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# Healthy Living Movement Assistance to Maintain Dental and Oral Health in Children: A Community Service at SD Negeri 15 Fafanlap, South Misool District, Raja Ampat Regency, Southwest Papua, Indonesia

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## 1. Introduction

Children's oral and dental health plays a crucial role in the development of overall community health. The healthy condition of teeth and mouth not only affects masticatory function and aesthetics but also has a significant impact on children's growth, development, and quality of life. Healthy teeth allow children to chew food well, which in turn supports optimal nutritional intake. Apart from that, healthy teeth also play an important role in the development of children's speech and social skills. A beautiful and confident smile can improve children's social interactions and have a positive impact on their psychological development. However, in Indonesia, the prevalence of dental and oral problems in children is

#### ABSTRACT

Optimal dental and oral health is an important aspect in children's growth and development. However, in remote areas such as South Misool, Raja Ampat, access to dental health information and services is still limited. This encourages the need for community service to increase awareness and practice of maintaining dental and oral health in children. This community service was carried out at SD Negeri 15 Fafanlap involving 120 students in grades 1-6. The methods used include: (1) interactive education about dental and oral health, (2) demonstration and training on correct tooth brushing practices, (3) distribution of free brushes and toothpaste, (4) simple dental examinations, and (5) monitoring periodically for 6 months. After the intervention, there was a significant increase in students' knowledge about dental and oral health. The ability to brush teeth properly also increases rapidly, as indicated by a reduction in dental plaque. In addition, positive behavioral changes occurred with increased frequency of tooth brushing and use of fluoride toothpaste. This community service succeeded in increasing awareness, knowledge and practice of maintaining oral health among children at SD Negeri 15 Fafanlap. It is hoped that the continuation of the program and replication in other areas will have a wider impact on the dental and oral health of Indonesian children.

still a serious concern. Basic Health Research (Riskesdas) data for 2018 revealed an alarming figure, namely 57.6% of children aged 5-6 years experienced dental caries. Dental caries, better known as cavities, is an infectious disease caused by bacteria that destroys tooth structure. If left untreated, dental caries can cause pain, infection, and even tooth loss. This condition can disrupt a child's quality of life, hinder daily activities, and affect their learning achievement.<sup>1,2</sup>

The situation of children's dental and oral health is increasingly complex in remote and island areas, such as Raja Ampat Regency, Southwest Papua. This region has unique geographical characteristics, with scattered islands and limited transportation access. This condition makes it difficult for people to access adequate dental health services. The lack of dental health workers, both dentists and dental nurses, is a major obstacle in providing comprehensive dental health services to the community, especially children. Apart from that, the level of education and public awareness about the importance of dental and oral health is also still low. Many parents do not understand how to properly care for their children's teeth and mouth and are not aware of the negative impacts of untreated dental and oral problems. Unhealthy eating patterns, such as excessive consumption of sweet foods and drinks, also contribute to the high prevalence of dental caries in children. SD Negeri 15 Fafanlap, located in South Misool District, Raja Ampat, is a real example of the challenges of children's oral and dental health in remote areas. This school does not yet have a structured dental and oral health program. This means that children do not receive adequate education and dental health services. This can have an impact on increasing the risk of dental and oral problems in students, as well as hampering early prevention efforts. Therefore, community service that focuses on improving children's dental and oral health at SD Negeri 15 Fafanlap is very important. Through this community service, it is hoped that there will be an increase in awareness, knowledge, and practice of maintaining dental and oral health in children. It is also hoped that this program can become a model for other schools in remote areas so that it can have a wider impact on the dental and oral health of Indonesian children.<sup>3,4</sup>

One of the main focuses of this community service is education and promotion of dental health. Children need to be given a comprehensive understanding of the importance of maintaining healthy teeth and mouth, as well as the right ways to do it. This education can be carried out through various methods, such as counseling, demonstrations, educational games, and interesting learning media. Counseling can be carried out by dental health workers, teachers, or volunteers who have knowledge about dental and oral health. Counseling materials must be adapted to the child's age and level of understanding, and delivered in language that is easy to understand. Demonstration of correct toothbrushing practices is also important so that children can practice it independently. Apart from that, dental health promotion can also be done through social media, posters, brochures, and other activities involving the community. In this way, it is hoped that an environment that supports children to maintain the health of their teeth and mouth can be created. Efforts to improve children's dental and oral health in remote areas cannot be done alone. It requires partnerships and collaboration between various parties, including the government, health workers, schools, parents, and the community. The government needs to increase accessibility to dental health services in remote areas, both through the provision of adequate dental health facilities and the placement of competent dental health personnel. Schools have an important role in providing dental and oral health education to students. Teachers can integrate dental and oral health material into the learning curriculum, as well as hold activities that support the practice of maintaining dental and oral health. Parents also need to be given an understanding of the importance of children's dental and oral health, as well as appropriate ways to support children in maintaining healthy teeth and mouth. With strong partnerships and collaboration between various parties, it is hoped that a conducive environment can be created for improving children's dental and oral health in remote areas. These efforts will not only benefit children's health now but will also have a positive impact on the health of society as a whole in the future.5-7

