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**THE EFFECTIVENESS OF THE ROLL TOOTH-BRUSHING TECHNIQUE
TOWARD GINGIVAL HEALTH STATUS OF TOTALLY BLIND PEOPLE**

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ABSTRACT

Background: *Gingivitis is an inflammatory reaction that occurs in gingival tissue. Based on 2018 RISKESDAS data, gingivitis case that occurs in Indonesia reaches 13,9%. The prevalence of gingivitis in South Kalimantan is higher than Indonesia's, that is 14,2%. The bad habit of maintaining oral health causes plaque accumulation on the marginal gingiva, which resulting in gingivitis. The said condition also affects disabled people, one of which is blind people. Tooth brushing intervention can be done in various kind. One of the recommended methods is the roll technique that effectively cleans plaque and can maintain gum health. Purpose:* To analyze the effectiveness of the roll tooth-brushing technique toward the gingival health status (gingival index) of totally blind people. **Methods:** *This research used quasi-experimental research method with non-equivalent control group design. The sampling technique was using purposive sampling with total samples were 15 people. This research was conducted in 21 days with 9 times encounter. The time span of each encounter is once in every 2 days. Gingival index examination used gingival index. The data analysis in this research was using Mann Whitney Test. Result:* The Mann Whitney test result shows that *p-value is 0,018, which is smaller than the alpha value that is 0,05 (p<0,05) which means that there is a difference between the case group that was given with socialization and roll brushing technique and the control group that was not given the said socialization and treatment. Conclusion:* The roll tooth-brushing technique is effective for gingival health status (gingival index) of totally blind people.

Keyword: *Gingival index, gingivitis, roll method, total blind*

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INTRODUCTION

Gingivitis is an inflammatory reaction that occurs in gingival tissue. This inflammation cannot spread to other periodontal tissue, such as periodontal ligament, alveolar bone, and cement.¹ Based on the 2018 Riskesdas, gingivitis case in Indonesia reached 13,9%. The prevalence of gingivitis in South Kalimantan is higher than Indonesia's, that is 14,2%.² The main cause of gingivitis is bacteria accumulation inside plaque which attached to gingiva's edge.³ A person's condition of dental and oral health is affected by habit.⁴ The bad habit of maintaining oral health causes plaque accumulation on the marginal gingiva, which resulting in gingivitis.⁵ The said condition also affects disabled people, one of which is blind people.⁶ The research by Alsadhan (2017) stated that blind people's gingival index is higher,

reaching 26,5%, compared to normal-sighted people that is only 6,9%.⁷

Blind people's oral cavity health can be said as very bad, which was caused by unsupervised tooth brushing, such as tooth brushing technique, motor growth, and also the help of the companion that is still being ignored.⁶ Blind people are also experiencing difficulties in the right way of tooth brushing. They usually give a strong pressure while brushing tooth horizontally or vertically. The said matter it can cause a trauma on gingival, resulting in gingival inflammation.⁸ The research by Choirunnisa (2015) showed that horizontal tooth brushing method is considered effective for reducing plaque.⁹ The disadvantage of horizontal technique is too much pressure, resulting in gingival recession.¹⁰

Tooth brushing technique that is often recommended in various research is roll method with the tip of toothbrush bristles laid out in the position to tooth root.¹¹ The tip of bristles moves following the tooth surfaces arch. The roll method is also can clean the plaque and can maintain gum health well.¹² Based on the previous research, the learning of the tooth brushing technique can be done by blind people through hearing or touching with an oral cavity model that has been prepared.¹³

According to a research by Alsadhan and Liu L (2019), gingivitis on totally blind people has a higher prevalence than normal-sighted people. The research conducted regarding gingival health status to totally blind people in Bina Netra Fajar Harapan Social Home, Martapura, South Kalimantan. The result of examination assessed with gingival index. The samples are totally blind people in Bina Netra Fajar Harapan Social Home, Martapura. This study aims to analyze the effectiveness of tooth brushing by the roll method in people who are truly blind with gingival health status (gingival index).

MATERIAL AND METHODS

This research has received research ethics permission with number 048/KEPKG-FKGULM/EC/I/2020 issued by the Health Research ethics committee of Dentistry Faculty, Lambung Mangkurat University. This research used a quasi-experimental method with a non-equivalent control group design with 15 samples. Then, the Saphiro Wilk normality test continued with the Mann Whitney test to find out the effectiveness of roll methods for gingival health status in blind people.

This research was conducted in 21 days with 9 times encounter. The time span of each encounter is once in every 2 days. Early examination conducted on the first day by doing probing using a WHO probe on already-set index teeth, which are teeth 16, 21, 24, 36, 41, and 44.

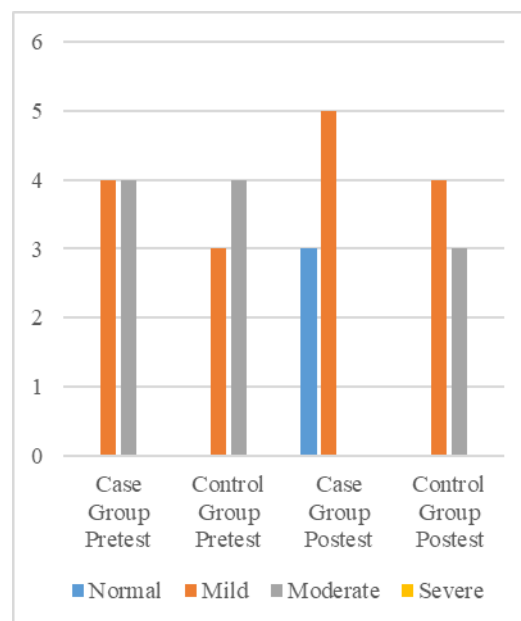
The measurement of gingival health status was used Gingival Index by Loe and Sillnes (1963). After the early examination was done, the test was continued with socialization where previously the samples were grouped into two groups consisting of the case group of 8 samples with roll tooth-brushing technique and the control group of 7 samples without intervention.

