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## A Survey on Dental Cartoon Animation on Oral Hygiene Improvement of Children with Special Needs

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**ABSTRACT:** Dental health is considered to be an essential and fundamental part in children's growth. However, numbers of parents in Indonesia are not concerned with their children dental health. This research aims to identify the influence of dental health education using cartoon animation media to the value change of oral hygiene towards children with special needs at SLB Negeri Bangli, Indonesia in 2017. This study is pre-experimental research, where the design was targeted in one group (X) in particular condition then followed by observation and measurement. The sample size of this study is 43 participants. In this study, univariate analysis was used in the form of mean, frequency and percentage, which then continued by bivariate analysis with T-test. The result of this study shows the average value of oral hygiene is increased by 0.84 after oral health education by cartoon animation, compared to the earlier stage (1.37). This study concludes that there is a significant difference in oral hygiene, before and after oral health education program by using cartoon animation for dental health, with significant value of 0.00 and correlation value of 0.84.

**KEYWORDS:** Cartoon animation, Children, Dental Health, Oral Hygiene

### I. INTRODUCTION

In developing countries, dental caries is a major dental health problem. It often attacks children, which is so harmful that resulted in absence of school. Yet, school age is an integral phase of children's growth as well as their health, one of them is dental health [1][2]. Data on Basic Health Research (Riskesdas) in 2013, shows that children aged 10-14 years in Bali Province, Indonesia amounted to 22.4% having oral and dental health problems. Yet, only 31.3% received dental health services from medical personnel. Furthermore, junior high school graduates as much as 24.4% experienced dental and oral health problems, and only 41.8% received dental health services from medical staff. The average DMF-T for the population graduating from junior high school is 3.17. This figure is far higher than the national target of 1.0 which becomes the challenge [3].

The knowledge lack and limited support about dental health education drives the reasons why dental health education needs to be instilled from the early age. Animated media is also used in form of video manifold 2D motion graphics to help a dentist giving dental health education towards children [4]. According to [5] which conducted a research of dental health using animated cartoon by randomised control trial involving 244 children selected from elementary classes show that it is statistically significant in the improvement of dental health of the children. Dental health cartoon video was applied to 92 deaf children aged around 10-15 years old which is significantly increase the level of knowledge  $7.73 \pm 0.38$  before education to  $10.75 \pm 0.42$  after education [6] and successfully decrease the plaque score [7]. However, few research conducted for children with special needs.

The behaviour of brushing teeth of people in Bali Province is reported that the majority (91.8%) of people aged 10 years and over have brushed their teeth every day, but the majority (86.8%) brushes their teeth while bathing in the morning and afternoon. Good brushing is recommended at least twice a day, after breakfast and at night before bed. According to article 15 of Law No. 20 of 2003 concerning National Education System, that the type of education for

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children with special needs is Special Education. Article 32 (1) of Law no. 20 of 2003 provides a limitation that special education is an education for students who have difficulty in following the learning process due to physical, emotional, mental, social, and / or potential disabilities and special talents. Technical education services type of Special Education for students with disabilities or students who have exceptional intelligence can be held inclusively or in the form of special education units at primary and secondary education levels. Therefore, special education only exists at the level of primary and secondary education. Specifically, tertiary education is not yet available. According to article 130 (1) PP No. 17 of 2010, special education for students with special needs can be held at all lines and types of education at the level of primary and secondary education. Special education can be carried out through special education units, general education units, vocational education units, and / or religious education units. Article 133 paragraph (4) stipulates that the implementation of special education units can be carried out in an integrated manner between levels of education and / or between types of disorders. The form of education units / institutions in accordance with its specialty in Indonesia is known as SLB (Special School) part A for the visually impaired, SLB part B for the deaf, SLB part C for mentally retarded, SLB part D for the physically impaired, SLB part E for unsociable and SLB part G for double disabilities.

Bangli State Special School (SLBN), is one of the schools that educate children with special needs. The school consists of three levels, namely Special School of Elementary (SDLB), Junior (SMPLB), and Senior High School (SMALB). The results of preliminary interviews with several groups at the school obtained information that, children with special needs are difficult to recommend to brush their teeth. The average Oral Hygiene for children with special needs in this school was 2.16 (moderate criteria), and those suffering from dental caries were 93.3% [8]. The general objective of this study is to investigate the effect of the Dental Health Education cartoon animation media on changes in the value of Oral Hygiene in special needs children in SLB NegeriBangli in 2017.

