

Indonesian Sign Language Visualization Model (BISINDO) Website-Based Oral Health on Tooth Brushing Behavior in Deaf Children

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Abstract: Dental health at school age with normal children is better than that of deaf children due to limited communication due to hearing loss to receive information. Children who are basically easily saturated or bored, the strategy to overcome this problem is that a medium or method is needed in the form of a BISINDO visualization model in the form of a website-based learning video through the senses of the eye so that deaf children understand the content of the material so that changes in teething behavior are obtained. The purpose to produce alternative behavior change through the Indonesian Sign Language (BISINDO) visualization model of effective dental health to improve the brushing behavior of deaf children. The research method use Research and Development (R&D) and model trials using quasy experiment methods (pre and post test with control group design). Sampling using the Lemeshow formula obtained 10 samples of children per group based on inclusion criteria. The intervention group to measure knowledge, attitudes, actions and debris indexes was then given education using the BISINDO visualization model for 21 days. The control group to measure knowledge, attitudes, actions and debris indexes was then given education using leaflet and phantom media. **Results :** The feasibility test of the Indonesian Sign Language visualization model (BISINDO) of website-based dental and oral health obtained an average score of 85.6% (very feasible). The implementation of this model is effective in increasing knowledge ($p=0.003$), attitude ($p=0.000$), action ($p=0.001$), and lowering the debris index score ($p=0.033$). **Conclusion :** The website-based Indonesian Sign Language (BISINDO) visualization model of dental and oral health is feasible as an alternative to behavior change and effectively improves brushing behavior compared to the control group

Keywords:- Visualization of Indonesian Sign Language (BISINDO), tooth brushing behavior, deaf children

I. INTRODUCTION

Dental and oral health is a major indicator of overall health. Dental and oral health problems that are widespread in most of the world's population are dental caries.[1] According to the World Health Organization (WHO), 60% - 90% of school-age children experience dental caries, while the 2018 Basic Health Research data shows that the national prevalence of dental and oral health problems is 57.6%. [2] Brushing your teeth properly can prevent tooth decay.[3]

Lack of knowledge will affect human behavior including health behavior. Behavior formation can be done through health education or education.[4] In this case, dental and oral health behavior is still lacking and encourages various efforts to improve dental and oral health, including promotive, preventive, curative and rehabilitative efforts.[5]

Children with special needs (ABK) are individuals who have lost / experienced a decrease in sensory function that affects learning and behavior problems and have intellectual privileges such as deafness.[6]

Deafness is a person who has lost all or part of his hearing power due to the malfunctioning of part or all of his hearing device[7] so the inability to use hearing aids in daily life, affects life in complex ways, especially the inability to use language skills, a very important communication tool.[8] A prominent feature in deaf children is verbal communication disorders which result in obstacles that further divert the function of visual observation.[9]

Dental health conditions at school age with normal children are better than those with deaf children. The limitations of communication due to hearing loss, this creates obstacles in obtaining knowledge related to dental and oral health[10] which will later determine the attitudes and actions of children to maintain oral hygiene.

Children who are basically easily bored or bored need a learning model that is both entertaining and educational, where the previous learning media were only print and oral media directly which would lead to boredom and lack of focus,[11] so an innovative learning model that inspires to motivate thoughts, feelings is needed, attention, and interest of children in order to optimize the learning process and achieve goals.

One of the things that can bridge communication between the deaf is the use of sign language,[12] namely Indonesian Sign Language, BISINDO as a communication tool for the deaf by using both hand movements, expressiveness, body movements and each sentence structure does not use affixes.[13]

The problem that is often experienced by the deaf is understanding something that is still verbal, therefore a tool or media is needed in the form of BISINDO visualization in the form of learning videos[14] through the senses of the eye so that deaf children understand the content of website-based learning materials which can be accessed anywhere and anytime. any time.

