Increasing Teeth Brushing Skills for Mentally Retarded Children with Application of "Educational Media Modification Puzzle" 3D Gosgi

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Abstract: **Mentally retarded children experience higher dental and oral health problems compared to normal children due their ability to carry out independent activities, especially in dental and oral health maintenance behaviours. The right behaviour change strategy is to provide dental health education using learning methods and media tailored to the needs of mentally retarded children. Model of the 3D Gosgi modification puzzle was made specifically for learning carried out by mentally retarded children in group and been assisted by teachers. Aims: Find effect of application media puzzle modified 3D Gosgi as an effort to improve the skills of brushing teeth for mentally retarded children. Research design is quasy experimental and research location at Special Need School at Semarang, Indonesia. The subjects were 30 mentally retarded children divided into two groups, intervention group was given education with a modified 3D puzzle model for 5 d and control group with video media and brushing teeth demonstrations. Measurement of index debris and tooth brushing skills of mentally retarded children were carried out before and after intervention. Statistical analysis used is Wilcoxon and Mann Whitney test. Puzzle modified 3D gosgi are effective to decrease debris index (p < 0.001) and improve tooth brushing skill   (p < 0.001) compared to group with video and demonstration. Application of puzzle modification 3D Gosgi by teacher for effective in improving the brushing skills of mentally retarded children.**

Keywords: Demontration, puzzle modified, special need children, video

1. INTRODUCTION:

Mentally retarded children experience higher levels of dental and oral health problems compared to normal children. In general, the problems most often experienced by mentally

retarded children are perforated teeth (caries), tartar (calculus), gum inflammation (gingivitis), irregular teeth position (malocclusion), and poor oral and dental hygiene [1,2].

Dental caries prevalence in mentally retarded children in Brazil is 71 %, Taiwan 72.88 %, China 53.5 %, and in India 79.2 %. The percentage of dental and oral hygiene status of mentally retarded children in Skopje Macedonia was 100 % in poor criteria, at Mohali India at 6 % in good category, 25 % in moderate category, and 69 % in bad category [3-8]. Results of research conducted in Semarang City SLB C on 101 mentally retarded children, 83.2 % experienced dental caries. The results of a previous similar study in 40 mentally retarded children of 87.5 % experienced dental caries [9,10].

Saptiwi's research results at Semarang State SLB.(Sekolah Luar Biasa) Special need school at Indonesia. on 72 mentally retarded children examined by OHI–S, 97.4 % in the moderate category and 26.1 % in the good category. A similar study at Widiasih Parigi State SLB Indonesia. on 27 mentally retarded children showed that the OHI–S value was 14.81 % in the good category, 73.37 % in the moderate category, and 14.81 % in the bad category [11].

Characteristics of mentally retarded children are decreased intellectual function, difficulty communicating, adaptive behavior, have a higher level of fear and anxiety than normal children in general, and require longer adapting time to new situations [12]. Based on general characteristics, it can be concluded that mentally retarded children unable to carry out independent activities on health care, especially efforts to maintain dental and oral health.

Mentally retarded children cannot carry out efforts to maintain oral health independently because of their limitations, so they need help from parents and teachers in carrying out independent activities [13,14]. The practice of maintaining dental and oral hygiene is the most important and recommended health care measure do brushing [15].

Dental and oral health education is an educational process that arises on the basis of dental and oral health needs which aim to improve the degree of dental health. The process of dental and oral health education is carried out so that individuals gain experience or knowledge through various methods and educational media [16].

In accordance with the characteristics of mentally retarded children, dental health education should use interesting learning methods that can produce understanding, develop imagination, and give pleasure. One method that can be used is cooperative learning, which is learning which children work together in groups and achieve their individual and group learning goals through feedback and discussion with friends. Such type of cooperative learning consists of jigsaw, group investigation, listening team, and make a match [17, 18, 19]. Cooperative learning type of make a match is one of learning mental retardation children, where children are asked to find, match and pair picture cards as media. A study proves that the make a match model improves children's skills such as fostering mutual respect, critical attitudes, attitudes to always achieve, mutual respect to motivate children to get more effective and efficient learning outcomes [20, 21].

One of the media that can be used in a learning method is the 3D gosgi modification puzzle, which is a media to unite fragments of images and then arranged to form the stages of brushing teeth. Wardani's research shows that there is an increase in the ability to develop self–brushing teeth for moderate mentally disabled students using puzzle media [22].

The media model Widi's 3D Gosgi puzzle modification will provide learning carried out by mentally retarded children in groups together with the teacher, because mentally retarded children have limitations and lack of independence, so that the teacher needs help in the educational process. simulation model of the puzzle, and demonstration of brushing teeth properly and correctly. Widi's Puzzle model has proven to be effective in increasing teacher

knowledge, attitudes and skills in training mentally disabled students. The development of this new puzzle model can be used as a testing medium for mentally disabled children.

2. RESEARCH ELABORATION:

Quasy experiment research design (pre and post–test with control group design). This study aims to make a model of the media puzzle step of brushing teeth in its implementation through learning methods. The procedure of research and development includes five main steps, as follows: the first Information gathering, second product or model design, third expert validation and revision, fourth product or model testing, and the fifth product or model results [23].

Samples of mentally retarded children were 30 children, divided into two groups consisting of 15 children as intervention group and 15 children in the control group. Data on measuring the debris score index of brushing skills is done by statistical tests. The research data uses a ratio scale so that the normality of the Shapiro–Wilk test is done. Statistical test to analyze paired variable data in the intervention group and the control group, if the normal data uses paired t–test, while it is not normal using the Wilxocon test. Statistical test to analyze the comparison between the intervention group and the control group, if the normal data uses an independent t–test, while it is not normal to use the Mann Whitney test.

