

RESEARCH ARTICLE

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The Effectiveness of Using BRAILLPOPAL Media and MOSIPEDALY Media in Improving Toothbrushing Skill in The Visually Impaired

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ABSTRACT Health has a major impact on the quality of life of children, one of which is with children with disabilities such as blind children, which is a term for individuals who experience impairment in their vision, whether it is total blind (total blindness) or low vision (there is still some vision left). The visually impaired are slower to detect early symptoms of poor oral health. The use of BRAILLPOPAL (Braille Pop Up Dental) and MOSIPEDALY (Modified Panthom Dental Study) media is an effort to improve tooth brushing skills in the blind. Poor oral hygiene in blind students of SLB N 1 Bantul. To know the effectiveness of BRAILLPOPAL and MOSIPEDALY media in improving tooth brushing skills in the blind at SLB N 1 Bantul. Type of research Quasi Experiment with Pre-test and Post-test Design research design using total sampling with research subjects as many as 30 students. The study showed that there was a significant increase in tooth brushing skills in the blind after being given counseling with BRAILLPOPAL media and MOSIPEDALY media. The use of BRAILLPOPAL media is more effective than MOSIPEDALY media in improving tooth brushing skills in the blind at SLB N 1 Bantul with an average increase of 18.80. Conclusion: Education using BRAILLPOPAL media and MOSIPEDALY media shows that there is an effectiveness in improving tooth brushing skills in blind students of SLB N 1 Bantu.

INDEX TERMS BRAILLPOPAL media, MOSIPEDALY media, tooth brushing, visually impaired children.

I. INTRODUCTION

Dental and oral health greatly affects the overall health of the body. Oral hygiene, which is free from plaque, debris, and tartar, is the main focus in this effort to maintain this health. The results of the 2018 Basic Health Research show that 90% of the Indonesian population experiences dental health problems, with caries as the main problem having a prevalence of 88.8% [16]. The main cause of caries is plaque accumulation, which is often caused by people's ignorance in maintaining dental health.

Dental plaque is a biofilm consisting of pathogenic microorganisms that can cause various dental and oral diseases [20]. Plaque prevention measures such as proper brushing, the use of dental floss, and the consumption of

fibrous fruits must be carried out early [12]. However, many people still neglect dental hygiene, as reflected in the 2018 Riskesdas data, which shows that only 2.8% of the population brushes their teeth the right way.

Visually impaired children are special needs, facing challenges in maintaining dental health. They tend to have difficulty detecting early symptoms of dental problems such as discoloration and bleeding due to lack of vision [28]. This is exacerbated by a lack of supervision when brushing your teeth as well as low motor skills required to maintain oral hygiene. A study found that 50% of visually impaired people in Indonesia have an Oral Hygiene Index Score (OHI-S) which indicates moderate to poor oral hygiene [5].

Proper education and the use of educational media, such as braille letters and dental model props, can increase the awareness and skills of blind children in maintaining dental health. This media not only helps them understand brushing techniques but also increases confidence and creativity [35]. At SLB N 1 Bantul, the initial examination showed a poor plaque index (PHP) in visually impaired students, reflecting the need for educational interventions in maintaining the cleanliness of their oral cavity.

The research focuses on the effectiveness of the use of *BRAILLPOPAL* media and *MOSIPEDALY media* in improving the ability to maintain dental and oral health in the visually impaired at SLB N 1 Bantul.

II. MATERIALS AND METHOD

The type of research with *Quasi Experiment* is through *Pre-test and Post-test Design* research designs. Experimental research is research conducted with the aim of determining the influence that appears to be the impact of the treatment given by the researcher, while the *post-test pre-test* design is used to determine the skills before and after the extension treatment using *BRAILLPOPAL* media and *MOSIPEDALY media*.

The research population is all visually impaired students of SLB N 1 Bantul as many as 30 students who are divided into 2 groups, namely A and B. While the sample is taken through *total sampling* with the sample according to the number of population.

The research was carried out from December 2023 to February 2024 at SLBN 1 Bantul. Data collection was carried out through *pre-test* and *post-test* to demonstrate brushing skills after and before the use of *BRAILLPOPAL* media and *MOSIPEDALY media*.

