

## THE EFFECT OF WHATSAPP GROUP/SOCIAL MEDIA INTERVENTION ON KNOWLEDGE, INTENTIONS AND WEIGHT LOSS BEHAVIOR AT THE SABANG CITY HEALTH AND FAMILY PLANNING SERVICE

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### ABSTRACT

Overweight is still a nutritional problem in Indonesia. However, there are still many health workers who are overweight and there is no specific program related to weight loss aimed at health workers. This study aims to determine the effect of WhatsApp group/social media intervention on knowledge, intentions and weight loss behavior at the Sabang City Health and Family Planning Service. This research uses a quantitative type of research with a non-equivalent quasi-experiment design with pretest and posttest control group design. The population in this study were all women in the Sabang City Health and Family Planning Service with a BMI > 23, totaling 273 respondents. The sampling method used proportional random sampling with the total sample in this study being 146 respondents, 73 people in the intervention group and 73 in the control group. The results showed that there were differences in changes in knowledge ( $p=0.001$ ), changes in intentions ( $p=0.029$ ) between the intervention group and the control group in weight loss, and there were no differences in changes in behavior ( $p=0.308$ ), changes in body weight (0.927) between intervention group and control group in weight loss. Concluded that the WhatsApp group/social media intervention has an effect on increasing the knowledge and intentions of health workers in weight loss.

**Keywords:** WhatsApp group/social media intervention., quasi experiment., weight loss., health worker

### INTRODUCTION

Nutrition problems in Indonesia are currently still high. The main cause is the low level of public awareness of efforts to improve nutrition. Nutritional problems in developed and developing countries are not only a problem of lack of essential substances, but also a problem of overeating which manifests itself in obesity. This is because the economic level of society is starting to improve so that food is better in terms of quantity and quality.<sup>1</sup>

One of the most common nutritional problems is overweight. Based on data of Riskesdas,<sup>2</sup> overweight in Indonesia reached 13.6%. Based on province, the highest overweight was in North Sumatra Province at 16%, the lowest was in East Nusa Tenggara at 8.8%. Meanwhile, Aceh occupies the 10th position in terms of overweight, namely 13.9%.<sup>2</sup>

If seen by Regency/City according to data of Riskesdas, the prevalence of nutritional status in the BMI category in adults aged > 18 years according to the Regency/City of Aceh Province, the highest percentage of overweight is in Sabang, namely 18.9% and the lowest in Simeulue is 10.4%, while the highest percentage of obesity is in Lhokseumawe, namely 33%, and Sabang is in fifth

place, namely 25%. Meanwhile, the proportion of central obesity in residents aged  $\geq 15$  years according to the District/City of Aceh Province, the highest percentage of obesity is in Lhokseumawe, namely 38.49% and Sabang is in sixth place, namely 33.56%.<sup>2</sup>

The impact of being overweight can increase the risk of heart and blood vessel disease, such as coronary artery disease, high blood pressure and stroke.<sup>3</sup> Overweight is a major risk factor for developing type 2 diabetes. Excess body fat can influence insulin resistance and impaired glucose metabolism.<sup>4</sup> Respiratory disorders, including sleep apnea (a sleep disorder characterized by periodic stopping of breathing) and asthma. Joints such as knees, hips, and ankles can cause problems such as osteoarthritis or injury.<sup>5</sup> A person's mental health, such as low self-confidence, depression, and eating disorders.<sup>6</sup> Risk of some types of cancer, including breast cancer, colon cancer, and uterine cancer; affects female and male fertility, disrupts the menstrual cycle, and increases the risk of complications during pregnancy.<sup>6</sup> Sleep disorders, such as insomnia, sleep apnea, and other sleep disorders.<sup>7</sup>

Based on Riskesdas data, it shows that overweight often occurs in civil servant, honorary, TNI/POLRI, BUMN/BUMD jobs. Kunyhamu's research showed that of

5,540 samples, 33.1% experienced excess weight experienced by health workers compared to other adult populations.<sup>8</sup> Generally, excess body weight in health workers can be caused by a greater susceptibility to overweight due to exposure to irregular and prolonged working hours, poor diet, and stress at work.<sup>9</sup>

