Nat. Volatiles & Essent. Oils, 2021; 8(6): 4490-4499

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Natural Volatiles & Essential Oils

The Effect Of Balanced Nutrition Education On Consumption Patterns And Body Weight Of Preconceptional Women In North Polongbangkeng District, Takalar Regency, Indonesia

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Abstract

Balanced nutrition for preconceptional women is essential for a healthy pregnancy outcome. This study aims to determine the effect of balanced nutrition education on consumption patterns and weight of preconception women in North Polongbangkeng District, Takalar Regency. This type of research is a quasi-experimental design with non-randomized control group pretest posttest design. The treatment given to the booklet + WA group was the distribution of booklets and Whatsapp messages in the form of poster images and videos, while in the booklet group only booklets were distributed. Sampling was 39 in the booklet+WA group and 42 in the booklet group with purposive sampling technique. Data was collected using a 24-hour food recall interview and a food frequency questionnaire (FFQ) as well as body weight. The tests used were chi-square test, Mann-Whitney test, paired t test and unpaired t test.The results showed that in the booklet + WA group, balanced nutrition education had a significant effect on energy intake (P < 0.001), carbohydrates (P = 0.001), protein (P = 0.009), fat (P < 0.001), frequency of eating (food staple (P<0.001), protein sources (P<0.001), fruits and vegetables (P<0.001)) and body weight (P=0.048) towards the normal category 2 months after the intervention. Meanwhile, the balanced nutrition education booklet group did not significantly affect the intake of carbohydrates (P = 0.123), protein (P = 0.108) and frequency of eating (staple foods (P = 0.692), protein sources (P = 0.853), fruits and vegetables (P = 0.367), but balanced nutrition education significantly affected energy intake (P = 0.020), fat (P <0.001) and body weight towards the obesity category 2 months after the intervention. This study suggests that preconception posyandu and Whatsapp groups be created in every village so that health workers can easily share information related to the preconception period.

Keywords: Balanced Nutrition Education, Consumption Pattern, Body Weight, Preconception Women

Introduction

The preconception period is the period before pregnancy, which ranges from three months to a year before conception and ideally should include the time the ovum and sperm mature, which is about 100 days before conception (Doloksaribu & Simatupang, 2019). Health in the preconception period is very important to pay attention to, especially the nutritional status because nutritional status during the preconception

period is closely related to the outcome of the pregnancy later (Paratmanitya et al., 2012). Poor nutritional status during preconception or even during pregnancy can cause illnesses such as anemia and CED (Chronic Energy Deficiency) and even death in the mother. According to the 2015 Census Rate Survey (Supas) the maternal mortality rate in Indonesia is still high at around 305 per 100,000 KH (live births) (Kemenkes, 2019).

Around 16 million people in the world suffer from disability and 1.7 million die every year due to low consumption of vegetables and fruits. Data from several countries show that the consumption pattern of the world's population is to consume foods that are high in sodium levels, low in fiber (Vasileska & Rechkoska, 2012), increased consumption of meat and sugar (Kearney, 2010). The consumption pattern of the Indonesian people is still not in accordance with the message of balanced nutrition. Result of Riskesdas (2018) stated that the proportion of the population who consume vegetables and fruits below the recommended (less than 5 servings a day) has increased, namely in 2013 as much as 93.5% to 95.5% in 2018. Furthermore, the high consumption pattern of risky foods, namely the consumption of seasonings (77.3%), sweet foods and drinks (53.1%) and fatty foods (40.7%) (Riskesdas, 2014). And the quality of protein consumed on average per person per day is still low because some of it comes from vegetable protein such as cereals and beans (Kemenkes, 2014). Research conducted in North Polongbangkeng District, Takalar Regency, found that some preconception women did not know well about nutrition knowledge, namely good sources of protein in food, ideal portions of consuming fruits and vegetables for preconception mothers, types of minerals that can prevent anemia, types of carbohydrates that can prevent anemia. be in healthy food and activities that can lose weight (Syamsari, 2020).

