



The Effect of Herbal Medicine on the Improvement of Nutritional Status of Premarital Women

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Abstract

One of the ways to overcome the problems is consuming herbal nutritious that can increase nutritional status. The aim of the research is to determine the effect of Herbal Medicine consisting of red ginger (*Zingiber officinale*), white onion (*Allium sativum*), lemon (*Citrus lemon*), apple vinegar (apple cider vinegar) and honey (honey bee pollen) on the improvement of nutrient status of prenuptial age women of the students of Midwifery Program of Indonesia Moslem University, Makassar City. The research used an experimental design with pre-post control group design conducted to the students of Midwifery Study Program. The samples were 30 students consisting of 30 girls given herbal Medicine as the intervention group and 30 female students given nutrition education as the control group. The measurement of Body Weight, BMI, UAC, and energy consumption was done before and after the treatment in week 8. The periodical measurement was done every two weeks. The data were analyzed using Wilcoxon Test and Mann Whitney Test. The results of the research indicate there is a significant effect on the nutrient status of the students of Midwifery Study Program, Public Health Faculty, Indonesia Muslim University in which body weight is $p=0.000$ for intervention group and $p=0.408$ for control group; body mass index is $p=0.000$ for intervention group and $p=0.317$ for control group; upper arm is $p=0.000$ for intervention group and $p=0.466$ for control group, and consumption energy is $p=0.001$ for intervention group and $p=0.719$ for control group.

Keywords: herbal medicine; nutrient status; prenuptial age women.

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1. Introduction

Based on Riskesdas in 2013, the prevalence of Chronic Energy risk (CER) in pregnant women aged 15-49 years is 24.2% [1]. These results indicate that the prevalence of SEZ risk in pregnant women is still high. CER pregnant women considered a public health problem if the prevalence is $\geq 10\%$. The proportion of women of fertile age with chronic energy deficiency, i.e., Women Of Productive Age with upper arm circumference (UAC) less than 23.5 cm has increased with the percentage of pregnant women aged 15-19 years with CER from 33.5% in 2010 to 38.5% in 2013. Also, the increase in women of productive age aged 15-19 years non-pregnant from 30.9% in 2010 rose to 46.6% in 2013 [1].

Barker's theory suggests that balanced nutrition becomes a fundamental need for human life. Fulfillment of nutrition before, during pregnancy until after childbirth is the initial capital of healthy life after the birth of a successor to the nation. Therefore, the preparation of juvenile nutrition before marriage needs to be considered. The existence of young women 15-21 years is essential because it is the development of the prospective mother. Teens Age Pregnancy is a potential mother who must be considered health status, including nutritional status. The nutrition of pre-conception women will significantly affect the outcome of pregnancy [2].

The prevalence of chronic energy deficiency (CER) in women of infertile age becomes a health problem because of its prevalence $> 10\%$. This needed a study of how to be able to improve nutritional status using Herbal ingredients. In a journal entitled "The Role of Traditional Herbal Medicine in Modern Japan," there are several ways to increase weight using conventional medicines and herbal remedies. One of the herbal remedies that many Japanese people use as a concoction of age-old prescription free of a thousand diseases, consisting of garlic, apple vinegar, honey, red ginger, and lemon, has been used as both food and medicine by Chinese, Egyptians, India, Indonesia, and various nations and cultures for thousands of years [3]. In the journal Witantri and his colleagues regarding the effect of adding red ginger in broiler chicken runsum, said that red ginger has benefits in digestion, absorption, and metabolism. Red ginger has an essential volatile bioactive component that helps the work of digestive enzymes so that the feed rate increases [4]. Regar and his colleagues study, regarding the provision of herbal combination rations with zinc minerals to broiler chickens, said that the active components in garlic that is allicin and allin are an active Zak that has the power to kill bacteria and anti-inflammation [5]. Based on data from Health Research Association of Ministry of Health 2010, about 60 (59.12%) of Indonesian population consume herbal medicine. Society considers herbal medicine safer than conventional medicine [6]. This study wanted to know the effect of Herbal Medicine on improving the nutritional status of pre-married women in Midwifery program.

