ANTISEPTICS AND DEODORIZING MOUTH RINSE WITH RED GINGER JUICE *(ZINGIBER OFFICINALE VAR. RUBRUM)* AT VARIOUS CONCENTRATIONS

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ABSTRACT - Red ginger juice *(Zingiber officinale var rubrum)* is effectively able to inhibit the growth of *Aggregatibacter actinomycetemcomitans* bacteria. The extract gel of red ginger which is about 4% proved sucessfully to provide the effect of anti inflammation bigger than the extract gel of turmeric rhizome 4%. The other values of red ginger can also be found on its hot but fresh in taste, cheap price, and easy to get. So far, it has not found yet the research about making such a mouth rinse using the anticeptics and deodorizing from the red ginger juice and the receptivity in using it. This study aims to describe and analyze the difference in receptivity of anticeptics mouth rinse with red ginger juice *(Zingiber officinale var rubrum)* at different concentrations. The research objectives are to take the potential benefits of Indonesia's natural resources which does not only support its cheap price, but it also prevents periodontal disease, safe also refresh the throat and oral cavity. The type of research is pre-experimental analytic with one shoot case study design. The sample was 30 people, taken from stratified random sampling. The analysis is done by univariate through tabulation percentage as well as bivariate data to know whether there is an alignment of sample while assessing antiseptics mouth rinse or not by using Kendall Concordance test statistic. Univariate and bivariate analysis showed that the most preferred fragrance, taste, color and overall favorite was anticeptics mouth rinse at 25% concentration. From the statistical test, it can be concluded that there is influences between the concentration on the preference on the fragrance, taste, color and overall favorite (p <0,05). The advice given preferably in using the anticeptics mouth rinse and deodorizing agent from the red ginger juice *(Zingiber officinale var rubrum)* is to make it at 25% concentration.

Keywords: Antiseptic, Deodorizing, Red Ginger Juice

1. INTRODUCTION

Generally, beside keeping our body health, we should pay attention to our dental and mouth health. It is because the dental and mouth health will also affect the condition of our body health as a whole[1]. The national prevalence in dental and mouth problem is 25,9%, but there is only 8,1% patients considered to receive the treatments and medications[2]. There are two types of dental and mouth deseases which have high prevalence in Indonesia, they are carries and periodontal desease[3]. Gingivitis is one of periodontal desease type. It is such an inflamation in gingiva occured because of plaque accumulations[4]. The plaques consist of the unstopped bacteria colonies growth which can affect irritation on gingiva[5]. Keeping clean our mouth is the best way to prevent the gingivitis[6]. The positive Aggregatibacter actinomycetemcomitans found on the plaque is prone to become the main cause on both gingivitis and periodontitis[7]. Aggregatibacter actinomycetemcomitans is the negative bacteria found in the mouth cavity which is said as a normal flora[8].

The use of herbs for curing a desease had been done continously based on the experience inherited from the old generation to the next generation[9]. There are many various traditional medications as anti inflammation has been investigated in which one of them is using the red ginger (Zingiber officinale var. rubrum). The extract gel of red ginger that is about 4% proved sucessfully to provide the effect of anti inflammation bigger than the extract gel of turmeric rhizome 4% applied on the male mice[10]. The Ginger is acclaimed as the first level for traditional medicine which is fond of in the world[11].

Based on the information, it is stated that the red ginger is the most favorite ginger among all three variants of ginger. The red ginger (Zingiber Officinalevar Rubrum) is used more with atsiri oil. Then its oleoresin is the highest level, so it is more effective to cure any deseases[12].The contents of red ginger atsiri oil are about

2,58 -3,72% (dry weight), emprit ginger 1,5 – 3,3% while elephant ginger 0,82 – 1,68% and the oleoresin of red ginger is bigger than other gingers, they are 3% of dry weight[13]. The other compounds which are effective inside red ginger are groups of flavonoids, polifenol, and saponin1[4].