As health workers, they have knowledge about nutritional problems and the impacts caused by obesity. In reality, changing behavior and achieving significant weight loss can be a challenge even for those with good knowledge. Interventions aimed specifically at health workers can help them overcome the barriers and challenges they face in losing weight. In this context, interventions can provide additional resources and support, as well as strengthen their commitment to behavior change.<sup>10,11</sup>

There is no specific program to help officers lose weight so there is no encouragement or intention for officers to lose weight. Intervention via WhatsApp can significantly reduce body weight. Wulff's research results show that a third of respondents reported that social media, including YouTube, Instagram, WhatsApp and others, regularly encouraged them to exercise.<sup>12</sup>

Survey results concluded that 73% respondents sought more information via social media. This percentage can be said to mean that respondents who have the habit of accessing social media are very high compared to other media.<sup>13</sup>

The WhatsApp application is one of the most dominant short (instant) messaging applications in Indonesia today. More than 83% of internet users in Indonesia use the WhatsApp application as an option for communicating. Based on the Business of Apps report, total WhatsApp users globally reached 2.41 billion people in the second quarter of 2022. This figure increased 5.41% compared to the second quarter of the previous year, which was 2.28 billion people.<sup>14</sup>

Global usage of WhatsApp has increased in the last five years as seen in the graph. Quoting the Business of Apps report, Indonesia is the third largest user at 112 million people, after India in first place, namely 390 million people in 2021 and followed by Brazil at 148 million people in second place.<sup>15</sup>

Previous research by Fadhilah on the effect of intervention via WhatsApp on knowledge, intentions and weight loss behavior.<sup>16</sup> This study was conducted on 200 adult participants who had a Body Mass Index (BMI) of more than 25 kg/m<sup>2</sup> (classified as overweight or obese). Participants were randomly divided into two groups, namely the intervention group who received motivational messages and information about nutrition and exercise via the Whatsapp group for 12 weeks and the control group who did not receive any intervention. The study results showed that the intervention group had a significant increase in knowledge about nutrition and physical activity as well as intention to lose weight compared to the control group. In addition, participants in the intervention group also reported

better behavior in choosing healthy foods and increasing physical activity.<sup>16</sup>

The Sabang City Health and Family Planning Service, oversees 6 UPTD Community Health Centers and 2 Family Planning Counseling Centers. The number of Civil Servants (PNS) and Non-PNS is 72 men and 344 women. Of the 416 health workers at the Sabang City Health and Family Planning Service, and 6 UPTD Community Health Centers and 2 Family Planning Counseling Centers, 14.15% were overweight, 33.87% were obese I, 15.78% were obese II. This research differentiates between the knowledge, intentions and behavior of women who have not been given weight loss intervention via WhatsApp group and those who have been given weight loss intervention via WhatsApp group. Based on the explanation above, researchers are interested in knowing the effect of WhatsApp group/social media intervention on knowledge, intentions and weight loss behavior at the Sabang City Health and Family Planning Service.

## MATERIALS AND METHOD

This research is an analytical research with a non-equivalent quasi-experimental design with pretest and posttest control group design. The population in this study were all women in the Sabang City Health and Family Planning Service who supervised six UPTD community health centers with a BMI>23 totaling 273 respondents. The sampling method used proportional random sampling with the total sample in this study being 146 respondents, 73 of whom were in the intervention group and 73 in the control group. This research was carried out for 3 (three) weeks, in July-August 2023.

This study determined subjects according to inclusion and exclusion criteria. Inclusion criteria: women who work as Civil Servants (PNS) or non-civil servants (non-PNS); women who work under the auspices of the Sabang Health Service. Body Mass Index (BMI) > 23, and have access to social media (WhatsApp group). The media used in the intervention are images and text. Respondents were selected according to inclusion and exclusion criteria. Included in the inclusion criteria are women who work as Civil Servants (PNS) or non-PNS; women who work under the auspices of the Sabang Health Service with a Body Mass Index (BMI)>23; and have access to social media (WhatsApp group). Meanwhile, the exclusion criteria are: being pregnant or breastfeeding; respondents have certain medical conditions that affect weight loss, such as diabetes or hypertension. Selected respondents are required to fill out an informed consent form attached to the questionnaire after receiving an explanation from the researcher.