2. Materials and Method

2.1. Collection of Samples

This research was conducted in Prodi DIII Midwifery Faculty of Public Health Universitas Muslim Indonesia Makassar City. This type of the investigation used an experimental design with pre-post control group design, which in this study will be utilized treatment group given Herbal Medicine and control group given nutrition education. The population is all female students in the Midwifery Faculty of the Public Health University of

Indonesia Indonesia, amounting to 222 girls. A sample of 60 female students who have BMI <18,5 and willing to participate in this research. The sample in this study was divided into two, where 30 female students were given Herbal Medicine as an intervention group and 30 female students who were given nutrition education as a control group.

2.2. Instrument

The data were collected through study of DIII Midwifery Prodi UMI students including Food Recall 24 hours, age, UAC, Weight (Body Weight) and Body Height so that Body Mass Index (BMI) can be determined. There were 60 female students who had BMI <18.5 and subsequently divided into two groups: a group of 30 interventions and 30 controls randomly selected. Researchers made herbal medicine and distributed Herbal Medicine to the intervention group and will be distributed every 2 weeks for 2 months and every 2 weeks will be done weight monitoring and observation 24 hours food recall form which has been filled by the respondent and at week 8 will be measured Body Weight, UAC, and BMI on all respondents both in the intervention group and in the control group.

2.3. Data Analysis

To know the standard or not the data distribution used data normality test by using Kolmogorov Smirnov test. To determine whether or not the difference of pretest and post test result in treatment group given Herbal Medicine and control group given nutrition education, then selected nonparametric test that is Wilcoxon test and to compare which group has more meaningful influence that is by using Mann Whitney test.

2.4. Ethical Clearance

Ethical approval for this study was obtained from Research Ethics Committee, ‘Indonesian Moslem University, Makassar, Indonesia.

3. Results

In Table 1 using Wilcoxon test showed 27 (90%) female students who increased body weight in the intervention group while in the control group only 13 (43.34%) female students who improved body weight.

Table 1: Differences between body weight before and after eight weeks

Body weight before - Body weight after	Intervention			Control		
	N	%	P value	N	%	P value
Negative Ranks	0	0%		7	23.33%	
Positive Ranks	27	90%	0.000	13	43.34%	0.408
ties	3	10%		10	33.33%	
Total	30	100%		30	100%	

Table 2 shows 15 (50%) female students who had elevated UAC in the intervention group whereas in the control group only 1 (3.34%) of the female students had raised UAC.

Table 2: Differences between UAC before and after eight weeks

Before UAC - UAC After	Intervention			Control		
	N	%	P value	N	%	P value
Negative Ranks	0	0%		0	0%	
Positive Ranks	15	50%	0.000	1	3.34%	0.317
ties	15	10%		29	96.66%	
Total	30	100%		30	100%	

Table 3 shows 27 (90%) female students who experienced an increase in BMI in the intervention group while in the control group only 13 (43.34%) of women students who experienced BMI increase.

Table 3: Differences between BMI before and after eight weeks

Before BMI - BMI After	Intervention			Control		
	N	%	P value	N	%	P value
Negative Ranks	0	0%		7	23.33%	
Positive Ranks	27	90%	0.000	13	43.34%	0.466
ties	3	10%		10	33.33%	
Total	30	100%		30	100%	

Table 4 shows 30 (100%) of female students who experienced an increase in energy consumption in the intervention group while in the control group only 16 (53.33%) of female students experienced an increase in energy consumption.