II. METHODS

The research method used is Research and Development (R&D) which is used to produce a website-based BISINDO visualization model as a medium for dental health promotion and to test the effectiveness of the behavior of brushing the teeth of deaf children. The research and development procedure includes 5 steps, namely: 1) information gathering, 2) model design, 3) expert validation and revision, 4) model testing, and 5) model results.

The design of this study was a quasi-experiment (pretest and posttest with control group design). Respondents consisted of 20 deaf children in grades 7-9. The minimum sample size was calculated based on the sample size by Sastroasmoro et al, with $\alpha = 0.05$ and power =

C. Expert Validation

Expert Validation			
Name	Model eligibility score	Average	p-value
Hermien Nugraheni, SKM, M.Kes	95,2 %	85,6%	0,002
Rizal Ginanjar, S.ST, M.Tr.Kep	90,4 %		
Bayu Pamungkas, S.Pd., M.Pd	71,2 %		

Intraclass correlation coefficient

Table 1 Expert Validation

The results of expert validation, a feasibility score of 85.6% with a very feasible category with a p-value = 0.002, which means that the website-based Indonesian Sign

D. Model test

Characteristics	Variable				p-value
	Intervention		Control		
	n	%	n	%	
Gender					
Male	5	50	7	70	0,207
Female	5	50	3	30	
Age					
13-16 TH	2	20	9	90	0,263
TH	7	70	1	10	
>21 TH	1	10			
learning achievement					
< 79	5	50	7	70	0,207
> 79	5	50	3	30	

Table 2: Respondent characteristic data

0.10. The minimum sample size required is 20. The sample is divided into two groups, namely 10 intervention groups and 10 control groups. The children in this study were taken from SLB B/C Swadaya and Widya Bakhti, Semarang.

Instruments to measure knowledge, attitudes, actions using questionnaires and debris index scores using observation sheets. The research data uses an interval scale, statistical test of the interclass correlation coefficient to test the feasibility of the model, while the normality test uses the Shapiro Wilk test because the number of respondents is less than 50. Test the effectiveness on normal data using the Paired Sample Test and Independent Sample Test.

III. RESULT

A. Information Collection

The collection of information was done through the interview method. It can be concluded that deaf children are children who have problems with the sense of hearing, have difficulty speaking and communicating with different characteristics. Efforts are used to improve dental health with media in the form of videos and direct tools that practice directly such as phantom.

B. Design and Build

The design of a website-based dental and oral health education model through the development of the ADDIE method system (Analysis, Design, Development, Implementation, and Evaluations)

Language (BISINDO) visualization model for dental and oral health is feasible as a model for tooth brushing behavior in deaf children.

Table 2 shows as many as 20 deaf children in this study with 5 (50%) and 7 (70%), male genders 5 (50%) and 3 (30%) in the intervention and control groups. Age 13-16 years 2 (20%) and 9 (90%), Age 17-20 years 7 (70%) and 1

(10%) in the intervention and control groups. Table 2 shows that there is no significant difference between the two groups in the characteristic data ($p > 0.05$)

Variable	Paired data test*			Unpaired data test **		
		Mean±SD	Delta	p-value	Mean±SD	p-value
Intervention	Pre	6,10±1,79	2,40	0,000	8,50±1,269	0,003
	Post	8,50±1,27				
Control	Pre	4,50±0,97	1,90	0,007	6,40±1,506	
	Post	6,40±1,51				

*Paired Sample Test

**Independent Sample Test

Table 3: Paired-Data and non-Paired Data Effectivity Test

Based on table 3 shows that the results of the paired data effectiveness test have a p-value of the intervention group is 0.000 ($p < 0.05$), meaning that the website-based Indonesian Sign Language (BISINDO) visualization model of dental health is effective in increasing the knowledge of deaf children. The p-value of the control group was 0.007 ($p < 0.05$), meaning that leaflet and dental phantom media also increased the knowledge of deaf children.

