

Difference in Effectiveness of Dental Health Education between Braille and Audio Method towards the Knowledge and Oral Health (OHIS) Score among the Blind Children in Karya Murni Foundation, Tunanetra Foundation and Binjai Special Needs Foundation

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Abstract–Blind children are the children with weak eyesight or complete loss of vision. Limitation of vision affects their ability to gain knowledge regarding oral health which will affect their oral hygiene status. This aim of this research is to determine the difference in effectiveness of dental health education between the audio and Braille method towards the knowledge and OHIS score among the blind children. This is an experimental research with pre and post test group design. This research comprised of 93 samples which were divided into two groups such as audio group (44 samples) and Braille group (49 samples) according to the inclusion and exclusion criteria. The knowledge and oral hygiene score were individually evaluated using questionnaire and OHIS index. The evaluation was taken before, on the 1st week and 1 month after the dental health education. Kruskal Wallis and Mann Whitney test were used to analyze the difference in effectiveness of dental health education between the audio and Braille method. The results showed that there was a significant increase in knowledge score and decrease in OHIS score in both method ($p=0.000$). There was no significant differences in gaining knowledge and decreasing the oral hygiene score between the both methods ($p>0.05$). Therefore, dental health education using the audio and Braille is effective in improving the knowledge and oral hygiene score among the blind children.

Keywords–dental health education, Braille, audio, blind children

I. INTRODUCTION

The World Health Organization (WHO) estimates that the number of children with disabilities is about 7-10% of the total child population. In Indonesia, there are 8.3 million of the total child population in Indonesia (82,840,600 children) with disabilities where 10,119 of whom are blind children. Visibility limitations possess negative effect on oral hygiene which results in poor oral hygiene in the blind child compared to a normal

child. In addition, calculus and debris scores are also higher in blind children [1]. Poor oral hygiene in blind is due to various factors such as cariogenic foods, tooth shape and lack of oral and dental health knowledge.

Dental and oral health knowledge in people with visual impairment is less due to lack of education in people with visual impairment which affect their ability in gaining oral health knowledge [2,3]. Therefore, health education about oral hygiene maintenance is important for all individuals including the blind children to improve their oral health status [4,5]. The education methods that are appropriate for people with visual impairment are by Audio method and Braille method [5]. The audio method is a method whereby education on oral health is delivered only through the sound and without face to face. While other methods by providing knowledge of dental health with Braille method. Dental Braille Education (DBE) is a learning process in the oral health field that is devoted to visually impaired or a person with visual disability using Braille alphabet media in order to optimize their dental and oral health status and also independency in maintaining oral health [5].

Based on the background, the author wishes to determine the difference between dental health knowledge score and oral hygiene in blind children using Audio and Braille method.

II. MATERIAL AND METHOD

This is an experimental research with pre and post test group design. Sampling technique was collected by total sampling technique according to inclusion criteria (age > 5 years and present at study) and exclusion criteria (wearing orthodontic appliance and no systemic abnormality). The final number of samples was 93 people where 44 people in the Audio group and 49 people in the Braille group. Subjects were randomly

divided into two groups such as the Audio and Braille groups. Oral health education through Audio and Braille methods are delivered on a daily basis for a month before the commencement of classes.

Measurements of the dental and oral health and OHIS score were performed before, 1 week and 1 month after the dental health education (DHE). Dental and oral health knowledge was measured through the questionnaires with 12 questions. The correct answer is given a score of 1 whereas the wrong answer is given a score of 0, so that a maximum score of 12 was obtainable. Good knowledge category has a score ranged from 9-12, moderate if the score ranged from 5-8, and bad if the score <4. Assessment the OHIS score was performed by examining 6 teeth such as the buccal surfaces of tooth 16, 26, and 46, as well as the labial surfaces of the teeth 11 and 31, and the lingual surfaces of the tooth 36. Good category if the score was 0-1.2, moderate was 1.3-3 and was 3.1-6.

Non-parametric test was used due to abnormal data distribution. Kruskal-Wallis test was done to determine difference of knowledge score and oral hygiene score before, one week and one month after dental health education using neither Audio nor Braille method and followed by Mann-Whitney test to analyze the difference in effectiveness of Audio and Braille methods of education on the score of knowledge and oral hygiene score in blind children.

III. RESULTS

Table I shows that none of the respondents from the Audio group has good knowledge before DHE. One week after the DHE, respondents who possess good knowledge had increased to 86.34%, and rose to 97.73% 1 month after the DHE.

TABLE I. DISTRIBUTION OF KNOWLEDGE CATEGORY USING AUDIO METHOD EDUCATION (N=44)

Knowledge Category	Audio					
	Before DHE		1 Week After DHE		1 Month After DHE	
	n	%	n	%	n	%
Good	0	0	38	86.34	43	97.73
Moderate	20	45.46	5	11.36	1	2.27
Bad	24	54.54	1	2.30	0	0

Table II shows that respondents in Braille group who had good knowledge were only 6.12% prior to the DHE. One week after DHE, the respondents had increased to 89.8%, and rose to 93.88% in one month after DHE.

TABLE II. DISTRIBUTION OF KNOWLEDGE CATEGORY USING BRAILLE METHOD EDUCATION (N=49)

Knowledge Category	Braille					
	Before DHE		1 Week After DHE		1 Month After DHE	
	n	%	n	%	n	%
Good	3	6.12	44	89.80	46	93.88
Moderate	23	46.93	5	10.20	3	6.12
Bad	23	46.95	0	0	0	0

Table III shows only 2.27% of respondents from the audio group having good oral hygiene. One week after DHE, respondents who possess good oral hygiene became 31.82% and increased to 36.36% in one month after the DHE.