The research[15] proved that the red ginger juice (Zingiber officinale var. rubrum) is effectively able to obstruct the Aggregatibacter actinomycetemcomitans bacteria growth on the consentration 25%,50%, 75%, and 100%. The effectiveness of its obstruction has improved significantly in a row once its concentration has increased. Despite its benefit material, the other values of red ginger can also be found on its hot but fresh in taste, cheap price, and easy to get[16]. For those reasons, if we use it for mouth rinse, it can give many benefits from its capability in obstructing the Aggregatibacter actinomycetemcomitans bacteria growth, the cause of periodontal desease. It can also make our throat and mouth cavity fresh. So far, it has not found yet the research about making such a mouth rinse using the anticeptics and deodorizing from the red ginger juice and the receptivity in using it. That is why it is very important to study the receptivity of using of mouth rinse with anticeptics and deodorizing from the red ginger juice more deeply.

2. MATERIALS AND METHOD

The type of research used in this study is analytical research that is a pre-experiment along with its objective to know the symptom or the impending effect because of the certain treatment but there is still an outside variable influencing the form of dependent variable[17]. The framework of the research is *one shoot case study.* The population of this research is the 82 students in the 4th semester from Nutrition department whom did the training of receptivity test. The population is divided into three groups according to the score of the training; they are: group with Sufficient score (C), Good score (B), and Excellent score (A). The sample of the research is 30 people got with a stratified random sampling technique. If there is a drop out student, the sample will not be changed because the substitute is assumed having no similar characteristics with the origin one. The research instrument is closed questionnaire, which is a questionnaire with its answers given. The questionnaire consists of 4 com- ponents; they are taste, fragrance, color, and overall favorite.

Steps of The Research:

- Training for the enumerator about the objective and techniques of the research.
- The process of making mouth rinse with anticeptics and deodorizing from the red ginger juice.
- The explanation to the respondents about the objectives, benefits, and techniques. Then the forms of Informed Concent are given to fill in and be signed by every respondent.
- The receptivity of mouth rinse with anticeptics and deodorizing from red ginger juice.
- After getting the Informed Concent, the 30 respondents would be asked to use mouth rinse has been made already.

Filling in Questionnaire:

- After finishing the mouth rinse, every respondent is being asked to fill the questionnaire about the taste, fragrance, and overall favorite from the mouth rinse which has already been used. This process would be guided by the enumerator.
- The steps from step 1 until 5 would be repeated for every concentration with the pause minimally 24 hours. It is for knowing the receptivity from the previous concentration has been already lost.
- The analysis of univariat to describe the favorite related to fragrant, taste, color, and the whole formulathrough the frequency distribution table. This analysis is to investigate whether there is agreement from the sample in evaluate the mouth rinse with using the Statistic Test of Concordance Kendall.

3. RESULTS AND DISCUSSION

The Description of Variable

The results showed the highest average of fragrance obtained at the concentration 25%, then 75%, then 50%, lastly at concentration 100%. According to the respondents, the most favourite fragrance on the anticeptics mouth rinse with 25% concentration while the respondents dislike very much at the 100% concentration.

The Description of Taste

The results showed the highest average of taste got are at the concentration 25%, then 100%, then 50%, then lastly at concentration 75%. According to the respondents, the most favourite taste on the anticeptics mouth rinse is with 25% concentration while the respondents dislike very much at the 75% concentration.

The Description of Color
The results showed the highest average of color obtained at the concentration 25%, then 50%, then 75%, then lastly at concentration 100%. According to the respondents, the most favourite color on the anticeptics mouth rinse is with 25% concentration while the respondents dislike very much at the 100% concentration.

The Description in Overall characteristics (Fragrance, Taste, and Color)
The results showed the highest favorite average got are at the concentration 25%, then 75%, then 50%, then lastly at concentration 100%. According to the respondents, the most favourite on the anticeptics mouth rinse is with 25% concentration while the respondents dislike very much at the 100% concentration.

Data Normality Test
In this research, the data normality used Saphiro wilk test because the data are under 5018. The results of data distribution test found the significant values on the all concentration in the all parameter under 5% or 0,05. The values found from 0,000 until 0,043. It means that all parameter measured did not distribute normally, therefore the continuation analysis which will be used is Concordance Kendall Test.

Result of Concordance Kendall Test
Hypothesis Test which is used is Concordance Kendall Test. It is a statistical non-parametric test. It has a principle to know whether there is a conformity of subjects (people) in order to determine the certain subjects[19].