The results of the unpaired data effectiveness test showed that the p-value between the intervention and control groups was 0.003 ($p < 0.05$), meaning that the website-based Indonesian Sign Language (BISINDO) visualization model for dental health was more effective in increasing knowledge than leaflets and dental phantom media.

Variable	Paired data test*			Unpaired data test **		
		Mean±SD	Delta	p-value	Mean±SD	p-value
Intervention	Pre	36,30±4,50	7,50	0,000	43,80±3,99	0,000
	Post	43,80±3,99				
Control	Pre	28,00±1,76	5,30	0,016	33,30±4,45	
	Post	33,30±4,45				

*Paired Sample Test

**Independent Sample Test

Table 4: Paired-Data and non-Paired Data Effectivity Test

Based on table 4 shows that the results of the paired data effectiveness test have a p-value of the intervention group is 0.000 ($p < 0.05$), meaning that the website-based Indonesian Sign Language (BISINDO) visualization model of dental health is effective in improving the attitude of deaf children. The p-value of the control group was 0.016 ($p < 0.05$), meaning that leaflet media and dental phantoms also improved the attitude of deaf children.

The results of the unpaired data effectiveness test showed that the p-value between the intervention and control groups was 0.000 ($p < 0.05$), meaning that the website-based Indonesian Sign Language (BISINDO) visualization model for dental health was more effective in improving attitudes compared to leaflet and dental phantom media.

Variable	Paired data test*			Unpaired data test **		
		Mean±SD	Delta	p-value	Mean±SD	p-value
Intervention	Pre	6,10±1,79	2,80	0,001	8,90±1,10	0,001
	Post	8,90±1,10				
Control	Pre	4,40±0,84	1,90	0,014	6,30±1,64	
	Post	6,30±1,64				

*Paired Sample Test

**Independent Sample Test

Table 5: Paired-Data and non-Paired Data Effectivity Test

Based on table 5 shows that the results of the paired data effectiveness test have a p-value of the intervention group is 0.001 ($p < 0.05$), meaning that the Indonesian Sign Language (BISINDO) visualization model of website-based dental health is effective in improving the actions of deaf children. The p-value of the control group was 0.014 ($p < 0.05$), meaning that leaflet media and dental phantoms increased the actions of deaf children.

The results of the unpaired data effectiveness test showed that the p-value between the intervention and control groups was 0.001 ($p < 0.05$), meaning that the website-based Indonesian Sign Language (BISINDO) visualization model for dental health was more effective in improving action compared to leaflet and dental phantom media.

Variable	Paired data test*			Unpaired data test **		
		Mean±SD	Delta	p-value	Mean±SD	p-value
Intervention	Pre	1,58±0,29	0,690	0,000	0,89±0,34	0,033
	Post	0,89±0,34				
Control	Pre	1,72±0,31	0,470	0,003	1,20±0,36	
	Post	1,25±0,36				

*Paired Sample Test

**Independent Sample Test

Table 6: Paired-Data and non-Paired Data Effectivity Test

Based on table 6 shows that the results of the paired data effectiveness test have a p-value of the intervention group is 0.000 (p <0.05), meaning that the website-based Indonesian Sign Language (BISINDO) visualization model of dental health is effective in reducing the debris index of deaf children. The p-value of the control group was 0.003 (p < 0.05), meaning that leaflet media and dental phantom reduced the debris index of deaf children.

The results of the unpaired data effectiveness test showed that the p-value between the intervention and control groups was 0.033 (p < 0.05), meaning that the website-based Indonesian Sign Language (BISINDO) visualization model for dental health was more effective in reducing index debris compared to leaflet and phantom media.

E. Product Results

The results are in the form of a visualization model of Indonesian sign language (BISINDO) on dental health, brushing teeth and mouth based on a website that can be accessed at the link <https://vibi-kgm.com/>. The Indonesian Sign Language (BISINDO) visualization model is a video content related to the behavior of brushing teeth and mouth using the website-based Indonesian Sign Language (BISINDO). This website-based Indonesian Sign Language (BISINDO) visualization model emphasizes independence to improve tooth brushing behavior for deaf children. The implementation of this model emphasizes the role of children in brushing their teeth independently starting with filling out registration, logging in, doing checklists every morning and evening after brushing their teeth according to the notifications that come in whatshap of each respondent and viewing videos and answering quizzes from each video.