The case group was given the socialization of roll method which was used during research. Socialization to the case group conducted in every encounter, then after

socialization the case group would brush their teeth with roll method that was given. Meanwhile the control group would brush their teeth with their daily method.

Final examination conducted on the last day with gingival examination used WHO probe on already-set index teeth. Then, recalculating used gingival index was conducted. The data used to be analyzed in this study are data of the post-test results from the control group and the case group to see the average difference between two groups to be analyzed by the application analysis program in accordance with the rules that apply to the data. The Saphiro Wilk test used to find out if the data are normally distributed or not, then Mann Whitney non-parametric test was conducted. The Mann Whitney test was used to prove the effectiveness of the roll method which can be seen from the difference of gingival index in the case group and the control group.

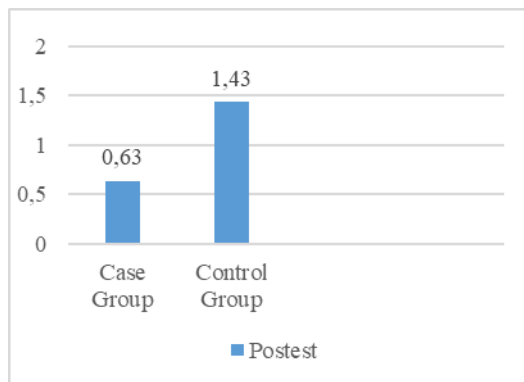
RESULT



Picture 1. Distribution of The Roll Method Gingival Index

Picture 1 shows that the case group had mild gingival index criteria with 4 samples (50%) and 4 samples in moderate criteria (50%). Meanwhile, the normal and severe gingival index criteria were not found. The control group had mild gingival index criteria with 3 samples (43%), moderate with 4 samples (57%), and none in normal and severe criteria. Picture 1 also shows that the post-test result of the case group was normal criteria with 3

samples (37,5%), mild criteria 5 samples (62,5%), and moderate and severe criteria were not found. Meanwhile, the control group was showed 4 samples (57%) included in mild criteria, 3 samples (43%) in moderate criteria, and normal and severe criteria were not found. The obtained post-test result was then analyzed to see the effectiveness of the roll method toward gingival health status.



Picture 2. The Effectiveness of the Roll Tooth-Brushing Method in Totally Blind People toward Gingival Health Status (Gingival Index)

The analysis results in Picture 2 shows that the average score of the case group's post-test was 0,63 and the control group was 1,43, which meant that the gingival index post-test score on the case group, that was socialized with the roll method, was lower than the control group. This data analysis was comparing data from independent 2 groups, which were the case and the control group to see the effectiveness of the roll tooth-brushing method in totally blind people toward gingival health status (gingival index).

Mann Whitney test result found that the p-value was 0,018 ($p < 0,05$), which meant that there was a difference between the case group that was given with treatment and the control group.

The data analysis result stated that there is the effectiveness of the roll tooth-brushing technique in totally blind people toward gingival health status (gingival index).

DISCUSSION

Blind people have limitations in vision. This limitations surely makes their activities different than normal-sighted people, one of which is their difficulties to maintain dental and oral health. This matter makes their dental and oral health status is low.¹⁴ Gingivitis is a dental and oral disease that more occurs in blind people than normal sighted people.¹⁵ The

research by Solanki (2018) that conducted gingival index examination on blind people and showed the result that the average of the blind people experiencing mild and moderate criteria of gingivitis¹⁶ One of the factors that is the limitation of the blind people that can affect their knowledge, especially about the importance of maintaining oral health.¹⁷

People with visual impairments in Bina Netra Fajar Harapan Social Home, Martapura for maintaining of dental and oral health are still low. This corresponds with Dorout (2015) that the difficulties of the blind people in receiving information make their awareness about the importance of dental and oral health is still low.¹⁸ Low dental and oral health will make plaque accumulation, then continuously will cause gingivitis.¹⁶

The difference between both group's gingival index happened because of their difference in tooth-brushing techniques. The control group brushed their teeth with their usual method without any intervention and the case group was given with an intervention, which is to brush teeth using the roll method. The research by Lasara (2014) proves that the roll method is capable to clean plaque well, resulting in the prevention of periodontal disease risk including gingivitis.¹⁹ The roll method applied by blind people is capable to reduce the gingival index, which corresponds with the research by Sriani Y (2019) that said the roll method can reduce plaque and maintain gingival health well so that can prevent the gingival bleeding.²⁰

The socialization and the treatment of the roll method which is done repeatedly also can support the success of this research. This can also increase their memory, then resulting in forming a habit. Repeated teaching will make the blind people remember faster and train their motor skills. The difference between the gingival index on these groups can happen because of the different tooth brushing method. When the tooth brushing learning on the case group during the research, the researcher, with their companion, gave the learning method that suits the blind people. The research by Riansyah Z (2018) stated that the approach to the blind people with their companion and suited teaching method can help them to receive the information well.²¹

The socialization of the roll method was done by giving an example with an oral cavity model and toothbrush as props for the blind people to learn. Zahara (2019) states that the limitations of blind people in seeing make them need concrete things to understand well.²² This

concreteness principle can stimulate their sense of hearing and touching with giving them props such as the oral cavity model.¹³

Based on this research, it can be concluded that the roll tooth-brushing method is effective for the totally blind people toward gingival health status (gingival index) in Bina Netra Fajar Harapan Social Home, Martapura.

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