The data collection stage begins with measuring TB using a Mikrotoa brand tool and weighing weight using Oserio brand scales to calculate the BMI for each respondent. Pre-intervention data was taken before the intervention was given using a questionnaire filled in by the respondents themselves. Intervention was provided via

online WhatsApp group messages. The intervention was provided in stages over 3 weeks, namely in the 1st week = First meeting; Week 2 = Second meeting and Week 3 = Third meeting. Post-intervention data was taken after the intervention was given using a questionnaire filled in by the respondents themselves. The intervention was carried out via WhatsApp group, to educate respondents about the importance of balanced nutrition. The researcher was assisted by two nutritionists with the latest education being A.Md.Gizi and S.Gz as a nutritionist at the Sabang City Health Office.

The validity test results for each questionnaire question have a calculated  $r$  value > from  $r$  table,  $0.4595 > 0.2973$  so it is concluded that all questions are valid, while the reliability test of the questionnaire obtained an  $r$ -calculated value > 0.60 so this questionnaire has a level of reliability.

The data that has been collected is then subjected to statistical analysis using independent t-test and dependent t-test. Followed by multivariate analysis using a linear regression test.

### RESULT

Univariate analysis was carried out to obtain a description (descriptive) of each variable, including respondent demographics (age, education, employment and marital status).

**Table 1.** Characteristics of Research Subjects based on education, age, employment and marital status

Variable	Group					
	Intervention (I)			Control(C)		
	N	%	SD	N	%	SD
<b>Education</b>						
High	29	39,73	37,68	25	34,25	38,25
Medium	39	53,42	(6,72)	42	57,53	(6,36)
Low	5	6,85		6	8,22	
<b>Age</b>						
Early Adult	32	43,84		24	32,88	
Last Adult	41	56,16		49	67,12	
<b>Work</b>						
PNS	55	75,34		61	83,56	
Non PNS	18	24,66		12	16,44	
<b>Marital Status</b>						
Married	68	93,15		62	84,93	
Not Married	2	2,74		6	8,22	
Separated/ Widowed	3	4,11		5	6,85	

Based on Table 1, it can be seen that the average age of respondents in the control group was 38.25 years, while the average age in the intervention group was 37.68 years, the age of late adulthood was greater in the control group at 67.12%. Respondents with low education were more in the control group at 8.22%, non-PNS respondents were more in the intervention group at 24.66%, and respondents who

were separated/widowed were more in the intervention group at 4.11%.

Table 2 shows that the average score of knowledge, intention, behavior and body weight of respondents after calculating the difference between the posttest and pretest scores was higher in the intervention group.

**Table 2.** Changes in Average Pretest and Posttest Scores on Knowledge, Intention, Behavior and Body Weight in Intervention and Control Groups

Variable (Δ Post-Pre)	Group		MD	ES	p
	I	C			
<b>Knowledge</b>	1,41(1,79)	-0,40(1,41)	1,81	1,120	0,0001
<b>Intention</b>	1,22(2,20)	0,42	0,79	0,365	0,365
<b>Behavior</b>	0,34(2,03)	0,05(2,15)	0,29	0,169	0,169
<b>Body Weight</b>	5,52(2,06)	5,49(1,29)	0,03	0,015	0,015
		(1,50)			

Table 2 shows the statistical test results that the  $p$ -value varied, it can be concluded that there were differences in the respondents' results after calculating the difference between the posttest and pretest scores in the intervention group and the control group in terms of weight loss. With the mean difference value, it means that there is a difference of 2 in the mean knowledge, intention, behavior and body weight of respondents after calculation. The difference between the posttest and pretest scores in the intervention group and the control group is 1.81, 0.79, 0.29 and 0.03. With the effect size values in table 2, it can be concluded that the intervention influences the respondents' knowledge, intentions, behavior and body weight.