Table 4: Differences between the energy needs before and after eight weeks

Before Energy - Energy After	Intervention			Control		
	N	%	P value	N	%	P value
Negative Ranks	0	0%		14	46.67%	
Positive Ranks	30	100%	0.000	16	53.33%	0.719
ties	0	0%		0	0%	
Total	30	100%		30	100%	

Table 5: Effectiveness of Giving Herbal Medicine In Women Age Prenuptial

Mann-Whitney Test	mean Rank	P value
Changes in Body Weight		
Intervention	42.13	0.000
Control	18.87	
Changes UAC		
Intervention	37.60	0.000
Control	23.40	
Changes in BMI		
Intervention	42.07	0.000
Control	18.93	
Changes in Energy Consumption		
Intervention	38.22	0.001
Control	22.78	

In Table 5 using the Mann Whitney Test showed that the mean value of rank for the intervention group was greater than the average value of the control group position of each of the measured variables, i.e., body weight 42.13 > 18.87, UAC 37.60 > 23,40, BMI 42,07 > 18,93 and energy consumption 38,22 > 22,78. The result of a statistical test using Mann-Whitney Test got p = 0,000 for body weight, UAC, and BMI, while p = 0,001 for the variable of energy consumption. The value is smaller than α (0.05) which means there is a significant difference between intervention and control groups for all variables. This shows the effectiveness of giving Herbal Medicine to improve the nutritional status of women of premarital age.

4. Discussion

The result of body weight weighting of intervention group and control group using body weight Camry Scale done by the researcher showed that there was an increase in body weight after giving Herbal Medicine to the intervention group. Nevertheless, the body weight in the intervention group and the control group had not fulfilled the standard body weight in Indonesia for the age group 16-19 years, is 50 kg and the age group of 20-49 years, ie 54 kg while the average body weight in the intervention group after treatment was given only 42, 10 kg and in the control group body weight an average of 41.53 kg. In the journal Herawati, regarding the addition of red ginger fito-biotic to the production & chicken blood profile where p < 0.05 (1955.53g /each). Feed with additional red ginger leads to the stimulation of digestion process, so the conversion of feed into meat runs more optimally. Red ginger has properties as digestant and stimulant. This research is in line with the theory, where

red ginger contains bioactive components (essential oils, oleoresins, and gingerol) that help the process of digestion, absorption, and metabolism [7]. In the journal Mufid & Solton, on the effect of garlic flour on mortality and chicken body weight where $f_{hit} > f_{table}$ (1.654g / head). The addition of garlic serves as an amino acid and antibiotics that aim in the formation & development of cells, so that body weight becomes more optimal. This study is in line with the theory that garlic contains allicin bioactive components that have bacterial kill power and anti-inflammation so that the absorption of food substances in the small intestine is not hampered and will be more optimal [8]. In the journal Ofili & Gwacham, on the effects of lemon Nigeria extract for body weight, liver, serum lipid Wistar rats, where $p < 0.05$ decreases in body weight. Lemons contain flavonoids and alkaloids that contribute to the decline in body weight and serum lipids. Vit C content contributes to efficient digestion and decrease of body weight by increasing acidity. The results of this study have differences with the herbal medicine where the study Ofili & Gwacham, only examine a herbal ingredient is a lemon while on herbal medicine contains five components of herbs are red ginger, lemon, and apple vinegar honey [9]. In the Elok & Izzati's journal, on the effects of apple and balsamic vinegar in lowering blood glucose in Wistar rats. Vinegar reduces body weight 2.27% on day 14 increases then returns to baseline. Acetic acid content affects glucose control by changing the rate of gastric emptying and prolonging satiety. Apple vinegar contains bioactive components of antioxidants (57.73%) and potassium. The results of this study have differences with the herbal medicine which in the study of Elok & Izzati (2015), only examine one herbal ingredient namely apple vinegar while on herbal medicine containing five herbal components so that the acetic acid level can be neutralized [10].

In the study Sofyan and his colleagues on the effect of honey on acute diarrhea in children. The result was a body weight increase in the honey supplementation group (82.9%) $p = 0.947$, but the nonsignificant increase was due to the children were taken as the sample were children with diarrhea. Honey contains many nutrients, including anfritis enzymes that function to convert sucrose into glucose and fructose so quickly absorbed and digested by the body. The existence of the influence on our research due to herbal medicine research combining honey with red ginger and garlic, so it shows significant results about increased body weight [11].