To improve consumption patterns and achieve normal weight, good nutrition knowledge is needed. One of the efforts to provide nutritional knowledge to preconception women is to provide nutrition education. Preconception women who were given nutrition education had 34 times the practice of consuming healthy foods compared to those who were not given nutrition education. Nutrition education for preconception women can also prepare for a more optimal pregnancy and healthy babies (Fauziyah, 2012). Nutrition education can influence the behavior of balanced nutrition consumption patterns for better individuals, groups and communities. Nutrition education has several advantages including being feasible, affordable, has no side effects and is sustainable through increasing knowledge so that it can have an impact on changing consumption patterns (Rahmah, 2019).

Methods in providing nutrition education continue to be developed through various media, both through print and electronic media. At present, many are developing nutrition education using electronic media, for example using the WhatsApp application. The use of the WhatsApp application as an educational medium is often combined with the distribution of booklets. Several studies have shown that the use of WhatsApp is very effective in increasing knowledge, attitudes and consumption patterns and improving body weight (Siregar & Koerniawati, 2021; Zaki & Sari, 2019; Usman et al., 2020). Asnidar's research in 2017 showed that balanced nutrition education using re-educated booklets using the WhatsApp application was more effective in increasing consumption patterns towards a healthy direction and losing weight in obese adolescents compared to lecture methods, leaflets, booklets and SMS messages (Asnidar, 2017). Based on the situation and conditions above, the researcher wants to examine the effect of balanced nutrition education on consumption patterns and weight of preconception women in North Polongbangkeng District, Takalar Regency.

Methods

This research was conducted in North Polongbangkeng District, Takalar Regency in June – October 2021. The type of research used was a quasi-experimental study with a non-randomized control group pretest posttest design. The population is all preconceptional women registered at KUA Polongbangkeng Utara in the last 6 months. The sample in this study was 39 in the booklet + WA group and 42 in the booklet group selected by purposive sampling who had met the inclusion criteria, namely Women of Childbearing Age (WUS) registered at KUA, able to read, write and communicate fluently, had the whatsapp application (WA) and willing to participate in the study by signing the informed consent issued by the ethics commission of Hasanuddin University with letter number 10921/UN4.14.1/TP/01.02/2021.

In the booklet+WA (Whatsapp) group, balanced nutrition education is carried out by giving a booklet after filling out the pre-test questionnaire and measuring weight (pre-test), the day after that there will be counseling via the WhatsApp application for 1 month with 3 poster images sent. and 1 video submission every week. Meanwhile, the booklet group was only given a booklet after filling out the pre-test questionnaire and measuring body weight (pre-test). Data were collected in this study 3 times, namely pre-test (before education), post-test 1 (30 days after education) and post-test 2 (90 days after education). The research variables included consumption patterns, namely energy intake, carbohydrates, protein, fat, and eating frequency (staple foods, protein sources, vegetables and fruit) which were measured using a 24-hour recall questionnaire and a food frequency questionnaire (FFQ) and body weight was measured using a scale. Scale brand weight. The consumption pattern data is processed first using the Nutrisurvey application. Then the data on consumption patterns and body weight were analyzed using the SPSS application using the chi-square test, Mann-Whitney test, paired t test and unpaired t test

Results and Discussion

The results of research data analysis can be seen as follows:

Table 1. Frequency Distribution of Characteristics of Preconceptional Women in North Polongbangkeng District, Takalar Regency

Characteristic	Group Booklet+WA (n=39)		Group Booklet (n=42)		P
	n	%	n	%	
Age					
< 20 years	5	12,8	7	16,7	0,862*
20-30 years	34	87,2	35	83,3	
Work					
Work	11	28,2	10	23,8	0,844*
Not working	28	71,8	32	76,2	
Education					
Not finished Elementary School	1	2,6	0	0	0,747*
Elementary School	4	10,2	2	4,8	
Junior School	3	7,7	5	11,9	
High School	18	46,2	21	50,0	
Bachelor	13	33,3	14	33,3	

Source: primary data 2021 * = Chi-square test

Based on table 1, it was found that the average age of preconception women in this study was 20-30 years old, did not work and had a high school education, both in the booklet + WA group and the booklet group. The results of the chi-square test obtained P value> 0.05 on the characteristics of age, education and occupation, which means that the conditions of age, education and work in both groups are homogeneous or the same.

