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RESEARCH

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Effectiveness of Dents-Voice to Increase Knowledge of Dental and Mouth Health and Decrease the Debris Index

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Abstract

60.5% of the population in West Kalimantan have problems with oral health. One of them is children with special needs who are blind. Promoting media used for children with special needs is different from the media used for healthy children. Dents-Voice is a teaching aid designed for children with visual impairment as a media for counseling oral health. This device will make a sound when the button is pressed. The sound that comes out is in the form of information relating to damage to the teeth, causes and how to prevent them. This study aims to discover the effectiveness of Dents-Voice props as an educational medium in improving dental and oral health knowledge and can reduce the index debris of the blind. This research is a *quasi-experimental* pre and post-test without control from a quantitative approach. This research was conducted at SLBN Mempawah Hilir, Ar-Rahmah Foundation, and Al-Iqra Foundation. The population of this research was 21 people. The sample of this study used a total sampling technique. The results of the study used a *Paired Sample T-Test*; the average value of respondents' initial knowledge was 71.86 and after counseling it, it rose to 90.71 with a *p-value* of 0,000. The average value of the respondents' initial index debris was 1.80 and after counseling it, it dropped to 1.09 with a *p-value* value of 0,000. The conclusions of this study show that Dents-Voice is effective for increasing knowledge and decreasing the debris index for the blind.

Keywords: Knowledge, debris index, dents-voice

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1. INTRODUCTION

Referring to the data from the Basic Health Research in 2018, the prevalence of dental and oral health problems in Indonesia is 57.6% with daily brushing behavior of 94.7% and only 2.8% behaving to brush teeth correctly. A total of 21 provinces in Indonesia have a prevalence of dental and oral health problems above the national prevalence including West Kalimantan Province. Around 60.5% of the population in West Kalimantan has problems with oral health (Kementerian Kesehatan R. I., 2018). High dental and oral health problems are caused by low dental and oral hygiene behavior and a lack of knowledge about dental and oral health. Therefore, it is necessary to increase efforts in overcoming these problems, one of which is by increasing promotive efforts at every level of society, including those who have special needs (Basuni, 2014).

Children with special needs are children who have limitations or unusual, both physical, mental-intellectual, social and emotional, which significantly influence the process of growth or development compared to other children of their age (Sabilillah et al., 2016). The World Health Organization (WHO) estimated that the number of children with special needs in Indonesia is around 7-10% of the total number of children. According to data from the National Socio-Economic Survey (SUSENAS) in 2012, the majority of people with disabilities were those who experienced more than one type of limitation, which are 39.97% followed by limitations seeing 29.63% and walking or climbing stairs 10.26% (Kementerian Kesehatan R. I., 2014).

Children with special needs need to be recognized and identified from the group of children in general, because they need special services, such as medical services, special education and certain exercises that aim to reduce the limitations and dependencies due to the disabilities suffered, and foster self-reliance in the community (Veriza, 2018)(Rosmawati, 2018). One of the children with special needs who need special services is blind children (Sabilillah et al., 2016). Based on the 2010 population census, in the province of West Kalimantan, there were 105,248 people who had little vision and 10,264 people who had severe visual impairment (Kementerian Kesehatan R.I., 2014).

Dental health is one of the most important things for a child's growth. However, in Indonesia, there are not many parents who care about children's Dental health, especially in children with visual impairments. It is found in the poor condition of the oral cavity of blind people caused by unsupervised tooth brushing. Other factors such as tooth brushing techniques, motor skills and assistance that are still neglected. In addition, the lack of visualization to understand and master the techniques of dental and oral hygiene practices is also a supporting factor (Sabilillah et al., 2016).

Based on research conducted by Yalcinkaya about the level of dental and oral health knowledge in the group of blind children consisting of 28 total blind patients and 37 partial blind patients stated that 57.1% of the total blind sufferers and 56.9% partially blind sufferers never received information about how to maintain healthy teeth and mouth (Yalcinkaya & Atalay, 2006). The low level of knowledge of children with visual impairments will have an impact on the poor condition of the oral cavity and increasingly encourage the occurrence of serious Dental health problems such as caries. It is supported by research conducted by Solanki on the prevalence of caries and dental and oral health status in normal children and children with disabilities which shows that the prevalence of caries in blind children is higher (60%) compared to normal children

(31.5%). It is caused by 90.2% of blind children brushing their teeth only once a day and only 0.9% who brush their teeth twice a day (Solanki et al., 2013).

Based on the results of a survey that we conducted in one of the State Special Need School (SLBN) of Mempawah, the data was obtained on the number of debris index of 6.67 with an average score of 2.23 which if categorized according to the index according to WHO is included in the medium category. Despite their limitations, blind children still have the ability to understand how to maintain oral hygiene, but they are often ignored because they cannot recognize abnormalities in their own oral cavity. Therefore, intervention is needed to educate blind children about maintaining oral health including counseling.