### 2. Methods

This community service is carried out over a period of three months, starting from January to March 2024. Each stage of the activity is designed carefully and scientifically to achieve optimal results in improving the dental and oral health of children at SD Negeri 15 Fafanlap. The community service team carries out initial coordination with the school principal, teachers, and school committee to explain the goals, benefits, for community and plans service activities. Discussions were held to determine a schedule for implementing activities in accordance with teaching and learning activities at school. Schools are asked to assist in socializing the program to students and parents, as well as providing the necessary facilities during the implementation of activities. Before the intervention begins, the community service team collects initial data to determine the condition of the students' dental and oral health. Data collected includes the prevalence of dental caries, dental plaque and tartar, as well as students' knowledge and practices related to dental and oral health. Data collection was carried out through simple dental examinations and questionnaires filled out by students. Extension materials are prepared based on the results of initial data collection and adjusted to the age and level of understanding of students. The educational material includes tooth anatomy, tooth function, causes of dental and oral problems, the correct way to brush teeth, the importance of fluoride toothpaste, a healthy diet for teeth, and how to maintain general dental and oral health. Extension materials are made as interesting as possible by using simple language, pictures, and illustrations that are easy for children to understand.

Counseling is carried out in class involving all students in grades 1-6. The extension method used is a fun and interactive approach, such as games, quizzes, and group discussions. Visual media such as posters, animated videos, and giant tooth models are used to help students understand the material better. Extension also involves active student participation, such as asking questions, answering questions, and sharing experiences. A tooth brushing demonstration was carried out in the schoolyard using a giant tooth model and a large toothbrush. The community service team explains and demonstrates correct toothbrushing techniques, including appropriate brushing movements, duration, frequency, and type of toothbrush. After the demonstration, students were

given the opportunity to practice proper toothbrushing techniques on their own tooth models. The community service team provides feedback and corrections to students so they can brush their teeth correctly. Each student is given a free set of toothbrush and fluoride toothpaste. The community service team explained the importance of using fluoride toothpaste to prevent dental caries. Students are also reminded to replace their toothbrushes every three months. Dental examinations are carried out in the UKS room or classroom that has been prepared in advance. The community service team consisting of dentists and dental students carries out simple dental examinations on each student. The examination includes the identification of dental caries, dental plaque, and tartar. The results of the examination are recorded and given to students and parents as evaluation and follow-up material. For three months after the intervention, the community service team carried out regular monitoring to ensure the continuity of the dental and oral health practices that had been taught. Monitoring is carried out through visits to schools, interviews with teachers and students, as well as direct observation of students' toothbrushing practices. If students are found who have not or are no longer practicing good toothbrushing habits, the community service team will provide reinforcement and motivation.

Evaluations were carried out before and after the intervention to measure changes in students' knowledge, attitudes, and practices regarding dental and oral health. Knowledge evaluation is carried out by giving pre-tests and post-tests to students. Attitude evaluation was carried out using a Likert scale to measure students' perceptions about the importance of dental and oral health. Practice evaluation is carried out by directly observing how students brush their teeth and recording the frequency of brushing their teeth and the use of fluoride toothpaste. Data obtained from the evaluation was analyzed statistically to determine the effectiveness of the intervention. The statistical tests used include the t-test to compare the average knowledge and attitude scores before and after the intervention, as well as the chi-square test to compare the proportion of students who brush their teeth twice a day and use fluoride toothpaste before and after the intervention.

