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**EFFECTIVENESS OF WHATSAPP AS A HEALTH PROMOTION MEDIA IN
IMPROVING TOOTH BRUSHING BEHAVIOR BASED ON FEDERATION
DENTAIRE INTERNATIONALE**

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ABSTRACT

Background: The majority of tooth decay is caused by improper brushing behavior. The correct behavior for tooth brushing refers to the Federation Dentaire Internationale (FDI), including the behaviour of tooth brushing every day at least twice a day, after breakfast and before going to bed at night. The results of RISKESDAS in 2018 reported that only 4.96% of adolescents aged 10-14 years who brushed their teeth properly in the city of Banjarbaru. WhatsApp groups as a media for health promotion is considered as an effective strategy to disseminate information to improve one's knowledge and behavior towards a better outcome. **Purpose:** To analyze the effectiveness of WhatsApp as a health promotion medium in improving the behavior of brushing teeth properly based on the Federation Dentaire Internationale (FDI) in grade VII students at SMPN 2 Banjarbaru. **Material and Methods:** This study used a pre-experiment design with one group post test pre test design with simple random sampling technique. The research was conducted at SMPN 2 Banjarbaru with a sample of 173 respondents. **Results:** The results of the pre test measurement showed that there no respondents in the bad behavior category (0%), 45 respondents (26%) in the moderate category and 128 respondents (74%) in the good category. The result of post test measurement revealed that there were no respondent in bad and moderate category that 173 respondents were fell into good behaviour category. The results of the Wilcoxon comparison test obtained a significance value of $0.000 < 0.05$, meaning that there was a difference in behavior between before and after being given health promotion. **Conclusion:** Counseling using WhatsApp social media is effective in increasing the behavior of proper tooth brushing according to FDI.

Keywords: Health promotion, Proper brushing behavior, Whatsapp

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INTRODUCTION

The majority of tooth decay is caused by improper brushing behavior. Brushing teeth properly is a strategy to reduce the growth and activity of bacteria, especially *Streptococcus mutans* and *Lactobacillus* bacteria so as to reduce the risk of dental caries.^{1,2} Basic Health Research in 2018 states that correct behavior for tooth brushing refers to the Fédération Dentaire Internationale (FDI) which is the behavior of tooth brushing every day at least twice a day, after breakfast and before going to bed at night.²

Based on the results of the 2018 Basic Health Research report, the proportion of the Indonesian population who demonstrated correct behaviour in brushing their teeth was only 2.8%, while in South Kalimantan it was 4.97%. The proportion of the population of Banjarbaru City who brush their teeth correctly was 2.06% so that the city of Banjarbaru is the area with the lowest percentage of correct tooth brushing time among districts/cities in South Kalimantan. In children aged 10-14 years, the proportion of brushing teeth properly was 4.96%.

The low proportion of tooth brushing properly in children resulted in a high prevalence of caries in children aged 10-14 years, which was 47.67%. Based on these data, it is necessary to disseminate additional information about dental and oral health in Banjarbaru City, especially in terms of how to brush teeth to improve the behavior of brushing teeth properly in adolescents aged 10-14 in a better direction.³

The provision of health promotion must be carried out in an appropriate and targeted manner. The Health Belief Model (HBM) theory is commonly used in health promotion. HBM functions as a preventive mindset that can influence a person's actions or behavior with three supporting factors, namely: demographic variables (class, age and gender), sociopsychological variables (personality, peers and group pressure) and structural variables (level of knowledge and experience).^{4,5} In providing health promotion also requires suitable media to be conveyed effectively. We are currently in the era of the Covid-19 pandemic so we are required not to do face-to-face activities or provide direct health promotions to prevent the spread of Covid-19 from getting wider.^{6,7}

Health promotion media that is applicable with the current conditions is by using smartphone with social media intermediaries as a means for health promotion. Social media is a popular promotional media today and has unlimited scope and time.⁷

WhatsApp social media is one of the most frequently accessed social media in Indonesia. This is explained by Bafadhal (2017), that 58% of smartphone users in Indonesia use WhatsApp as their preferred instant messaging application.⁷ Through WhatsApp, users can share text messages, voice messages, files, images and videos without being constrained by the limitations of distance, time and cost so that they can be used as media for health promotion in a pandemic situation like today.⁹

Based on the information above, it is necessary to conduct research on the effectiveness of WhatsApp as a media for health promotion in improving the behavior of brushing teeth properly based on the Fédération Dentaire Internationale (FDI) in grade VII students of SMPN 2 Banjarbaru.

MATERIAL AND METHODS

The research method is pre-experimental with one-group post-test pre-test design that has obtained ethical approval by the Health Research Ethics Commission, Faculty of Dentistry, Lambung Mangkurat University with No. 064/KEPKG-FKGULM/EC/IV/2021. The

research location at SMPN 2 Banjarbaru in April-May 2021 with a population of grade VII students at SMPN 2 Banjarbaru as many as 288 people. The research sample size was taken by simple random sampling technique using the Slovin formula and the number of samples was corrected by predicting the percentage of sample drop out 10% and obtained 173 samples that met the inclusion and exclusion criteria of the study. The inclusion criteria in the study were seventh grade students of SMPN 2 Banjarbaru, who had personal smartphones, using WhatsApp application, and having internet connection. Then, the exclusion criteria in the study were children who were not willing to take part in the activities until the post test.

