



BONTOA 5G: Motivational Doll for Dental Fillings for Preschoolers

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ABSTRACT: One of the causes of the high prevalence of dental caries in preschoolers is low dental and oral health behavior and delays in dental caries treatment. In changing behavior, motivation is needed, with the right media innovation, able to increase the motivation of preschool children to fill their baby teeth. The purpose of this study is to create a feasible and effective educational media for Bontoa 5G sound dolls in motivating preschoolers to perform dental fillings at the Bontoa Health Center. The research method used is Research and Development (R&D) with a quasi experiment pretest-posttest control group design. There were two groups of 60 respondents, consisting of 30 people in the intervention group and 30 people in the control group. The intervention group was given counseling using a 5G bontoa sound doll. The data were statistically analyzed using ICC, data normality test, paired sample t-test, and independent sample t-test. The results of the paired data test showed that the p-value of the intervention pre-posttest was 0.000 ($p < 0.05$), meaning that the Bontoa 5G sound doll had an effect on the motivation of dental fillings of preschool children, and the results of the unpaired data test showed that the p-value of the intervention group and the control group, was 0.000 ($p < 0.05$) meaning 5G vocal dolls and dental phantom caries were effective in increasing motivation, but had different Δ difference values in the intervention group 15.76 and the control group 12.43 so that the intervention group was more effective. The use of Bontoa 5G voice dolls is feasible and effective in motivating preschoolers to perform dental fillings at the Bontoa Health Center.

KEYWORDS: Motivation, dental filling, educational media, vocal doll

I. INTRODUCTION

Dental and oral health problems are often ignored by the public. It can be seen from the WHO Global Oral Health status report that oral diseases affect nearly 3.5 billion people worldwide, with 3 out of 4 people affected living in middle-income countries. Globally, an estimated 2 billion

people suffer from permanent dental caries and 514 million children suffer from caries of the first teeth[1].

The results of Basic Health Research (Riskesdas) in 2018 show that 57.6% of the Indonesia population has dental and oral problems and only about 10.2% have received medical services. The prevalence of cavities is very high in children aged five years (93%) and only 7% of children are free from cavities, while the prevalence of children aged 5-9 years who see a dentist is only 17.8%.[2] One of the causes of the high prevalence of dental and oral diseases in Indonesia is the low behavior of dental and oral health and the delay in dental caries treatment so that tooth decay left untreated causes an increase in tooth extraction, the cause of the high percentage of children who do not undergo treatment is 22%.[3]

Children of parents with a lack of knowledge and attitudes towards dental hygiene, cariogenic food diet, and children's oral health will have higher rates of caries. Parents' knowledge, attitudes and actions applied to children will affect the health of children.[4]

Dental caries can interfere with children's nutritional conditions, Ratnasari's research results state that dental caries in children can cause digestive disorders and eating difficulties which cause disturbances in the relationship between dental caries and the nutritional status of elementary school children, the relationship between dental caries and the level of energy and protein consumption in elementary school children. There is a relationship between stunting and dental caries levels in kindergarten students in Kertak District, Hanyar, Banjar Regency. The occurrence of infection can cause a decrease in appetite, decreased absorption, which results in a decrease in micronutrients in the body. The incidence of infections that cause decreased appetite is associated with the occurrence of dental caries. The consequences of dental caries certainly cause pain, which will eventually interfere with chewing function. Impaired chewing function will affect the nutritional intake of individuals and their



nutritional status. If nutritional status is disturbed, there is a risk of stunting.[5]

Preventing caries early can begin by providing dental and oral health information about dental caries and preventing it by brushing your teeth. According to the results of research conducted by Rahmi (2023), the target before being exposed to health education had an average knowledge level of 53.77 and entered the lack of knowledge, while after being given knowledge, it changed to a good category with an average score of 94.21. Other studies showed an average of 8.68 before exposure to dental and oral health promotion and 13.68 after being given dental and oral health promotion.[6]

Efforts to improve dental and oral health can include efforts to increase knowledge, both promotive, preventive, curative, and rehabilitative. Knowledge can cause changes in attitudes and behaviors in an individual that have an impact on his daily life. One of the preventive efforts is by providing counseling, which is a way to influence human behavior so that the desire to change behavior for the better arises. Lack of knowledge about oral health causes this problem to be ignored in many cases. The better the knowledge, attitude and behavior towards the maintenance of dental and oral hygiene, the better the oral health status will be.[7]