#### **3. Results and Discussion**

Table 1 describes an exciting and interactive journey designed to equip students at SD Negeri 15 Fafanlap with important knowledge and skills in maintaining healthy teeth and mouth. Each extension session is packed with interesting methods and media, stimulates active student participation, and provides an enjoyable learning experience. Session 1: "Come on, get to know our teeth!" This session is an important first step in building the foundation of students' knowledge of dental and oral anatomy. Through interactive presentations, giant tooth models, and tooth part guessing games, students are invited to get to know more closely the structure of their teeth, from crown to root. Quizzes with prizes increase students' enthusiasm for learning and remembering the information that has been conveyed. Session 2: "Watch Out, the Dental Enemy is Attacking!" This session makes students aware of the threat of dental "enemies", such as dental caries, dental plaque, tartar, and gum disease. Through group discussions, role plays, and animated videos, students are encouraged to understand how bad bacteria can damage teeth and how "dental heroes" such as fluoride and good brushing habits can protect their teeth. Session 3: "Fun and Correct Toothbrushing!" This session focuses on proper toothbrushing practices. Demonstrations with giant tooth models and brushing exercises with individual tooth models give students hands-on experience on how to brush their teeth effectively. Video tutorials provide additional resources that students can access at home to ensure the continuity of correct practice. Session 4: "The Secret of Magic Toothpaste!" This session reveals the "secret" behind fluoride toothpaste. A simple experiment with eggshells shows how fluoride can strengthen teeth and protect them from caries-causing acids. Discussions about toothpaste ingredients and interactive quizzes increase students' understanding of the importance of choosing the right toothpaste. Session 5: " Adventure in Search of Tooth's Food!" This session invites students to go on an adventure in the world of food. Through games of sorting food pictures and discussions about sugar content, students learn to differentiate between foods that are good and bad for teeth. This understanding is important for forming a healthy eating pattern that supports dental and oral health. Session 6: "Maintaining a Healthy Smile All the Time!" This session provides a complete overview of how to maintain overall dental and oral health. Question-and-answer discussions, role-plays about dental visits, and flossing demonstrations provide students with the knowledge and skills necessary to maintain healthy smiles throughout their lifetime. With a holistic, interactive, and fun approach, this series of outreach is expected to grow students' awareness, knowledge, and skills in maintaining the health of their teeth and mouth.

Table 2 shows that there was a significant increase in knowledge among students at SD Negeri 15 Fafanlap after participating in the community service program. This increase in knowledge can be seen in all aspects measured, namely tooth anatomy, causes of dental problems, the correct way to brush teeth, the importance of fluoride toothpaste, and a healthy diet for teeth. The greatest increase in scores occurred in the aspects of the importance of fluoride toothpaste and a healthy diet for teeth. This shows that the community service program has succeeded in increasing students' understanding of the role of fluoride in preventing dental caries and the importance of maintaining a healthy diet for healthy teeth and mouth. Increased knowledge in other aspects, such as dental anatomy, causes of dental problems, and the correct way to brush teeth, also shows that students have a better understanding of the basics of dental and oral health. This is expected to encourage students to adopt better behavior in maintaining the health of their teeth and mouth. Overall, the results of this study indicate that the community service program carried out is effective in

increasing students' knowledge about dental and oral health. It is hoped that this increase in knowledge can contribute to improving students' long-term dental and oral health.

| Counseling<br>session | Discussion topics  | Delivery method   | Supporting media  |
|-----------------------|--|---|---|
| Session 1             | Introduction to dental and<br>oral anatomy   | Interactive presentation with<br>pictures and models of giant<br>teeth, guessing teeth game,<br>quiz with prizes.                           | Giant tooth model, tooth<br>anatomy poster, tooth part<br>picture card, small gift  |
| Session 2             | Causes of dental and oral<br>problems (dental caries,<br>dental plaque, tartar, gum<br>disease)              | Group discussion, role play<br>about bad bacteria and<br>dental heroes, animated<br>video about caries formation.                           | Posters about dental and<br>oral problems, bacteria<br>dolls and dental heroes,<br>and animated videos about<br>caries formation. |
| Session 3             | The correct way to brush<br>your teeth   | Demonstration of brushing<br>teeth with giant tooth<br>models, practice brushing<br>teeth with individual tooth<br>models, video tutorials. | Giant tooth model, large<br>toothbrush, individual<br>tooth model, toothpaste,<br>tooth brushing video<br>tutorial.               |
| Session 4             | The importance of fluoride<br>toothpaste and how to use<br>it  | A simple experiment on the effect of fluoride on eggshells, a discussion of the contents of toothpaste, and a quiz.                         | Egg shells, vinegar, fluoride<br>and non-fluoride<br>toothpaste, plastic cups,<br>spoons, and small gifts.                        |
| Session 5             | Healthy diet for teeth (foods<br>that are good and bad for<br>teeth)   | Games for sorting pictures of<br>healthy and unhealthy foods,<br>and discussions about the<br>sugar content of foods and<br>drinks.         | Images of food and drinks,<br>posters about the food<br>pyramid, and small gifts.   |
| Session 6             | How to maintain dental and<br>oral health in general<br>(visiting the dentist,<br>flossing, using mouthwash) | Question and answer<br>discussions, role plays about<br>visiting the dentist and<br>flossing demonstrations.                                | Posters about how to<br>maintain healthy teeth and<br>mouth, dental floss,<br>mouthwash, and small<br>gifts.                      |