## II. RELATED WORK

Problems of caries which often occur on children shows that it must be prevented in an early ages it is a results in gingivitis [9-11]. An effort to improve dental and oral health of school-age children is the health education using a method to attract children's attention. Research of quasi experimental with one group pretest and posttest have already done conducted in elementary school. The parameter used PHP (Patient Hygiene Performance) Index in which it successfully improves the PHP Index from moderate to good category [1].

A research conducted by [2] using flipbook named "KakAyu Dental Flipbook" is the way to improve the knowledge of children to maintain dental health. It is a way to attract the children's attention. There is improvement of knowledge of the children after the implementation of "KakAyu Dental Flipbook" from 80.85 to 93.40. In additional, there is a relation between the improvement and education by using "KakAyu Dental Flipbook" itself with p value of 0.001.

The improvement of education media for dental health is ongoing. There is also a video manifold 2D motion graphics and the interactivity in it by clicking. This media is intended to help dentists while they are doing dental health education towards the children as well as facilitate children in learning how to take care of their teeth carefully. Thus, the animation play roles in dental health education media [4].

Plaque formation was used in [5] as a parameter to check individual's dental health while the data were analysed using multiple logistic regression/ Cluster randomized controlled trial with 244 children of elementary school were involved in the program of dental health education using animated cartoons in Thailand. In comparison between the treatment group and control group, it can be concluded that the treatment group has gained more improvement including plaque formation.

## III. METHOD

This research method is a Pre-Experimental study, a design that involves a group (x) in a particular treatment which is then followed by observation / measurement. This study was conducted in SLB NegeriBangli in June to October 2017. The population in this study were all children with intellectual disabilities in SLB NegeriBangli. This study does not use a sample, this study uses a total population.

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## IV. RESULT AND DISCUSSION

Cavity problem is a reversible condition. It happens due to the continuous accumulation of dental plaque. Good oral care in children especially aged 7 to 9 is important to minimise periodontal health problems [5]. Oral health promotion intervention must be designed by involving community [12].

According to the experiment, the results are divided into two main parts, i.e. the subject characteristics and bivariate T-Test.

### 1. Research Subject's Characteristics

- a. Characteristics of subject research of children with special needs in SLBN Bangli based on gender

Table 1 Subjects based on gender

Gender	Total	%
Male	29	67.4
Female	14	32.6
Total	43	100

Table 1 shows that the number of male students is 67.4%, higher than that of female students with 32.6%.

- b. Characteristics of subject research of children with special needs in SLBN Bangli based on education

Table 2 Subjects based on education level

Level of Education	Total	%
Elementary School	34	79
Junior High School	4	9.3
Senior High School	5	11.7
Total	43	100=

Table 2 shows that the education level of children with special needs in SLB NegeriBangli at most is elementary level (79%) and the least is junior high school level (9.3%).

- c. The average value of oral hygiene before and after dental health education was given by using the cartoon animation media Dental Health Education

Table 3 Subject's Oral Hygiene

Oral Hygiene	Average
Before treatment	1.37
After treatment	0.84

Table 3 shows that the average value of oral hygiene after the treatment using cartoon animation media is 0.84, greater than compared to 1.37.

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d. Level of oral hygiene before and after dental and oral health education using cartoon animation media

Table 4 Subject's Oral Hygiene before and after treatment

Category	Before (f)	%	After (f)	%
Good (0.0 – 1.2)	17	39.53	35	81,40
Fair (1.3 – 3.0)	24	55.81	7	16,28
Bad (3.1 – 6.0)	2	4.66	1	2,32
Total	43	100	43	100

Table 4 shows that the oral hygiene level before the treatment using animated cartoon media is in category of fair as much as 55.81% and after the treatment, it includes in good category with 81.40%

## 2. Bivariate with T- Test

Table 5 Bivariate analysis on OHI-S

	N	Correlation	Sig
Pair OHI-S and OHI-S post	43	0.844	0.000

Table 5 shows that there are differences in the average OHI-S before and after the treatment using animated cartoon media, with a significance value of 0.000, and a correlation value of 0.844.