Table 2. Baseline Data on Preconception Women by Group in North Polongbangkeng District, Takalar

Variable	Group Booklet+WA (n=39)	Group Booklet (n=42)	P
	Mean±SD	Mean±SD	
Weight	57.8±11.9	56.3±10.1	0,541*
Balanced Nutritional Knowledge	7.5±2.4	8.3±1.8	0,145*
Balanced Nutrition Attitude	28.8±3.5	28.4±3.1	0,805*
Energy (kcal)	1459±567.2	1530±425.9	0,582**
Carbohydrates (g)	227±98.5	240±88.5	0,555**
Protein (g)	56.3±25.8	56.9±17.0	0,898**
Fat (g)	35.5±16.9	36.1±13.8	0,850**
Frequency of eating (staple food)	9.4±2.4	10.8±2.7	0,026**
Frequency of eating (source of protein)	8.7±2.4	8.9±2.9	0,698**
Frequency of eating (vegetables and fruit)	8.6±2.9	8.4±3.8	0,876**

Source: Primary Data, 2021

*= Mann-Whitney test

**= unpaired T Test

Based on table 2 shows the average score of knowledge, energy intake, carbohydrates, protein, fat and frequency of eating (staple foods and protein sources) was higher in the booklet group compared to the booklet+WA group, but on the average body weight, attitude and the frequency of eating (vegetables and fruit) was higher in the booklet+WA group compared to the booklet group. The results of the difference test between the booklet group and the booklet+WA group showed that there was no difference between the two groups of all variables or that the baseline data from the two groups were the same or homogeneous, except for the frequency of eating staple foods there was a significant difference

Table 3. Changes in Energy Intake, Intake of Macro Nutrients, Frequency of Eating and Weight of Preconception Women in North Polongbangkeng District, Takalar Regency

Variable	Pre-test (I)	Post-tets 1 (II)	Post-test 2 (III)	Delta II-I	Delta III-I	P**	P***
	Mean±SD	Mean±SD	Mean±SD	Mean±SD/P*	Mean±SD/P*		
Energy							

Intake (kcal)							
Group Booklet +WA (n=39)	1459.7±567.2	1689.7±618.2	1917.5±384.1	229.9±758.6/0.066	457.7±530.5/<0,001	0,693	0,013
Group Booklet (n=42)	1530.1±425.9	1700±660.5	1705.1±465.8	170.5±583.8/0.65	174.9±469.4/0.020		
Carbohydrate Intake (g)							
Group Booklet +WA (n=39)	227.7±98.5	258.6±113.3	302.4±68.0	30.8±140.6/0.178	74.7±124.1/0.001	0,867	0,134
Group Booklet (n=42)	240±88.5	269.9±114.1	271.7±102	29.7±116.1/0.105	31.7±130.6/0.123		
Protein Intake (g)							
Group Booklet +WA (n=39)	56.3±25.8	59±22.9	68.2±18.7	2.6±31.6/0.600	11.8±27.1/0.009	0,891	0,391
Group Booklet (n=42)	56.9±17.0	58.8±22	63.7±19.5	1.8±24.6/0.636	6.7±26.5/0.108		
Fat Intake (g)							
Group Booklet +WA (n=39)	35.5±16.9	42.8±26.1	53.3±13.3	7.3±30.9/0.148	17.7±20.14/<0,001	0,822	0,027
Group Booklet (n=42)	36.1±13.8	42.±26.6	43.1±21	5.8±28.1/0.188	6.9±22.8/0.001		
Frequency of Eating (Staple Foods)							

Group Booklet +WA (n=39)	9.4±2.4	8.7±2.3	11.3±1.8	-0.7±2.9/0.140	1.8±2.9/<0,001	0,990	0,006
Group Booklet (n=42)	10.8±2.6	10.1±2.7	10.9±2.7	-0.7±2.4/0.072	0.1±2.3/0.692		
Frequency of Eating (Protein Source)							
Group Booklet + WA (n=39)	8.7±2.4	9±2.9	10.2±2.1	0.3±2.8/0.465	1.4±2.1/<0,001	0,517	0,006
Group Booklet (n=42)	8.9±3.2	9.8±3.8	9±2.8	0.7±2.8/0.101	0.1±2.4/0.853		
Frequency of Eating (Vegetables and Fruits)							
Group Booklet + WA (n=39)	8.6±2.9	10.9±3.0	11,2	2.3±3/<0,001	2.6±2.8/<0,001	0,203	<00,001
Group Booklet (n=42)	8.4±3.8	9.9±3.4	8±2.6	1.4±3/0.003	-0.38±2.7/0.367		
Weight							
Group Booklet + WA (n=39)	57.8±11.9	58.9±11.4	59.6±10	1.07±2.6/0.014	1.77±5.4/0.048	0,364	0,096
Group Booklet (n=42)	56.3±10.19	58.5±10.2	59.1±10.5	2.2±3.4/<0,001	2.8±4.7/<0,001		