To change the way people see it, it is necessary to promote dental and oral health so that it can improve public health through a combination of strategies including the implementation of behavior change, health education, early detection of health risks, and improving and maintaining health. Health promotion using educational media can make it easier to convey information to increase knowledge and change target behavior.[8]

In changing behavior, motivation is needed, learning media or health education is needed which aims to facilitate efforts to convey information to increase knowledge and motivate children from refusing to do dental fillings to being motivated to do dental fillings. There are several media that are suitable for preschool-age children such as animated videos, children's games based on local wisdom, as well as three-dimensional innovations with the shapes of objects that children like, such as dolls.

The 5G Voice Doll is a development of the UKGS program at the Bontoa Health Center, which is a dental health program consisting of 5 G's: clean teeth, strong teeth, caries-free teeth, healthy generation, and generation without stunting. This program is in the form of independent activities that are carried out regularly

by small doctors and UKS teachers at the dental poly of the Bontoa Health Center. There has been an increase in routine dental check-up visits and persistent tooth extraction for preschool children at the Bontoa Health Center. Health services for preschool children are not carried out in kindergarten/early childhood, but are referred to the dental polyclinic of the Bontoa Health Center, in addition to the extraction of persistent teeth, dental fillings are also carried out both on molar teeth of one permanent tooth that have just grown and caries on baby teeth. The dental filling method carried out is ART. The filling needs to be done because the permanent molar teeth are the first permanent teeth to erupt at about 6-7 years old, so they are the most vulnerable teeth to caries. If the tooth is affected by caries, it can result in extraction, which poses new risks such as changes in tooth position, affecting occlusion, jaw joints, and the mastication process which has an impact on the absorption of food nutrients. Similarly, if caries on baby teeth that have not fallen out needs to be filled because the accumulation of dental plaque and food residue in one tooth that is left cavities can cause the teeth next to it to also have cavities. The depletion of tooth structure due to untreated cavities, causing teeth to be extracted and premature loss of the first teeth can make the permanent replacement teeth grow messy, because the first teeth are the guard of the room and the direction for the replacement permanent teeth.

Refusal to have a dental filling by a child is influenced by several things. Among them are children who have never had dental fillings before, feel afraid because they think that dental fillings are painful, and the attitude of parents in providing understanding about the importance of baby teeth fillings. When children have not had previous experiences, fear of things that have never been experienced can be a major factor. Children tend to imagine a painful and frightening process, so they refuse to have their teeth filled. It is important for parents and medical personnel to provide a clear and convincing explanation of the procedure to be performed, as well as the benefits of dental fillings.

Preschoolers still really need idols to do or not do an activity. A serious effort is needed to increase their motivation, one of which is with the right media. If so far counseling has only been carried out using dental phantoms, it is worth trying with other innovations that are able to foster children's motivation to fill their baby teeth with small dolls that have bright colors that are widely liked by children.



II. METHOD

This research method uses the Research and Development (R&D) development method. This research and development method is used to produce a product and test the effectiveness of the product. The Research and Development procedure includes five main steps, namely: (1) Information collection, (2) Model design, (3) Expert validation and revision, (4) Model trial, and (5) Model results.

Data collection in information collection by means of interviews and observations. The sample consisted of the Health Office and health workers (dentists and dental therapists).

At the expert validation and revision

stages, expert validation tests are carried out before being used by the public. The sample at this stage consisted of media experts and dental health promotion experts.

The research design in the model trial uses Quasy experiment Pretest-Postest Control Group Design. The sample used was preschool children with inclusion criteria for preschool children aged 4-6 years and having cavities.

III. RESULT

A. Information Collection

Information collection was carried out by interview methods with the Health Office, dentists and dental therapists.