In conducting their profession, dental nurses have competence as dental hygienists who play a role in the maintenance of dental and oral health of patients, one of which is by performing promotive activities. Generally, promotive activities such as counseling are conducted in schools and health care centers with the target of normal people. As we know, when conducting promotive activities, health workers such as dentists and dental nurses will use media such as posters, phantom teeth, flipcharts and leaflets. Media that is commonly used, of course, cannot be used for people with special needs such as the blinds, because generally these media are visual media. People with special needs also need special treatment. The lack of dental and oral health promotion programs conducted by health workers in people with special needs such as the blind makes this as a serious problem. It is also supported by the lack of appropriate media in the promotive program itself (Kencana, 2014).

Children with visual impairments besides having limitations in seeing but have advantages, especially in terms of identifying objects and sounds. One of the media that can be used to increase knowledge is audio media and sensory media. Audio media is media that relies on sound that can stimulate the sense of hearing in receiving information, while sensory media is a media that uses the sense of touch to understand a material or learning (Handoyo, 2016).

Blind children still need help from parents in maintaining their health, and with these conditions, of course, they also have the same problem with us in general, especially the problem of tooth decay. Based on this, the authors are interested in creating a media of teaching aids that can provide knowledge and change the attitudes and behavior of blind students, which will later be given the name of the Dents-voice. In addition, research on dental and oral health counseling for children with visual impairment is very rarely conducted in the Department of Dental Health at the Health Polytechnic of Health Ministry, Pontianak especially using teaching aids that combine audio and sensory abilities of the child. Therefore, the authors are interested in researching about the effectiveness of the Dents-Voice teaching aid media as a health education media in improving dental and oral health knowledge as well as decreasing the Debris Index in blind people.

2. RESEARCH METHOD

This research is a *quasi experimental pre and post-test* without control with a quantitative approach. This research was conducted in State Special Need School (SLBN) of Mempawah Hilir located at Jalan Raden Kusno, Terusan, Kab. Mempawah, Yayasan Ar-Rahmah located at Street Seram No.16 Pontianak City, Al-Iqra Foundation located at Street Sepakat 2, Pontianak City. The population in this study was 21 blind people. The sample taken in this study used a total sampling technique. The criteria for

inclusion in this study were to understand Indonesian; blind patients with total blind classification and low vision (low vision) and are willing to be respondents, while the exclusion criterion in this study is resignation to be a respondent during the study. This study had obtained ethical eligibility from Health Polytechnic of Health Ministry, Pontianak with Number: 146/KEPK-PK.PKP/V/2019.

3. RESULTS AND DISCUSSION

Table 1. Frequency distribution of respondents based on gender, age and visual criteria.

Respondent Characteristic	Total	Percentage
1. Sex		
Male	14	67
Female	7	33
Total	21	100
2. Age		
5 – 11 years	6	28,6
12 – 25 years	6	28,6
26 – 45 years	6	28,6
46 – 65 years	3	14,2
Total	21	100
3. Blindness Criteria		
Total Blindness	12	57
Low vision	9	43
Total	21	100

Table 1 shows that the majority of respondents were male, 14 people (67%), while those who were female were 7 people (33%). Respondents with the age character of 5-11 years, 12-25 years and adults 26-45 years, each with 6 people (28.6%) and respondents with total blindness in total population are 12 people (57%).

Table 2. Frequency distribution of respondents' knowledge values before and after the health counseling using Dents-Voice model.

Knowledge Value	Before		After	
	Total	Percentage	Total	Percentage
7	1	4,8	-	-
9	5	23,8	1	4,8
10	4	19,0	-	-
11	2	9,5	1	4,8
12	5	23,8	2	9,5
13	4	19	3	14,3
14	-	-	7	33,3
15	-	-	7	33,3
Total	21	100	21	100

Table 2 shows the majority of respondents who had knowledge values before being provided with health counseling were 9 and 12, 5 people for each (23.8), while the majority of respondents who had knowledge values after being provided with health counseling were 14 and 15, 7 people for each (23.8).

Table 3. Category of knowledge and Debris Index of respondents before and after being provided with health counseling using the Dents-Voice Tool.

No	Respondent Category	Before		After	
		Total	Percentage	Total	Percentage
1	Knowledge				
	Good	9	42,9	19	90,5
	Good enough	6	28,6	1	4,8
	Low	6	28,6	1	4,8
	Total	21	100	21	100
2	Debris Index				
	Good	0	0	4	19
	Good enough	4	19	7	33,3
	Bad	17	81	10	47,6
	Total	21	100	21	100

Table 3 shows that the number of respondents who had a good knowledge category before being provided with health counseling was 9 people (42.9%) and increased to 19 people (90.5%) after being provided with health counseling using Dents-Voice model. Meanwhile, the number of respondents who had a good debris index before being provided with health education was 0 people (0%) and increased to 4 people (19%) after being provided with health education using Dents-Voice model.