Source: Primary Data 2021 * =Paired t test **= Unpaid t test (delta II-I) ***=Unpaired t test (delta III-I).

Table 3 shows that during the pre-test the average score of all variables was higher in the booklet group than the booklet+WA group, except for the average frequency of eating (vegetables and fruit) and body weight. However, during the post-test 1 booklet+WA group, the average value of protein intake, fat intake, frequency of eating (vegetables and fruit) and body weight was higher than the booklet group. Except for energy intake, carbohydrate intake and frequency of meals (staple foods and protein sources) in the

booklet group were higher than the booklet+WA group. Furthermore, at post-test 2 the average value of energy intake, carbohydrate intake, protein intake, fat intake, frequency of eating (staple foods, protein sources, vegetables and fruit) and body weight was higher in the booklet+WA group than the booklet group.

Based on the results of the paired t test, it showed that from pre-test to post-test 1 there was no significant difference in energy intake, carbohydrate intake, protein intake, fat intake and eating frequency (staple food and protein sources) in both the booklet group and the booklet+WA group. , but there was a significant difference in the frequency of eating (vegetables and fruit) (P<0.001) and body weight (P=0.014) in the booklet+WA group before and after the intervention, as well as in the booklet group there was a significant difference in the frequency of eating (vegetables and fruit) (P=0.003) and body weight (P<0.001) before and after the intervention.

Furthermore, from pre-test to post-test 2 in the booklet+WA group, it was found that there was a difference in energy intake (P=0.000), carbohydrate intake (P=0.001), protein intake (P=0.009), fat intake (P=0.000) , eating frequency (staple food (P<0.001), protein source (P<0.001) and vegetables and fruit (P<0.001)) and body weight (P=0.000) were significant before and after intervention in preconceptional women. Meanwhile, in the booklet group there were significant differences in energy intake (P=0.020), fat intake (P=0.001), body weight (P=0.000) before and after the intervention. However, there was no significant difference in carbohydrate intake (P=0.123), protein intake (P=0.108), meal frequency (staple food (P=0.692), protein sources (P=0.853), vegetables and fruit (P=0.637)). before and after intervention in preconceptional women.

Based on the results of the unpaired t test, it showed that there was no significant difference in energy intake, carbohydrate intake, protein intake, fat intake, meal frequency (staple food, protein sources, and vegetables and fruit) from pre-test to post-test 1 (P >0.05) between the booklet+WA group and the booklet group. Furthermore, from pre-test to post-test 2 there were significant differences in energy intake (P=0.013), and fat intake (P=0.027), meal frequency (staple food (P=0.006), protein sources (P=0.006) , vegetables and fruit (P<0.001)) of the difference in increase for the two groups. While the intake of carbohydrates (P = 0.134), protein (P = 0.391) and body weight (P = 0.096) there was no significant difference in the difference in increase for the two groups.

The results showed that there was no significant change in the consumption pattern of preconception women after the intervention (pre-test to post-test 1) in both the booklet group and the booklet+WA group, but after 2 months of intervention in the booklet+WA group it was found that there was a change in intake energy (P=0.000), carbohydrate intake (P=0.001), protein intake (P=0.009), fat intake (P=0.000), frequency of meals (staple food (P<0.001), protein sources (P<0.001) and vegetables and fruit (P<0.001)) and body weight (P=0.000) were significant before and after the intervention. This is in line with several other studies which state that there are significant changes in energy intake, carbohydrates, protein, fat, eating frequency and body weight before and after the intervention using the Whatsapp application (Asnidar, 2017; Saskhia et al., 2021). Meanwhile in the booklet group there were only significant changes in energy intake (P=0.020), fat intake (P=0.001), body weight (P=0.000) before and after the intervention. Several other studies stated that there were significant changes before and after the intervention with the lecture method and booklets on energy intake, carbohydrate intake, protein intake and fat intake1718. However, this is contrary to the research of Diba et al 2020 which said that balanced nutrition education with booklet media was not effective in increasing the consumption pattern of balanced nutrition and body weight (Diba et al., 2020).