Based on the description of the subject's characteristics, it was found there are 67.4% male students, more than the female in just 32.6%. While the characteristics based on the level of education indicate that the level of education of children with special need in SLB Negeri Bangli is at most elementary level (79%) and the least is at junior high school (9.3%).

The average oral hygiene after the treatment using animated cartoon media is better in 0.84 compared to the previous one (1.37) in 2017. The level of oral hygiene in children with special need in SLB Negeri Bangli before being treated is included in the fair category 55.81%. The results of this study are in accordance with [8] which shows that the average oral hygiene for children with special need in this school is 2.16 (fair criteria), and those suffering from dental caries are 93.3%. After the treatment, which was given counselling by using the cartoon media of Dental Health Education, the oral hygiene is included in the good category as much as 81.40%.

The results of bivariate analysis, the average oral hygiene before and after treatment showed that there is significant differences in the average oral hygiene between before and after treatment, with a significance value of 0.000, and with a correlation value of 0.844. Decreasing the value of oral hygiene after treatment shows that the use of cartoon animation media towards the children with special need can increase knowledge about dental and oral health, especially regarding ways to maintain dental health. This is because the animation media can convey messages and information with a clear picture to the children with special need. According to [13] animation media has advantages in supporting the learning of science for children with special need that is encouraging the interests and motivation of learning, increasing the concentration and attention of students towards the learning process. Increasing attention and concentration is one more value from the use of this animation media in the learning process of science, because usually the students are often lazy and not interested in academic learning, one of them is science subjects. The use of images, stories displayed in computer animation can help clarify the delivery of messages to the students.

This research is in line with the research of [14], which uses the Irene's Donut method and video is more effective in reducing the plaque index compared to conventional methods. The results obtain an average value of oral hygiene before counselling 1.37 and after counselling given oral health and oral hygiene the average oral hygiene of children

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with special need is in 0.84. The level of oral hygiene using animated cartoon media for children with special needs in fair category 55.81% and after counselling, the level of oral hygiene is in the good category of 81.40%. It shows that there are significant differences in the average OHI-S between before and after counselling by using the animated media, with a significance value of 0.000, and a correlation value of 0.844.

## V. CONCLUSION

We have conducted a study which obtain the fact that there is a significant difference of average OHI-S between before and after the treatment using dental cartoon animation for dental health education, with a significance value of 0.000, and with correlation of 0.844. Treatment using dental cartoon animation media of health education brings better oral hygiene towards the children with special need.

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Primary School in Denpasar. Besides, the research was also Relationship between gingivitis and smoking behaviour in wooden sculpture artists in Mas Village, Ubud District, Gianyar Regency, Effectiveness of Counselling and Training Using Audio Visual and Edutainment Media on Increasing Knowledge and Skills in Maintenance of Dental and Oral Health (Study conducted at Rijasa Penebel Tabanan 2 Elementary School in 2016). In addition, he is also already done Optimization of School Dental Health Unit (UKGS) to Increase the Degree of Dental Health of Students at UBUD Kertha Budaya Subdistrict, Interaction of Aloe Vera Leaf Extract (Aloe Vera L) and Betel Leaves (Piper Betle L) Against In Vitro Inhibitory Streptococcus Mutans Causes of Dental Plaque. Lastly, Effect of Cartoon Dental Health Education Animation Media on Oral Hygiene in Children with Impotence in Bangli State SLB.



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Services at the BPG Puskesmas in Bangli district. In addition, the other researches are Analysis of Factors Associated with Gingivitis in *Tuak* Drinkers in Satra Village, Differences in The Occurrence of Tartar in Society with Well Water and without Well Water, besides also The Effectiveness of Counselling and Training Using Audio-Visual And Edutainment Media to Increase The Knowledge and Skills in Maintaining Dental and Oral Health in SDN Rijasa Penebel Tabanan 2. Lastly, the research was done by the author was Effectiveness of Motivation by Class Teachers on Dental and Oral Hygiene Class III SD N Bangli Regency 2018.



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Schools: Study in Four Primary Schools in South Denpasar Health Center I Work Area, Factors Causing Caries Towards Mother Visitors in Posyandu Melati 1 in Sendang Mulyo Village, Ngawen District, Blora Regency as well as Effect of Chewing Guava Fruit on Changes in Debris Index in Class III and IV Students of MI Baiturahman Surabaya in 2014.