3. RESULTS:

Tabel 1. Characteristic of samples of children mentally retarded

Variable	Intervention		Control		Homogenity test*
	n	f (%)	n	f (%)	
IQ					
Low	13	87	13	87	1. 000
Middle	2	13	2	13	
Age (years old)					
7 to 9	2	13	1	7	
10 to 12	6	40	7	46	
13 to 15	5	33	5	33	
16 to 18	1	7	1	7	
19 to 21	1	7	1	7	
Gender					
Boy	10	67	9	60	0.716
Girl	5	33	6	40	

Anova

Based on the table above, it can be seen the frequency distribution of mentally retarded children based on IQ level, the highest percentage is 87 % (13 children) in mild mental retardation classification. The frequency of mentally retarded children by age, the largest percentage is 46 % (five children) aged 10 yr to 12 yr. The frequency of mentally retarded children by sex, the highest percentage was 67 % (10 children) of the male sex in the intervention group. The homogeneity test results show that the p–value is > 0.05, so it can be concluded that the variants of the two sample groups are similar.

Table 2. Normality test of intervention and control group

Variable	Normality test*	
	p-value	
	Intervention (n = 15)	Control (n = 15)
Debris Indeks pre–test	1 000	0.000
Debris Indeks post–test	1 000	1 000
Skills pre–test	0.637	0.000
Skills post–test	1 000	1 000

Shapiro–Wilk

The results of the normality test indicate that the p–value is < 0.05, so that it can be concluded that the data are not normally distributed, followed by non parametric tests.

Table 3. Difference of debris index and tooth bruhing skill at pre and post intervention

Group		n	Debris Indeks**		Skills**	
			Negative Rank + Sum of Ranks	Z+p–value	Positive Rank + Sum of Ranks	Z+p–value
Intervensi	Pre Post	15	8.00±120.00	-3.411±0.001	8.00±120.00	-3.438±0.001
Control	Pre Post	15	7.00±91.00	-3.196±0.001	6.50±78.00	-3.166±0.002

**Wilcoxon

The results of the effectiveness of the paired debris index data showed p–value is 0.001 (p < 0.05) and the control group's p–value is 0.001 (p < 0.05) meaning widi's model of 3D gosgi modification puzzle and video media and scrub demonstration teeth effectively reduce index debris scores for mentally retarded children. Tooth brushing skills showed that the intervention group's p–value was 0.001 (p < 0.05) and the control group's p–value was 0.002 (p < 0.05) means that the model of 3D gosgi modification puzzle and video media and tooth brushing demonstration effectively improve the brushing skills of mentally retarded children.

Table 4. Differences of debris index and tooth brushing skill of two groups

Groups		N	Debris Indeks***		Skills***	
			Mean Rank	Z±p–value	Mean Rank	Z±p–value
Intervention	Pre Post	15	9.2		22.43	
				-3.940±0.000		-4.449±0.000
Control	Pre Post	15	21.8		8.57	

***Mann Whitney

The test results of the effectiveness of unpaired index debris data show the p–value value between the intervention and control groups was 0.000 (p < 0.05), meaning the modified 3D gosgi puzzle model was more effective in lowering the debris score in the index of tooth brushing skills for mentally retarded children compared to video media and brushing teeth demonstrations. Skills show the p–value between the intervention and control groups is 0.000   (p < 0.05), which means that the modification puzzle model 3D gosgi is more effective in improving the teeth brushing skills of mentally retarded children compared to video media and brushing teeth demonstrations.

According to Fatmasari mentally retarded children need special services tailored to their needs [24]. The suitable media to achieve this is the gosgi 3D modification puzzle model. Expert validation process is important in product or model development in order to produce products or models that are useful in improving the quality of education [25]. In

accordance with Sharma's research, good media will support the practice of brushing teeth [26].

Based on the characteristics of mentally retarded children unable to carry out independent activities the practice of brushing teeth and need help from other people both parents / teachers [27, 28]. The teacher is considered the person closest to the child in school and is someone who is expert in providing educational interventions to mentally retarded children so improve children's skills [29, 30].

Dental and oral health education interventions can be given by the teacher to mentally retarded children, but in the process the teacher needs to be trained in advance because with the knowledge, attitudes and skills of maintaining dental and oral hygiene the teacher is able to transfer knowledge and transfer of skills to children mentally disabled. According to Santoso research, the provision of dental health education to mentally retarded children is not much different from normal children, but requires the role of parents / teachers in the implementation process. The effectiveness test results of unpaired variables indicate that the p–value between the intervention and control groups is 0,000 ($p < 0.05$), meaning that the modification puzzle model 3D gosgi is more effective in improving the skills of brushing children with intellectual disabilities compared to video media and brushing teeth demonstrations. This is because the advantages of media 3D modification puzzle gives gosgi a lot of stimulus in the learning process, implementation is carried out in small groups and children are directly involved in demonstrating for themselves how to brush teeth properly and correctly. The best method for providing dental and oral health education is suitable given in small groups because in the process mentally retarded children can conduct discussions [31]. Children with mental retardation can express their motivation in this learning method, according to Fatmasari, discussion in small groups is more effective in improving dental hygiene compared to large groups [32].

Learning activities in the model modified 3D Gosgi puzzle aim to provoke thought, creativity, and make them understand the dental and oral hygiene maintenance skills [33]. Use of interactive learning media and methods is suitable for use in the world of education. Media puzzle of mentally retarded children can learn to do cooperative learning methods, simulations, and demonstrations of brushing teeth properly and correctly.

4. CONCLUSION:

From the results of the study, it can be summarized that the launching of the 3D modification model of 3D Gosgi puzzle has been shown to be effective in reducing index debris scores and improving the skills of brushing teeth for mentally retarded children.

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