability is related to his or her thinking, memorizing, valuing, and perceptive capabilities. Cognitive development between congenitally visually impaired children and secondary visually impaired children does not differ significantly, hence subjects were not differed according to the cause of their impaired vision or the onset of the impairment. Children who use Braille have better tactile ability compared to children incapable of using it; that is, they excel at noticing differences in the shapes, textures, and thicknesses of objects.⁸

However, the MDAS and BLDHE instruments consisted of elaborate language, which may have hindered the visually impaired children from fully understanding both the questionnaire and provided dental health education materials.

Differences in anxiety scores before and after dental health education in visually impaired children using the ADHE and BLDHE methods were also observed. It must be explained that there were no statistically significant differences in the anxiety scores before using the methods. By contrast, the results showed a statistically significant difference after using the ADHE and BLDHE methods (Table 2).

Conclusion

There was a difference in dental anxiety before and after ADHE in the BLDHE group, although it was not significant. There was a significant difference in dental anxiety among visually impaired children after being educated with either the BLDHE or ADHE method. Dental anxiety decreased more after the provision of dental health education using ADHE, compared to BLDHE.

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