**Table 3.** The Influence of Demographics on Whatsapp Group/Social Media Intervention on Weight Change in the Intervention Group

Variable	Coefficient	95%CI	P Value
<b>Age</b>			
Early Adult			
Late Adult	0,054	-0,98-1,09	0,000
<b>Education</b>			
High			
Medium	0,555	-0,53-1,64	0,311
Low	-0,649	-2,68 -1,38	0,526
<b>Work</b>			
PNS			
Non PNS	-0,274	-1,54-0,99	0,669
<b>Marital Status</b>			
Married			
Not Married	2,603	-0,53-5,73	0,102
Separated/ Widowed	1,554	-0,95-4,06	0,219

Based on the results of the multivariate regression analysis, the age significance value was  $0.918 < 0.05$  ( $\alpha=5\%$ ), so  $H_0$  was accepted. This means that the WhatsApp group/social media intervention between ages did not have a significant effect on changes in body weight. Different

educational factors, the results of the regression analysis obtained a significance value of  $0.526 < 0.05$  ( $\alpha=5\%$ ) so  $H_0$  was rejected. This means that the WhatsApp group/social media intervention among those with low education has a significant effect on changes in body weight. The results of regression testing on work obtained a significance value of  $0.669 < 0.05$  ( $\alpha=5\%$ ) so  $H_0$  was accepted. This means that the WhatsApp group/social media intervention between working as a civil servant (PNS) and non-civil servant (non-PNS) does not have a significant effect on changes in body weight. Likewise with marital status, the results of the regression test obtained a significance value of  $0.219 < 0.05$  ( $\alpha=5\%$ ) so  $H_0$  was accepted. This means that the WhatsApp group/social media intervention between nurses with separated/widowed marital status did not have a significant effect on changes in body weight.

**Table 4.** The Influence of Demographics at Pretest and Posttest on Control Group Weight Changes

Variable	Coefficient	95%CI	P Value
<b>Age</b>			
Early Adult			
Last Adult	-0,335	-1,10-0,43	0,386
<b>Education</b>			
High			
Medium	-0,396	-1,20-0,41	0,330
Low	0,671	-0,84 -2,18	0,378
<b>Work</b>			
PNS			
Non PNS	-0,726	-1,67-0,22	0,129
<b>Marital Status</b>			
Married			
Not Married	0,693	-1,63-3,02	0,554
Separated/ Widowed	-0,635	-2,49-1,22	0,497

Based on the results of the analysis in table 4. The results of the regression test show a significance value of  $0.386 < 0.05$  ( $\alpha=5\%$ ), so  $H_0$  is accepted. This means that age does not have a significant effect on changes in body weight. Likewise for work factors, the results of regression testing obtained a significance value of  $0.129 < 0.05$  ( $\alpha=5\%$ ) so  $H_0$  was accepted. This means that work does not have a significant effect on changes in body weight. Meanwhile, the results of regression testing on educational factors obtained a significance value of  $0.378 < 0.05$  ( $\alpha=5\%$ ) so  $H_0$  was rejected. This means that low education has a significant effect on changes in body weight. The relationship between marital status separated/widowed and changes in body weight based on regression analysis obtained a significance value of  $0.497 < 0.05$  ( $\alpha=5\%$ ) so  $H_0$  was accepted. This means that marital status, separated/widowed, does not have a significant effect on changes in body weight.

## DISCUSSION

As a person gets older, less active movement causes muscle mass in the body to tend to decrease and muscle loss causes a slowdown in the rate of calorie burning in the body. As you get older and with a constant calorie intake, it becomes increasingly difficult for the body to burn the incoming calories, resulting in a buildup of energy in the body and this results in obesity.<sup>7</sup>

The research results of Widiyanti & Tafal (2014) show that the relationship between age and weight gain, in this study obtained a p value of 0.008 and 0.029, meaning that there is a significant relationship between age and the incidence of obesity.<sup>18</sup> Previous research has proven a significant relationship between age and the incidence of overnutrition or obesity. As you get older and move less actively, your body's muscle mass tends to decrease, which causes a slowdown in the rate of calorie burning, making it increasingly difficult for the body to burn the incoming calories. Over time, there is a buildup of energy in the body which results in obesity.<sup>19</sup>