IV. DISCUSSION

Deaf people with dental health are characterized by several dental problems they experience including dental caries, malocclusion, calculus, and gingivitis, this is due to low dental health maintenance behavior. To shape changes in tooth brushing behavior in deaf children, appropriate, interesting, and motivating methods and learning media are needed that are in accordance with the characteristics of deaf children and combine them with sign language.[15]

Knowledge is the result of knowing that occurs after the respondent has sensed an object.[16] This is in line with the research of Sari et al where the Website provides convenience in providing information because it is available anytime, anywhere, and can be accessed at any time.[17] The results of this study are also in line with the research of Wahyunita VD et al. who stated that the advantage of the video method is that the material does not directly reach children, so it is easier to convey messages clearly and easily without being too verbal. In addition, web-based methods often have many advantages for children when learning methods are learning on the web. One of them is because its virtual or virtual nature allows children to learn anything anytime, anywhere.[18]

An increase in attitude occurs when someone responds after being given information and then considers whether to take action in accordance with the information provided. Attitudes can be formed when someone obtains information, responds and will take action after being given the information.[19] Putri AA & Kurniasari R's research uses the website in the application of education to attitudes because the media is very interesting among teenagers and also easy to understand, the writing model is easy to read and the pictures really describe the content of the material.[20]

Increasing the value of actions using website-based BISINDO visualization is more effective than using leaflet media. The increase in brushing teeth occurs because the website-based BISINDO model has a video on how to brush your teeth properly and correctly with reminders to brush your teeth regularly 2 times a day, and on the website there is a feature that can see who is accessing the website so that it can be monitored. by admin.

By providing experience that is sourced from knowledge, it is hoped that the practices/actions that have been adopted will be maintained as well as the act of brushing teeth in deaf children.[17]

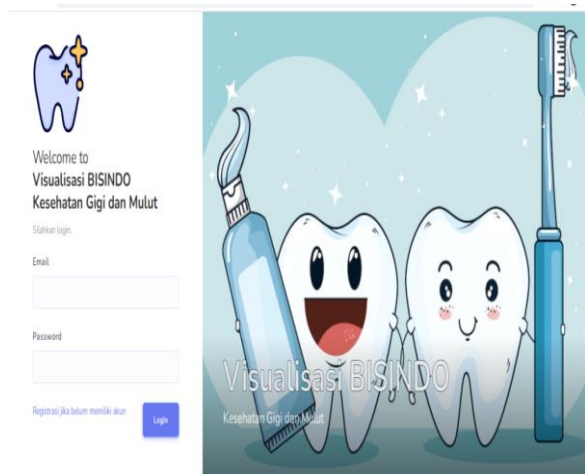


Fig. 1: Website front page

The website-based Indonesian Sign Language (BISINDO) visualization model for dental health is more effective in reducing index debris compared to leaflet media. The debris index score has decreased because children have been taught to understand good and correct dental practice for 21 days. The practice of brushing your teeth properly and correctly will remove debris. Deinzer research proves that brushing teeth with the right technique will improve the status of oral hygiene.[21] This is also in line with the research of Hermawan and Agustina Y. The decrease in debris scores is caused by providing health promotion about brushing teeth properly and correctly and can change behavior using the right methods and media, so that children can understand and practice it in their daily lives. [22],[23]

V. CONCLUSION

The deaf are children with hearing loss, difficulty speaking and communicating with different characteristics. Within the limitations and based on the results of this study, it can be concluded that the website-based Indonesian Sign Language (BISINDO) visualization model for oral health is more effective than leaflet media. BISINDO visualization model can increase knowledge, action, and decrease debris index scores for deaf children

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