Table 1. Results of Information Collection

Less	Question	Conclusion Answer
1	What is meant by preschoolers?	Children aged 3-6 years, where children at that age have not entered formal education
2	What are the characteristics of preschool children?	Preschool children are the period when development in children occurs starting from growth and development physically, intellectually, and emotionally. Children at this time become excellent imitators, easily influenced by things that attract their attention or are often heard or seen
3	What form of efforts have been given to preschoolers by the dental and oral health program at the Health Center?	The UKGS program conducts dental health examination and counseling activities for preschool children in kindergartens and integrated service post, but innovative efforts are needed to improve service achievements at the Health Center, especially for dental fillings
4	What is the attitude of preschoolers towards dental fillings?	Preschool children who visit dental polyclinics refuse dental fillings because they are afraid of the tools used during dental fillings, so it is necessary to have the right education so that children become brave to fill their teeth
5	What kind of health education media is suitable for preschool children to provide dental fillings education?	Educational media that is able to attract children's attention, both in terms of shape, color and new media, is different from media that has been seen before and contains education that dental fillings are not painful so that they can motivate children to do dental fillings

B. Design and Build Models

From the results of collecting information data from the research subjects, it is known that preschool children who visit the dental poly refuse to do dental fillings because they are afraid of seeing the tools used during dental fillings and think that dental fillings are painful, to overcome this problem develop educational media that will be used to educate preschool patients.

The educational media for the Bontoa 5G voice doll is a boy doll with a shape that is suitable for preschoolers, the name of the voice doll is taken from the name of the innovation that has been carried out by the Bontoa Health Center UKGS program, namely Bontoa 5G. To make it more

interesting, the doll was developed so that it can emit its own voice through a voice recorder implanted in the doll.

The Bontoa 5G voice doll is a three-dimensional media, namely media without projection whose presentation is audio-visual, containing counseling voices and conversation sounds during dental fillings as well as visual simulations or dental filling practices of the ART method directly on the doll's mouth that has been implanted with dental phantom with various cases that generally occur in preschoolers, including cases of persistence, Ulcus Decubitus and dental caries.

The stages of making the Bontoa 5G voice doll



- a. Determine the concept to be made where the doll has a Bontoa 5G voice, where the doll made is in the form of a male doll with the name Bontoa 5G, the doll makes a sound through a voice recording planted on the doll's back, the sound is counseling on dental caries material, conversations with dental therapists during dental filling simulations and patching practices with the ART method directly on the doll's mouth
- b. The implantation of a voice recording device on the doll's back by IT experts, the voice recordings came from the boy's dubbing voice, counseling materials and conversation materials as well as a model of dental caries phantom on the doll's mouth made by the researcher and then submitted to IT experts.
- c. After that, the doll display was designed by researchers, where the doll will wear hats, boys' shoes and clothes made of colored fanel fabric and on the chest is embroidered the name 5G Doll as a doll marker.
- d. Attaching the shape of the plastic eye and the shape of the nose of cotton wrapped in a leather-colored fanel cloth
- e. Because the shape of the mouth cannot be closed because it will be difficult during the filling simulation, a lip model is made of fanel fabric sewn on the edge of the phantoom caries of the outer teeth, as if the doll is in a state of big smile.
- f. Output of Bontoa 5G sound puppet

C. Expert Validation

Expert validation is carried out on media experts and dental health promotion experts.

Table 2. Expert Validation Results with ICC Test

Average	Average	ICC	p-value
Media members		0.989	0,000
Dental health promotion expert	77,5%	0,732	

Based on the results of the assessment from expert validators assessed using the correlation reliability test, the material value of Interclass Correlation Coefficient was 0.887 and the media value of Interclass Correlation Coefficient was 0.732. It can be interpreted that the value of material in the category of satisfactory (good relibility) because of the value of >0.76 and the value of media in the moderate category (moderate relibility) because of the value of >0.51 (Portney & Watkins, 2009). The p-value is p < 0.000. Thus, there is an expert agreement that the use of Bontoa 5G voice dolls on the motivation of

dental fillings for preschool children is relevant and feasible.

D. Product Trial

The trial of the results of the development of a model on the motivation of dental fillings for preschool children at the dental poly of the Bontoa health center used a 5G Bontoa voice doll and a dental caries phantom. This was done in accordance with the purpose of the trial, which was to analyze the influence of the model from the development of the use of Bontoa 5G voice dolls on the motivation of dental fillings for preschool children.