Table 4. Paired Sample T-Test Result of Knowledge and Debris Index Before and After counseling

No	Paired Sample T-Test Result	Average	Deviation	t	p-value
1	Knowledge				
	After the counseling	13,62	2,857	12,910	0,000
	Before the counseling	10,76			
2	Debris Index				
	After the counseling	1,09	0,719	15,964	0,000
	Before the counseling	1,80			

Table 4 shows that the average value of respondent knowledge before counseling was 10.76 and after counseling, it rose to 13.62 with the difference in the average value of knowledge after and before counseling which was 2.857 which means the average value of knowledge after counseling was higher compared to the value of knowledge before being provided counseling. Based on the results of the Paired Sample T-Test, the value of *p-value* was 0.000, with a $p\text{-value} < 0.05$ which means that H_0 is rejected and H_a is accepted. Thus, it can be concluded that there are significant differences regarding the dental caries knowledge of blind people before and after health counseling by using Dents-Voice model. Meanwhile, the average index score of the debris of the respondents before counseling was 1.80 (bad category) and after being counseled, it dropped to 1.09 (medium category) with the difference in the average value of the Debris Index before and after being counseled was 0.719 which means the mean value of the average debris index after counseling is lower than the average value of Debris Index before counseling. Based on the results of the Paired Sample T-Test, the value of *p-value* is 0.000 with a $p\text{-value} < 0.05$ meaning that H_0 is rejected and H_a is accepted, it can be concluded that there are significant differences regarding the decrease in the

debris index for the blind before and after being given health counseling using Dents-Voice model.

The result of table 4 indicates that the increase in knowledge about dental caries after conducting health counseling using the Dents-Voice model. The average knowledge of the initial respondent about dental caries was 10.76 and after being provided with counseling, it increased to 13.62. It is in line with research conducted by Javer in which the blind category respondents with a good category rose to 32 people from initially 0 people after being provided with health counseling using audio media (Javer, 2017), and also it was also supported by research conducted by AK Ganapathi, where the level of knowledge in the counseling group by the audio method was in the bad category before counseling that was equal to 32.14% and increased to good by 85.71% after counseling (Ganapathi et al., 2015).

Likewise, the decline in the respondent's Debris Index, where the average of the index's initial debris before provided with health counseling, it reached the value of 1.80 which was a bad category which has decreased to 1.09 in the category of health after giving health counseling. It is true by research conducted by Javanese respondents who were given counseling with an audio method measured after a week after extension, experiencing a decrease in the initial debris average value of 1.51 decrease to 0.27 (Javer, 2017).

From the results of statistical analysis of knowledge and debris index before and after the counseling, the value of *p-value* for each category is 0.000. With a *p* value < 0.05 meaning that *H₀* is rejected and *H_a* is accepted, it can be concluded that there are significant differences regarding the increase in knowledge and the decrease in the debris index of the blind person before and after being provided with health counseling using Dents-Voice model. Counseling by using dents-voice model basically emphasizes the ability of the senses of the listener and the feelers of the blind because in addition to listening to information, the blind can also feel the shape of the teeth and types of holes in the teeth. It is also in line with the statement of one of the class teachers in State Special Need School (SLBN) of Mempawah Hilir that, "learning for blind children with this media (dents-voice props) is good, because the child can directly touch the media and also the media is authentic". It is also supported by statements from Hallahan and Kaufman that listening to sound recordings gain much more information and is more efficient in children with visual impairment compared to reading Braille letters (Ishartiwi, 2002). The result of the study also states that audio media is able to stimulate the attention of the target so that the information knowledge provided is more quickly captured by respondents (Rahmawati, 2007) (Wirawan, 2014).

The high Debris Index before being provided with health counseling using Dents-Voice model occurred because respondents did not understand or did not know how to maintain oral and dental hygiene. For instance, the respondents were only limited to understanding brushing teeth without knowing the cleanliness of the entire tooth surface after brushing teeth and the respondents were less aware that brushing teeth must pay attention to the movement of brushing teeth properly on each tooth surface, in order to eliminate debris or food debris on teeth.

The changes in Debris Index before and after are influenced by the knowledge received by respondents during the counseling process using Dents-Voice model. Knowledge is the result of human sensing or the result of knowing someone after sensing a certain object (Undarti, 2013). Sensing occurs through the five human senses, which is the sense of sight, smell, taste and touch. When receiving health counseling, most of the senses used by respondents were the sense of touch and listener, where the respondent will hear the sound from the visual aids and also feel the shape of the teeth.

The use of teaching aids in this study made respondents gain knowledge by listening and identifying the shape of teeth whose occlusal surfaces are curved and hollow so they can imagine the impact of improper brushing on those surfaces. In addition, counseling using Dents-Voice model makes monotonous counseling become more fun and interesting so that respondents do not feel bored.

4. CONCLUSION

Based on the results and discussion, it can be concluded that health counseling by using the Dents-Voice model is effective for counseling with the target of blind or normal people and can be a new counseling media.

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