The research includes preparation, implementation and completion steps then data analysis through *the Wilcoxon* test and improvement difference analysis through *the Mann Whitney test*, including

A. Preparation stage

1. Research agreement at SLB N 1 Bantul. The agreement began by taking care of research permits at the TU Department of Dental Health, Surabaya Polytechnic. Furthermore, he handed over a research permit to the principal of SLB N 1 Bantul. After the principal gives permission to conduct the research, the researcher coordinates with the classroom teacher to arrange the research schedule.
2. Enumerators: the researcher is assisted by 4 enumerators from the same department and has been provided with an explanation of the data collection strategy to be carried out.
- a. Determine respondents (group A totals 15 visually impaired students and group B totals 15 visually impaired students)
- b. Creating an Extension Event Unit (SATPEL)

- e. Making *BRAILLPOPAL* and *MOSIPEDALY* media
- e. After the proposal exam, the researcher submits a research proposal to the KEPK (Health Research Ethics Commission) to take care of ethical clearance.

B. Implementation stage

1. Gather respondents in one room.
2. Conveying the objectives and instructions of brushing practice for preliminary data (pre-test)
3. The pre-test on the respondents was taken at the first

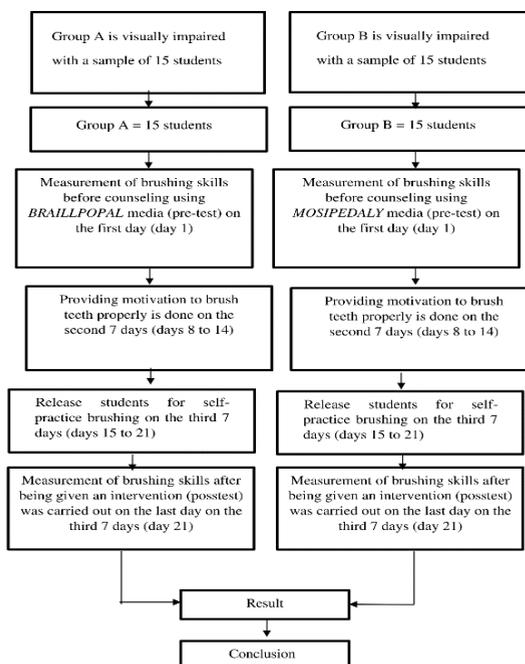


Figure 1. Research Flow

meeting (day 1), by calling the children one by one to brush their teeth in the sink, then given counseling treatment using *BRAILLPOPAL* media for blind students in group A and using *MOSIPEDALY* media for blind students in group B, regarding how to brush their teeth for ± 15 minutes for the first 7 days (day 1 to day 7).

4. The second 7 days (days 8 to 14) provide motivation to brush teeth properly to the respondents.
5. The third 7 days (day 15 to day 21) release students for self-practice brushing.
6. Post-test is carried out on the last day (day 21). The researcher conducted a post-test by observing the skills of how to brush teeth using sheet Observation. Observation was carried out by direct brushing practice

C. Completion Stage

After the data is collected, the next step is for the researcher to process and analyze the data that has been obtained from the observation results of blind children at SLB

N 1 Bantul before and after being given counseling using *BRAILLPOPAL* and *MOSIPEDALY media*.

The data analysis used was the *Wilcoxon* test to determine the score of brushing skills before and after counseling in each group, both the *BRAILLPOPAL media group* and the *MOSIPEDALY media group*. The difference in the difference in brushing skills in the two groups can be analyzed using the *Mann Whitney test*.

III. RESULTS AND DISCUSSION

A. Characteristics of Respondents

TABLE 1.

DISTRIBUTION OF RESPONDENTS BASED ON THE CHARACTERISTICS OF BLIND STUDENTS AT SLB N 1 BANTUL

Characteristic	Frequency	Percentage (%)
Gender	Man	19
	Woman	11
	Total	30
Age	8 years – 12 years	5
	13 years – 16 years	4
	17 years – 21 years old	21
	Total	30

Based on the TABLE 1, the characteristics of the respondents in this study are dominated by men, namely 19 students (63.4%) and the age of the respondents from this study is predominantly 18 years old, namely 9 students (30%).