Table 3. Statistical tests

Variable	Group	Intervention Mean±SD	Control Mean±SD	p-value
Motivation	Pre test	27.27 ± 3,290	27.27 ± 3,290	0,000**
	Post test	43.03 ± 1,810	39.70 ± 1,489	0,010**
	Difference	15.76 ± 2,223	12.43 ± 2,921	0,000**
	p-value	0,000*	0,000*	

Based on the table of the results of the difference test of paired data, it was shown that the

p-value before and after the intervention of the Bontoa 5G sound doll was 0.000 (p<0.05),



meaning that the development model of the use of the Bontoa sound doll had an effect on the motivation of preschool children to have teeth filling, as evidenced by the increase in the average value before the intervention of 27.27 and after the intervention using the Bontoa 5G sound doll of 43.03 was more influential than the control using a pantome with an average score before 27.27 and after 39.70.

The results of the effectiveness test of unpaired data were seen in the average score before the intervention of 27.27 increased to 43.06 so that there was a difference of 15.76, this shows that the Bontoa 5G sound puppet model is more effective in motivating dental fillings in preschool children while in the control group the average value before 27.27 and after 39.70 with a difference of 12.43 shows that pantom is less effective in motivating dental fillings in preschool children.

E. Product

The resulting product is in the form of a 5G Bontoa sound doll.

IV. DISCUSSION

A. The Level of Effect of the Use of Bontoa 5G Voice Doll on the Motivation of Preschool Children's Dental Fillings at the Bontoa Health Center Dental Poly

In this study, counseling and simulation of dental fillings with the media of Bontoa 5G sound dolls have been carried out on 30 respondents at the Bontoa Health Center Dental Poly which is hereinafter referred to as group A. Descriptive analysis shows that the average level of influence of the use of Bontoa 5G sound dolls on the motivation of preschool children to have dental fillings at the Bontoa Health Center dental poly obtained a value of 27.27 and after the counseling was carried out, There was an increase in the average score of respondents to 43.03. This shows an increase in the effect of the use of Bontoa 5G voice dolls on the motivation of dental fillings in respondents before and after counseling with the Bontoa 5G voice doll media with a difference of 15.76.

From the results of the statistical test with paired t-test, this study shows that there is a significant difference and increase in the influence of the use of Bontoa 5G sound dolls on the motivation of dental fillings of preschool children at the dental poly of the Bontoa Health Center after counseling with the Bontoa 5G sound doll media with a p- value of 0.000 ($p < 0.05$). This shows that counseling with the Bontoa 5G voice puppet media

is effective in increasing the motivation of dental fillings in respondents.

The use of the Bontoa 5G voice doll has shown significant potential in increasing the motivation of preschoolers to have dental fillings. These dolls are designed to convey information about the importance of maintaining dental health in a fun and interactive way. By using 5G technology, these dolls can communicate faster and more accurately, making them more effective in conveying messages about the importance of maintaining healthy teeth.

Research conducted shows that the use of Bontoa 5G voice dolls can increase children's knowledge about dental health. Children who used these dolls showed improvement in understanding ways to maintain healthy teeth, such as cleaning teeth regularly and avoiding foods that can cause caries. In addition, this doll can also increase children's motivation to maintain dental health in a more fun way[9].

The use of Bontoa 5G voice dolls can also help parents in guiding their children about the importance of maintaining dental health. By conveying information in an interactive and fun way, this doll can help parents in maintaining the dental health of their children[10]. This can help in preventing dental caries and improving overall dental health.

The use of vocal dolls in the dental care practices of preschoolers has been shown to be effective in increasing motivation and reducing anxiety. Children often feel scared or anxious when it comes to undergoing medical procedures, including dental fillings. Therefore, a fun and interactive approach such as a voice puppet can help create a more positive atmosphere. These dolls not only serve as communication aids, but also as companions that can entertain and provide information in a way that is interesting to children[11].

In addition to reducing anxiety, the voice doll also serves to increase children's motivation in maintaining their dental health. Through stories and games performed by dolls, children can learn about the importance of brushing their teeth and maintaining oral hygiene. This interaction not only makes children more excited to undergo treatment, but also helps them develop good habits in dental care from an early age. This is very important considering that children at this age are still in the learning stage and instilling health values[12].