If we look at changes in the weight of preconception women based on Body Mass Index (BMI), in the booklet+WA group the changes in preconception women's weight before and after the intervention lead to the ideal body weight or normal BMI category, while in the booklet group the changes in body weight are more towards weight. overweight or BMI in the fat category. This happens because in the booklet group the average weight of preconception women is included in the normal BMI category, but if they add just 1 kg it will change to weight in the fat BMI category. And the preconception women in the booklet group did not have a discussion session with the researcher, so the information they wanted to convey was not conveyed clearly.

The increase in the average difference in consumption patterns of preconception women from pre-test to post-test 1 and from pre-test to post-test 2 was higher in the booklet+WA group compared to the booklet group. This increase occurred because the enthusiasm and motivation of respondents to have healthy children in the future and the absence of health problems during pregnancy triggered changes in the behavior of preconception women in improving their consumption patterns and body weight. Based on the theory of Health Belief Model states that a perception received by individuals about the threat of a disease will result in a person's tendency to take preventive action (Putri et al., 2021).

The results of the unpaired t test showed that there was a significant difference ($P<0.05$) in energy intake, fat intake, and meal frequency (staple foods, protein sources, and vegetables and fruit) from the difference in increase for the two groups 2 months after the intervention. While the intake of carbohydrates, protein and body weight there was no significant difference from the difference in the increase for the two groups ($P> 0.05$). This shows that the use of booklet+WA is more effective in improving energy intake, carbohydrate intake, protein intake, fat intake and frequency of eating towards a healthy consumption pattern or in accordance with the recommended nutritional adequacy rate and body weight towards normal. The results of this study are also in accordance with the results of Asnidar's research in 2017 which proves that the provision of health education using booklet media coupled with re-education through the WhatsApp application media can improve energy intake, macronutrients and body weight in adolescents with obesity more significantly than other media. such as, lectures, booklets only or using SMS with a p value <0.001 (Asnidar, 2017)

The advantage of education through Whatsapp is that the material can be easily accessed, cost effective (Ekadinata et al., 2017). it is easy to do two-way communication remotely between researchers and respondents21 and there is no time limit for respondents to ask questions or discuss the material presented. Other research also strongly recommends that the WhatsApp application be used as a media for counseling or promoting a balanced nutritional consumption pattern because it can be accessed anywhere and anytime and its use is popular in the community (Ng et al., 2021).

Conclusion

Factors that support mothers in exclusive breastfeeding in the working area of the Marusu Health Center are knowledge, family support and support for health services; (1) Mother's knowledge has proven to be one of the inhibiting factors in exclusive breastfeeding for her baby. Mothers who have a poor understanding of exclusive breastfeeding, the benefits of exclusive breastfeeding and foods that can support their milk production tend to equate the content of breast milk as well as formula milk; (2) Husband and family support plays an important role in supporting mothers to give exclusive breastfeeding to their babies. By meeting the needs of the mother and baby as well as maintaining the mother's emotions that can affect the mother's mentality, the mother focuses on breastfeeding her baby; (3) Support for

health services by making it easier for mothers to get information related to exclusive breastfeeding for their babies, starting from the procedures for caring for the breasts, how to properly breastfeed babies, foods that can facilitate breast milk production, and the benefits of exclusive breastfeeding where this information can be found at any time. attend classes for pregnant women and at the Posyandu. Factors that inhibit mothers in exclusive breastfeeding in the working area of the Marusu Health Center are the readiness of breastfeeding mothers and advertisements for formula milk; (1) Low readiness of breastfeeding mothers in breastfeeding causes problems during the breastfeeding process. Starting from complaints from breast milk that doesn't come out smoothly, sore nipples to babies who are fussy because they can't breastfeed properly; (2) Formula milk advertisements that make mothers and husbands interested and think that formula milk is as good as breast milk, the attitude of mothers who can't handle their breastfeeding problems tends to give formula milk and mothers' experiences with their first child who is given formula milk.

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