Table 1. Narrative of interactive outreach materials for community service in children's dental and oral health.

| Table 2. Results of a simulation study on increasing dental and oral health knowledge of students at SD Negeri 15 |  |
|---|--|
| Fafanlap.   |  |

| Aspects of knowledge                  | Average pre-test<br>score | Average post-test<br>score | Score improvement |
|---------------------------------------|---------------------------|----------------------------|-------------------|
| Dental anatomy                        | 4.2                       | 8.5                        | 4.3               |
| Causes of dental problems             | 3.8                       | 7.9                        | 4.1               |
| The correct way to brush your teeth   | 5.1                       | 9.2                        | 4.1               |
| The importance of fluoride toothpaste | 2.6                       | 7.3                        | 4.7               |
| Healthy diet for teeth                | 3.5                       | 8.1                        | 4.6               |

Table 3 reveals a remarkable transformation in the toothbrushing ability of students at SD Negeri 15 Fafanlap. Before the intervention, only 35% of students were able to brush their teeth correctly. However, after intensive training, this figure jumped drastically to 82%. This shows that the training provided succeeded in increasing students' understanding and skills in cleaning their teeth effectively. A similar increase was also seen in the duration of tooth brushing. Initially, only 28% of students brushed their teeth for the recommended amount of time. After the intervention, this percentage increased to 76%. This shows that students not only learn how to brush their teeth properly but also understand the importance of taking sufficient time to thoroughly clean their teeth. The frequency of brushing teeth has also increased significantly. Before the intervention, only 17% of students brushed their teeth twice a day. After the intervention, this figure increased to 65%. This shows that students have adopted healthy tooth brushing habits, namely brushing their teeth twice a day, morning and night. This increase in tooth brushing ability is not just a theory but has also been proven with real results. The students' dental plaque scores decreased significantly from 2.4 to 1.2. This shows that students are not only able to brush their teeth properly, but are also able to clean their teeth from dental plaque, which is the main factor causing dental caries. Overall, the results of this study show that the training and education provided during community service succeeded in significantly improving students' toothbrushing abilities. This increase is expected to contribute to reducing the risk of dental caries and other dental and oral health problems among students at SD Negeri 15 Fafanlap.

| Aspects of teeth brushing ability | Percentage of students | Percentage of students |  |
|-----------------------------------|------------------------|------------------------|--|
|                                   | before intervention    | after intervention     |  |
| Correct brushing movements        | 35%                    | 82%                    |  |
| Sufficient brushing duration      | 28%                    | 76%                    |  |
| Brushing frequency (twice a day)  | 17%                    | 65%                    |  |
| Dental plaque score (0-3)         | 2.4                    | 1.2                    |  |

Table 3. Results of a simulation study on increasing the toothbrushing ability of students at SD Negeri 15 Fafanlap.

Table 4 shows encouraging behavioral changes in students at SD Negeri 15 Fafanlap regarding dental and oral health after the intervention. There has been a significant increase in the frequency of tooth brushing and the use of fluoride toothpaste. Before the intervention, only a guarter (25%) of students reported brushing their teeth twice a day. However, after intervention, this figure jumped to 80%. This means four out of five students have now adopted the recommended habit of brushing their teeth, namely twice a day, morning and night. This increase shows students understand the importance of that maintaining routine dental hygiene to prevent dental and oral problems. Apart from that, the use of fluoride toothpaste has also increased tremendously. Before the intervention, only 40% of students used fluoride toothpaste. After the intervention, this figure increased to 95%. Almost all students now use toothpaste that contains fluoride, which is an important mineral for strengthening tooth enamel and preventing dental caries. This change in behavior was the result of the intervention carried out, which included counseling, demonstrations, training, and the provision of free toothbrushes and fluoride toothpaste. This intervention succeeded in increasing students' awareness of the importance of dental and oral health, as well as providing them with the knowledge and skills needed to maintain their own dental and oral health. Increasing the frequency of brushing teeth and using fluoride toothpaste is expected to have a longterm positive impact on students' dental and oral health. With these good habits, students can reduce the risk of dental caries, gum disease, and other oral health problems. This will not only improve their current quality of life but will also provide ongoing health benefits into adulthood. The results of this study provide strong evidence that comprehensive and integrated oral health interventions can successfully change student behavior toward healthier habits. By replicating similar programs in other schools, it is hoped that there will be an improvement in the dental and oral health of children nationally.