The use of vocal dolls in the context of dental fillings can also strengthen the bond between children and medical personnel. By creating a fun experience, children tend to be more open and



cooperative during the treatment process. Not only does this help dentists in performing their duties more effectively, but it also creates a positive experience that can reduce the child's fear of future visits to the dentist.

The results of the study showed that the use of Bontoa 5G voice dolls could increase the motivation of preschoolers to have their teeth filled. Children who use these dolls show an improvement in performing dental fillings regularly. In addition, this doll can also increase children's confidence in maintaining dental health, making them more motivated to perform dental fillings regularly. In conclusion, the use of Bontoa 5G voice dolls can be an effective tool in increasing the motivation of preschoolers to have dental fillings. By conveying information in an interactive and fun way, this doll can help children understand the importance of maintaining dental health and increase their motivation to perform regular dental fillings.

B. Differences in motivation between Bontoa 5G and Phantom dental puppet media on the motivation of dental fillings for preschool children at the dental polyclinic of the Bontoa Health Center

In this study, the 5G Bontoa vocal doll media and the dental phantom media are counseling media used by researchers to see an increase in dental filling motivation in preschool children at the Bontoa Health Center Dental Poly. The results of this study show that these two counseling media are effective in increasing the knowledge of brushing the respondents' teeth. This can be seen from the increase in the mean value before and after counseling with the Bontoa 5G voice puppet media, namely from 27.26 to 43.03 with an increase of 15.76. Meanwhile, in the Phantom media, there was an increase in the mean value from 27.26 to 39.70 with an increase of 12.43. This shows that these two counseling media can increase the motivation of dental fillings in respondents.

The results of the statistical test with an independent t-test showed that there was a significant difference in the motivation of dental fillings in the respondents through counseling with the media of the 5G Bontoa sound doll and the media of the dental phantom with a p-value of 0.000 ($p < 0.05$). In general, both counseling media were effective in increasing the motivation of dental fillings in respondents, but the 5G Bontoa voice doll media was more effective than the dental phantom media.

Dental health counseling for preschool children is an important step to increase their awareness and understanding of the importance of maintaining dental health. In this context, the use of voice dolls has been shown to be more effective in increasing children's motivation to undergo dental fillings compared to the use of dental phantoms. Voice puppets not only function as visual aids, but also as interactive media that can attract attention and reduce children's anxiety[13].

One of the reasons why vocal puppets are more effective is their ability to create a pleasant atmosphere. Children tend to be more interested in interactions that involve characters who can speak and act. By using voice puppets, medical personnel can tell relevant stories about dental health, which makes children feel engaged and excited. This is different from dental phantom which only provides a visual picture without emotional interaction, so it is less able to attract the attention of children. Research shows that the use of voice dolls can significantly lower the level of anxiety in children who are about to undergo dental procedures. In one study, children who were exposed to counseling using a voice doll showed a significant decrease in anxiety before undergoing tooth extraction. By reducing anxiety, children become more cooperative and ready to undergo treatments, including dental fillings[14].

The importance of a fun approach to dental health counseling cannot be overlooked. Preschoolers have a short attention span and are more responsive to interactive learning methods. By using voice puppets, counseling can be carried out in the form of games or stories that actively involve children. Not only does this make them more engaged, but it also helps them remember important information about dental health. In the context of dental fillings, the child's motivation to undergo this procedure is very important[15]. By using a voice doll, children can feel more comfortable and confident when facing dental care. They can see that dental care is not something scary, but rather part of maintaining their health. This is in contrast to the dental phantom approach which may make the child feel depressed or scared because of an unfamiliar look. In addition, the use of voice puppets can also strengthen the relationship between medical personnel and children[16]. When children are comfortable with dolls, they tend to be more open and cooperative with the dentist. This creates a positive experience that can reduce the child's fear of future visits to the dentist. In the long run, these positive experiences can help children develop a better attitude towards dental care. Overall, counseling using voice dolls



was proven to be more effective in increasing the motivation of preschoolers to undergo dental fillings compared to dental phantoms. This approach not only reduces anxiety, but also creates a supportive and enjoyable environment for the child. By utilizing interactive and engaging media, we can help children understand the importance of maintaining dental health and make the dental care experience more positive.

V. CONCLUSION

The results of the study showed the effect of the use of Bontoa 5G sound dolls on the Motivation of Dental Fillings for Preschool Children at the Dental Poly of the Bontoa Health Center.