TABLE 2.

FREQUENCY DISTRIBUTION OF BRUSHING SKILLS OF BLIND STUDENTS

Categories How to Brush Your Teeth	Before		After	
	Frequency	Percentage (%)	Frequency	Percentage (%)
Good	0	0	13	86,6
Keep	5	33,4	2	13,4
Bad	10	66,6	0	0
Total	15	100	15	100

Based on the TABLE 2 related to the brushing skills of visually impaired students before counseling using *BRAILLPOPAL* media, the results were obtained that many students had skills with a poor category, namely 10 students (66.6%) and after counseling using *BRAILLPOPAL* media, the results were obtained that many students had skills with a good category, namely 13 students (86.6%).

TABLE 3.

FREQUENCY DISTRIBUTION OF BRUSHING SKILLS FOR BLIND STUDENTS BEFORE AND AFTER COUNSELING USING *MOSIPEDALY MEDIA* (MODIFIED PANTHOM DENTAL STUDY)

Categories How to Brush Your Teeth	Before		After	
	Frequency	Percentage (%)	Frequency	Percentage (%)
Good	0	0	11	73,3
Keep	6	40	4	26,6
Bad	9	60	0	0
Total	15	100	15	100

Based on the TABLE 3 related to the brushing skills of visually impaired students before counseling using

MOSIPEDALY media, the results were obtained that many students had skills with a bad category, namely 9 students (60%) and after counseling using *MOSIPEDALY* media, the results were obtained that many students had skills with a good category, namely 11 students (73.3%).

B. Data Analysis Results

TABLE 4.

RESULTS BEFORE AND AFTER COUNSELING USING *BRAILLPOPAL MEDIA* (BRAILLE POP UP DENTAL)

Variable	Category			P Value
	Good	Keep	Bad	
Before Counseling	0	5	10	0.001
After the Counseling	13	2	0	

Based on the TABLE 4, a significance value of 0.001 ($p < 0.05$) was obtained, indicating that there was a significant difference between the variables of brushing skills before and after counseling using *BRAILLPOPAL*.

TABLE 5.

RESULTS BEFORE AND AFTER COUNSELING USING *MOSIPEDALY MEDIA* (MODIFIED PANTHOM DENTAL STUDY)

Variable	Category			P Value
	Good	Keep	Bad	
Before Counseling	0	6	9	0.001
After the Counseling	11	4	0	

Based on the TABLE 5, a significance value of 0.001 ($p < 0.05$) was obtained, indicating that there was a significant difference between the variables of brushing skills before and after counseling using *MOSIPEDALY media*.

TABLE 6.

DIFFERENCES IN THE EFFECTIVENESS OF *MOSIPEDALY* AND *BRAILLPOPAL MEDIA* IN IMPROVING DENTAL BRUSHING SKILLS OF BLIND STUDENTS

Group	Mann Whitney Test						P Value
	Skills						
	Good		Keep		Bad		
	N	%	n	%	n	%	
<i>MOSIPEDALY</i>	1	73,	4	26,	0	0	0.032
	1	3	6	6			
<i>BRAILLPOPAL</i>	1	86,	2	13,	0	0	
	3	6	3	3			

Based on the TABLE 6, a significance value of 0.032 ($p < 0.05$) was obtained, so that H_0 was rejected and H_1 was accepted, thus it was known that **there was a significant difference between the *MOSIPEDALY* and *BRAILLPOPAL media groups*** on the brushing skills of visually impaired students at SLB N 1 Bantul.

IV. DISCUSSION

A. Toothbrushing Skills for Blind Students Before and After Counseling Using *BRAILLPOPAL Media* (Braille Pop Up Dental)

Based on the results of the research that has been conducted, it shows that the average value of brushing skills before and after counseling using *BRAILLPOPAL* media has a significant increase in brushing skills. The results of the researcher's observations, after being given counseling, students were able to understand and understand what had

been explained with BRAILLPOPAL media. This is because BRAILLPOPAL (Braille Pop Up Dental) media is a media that utilizes braille letters and the support of embossed image animation that makes it easier for visually impaired students to get information through touch. Braille is a writing system used by visually impaired people to read and write (Sukmana, 2020). For visually impaired students, the use of media with braille letters as a substitute for Latin letters in the learning system can arouse their interest, inspire them more, and liven up their learning [30].