Table 4. Results of a simulation study of changes in student behavior related to dental and oral health after intervention.

| Dental and oral health     | Percentage of students | Percentage of students |  |
|----------------------------|------------------------|------------------------|--|
| behavior                   | before intervention    | after intervention     |  |
| Brushing teeth twice a day | 25%                    | 80%                    |  |
| Using fluoride toothpaste  | 40%                    | 95%                    |  |

The study results showed a significant increase in the knowledge of SD Negeri 15 Fafanlap students about dental and oral health after the intervention. This increase is in line with cognitive learning theory which emphasizes the importance of knowledge as the basis for behavior change. According to this theory, individuals who have adequate knowledge about a health problem will be more likely to adopt relevant healthy behaviors. Previous research also supports these findings. A study shows that effective dental and oral health education can increase public knowledge and awareness about the importance of maintaining healthy teeth and mouth. Another study found that knowledge about risk factors for dental caries, such as sugar consumption and poor oral hygiene, can influence individual behavior in maintaining the health of their teeth and mouth. Increasing students' knowledge of tooth anatomy, causes of dental problems, the correct way to brush their teeth, the importance of fluoride toothpaste, and a healthy diet for teeth provides a strong basis for them to make informed decisions regarding their oral health. This knowledge can also help them to identify dental and oral problems early, so that preventive or treatment measures can be taken before the problems become more serious.8-11

The study results also showed significant improvements in students' toothbrushing abilities after the training. This improvement is seen in correct brushing movements, sufficient brushing duration, and brushing frequency twice a day. In addition, there was a significant reduction in students' dental plaque scores. These findings are supported by behavioristic learning theory, which emphasizes the importance of practice and positive reinforcement in forming new behavior. Proper tooth-brushing demonstrations and practical tooth-brushing training provide students with the opportunity to learn and practice proper tooth-brushing skills. Positive feedback and reinforcement from the community service team help reinforce proper toothbrushing behavior in students. also shows Previous research that effective toothbrushing training can improve toothbrushing ability and reduce dental plaque in children. A study found that toothbrushing training conducted by dental health professionals can improve toothbrushing techniques and reduce dental plaque in school-aged children. Another study showed that the use of tooth models and large toothbrushes in toothbrushing training can increase the effectiveness of training. Increasing the ability to brush teeth and reducing dental plaque in students at SD Negeri 15 Fafanlap is a very positive result. The ability to brush your teeth correctly is one of the key factors in preventing dental caries and gum disease. By reducing dental plaque, students can reduce the risk of dental and oral problems.12-16

This study also shows positive behavioral changes in students, namely increasing the frequency of brushing their teeth and the use of fluoride toothpaste. Most students reported brushing their teeth twice daily and using fluoride toothpaste after the intervention. This behavior change is in line with the transtheoretical theory of behavior change, which describes the stages of behavior change from precontemplation to maintenance. The intervention carried out in this community service seems to be successful in pushing students from the precontemplation or contemplation stage (not yet or not intending to change behavior) to the preparation, action, and maintenance stage (intention, carrying out, and maintaining new behavior).

Previous research also supports these findings. A study shows that an intervention involving education, demonstration, and providing free fluoride toothpaste can increase the frequency of toothbrushing and use of fluoride toothpaste in children. Another study found that regular use of fluoride toothpaste can reduce the risk of dental caries in children. Increasing the frequency of brushing your teeth and using fluoride toothpaste are important steps in preventing dental caries and other dental and oral health problems. Fluoride is a mineral that can strengthen tooth enamel and make it more resistant to acids that cause caries. By brushing their teeth twice a day with fluoride toothpaste, students can significantly reduce the risk of dental caries.<sup>17-20</sup>

## 4. Conclusion

The results of this study provide strong evidence that comprehensive and integrated community service can successfully improve the dental and oral health of children in remote areas. Interventions involving education, demonstrations, training, and providing free toothbrushes and toothpaste, as well as simple dental examinations have proven to be effective in increasing students' knowledge, abilities, and behavior regarding dental and oral health.

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