REFERENCES

- [1] World Health Organization, "Oral Health," World Health Organization, 2022. [Daring]. Tersedia pada: <https://www.who.int/news-room/fact-sheets/detail/oral-health>.
- [2] Kementerian Kesehatan RI, "Riskesmas 2018," *Lap. Nas. Riskesmas 2018*, vol. 44, no. 8, hal. 181–222, 2018.
- [3] S. Hadi, R. Siregar, dan B. Sugito, "Pengaruh Komunikasi Terapeutik Terhadap Rasa Cemas Pada Anak Saat Pencabutan Gigi Di Health center Kahean Pamatangsiantar," *Indones. J. Heal. Med.*, vol. 2, no. 3, hal. 223–232, 2022.
- [4] N. Widyastuti, D. Fatmasari, dan M. Djamil, "EFEKTIFITAS 'BUKU FLANEL GIGI HENI' PADA PENINGKATAN PERAWATAN KESEHATAN GIGI DI ANTARA PROGRAM PENDIDIKAN ANAK USIA DINI Nugraheni," *J. Appl. Meas.*, vol. 6, no. 4, hal. 1–20, 2020.
- [5] M. Abdat, "Stunting Pada Balita Dipengaruhi Kesehatan Gigi Geliginya," *J. Syiah Kuala Dent. Soc.*, vol. 4, no. 2, hal. 33–37, 2019.
- [6] S. A. Rahmi, R. J. Mulia, F. Sara, dan W. A. Rahman, "Penggunaan Media Yang Efektif Dalam Promosi Kesehatan," vol. 1, hal. 203–209, 2023.
- [7] L. T. Alphianti dan F. T. A. Rahma, "Perbedaan Tingkat Pemahaman Pengetahuan pada Anak Tunarungu antara Penyuluhan Metode Komik dan Video," *Insisiva Dent. J. Maj. Kedokt. Gigi Insisiva*, vol. 10, no. 1, hal. 32–38, 2021.
- [8] Salmawati, S. Hadisaputro, L. Sunarjo, dan B. Sutomo, "D- SALMA ' S CATALOG SMART EFEKTIF MENINGKATKAN PENGETAHUAN," vol. 4, hal. 114–119, 2023.
- [9] D. Sulistyowati, "Educational Trip With Teeth Doll to Promote Dental Health in Preschool-Age Children," *Muhammadiyah Int. Public Heal. Med. Proceeding*, vol. 1, no. 1, hal. 747–754, 2021.
- [10] R. Rahayu, "Comparison of the Effectiveness of Movie Media and Puppet Story toward Dental and Oral Hygiene in Elementary School Students in Semarang," *Public Heal. Perspect. J. Puput Ediyarsari*, vol. 5, no. 2, hal. 2020–170, 2020.
- [11] N. Amaliah, Z. Afifah, dan A. Fatayan, "The Influence of Hand Puppet Media on Early Childhood Story Listening Skills," *J. Obs. J. Pendidik. Anak Usia Dini*, vol. 6, no. 6, hal. 6443–6449, 2022.
- [12] J. L. Lerwick, "Minimizing pediatric healthcare-induced anxiety and trauma," *World J. Clin. Pediatr.*, vol. 5, no. 2, hal. 143, 2016.
- [13] S. Macari et al., "Puppets facilitate attention to social cues in children with ASD," *Autism Res.*, vol. 14, no. 9, hal. 1975–1985, 2021.
- [14] C. Gómez-Polo, A. A. Vilches, D. Ribas, A. Castaño-Séiquer, dan J. Montero, "Behaviour and anxiety management of paediatric dental patients through virtual reality: A randomised clinical trial," *J. Clin. Med.*, vol. 10, no. 14, 2021.
- [15] L. Rutter et al., "Experiences of Newly Qualified Dentists in Delivering Oral Health Advice to Parents/Caregivers of Young Children—Challenges and Solutions," *Front. Oral Heal.*, vol. 4, 2023.
- [16] T. Purnama dan R. Sofian, "Dental Phantom Dolls: a Media Innovation in Teaching Brushing Teeth To Preschool Children," *JDHT J. Dent. Hyg. Ther.*, vol. 4, no. 2, hal. 160–165, 2023.