Saleh's (2022) previous research results showed that work had no effect on changes in body weight. The results of the logistic regression statistical test showed a p value of 0.081, so there was no significant effect of work on changes in body weight. Work is an activity carried out by a person with the aim of earning income/profit per hour per day/week. Other references state that work is something that is done to earn a living or earn a living. Jobs are divided into two groups, namely working as PNS and non-PNS.<sup>10</sup>

Previous research shows that the prevalence of obesity is highest in divorced status and lowest in single status, the results of data analysis show that there is a significant relationship between marital status and weight gain.<sup>20</sup> The results of the analysis are in accordance with research conducted by Erem (2004) which found that obesity had a significantly positive relationship with marital status.<sup>21</sup> The high prevalence of obesity in divorced status is thought to be due to depression experienced by a person when divorced, which causes unhealthy lifestyle changes such as consuming alcoholic drinks and high-fat foods.<sup>21</sup> The food consumed will be excessive when experiencing depression. According to Janghorbani (2007), the high prevalence of obesity in married people is thought to be because after marriage they tend to adapt to their partner both in terms of lifestyle and eating patterns.<sup>22</sup> The results of multiple logistic regression analysis show that respondents who are married and divorced are at risk of obesity respectively, namely 2,260 and 2,722 times greater than respondents who are never married.

Based on the results of the analysis in table 5.6 above, it can be seen that in terms of knowledge, the average knowledge score of respondents in the intervention group was higher at the posttest, namely 8.90, compared to the average at the pretest. The statistical test results obtained p-value: 0.0001, which means  $H_0$  is rejected. It can be concluded that there is a difference in the knowledge of

respondents in the intervention group between the pretest and posttest in weight loss. Meanwhile, the average knowledge score of respondents in the control group was higher at the posttest, namely 6.97, compared to the average at the pretest. The statistical test results obtained p-value: 0.134, which means  $H_0$  is accepted. It can be concluded that there is no difference in the knowledge of respondents in the control group between the pretest and posttest in weight loss.

This research shows that there is a difference in knowledge between before and after being given the intervention ( $p= 0.001$ ). In line with Nugroho's (2018) research results, it shows that there is no difference in knowledge between the pretest and posttest in the control group ( $p= 0.726$ ).<sup>23</sup>

These results are in accordance with the theory which states that the more five senses are used when presenting material, in this case the use of nutritional media (WhatsApp), the more it will arouse a person's attraction and interest so that the message conveyed becomes much easier to accept, especially for officers. health.<sup>24</sup>

Based on the research results of Usmaran the increase in knowledge scores occurred because the information provided through nutrition education changed from not knowing to knowing.<sup>25</sup> According to Notoatmodjo someone who is exposed to information about a particular topic will have more knowledge than someone who is not exposed to information.<sup>26</sup>

Knowledge is an indirect factor that influences a person's behavior, in this case nutritional behavior. Nutrition education aims to influence food consumption behavior towards better behavior, which begins with providing information to increase children's knowledge to raise awareness and cause behavior change. In accordance with the theory of health education and behavior which states that health education in a short period of time (immediate impact) will result in changes or increases in public knowledge.<sup>27</sup>

Saleh's research results show that the prevalence of obesity is higher at lower levels of education.<sup>20</sup> The results of data analysis show that there is a significant relationship between education level and weight gain in productive age (15-64 years) in the city of Surabaya.<sup>20</sup> The results of this analysis are in accordance with research by Panagiotakos which found that low education was associated with an increased incidence of obesity, where abdominal obesity increased in people with higher education.<sup>28</sup>

Education is related to mindsets and levels of knowledge that can lead to changes in behavior.<sup>29</sup> The higher the education, the easier it is to receive knowledge and information both through other people and mass media. The knowledge gained can be used as a good guide in daily life, especially knowledge about balanced nutrition and health so that it can help in choosing good food in terms of quality and quantity. Apart from that, it can increase awareness in maintaining body health and ideal body

weight, thereby reducing the possibility of experiencing obesity. The results of multiple logistic regression analysis show that low and medium education levels are at risk of obesity respectively, namely 0.694 and 0.693 times greater than high education levels.