The use of BRAILLPOPAL media which contains how to brush teeth with braille media increases the interest of visually impaired children to read it. The results of the study showed that counseling using the BRAILLPOPAL printing method increased knowledge in visually impaired children. This is supported by the statement of Tumirah (2021) which stated that the use of braille writing aims to improve the reading ability of visually impaired children in obtaining information to increase their knowledge. This media focuses on the sense of touch. The sense of touch of blind children is quite good. So, BRAILLPOPAL media is quite appropriate to increase the knowledge of visually impaired children.

The combination of braille media and three-dimensional images in BRAILLPOPAL media is a media that can optimize the character of visually impaired children, namely like to fantasize and have a good sense of touch at the same time in visually impaired children. The message given is acceptable and has a positive influence on the knowledge of visually impaired children. The more the five senses are involved in receiving information, the more complex the knowledge obtained.

B. Toothbrushing Skills for Blind Students Before and After Counseling Using MOSIPEDALY Media (Modified Panthom Dental Study)

Based on the results of the research that has been conducted, it shows that the average value of brushing skills before and after the education using MOSIPEDALY media is carried out, there is a significant increase in brushing skills. The average value of brushing skills before providing education using MOSIPEDALY media is in the bad category, while the average score of brushing skills after providing education using MOSIPEDALY media is in the good category.

Based on the results of the researcher's observations, after being given information, students are able to understand and understand what has been explained using MOSIPEDALY media. This can be seen from the improvement of children's ability to clean teeth such as brushing teeth in places that have never been brushed before.

Teaching aids in the form of dental models are the most commonly used aids in delivering toothbrushing counseling. These props are used to study the parts of the teeth. Panthom media is a three-dimensional teaching aid that can be seen, held, and practiced directly, so that the target can capture the knowledge provided [19]. This is because MOSIPEDALY (Modified Panthom Dental Study) media is a three-

dimensional teaching aid that can be seen, held, and practiced directly. MOSIPEDALY media has the advantage of being props shaped like human teeth, gums and tongues that can be felt using the sense of touch by visually impaired children equipped with braille writing on each part.

Learning toothbrushing skills to visually impaired children by providing explanations captured through stimulation using concrete objects in the form of jaw imitation models, children learn through touch using the left hand to hold the jaw prosthesis and the right hand holding a toothbrush with the guidance of the researcher and assisted by SLB N 1 Bantul teachers, students are taught to brush their teeth using the model. This strategy is considered quite effective in teaching visually impaired children about brushing skills which is done by holding and feeling.

C. The Effectiveness of MOSIPEDALY Media and BRAILLPOPAL Media in Improving Toothbrushing Skills in the Blind

Health has a big impact on the quality of life of children, one of which is with unstable children such as blind children. Blindness or blindness is a condition in which there is no vision at all or total blindness. This is related to blindness, which refers to the loss of a person's visual sense function, which directly affects the development and learning in varying ways, especially in their knowledge [9]. This makes the oral health of blind children poor because they tend to be slower to detect the initial symptoms of cavities, such as tooth discorption and bleeding when brushing teeth which is the beginning of dental inflammation, because generally these symptoms are known through the sense of vision [28]. As for the causes of the poor condition of the oral cavity of the visually impaired due to unsupervised brushing actions, other factors such as brushing skills, motor skills and assistance are neglected. In addition, there is a lack of visualization to understand and master dental and oral hygiene practice techniques.

Media also has the advantage of making it easier for respondents to understand the purpose of the learning system. Media can be used as a supporting means, which can stimulate the thoughts, feelings, attention, and interest of the recipient of the material [31]. Visually impaired children have limited vision which is a factor that hinders blind children in obtaining information. However, visually impaired children have good sense of touch. The use of BRAILLPOPAL media and MOSIPEDALY media can stimulate a good sense of touch in visually impaired children to attract the attention of visually impaired children and be able to optimize the success of dental and oral health education, namely brushing skills in visually impaired students.