TABLE III. DISTRIBUTION OF ORAL HYGIENE USING AUDIO METHOD EDUCATION (N=44)

Oral Hygiene Category	Audio					
	Before DHE		1 Week After DHE		1 Month After DHE	
	n	%	n	%	n	%
Good	1	2.27	14	31.82	16	36.36
Moderate	18	40.91	29	45.45	28	63.64
Bad	25	56.82	1	22.73	0	0

Table IV shows 10.21% of respondents from the Braille group are having good oral hygiene. One week after the DHE, the number increased to 26.53% and became 28.57% in one month after DHE.

TABLE IV. DISTRIBUTION OF ORAL HYGIENE CATEGORY USING BRAILLE METHOD EDUCATION (N=49)

Oral Hygiene Category	Braille					
	Before DHE		1 Week After DHE		1 Month After DHE	
	n	%	n	%	n	%
Good	5	10.21	13	26.53	14	28.57
Moderate	17	34.69	35	71.43	35	71.43
Bad	17	55.10	1	2.04	0	0

From Table V, the mean of knowledge score of both Audio and Braille group increased from before to one week and lastly one month after the DHE. The statistical analysis results shows that there is a significant difference in at least one of the measurement time (p = 0,000).

TABLE V. MEAN OF KNOWLEDGE SCORE BEFORE, 1 WEEK AND 1 MONTH AFTER DENTAL HEALTH EDUCATION USING AUDIO AND BRAILLE METHOD

Group	n	Mean of Knowledge Score ($\bar{x} \pm SD$)			Statistical Analysis
		Before DHE	1 week after DHE	1 month after DHE	
Audio Method	44	4.48 ± 1.21	10.52±1.81	11.20±0.98	0.000
Braille Method	49	5.08 ± 1.59	10.57±1.59	10.92±1.13	0.000

From Table VI, the mean of oral hygiene score of the Audio and Braille group had increased from before to one week and one month after DHE. The statistical analysis results shows that there is a significant difference in at least one measurement time (p = 0,000).

There were no statistically significant differences in effectiveness between audio and braille counselling with knowledge and oral hygiene (p> 0.05).

TABLE VI. AVERAGE ORAL HYGIENE SCORE BEFORE, 1 WEEK AND 1 MONTH AFTER DENTAL HEALTH EDUCATION USING AUDIO AND BRAILLE METHOD

Group	n	Mean of Oral Hygiene Score ($\bar{x} \pm SD$)			Statistical Analysis
		Before DHE	1 week after DHE	1 month after DHE	
Audio Method	44	2.90±0.76	1.66±0.69	1.44±0.72	0.000
Braille Method	49	2.99±1.02	1.77±0.71	1.56±0.63	0.000

IV. DISCUSSION

The results showed an increase in the average knowledge score before, one week, and one month after dental health education using both methods of education. In the Audio method, the mean knowledge score before dental health education was 4.48 ± 1.21 , increasing to 10.52 ± 1.81 a week after counseling, and to 11.20 ± 0.98 a month after counseling. In Braille method, the average knowledge score before was 5.08 ± 1.59 , increased to 10.57 ± 1.59 one week after dental health education, and became 10.92 ± 1.13 a month after dental health education. An increase in knowledge scores after the dental health education using the Audio and Braille methods was due to the same level of intelligence possess by the blind children as well as the normal children where special approach was needed to the visually impaired children so that they can receive information properly with the right method [2,8].

Statistical test results on each of the Audio and Braille methods showed that there is a significant difference between the knowledge score before and one week after the dental health education and before and 1 month after dental health education ($p = 0.000$). This is due to the knowledge of respondents before dental health education was still very low so that the given information is able to stimulate their memory continuously. The statistical test result on each Audio and Braille method shows that there was a significant difference between the knowledge score before and one month after counseling $p = 0,000$. This is because the respondents still have retention from the given knowledge. In addition, the knowledge given to children will sustain in their memory if the knowledge is given to the child for 21 days continuously. According to Notoatmodjo that the media as a tool to convey health messages, the tool has a function to generate interest in goals, achieve better goals, helps in overcoming many obstacles in the understanding so that to facilitate the delivery of materials or health information especially for the visually impaired children where they faced problems in receiving information and perception, therefore if will be able to stimulate the respondents to understand the message if the approach and communication are well done [6,8,9].

The results showed a decrease in the mean score of oral hygiene before, one week, and one month after dental health education with both methods. In the Audio method, the mean oral hygiene score before dental health education was 2.90 ± 0.76 , then decreased to

1.66 ± 0.69 after one week and further decreased again to 1.44 ± 0.72 after one month. Whereas in the Braille method, the average oral hygiene score before dental health education was 2.99 ± 1.02 , then decreased to 1.77 ± 0.71 after one week and further decreased to 1.56 ± 0.63 after one month. This significant change occurs because of the increased knowledge experienced by the respondents will which influenced their behaviour in maintaining oral hygiene [2,8,10].

The result of statistical test shows that there is no significant difference between Audio and Braille method in knowledge and oral hygiene score among the blind children before, one week, and one month after dental health education ($p > 0.05$). Both methods are often used to convey messages to those visually impaired children because of their characteristics of relying solely on hearing and touch [7].

It can be concluded that audio and Braille methods are effective media in improving the oral health knowledge and lowering the oral hygiene score among the blind children.

Cooperation should be between the dentist and the teachers in Special School Foundation, especially SLB-A to conduct dental health education to improve their knowledge regarding dental and oral health through effective media in order for them to practice good behaviour to maintain good dental and oral health among the blind child.

ACKNOWLEDGEMENT

This research is funded by Lembaga Penelitian Universitas Sumatera Utara with contract number 238/UN5.2.3.1/PPM/KP-TALENTA USU/2017.

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