The statistical test results showed that there was no difference in the behavior of respondents in the control group between the pretest and posttest in weight loss. This research is in line with Khoirunnisa & Kurniasari that there is no difference in behavior between before and after intervention is given.<sup>30</sup> Changing understanding to taking good action requires intensive health promotion. It can be seen that children do not understand, respond and carry out good practices in choosing healthy food.<sup>31</sup>

Providing health education via social media does not have a significant influence on weight maintenance behavior. Behavior decreased both in each group and after comparisons were made between groups, possibly due to an increase in respondents' knowledge after receiving health education. This happens because health education is an effort to change a person's behavior which is carried out using an educational approach aimed at fostering positive attitudes of individuals and society towards nutritional intake which will influence eating habits so that nutritional improvements are achieved. Another factor that might cause the absence of an effect of health education on energy intake is due to limited research on the 24-hour recall method which relies heavily on memory, both from identifying the food consumed and its size or portion.<sup>30</sup>

Based on the results of statistical tests, it was found that there was no difference in the intentions of respondents in the control group between pretest and posttest in terms of weight loss. In line with Riyanto's research results which showed that there was a difference in intention between before and after the intervention was given ( $p=0.001$ ).<sup>32</sup> According to Ajzen intention is a person's desire to carry out behavior.<sup>31</sup> Intention is the conscious intention to carry out an action.<sup>33</sup> Intentions can be changed by providing information about the dangers of being overweight through health promotion.

Behavior is an individual's actual action as a result of factors that influence it. According to Ajzen, intention is the closest factor to the occurrence of a behavior.<sup>31</sup> Intention can be used to predict how strongly an individual wants to perform a behavior and how much effort the individual plans or makes to carry out that behavior. The influencing factors are knowledge, attitudes, subjective norms and perceived behavior control (PBC).<sup>34</sup>

WhatsApp Groups or social media can create space for support and communication between health workers who have similar goals. can share experiences, challenges and motivation with each other. Group support can increase motivation and commitment to achieving weight loss goals.<sup>35</sup>

According to researchers' assumptions, there is no effect of intervention on behavior because changing

behavior takes a long time. In accordance with Mubarak & Chayatin where behavior when it has become a habit is sometimes difficult to change, but it can still be changed, even though it takes a long time.<sup>36</sup>

It was statistically found that there was no difference in the weight loss of respondents in the control group between the pretest and posttest. This research is in line with Nugroho which shows that there is a difference in behavior between before and after being given the intervention ( $p= 0.491$ ). In fact, there was no difference in behavior between the pretest and posttest in the control group ( $p= 0.725$ ).<sup>23</sup>

The formation of behavior is also influenced by the environment, one of which is social support.<sup>37</sup> The most influential support besides family is work friends.<sup>38</sup> The influence of co-workers is a social factor that can also influence the choice of snacks which are directly related to energy intake.<sup>39</sup> This change in knowledge will be followed by a change in intention and will ultimately be able to change behavior to form a new behavior that is better in line with the initial goal of providing nutrition education.<sup>37</sup>

Previous research by Dewi showed that there was no difference before and after the intervention in weight loss. With an intervention time of 3 weeks.<sup>40</sup> However, the group's body weight before being given the intervention was higher than after being given the intervention.

The formation of new behavior in a person begins with the cognitive domain, meaning that the subject has knowledge of an object due to stimulation in the form of external material which then triggers stimulation that is fully realized, giving rise to a further response in the form of a new action to the stimulation it receives.<sup>20</sup> Then the research time limitations were still too short, namely 3 weeks (21 days), so we could not see significant changes in actions. There was no difference in body weight due to limited intervention time. Even though there is weight loss, it is still not significant.

## CONCLUSION

The Body Mass Index (BMI) of health workers in Sabang City is still high. The Whatsapp Group/Social Media intervention that was carried out resulted in changes in knowledge and intentions in the intervention group regarding weight loss. Behavioral changes and weight loss were not significantly different in the intervention group between pretest and posttest. Although there was a decrease in weight, it was not statistically significant.

## SUGGESTION

Intervention activities regarding weight loss should be routinely carried out via WhatsApp aimed at all health workers in health agencies in Sabang City. In future research, it is recommended that the intervention be carried out for >3 weeks to get maximum results.

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