The results of UAC measurements in the intervention group and the control group using the tape meter performed by the researchers revealed that there was an increase of UAC after Herbal Medicine administration in the intervention group. In this study, there was an increase of UAC, although it was still in the category of Chronic Energy Lacking (CER) because the average UAC after the herbal medicine intake was only 22.10 cm and the UAC control group averaged 22.01 cm or less than 23, 5 cm (normal limit of UAC). In the study of Nugraha and his colleagues on the effect of giving honey to the percentage of body fat and thick skin folds on the janitor. From the results of the analysis, there was an increase in nutritional status (LT $p = 0.687$; TLK $p = 0.009$), in this study, there was an increase in body weight and appetite, but there was no increase in the percentage of body fat. If the growth in body weight only increases 1 kg or 2 kg usually does not affect the growth of UAC. UAC causes this reflects the growth of fat tissue under the skin and muscles that do not affect much by body fluids [12].

BMI measurements conducted by the researchers showed that an increase in BMI after the administration of Herbal Medicine in the intervention group. In this study, there was an increase in BMI although still in the category of Skinny because the average BMI after the interactiveness of herbal medicine only 17.86 and in the

control group BMI average of 17.42 or are at BMI vulnerable 17.0-18.4 (Thin category). In the study Limanjaya, the relationship between giving honey supplementation with an increase of body weight mice conducted for 28 days showed $p = 0,001$ which describes the relationship between supplementation of honey with the growth of body weight mice [13]. In the study of Kamil and his colleagues on the effect of giving honey to improving nutritional status in janitor. The result of the statistical analysis showed that the effect of honey on the increase of nutritional status (BMI: $p = 0,233$) decreased, so there was no significant correlation of honey ritual to improve BMI nutrition status. This is because the samples taken by researchers have a diverse work activity varied, working time change. The increase in weight is accompanied by an increase in BMI. BMI is a clue to determine the weight of being based on the Quetelet index (weight in kilograms divided by the square of height in meters "kg / m²") [14, 15]. The result of calculation of energy consumption of intervention group and control group using food recall conducted by the researcher showed that there was an increase of energy consumption after giving Herbal Medicine to the intervention group. In this study, there is an increase in consumption, although most still have not reached the needs of energy/day that is 1900 Kcal. However, the average consumption of energy after the herbal medicine intervention increased by 1540.7 Kcal and in the mean energy consumption control group of 1260.3 kcal. In the study Herawati, the effect of adding gamma fitobiotik to the production and broiler chicken blood profile obtained by weight gain (1955,53 g / head). From the results of this study showed $p < 0.05$, but the addition of red ginger in broiler feeds decreased after getting additional go to fitobiotik red ginger as much as 2.0%. The addition of red ginger fitobiotik reduces feed consumption from 4180 g / tail to 4050 g / tail, the decline of feed consumption is thought to be caused by penetration of active compounds contained in red ginger rhizome contains a spicy substance that is zingerone and shogaol [7]. The occurrence of weight gain in this study coupled with an increase in energy consumption needs. In this study, used food recall one time 24 hours conducted for eight weeks / two months in a row both in the intervention group and control group.

5. Conclusion

We conclude that the provision of Herbal Medicine has a significant effect on the improvement of the nutritional status of female students of Midwifery Department, which can be seen from the increase of Body Weight, Body Mass Index (BMI), Upper Arm Circumference (UAC) and energy consumption requirement. With the influence of herbal medicine to improve the nutritional status of women of premarital age is expected to herbal medicine can be one of the alternative sources of nutrition in the improvement of nutritional status in women of childbearing age, particularly in the age of 17-21 years who have BMI <18.5.

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Footnote

Conflicts of Interest: The authors have no conflicts of interest to declare

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