Respondents who met the criteria were collected in a WhatsApp group to measure the prior behaviour in brushing teeth correctly (pre- test). The respondents were then given health promotion for 21 days by distributing infographic posters and animated videos about tooth brushing correctly based on FDI and reminding respondents to brush teeth in the morning after breakfast and at night before going to bed routinely every day for 21 days. After being given health promotion for 21 days, the researcher measured the behavior of brushing teeth correctly based on the FDI of the respondents (post-test).

Measurement of respondent behavior using a questionnaire totaling 10 statements using a Likert scale consisting of 7 positive statements and 3 negative statements with 5 answer choices "strongly agree", "agree", "undecided", "disagree" and "strongly disagree". Then, the results were calculated and assigned to the following criteria: bad behavior criteria with a score of 0-17; moderate behavior criteria score 18-34; and good behavior criteria score 35-50.

Health promotion on Monday and Tuesday of the first week was delivered by giving infographic posters which contained material on tooth brushing according to FDI. On Wednesday and Thursday, videos containing material for correct tooth brushing according to FDI and how to brush teeth correctly was delivered. On Friday and Saturday delivered by giving infographic posters which contained material on how to brush your teeth properly. The second week, on Monday and Tuesday, was delivered by giving infographic posters which contained material on how to brush your teeth properly. On Wednesday and Thursday, videos containing material how to brush your teeth properly and the purpose of brushing your teeth was delivered. On Friday and Saturday

delivered by giving infographic posters which contained material on brushing your teeth. The third week, on Monday and Tuesday, was delivered by giving infographic posters which contained material on the benefits of brushing your teeth. On Wednesday and Thursday, videos contained material the benefits of brushing your teeth and the consequences of not brushing your teeth. On Friday and Saturday delivered by giving infographic posters which contained material on the consequences if you don't brush your teeth. The results of measuring the behavior of brushing teeth correctly based on FDI were then carried out with the Wilcoxon comparison test. The Wilcoxon comparison test was used to measure the significance of differences between groups of paired data in ordinal scale which werenot normally distributed.

RESULT

This research was conducted on 173 respondents consisting of 71 male and 102 female students of SMPN 2 Banjarbaru. In the age range of 11-14 years consisting of 1 respondent aged 11 years (1%), 52 respondents aged 12years (30%), 108 respondents aged 13 years (62%) and 12 respondents aged 14 years (7%). Based on class VII consisting of 17 respondents in class VII A (10%), 19 respondents in class VII B (11%), 17 respondents in class VII C (10%), 18 respondents in class VII D (10%), 15 respondents in class VII E (8%), 22 respondents in class F (13%), 24 respondents in class VII G (14%), 24 respondents in class VII H (14%) and 17 respondents in class VII I (10%).Examination of pre-test dental behavior is presented in table 1. This table shows the results of correct tooth brushing behavior after promoted using WhatsApp in a total of 173 respondents. The results obtained were that there were no respondents with bad behavior criteria (0%), while respondents with moderate behavior criteria did 45 people (26%) and respondents with good behavior criteria did 128 people (74%).

Table 1. Results of correct tooth brushing behavior Measurement Before Health Promotion Using WhatsApp Social Media(pre-test)

Criteria	Total (N)	Percentage (%)
Bad behavior	0	0
moderate behavior	45	26
good behavior	128	74
Total	173	100

The results of measuring the behavior of correct tooth brushing based on the FDI post-test are presented in table 2. This table shows the behavior of correct tooth brushing based on the FDI after being given health promotion using WhatsApp social media with 173 respondents. The result is that there are no respondents with bad behavior criteria. and moderate behavior (0%), so that 173 respondents (100%) were onthe criteria for good behavior (100%).

Table 2. Results of correct tooth brushing behavior Measurement After Health Promotion Using WhatsApp Social Media (post-test)

Criteria	Total (N)	Percentage (%)
Bad behavior	0	0
moderate behavior	0	0
good behavior	173	100
Total	173	100

Based on table 3, there are no respondents in bad behavior categories in pre-test and post- test, while there was an improvement in the moderate behavior category from 45 people in pre-test to no respondent in moderate behavior category in post-test. This reveals that there was an improvement in respondent behavior from 128 people pre-test to 173 people post-test.

Table 3 shows the results of the Wilcoxon test data. It is known that the significance value is $0.00 < 0.05$. Conclusion H_0 is rejected, which means that there is a difference in behavior between before and after being counseling. The results of the data analysis can be said that counseling using WhatsApp social media is effective in increasing tooth brushing behavior according to FDI.