The Level of Favorite Fragrance at the various concentration
The cross-tabulation result showed that at consentration 25% it is included on the rather like group (11%), at consentration 50% it is included on the dislike group (12%). Then, at consentration 75% it is included on the rather like group (10%), while at consentration 100% it is included on the dislike group (13%). The significance test result has found that p- 0,004 is smaller than 0,05 showed that all respondents agree about the favorite fragrant coming from concentration 25%. Then, it is got the points for Kendall's W is 0,178 is less than 0,2 showing the low agreement level.

The Level of Favorite Taste at the various concentration
The cross-tabulation result showed that at consentration 25% it is included on the like group (12%), at consentration 50% it is included on the rather like group (12%). Then, at consentration 75% it is included on the dislike and the rather like group (each of them is 9%), while at consentration 100% it is included on the rather like and the like group (each of them is 10%). The significance test result has found that p- 0,000 is smaller than 0,05 showed that all respondents agree about the favorite taste coming from concentration 25%. Then, it is got the points for Kendall's W in as much as 0,366 which is more than 0,25 showing the sufficient agreement level.

The Level of Favorite Color at the various concentration
The cross-tabulation result showed that at consentration 25% it is included on the like group (13%), at consentration 50% it is included on the like group (14%). Then, at consentration 75% it is included on the dislike (10%), while at consentration 100% it is included on the dislike (12%). The significantly test result has found that p- 0,000 is smaller than 0,05 showed that all respondents agree about the favorite color coming from concentration 25%. Then, it is got the points for Kendall's W is 0,379 is more than 0,25 showing the sufficient agreement level.

The Level of Favorite Whole Description at the various concentration
The cross-tabulation result showed that at consentration 25% it is included on the rather like group (11%), at consentration 50% it is included on the dislike group (12%). Then, at consentration 75% it is included on the rather like group (10%), while at consentration 100% it is included on the dislike (13%). The significantly test result has found that p- 0,000 is smaller than 0,05 showed that all respondents agree about the most favorite antiseptics mouth rinse are its color and taste coming from concentration 25%. Then, it is got the points for Kendall's W is 0,234 is more than 0,2 showing the sufficient agreement level.

Discussion
The results of investigation related to the receptivity for 25 respondents reported that 5 respondents were dropped out and did not do for the substitute. According to the research above, it was known that the favorite aroma or fragrance which has belonged to their favorite is on the concentration 25%, while the most dislike is on the concentration 100%. It is because of the higher concentration of red ginger, the stronger fragrance would be spreaded, this case showed that the respondents did not like the strongest fragrance from the red ginger.
From the taste, it is showed that the respondents give their like responses on the concentration 25% but for the dislike response is on the concentration 75%. Related to the responses[20] stated that the hot level of the red ginger is low. Inspite of the low level of red ginger, if the concentration becomes higher the hot level of the

red ginger taste will be higher too, therefore, the respondents like more to the taste on the lowest concentration, which is 25% because of its comfortable. But the research showed that the concentration 100% is more favorite than the concentration 75%. It is because on the concentration 75% would leave the bitter taste in the end, while on the concentration 100% would not. Based on these reasons the respondents like the liquids on the concentration 100%. The results of investigation also proved that respondents like the color of liquid with the concentration 25% better than the concentration 100%. The reason is the higher level of concentration (100%), the color would be getting more turbid. So, this condition is not interested by the respondents.

When viewed as a whole, the mouth rinse is most preferred at a concentration of 25%. The statistical test results also showed that the most preferred mouth rinse was at 25% concentration. This shows that respondents received more red ginger mouth rinse at a concentration of 25% both in terms of fragrance, taste and color, compared with higher concentrations. When taken from the health benefits of periodontal tissue, the 25% concentration has been beneficial. This is in accordance with the research results[15] of which prove that the juice of red ginger (Zingiber officinale var. Rubrum) can effectively inhibit bacterial growth at concentrations of 25%, 50%, 75% and 100%, where the effectiveness of inhibitory power increases significantly along with the increase in concentration.

4. CONCLUSION

The favorite choice of anticeptics mouth rinse related to its fragrance, taste, and color is the liquid with 25% concentration. Statistically, there is an impact among concentration into the favorite of fragrant, taste, color, and overall favorite ($p<0,05$).

It is suggested to use the deodorizing and anticeptics mouth rinse from Red Ginger Juice (Zingiber officinale var. rubrum) made at 25% concentration.

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