It can be concluded from the results of the above study that there is a significant difference between the effectiveness of the use of BRAILLPOPAL and MOSIPEDALY media in improving the brushing skills of the visually impaired. This is in line with the understanding of the characteristics of blind children who like to fantasize and think critically, compared

to children who can do activities of looking, and looking for information while relaxing or at certain times these activities cannot be done by blind children so that blind children can only fantasize [7].

The limitation of visual information can motivate blind children to think critically about a problem, with the help of media visually impaired children will find it easier to get information and knowledge. With the good use of the sense of touch, visually impaired children can optimize the success of dental and oral health education, namely increasing knowledge of how to brush the teeth of blind children [24]. MOSIPEDALY media and BRAILLPOPAL media are one of the supporting facilities, especially in providing education about brushing skills. This hail is in line with the understanding that media can be used as a supporting means, which can stimulate the thoughts, feelings, attention, and interest of the recipient of the material [30].

BRAILLPOPAL media is more effective in improving the brushing skills of visually impaired students when compared to the MOSIPEDALY media group. The advantages of BRAILLPOPAL media can improve the brushing skills of visually impaired children, because in accordance with the meaning of braille letters is a writing system used by visually impaired people to read and write [31]. In the braille system, each letter, number, punctuation, and special character is represented by a combination of raised dots on the surface of paper or other materials. The use of braille media as a substitute for Latin letters in the learning system can encourage interest, increase inspiration and enliven learning for visually impaired students. Learning through media with braille letters increases self-confidence, in general they are more creative and not inferior to normal children in general [26]. BRAILLPOPAL media also has the advantage of having writing and images that can stimulate the mind, attention and interest of the recipient of the material.

The increase in knowledge of dental and oral hygiene with BRAILLPOPAL media occurs because visually impaired children have a habit of reading with braille so that visually impaired children are very familiar with and understand braille letters [24]. Skinner's theory (1938) states that the cause of individual behavior depends on the quality of the stimulus that communicates with the organism. In the promotion of dental and oral health, the selection of the right dental and oral health promotion media will make it easier for visually impaired children to understand in receiving information.

Linking the data from the research results with the S-O-R theory shows that every stimulus given must have a response. The stimulus in this study is counseling using BRAILLPOPAL and MOSIPEDALY media. The improvement in brushing skills showed that the stimulus provided was accepted by the respondents. The stimulus given to organisms aims to gain attention, understanding, and acceptance, so that it is expected to build a positive attitude and be able to provide an action response. This positive

attitude can form a good action response related to their brushing skills [22].

At the beginning of the meeting at SLB N 1 Bantul, students seemed not used to the arrival of researchers who were new to them and tended to be silent but when the researchers began to show BRAILLPOPAL and MOSIPEDALY media, students began to be active and enthusiastic when they began to touch the media given. When the researcher started the counseling, the students were able to listen well with great enthusiasm. At each subsequent meeting, students are always enthusiastic and students always want to learn to brush their teeth through the media first. After the research is carried out, at the evaluation stage it can re-demonstrate the correct way to brush your teeth. So it can be concluded that the theory and research results are appropriate because there is a meaningful difference between counseling using BRAILLPOPAL and MOSIPEDALY media. This can be because MOSIPEDALY media has a shape that is more like human teeth and mouths so that it is more attractive to children to learn and children are able to understand well and BRAILLPOPAL has braille letters that are equipped with three-dimensional images that add insight, and resources.

V. CONCLUSION

Based on the results of research on the effectiveness of the use of BRAILLPOPAL and MOSIPEDALY media in improving brushing skills in visually impaired people, it can be concluded that:

1. Brushing skills of blind students before being given counseling, namely many students have a bad category, after counseling using BRAILLPOPAL media, namely many students have a good category so that there is an improvement in brushing skills.
2. Brushing skills of visually impaired students before being given counseling, namely many students have a bad category, after counseling using MOSIPEDALY media, namely many students have a good category so that there is an improvement in brushing skills.
3. There is a difference in the effectiveness of BRAILLPOPAL media and MOSIPEDALY media on the brushing skills of visually impaired students at SLB N 1 Bantul.

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