Table 3. Wilcoxon Analysis Test Results Comparison Before and After Health Promotion in One Group

<i>Pre-test</i>	<i>Post-test</i>			Sig.	
	Bad behavior	moderate behavior	good behavior	Total	
Bad behavior	0	0	0	0	0,000
moderate behavior	0	0	45	45	
good behavior	0	0	128	128	
Total	0	0	173	173	

DISCUSSION

Middle school students are 12-15 years old on average, which at that age is an indicator in the "Global Goals for Oral Health 2020", because it is a critical period to monitor dental and oral disease when all permanent have completely erupted. Therefore, this period requires proper direction as a form of prevention through proper tooth brushing behavior according to FDI.¹⁰ Researchers measured the tooth brushing behavior of the sample before being given health promotion using a questionnaire as a pre-test in the WhatsApp group with a total of 173 adolescent students aged 11-14 years. The results of the measurement showed that there was no respondents in the category of bad tooth brushing behavior (0%) at a score of 0-17, 45 respondents (26%) in moderate brushing behavior category with a score of 18-34, and 128 respondents (74%) in a good brushing behavior category scored 35-50.

The Health Belief Model (HBM) theory was proposed by Rosenstok (1974) and quoted by Widodo *et al* (2016), as the basis of health promotion to be provided and emphasized on sociopsychological factors (personality, peer and group pressure) with the aim of influencing personal perceptions, beliefs about a disease, and strategies to reduce disease incidence. Health promotion using WhatsApp social media intermediaries with materials in the form of infographic posters and videos aiming to change the behavior of better parenting patterns.¹¹ Widodo *et al* (2016), explained that the use of assistive devices in changing behavior is very important because it can improve learning abilities, strengthen memory and increase interest. Through attractive images and audio-visuals, it will be more effective in changing behavior because it can be received or captured through the five senses better.¹¹ Similar to the opinion of Sukarsih (2020), that assistive devices are needed to maximize the utilization of the target senses, namely sight, smell, hearing, taste and touch which purpose is adjusted to the counseling method provided.¹²

Behavior change does not just happen, but

through a sequential process. According to Roger (1974) in the book Notoatmodjo (2003), reveals that before a person adopts a new behavior within the person there is a sequential process, namely, Awareness, Interest, Evaluation, Trial and Adaption.¹³ This statement is in line with Maxwell's (1969) theory in research by Widodo *et al* (2016), which mentioned that behavioral changes based on knowledge will be more long-lasting than behavior that is not based on knowledge and it takes a minimum of 21 days and must be carried out intensively and without intermission. Changes in healthy living behavior consist of three stages, the first seven days are the stage of instilling knowledge to influence the mindset, the second seven days are the internalization stage to make a behavior that has been known as an attitude pattern or habit, the last seven days are the stage to change the attitude pattern into newculture.¹¹

Adolescent knowledge about dental and oral health will determine the health status of their teeth and mouth in the future, but knowledge alone is not enough because it needs to be followed by appropriate attitudes and actions. According to Lawrence Green quoted in a health promotion book in (2014), there are three factors that determine behavior to lead to positive behavior, namely predisposing factors, enabling factors and reinforcing factors.¹⁴ Health promotion based on Lawrence Green's theory can be done through WhatsApp social media to influence respondents tooth brushing behavior in a positive direction. This is evident after measuring the behavior of brushing teeth correctly based on FDI which is carried out after 21 days after being given health promotion and reminding to brush their teeth in the morning after breakfast and at night before going to bed to the research sample with the result that there are no respondents in bad and moderate behavior (0%), so that 173 respondents (100%) are in the good behavior category. When compared with the pretest, there was an increase in the behavior of respondents by about 26%, which means that there was an increase in the behavior of brushing teeth properly according to FDI.

Changes in tooth brushing behavior in a better direction were caused by providing interventions using WhatsApp social media in the form of infographic posters, videos and reminding them to brush their teeth according to FDI every day. Hartati (2020), explained that a poster presents a simple display with colors and text containing the main message that is able to influence and motivate a person so that the information received is easy to understand.¹⁵ This is in accordance with research conducted by Sukarsih and Silfia (2020), showing that counseling on how to brush teeth using posters can increase knowledge by 52.94% and skills by 61.76% before and after counseling.¹² Similar to the research conducted by Mardhiah (2020), it was revealed that counseling using audio-visual media is effective in increasing knowledge and mother's attitude in terms of health. According to Mardhiah, the delivery of information using audio-visual media can be better captured by the respondents because the hearing and sight processes can grow the respondent's interest so that it accelerates the understanding process and strengthens memory.¹⁶

Changes in tooth brushing behavior in a positive direction were caused by the provision of interventions using WhatsApp social media in the form of infographic posters and videos. According to the researchers, WhatsApp has met the criteria as a promotional media from Notoatmodjo (2005), namely technology that is easy to use, easily accessible to the target, efficient in cost considerations and creates interaction by its users.¹⁷ It can be concluded that health promotion using WhatsApp social media is effective in increasing proper tooth brushing behavior according to FDI.

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