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Torbangun (Coleus Amboinicus L) leaves extract as an alternative to increase breast milk production and prolactin hormone level among normal postpartum women (study in the work area of bergas community health center Semarang district)

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ABSTRACT

Background

There are many causes of failure in exclusive breastfeeding, one of them is that the feeling of insufficient breast milk production which can inhibits the breastfeeding activity.

Objective

This study aims to prove torbangun leaves (Coleus amboinicus Lour) extract as an alternative to increase breast milk production and prolactin hormone level among Normal Postpartum women in the work area of Bergas Community Health Center Semarang District.

Methods

This study was an experimental study with randomized pre-post with control group design that used consecutive sampling method. The number of sample was 32 respondents assigned equally in the control group and intervention group with 16 respondents in each group. The dependent variable in this study was breast milk production and prolactin hormone level as an intermediate variable. The independent variable in this study was torbangun leaves (coleusamboinicus L) extract with a dose of @ 500 mg taken 3x a day.

Results

The mean of prolactin hormone level in the intervention group after treatment was 152.69 ng/ml while in the control group was 131.06 ng/ml with p value of 0.03. The mean infant weight in the intervention group was 3229.69 grams while in the control group was 2980 grams with p value of 0.000. The mean of defecation among infants in the intervention group after treatment was 3.56 times/day whereas the mean of defecation among infants in the control group was 3.00 times/day with p value of 0.043. The mean of urination among infants in the intervention group after treatment was 9.44 times/day whereas the mean of urination among infants in the control group was 8.81 times/day with p value of 0.019. The mean of infants sleep duration in the intervention group after treatment was 11.63 hours/day whereas the mean of infants sleep duration in the control group was 10.94 hours/day with p value of 0.003.

Conclusion

It was evidenced that the consumption of torbangun leaves could increase breast milk production and prolactin hormone level.

Keywords: Torbangun leaves, Breast milk production, Prolactin hormone

BACKGROUND

Exclusive breastfeeding aims to meet the baby's main food requirement. Breast milk must be given exclusively for 6 months, without additional fluids such as formula milk, oranges, honey, tea, water, and without the addition of solid foods such as bananas, papaya, powder milk, biscuits, rice porridge, and steamed rice.[1] WHO and UNICEF recommend that children should only be given breast milk for at least 6 months and continue breastfeeding until the child is two years old. [1]

One way to reduce IMR which can be done is by exclusive breastfeeding.[3] UNICEF data explained that out of 136, 7 million babies are born worldwide and only 32, 6% of those who were exclusively breastfed in the first 6 months. [2]

In Central Java Province in 2015-2016 the level of breastfeeding coverage increased from 56.1% to 59.9%, which meant that it had reached the strategic plan target for Exclusive Breastfeeding coverage. However, in the 2015 Central Java health profile the percentage of exclusive breastfeeding for the last 3 years was 61.6%, where many districts and cities in the Central Java Region had Exclusive Breastfeeding coverage that still below the standard. Semarang is one of the cities in the Central Java Region with Exclusive Breastfeeding coverage under Exclusive Breastfeeding coverage in Central Java for 3 consecutive years. [3]

The most common challenge faced by breastfeeding mothers is that the mothers feel that their breast milk production is insufficient so that it inhibits breastfeeding. This is usually concluded when the baby cries frequently, the baby sleeps not soundly, often wakes up, and the baby looks thin. [4] Breast milk production is always continuous, after breast feeding the breast will be felt empty and it softens. In this situation, the mother will still be deficient in breast milk, because breast milk will continue to be produced as long as the baby continues to suck, the mother has enough food and drink and there is confidence in being able to breastfeed her child. [11] Prolactin hormone plays a role in the milk production and oxytocin plays a role in stimulating the release of breast milk. Suction on the mother's nipple will stimulate more prolactin release, which then ensures continuity of milk production through the alveoli. This stimulation is passed on to the pituitary via the vagus nerve which continues into the anterior lobe. This lobe will release the hormone prolactin which enters the bloodstream and reaches the glands that produce breast milk. This gland will be stimulated to produce breastmilk. [4]

One factor that influences breast milk production is food. [5] The use of galactagogue is one way that can be done to increase the rate of secretion and production of breast milk. Various studies showed that there were a number of food crops in Indonesia that had a function as galactagogue. The use and development of food crops with a function as lactagogue can be one strategy to overcome the failure of exclusive breastfeeding due to low secretion and milk production. One of the food crops that has a function as galaktagogue is a bangun bangun plant (Coleus amoboinicus Lour). [6]

Torbangun leaves are very potential to be developed both in terms of their benefits as galaktogogue and in terms of the nature of the plant which is very easy to grow with a short harvesting age. Nevertheless, its utilization is still limited among Batak tribes with the forms of processed fodd only as vegetables or soup [15] Therefore, this study was conducted with the use of torbangun leaves extract product for normal postpartum mothers who breastfed their babies. Torbangun leaves extract is expected to be able to facilitate its use by people outside the Batak tribe.

Study Objectives

This study aims to prove torbangun leaveses (Coleus amboinicus Lour) extract at a dose of @ 500 mg 3 times a day for 14 days as an alternative to increase breast milk production as assessed by indicators of urination, defecation, infant sleep duration, and breastfeeding frequency.

Methods

The independent variable was torbangun leaves (Coleus amboinicus L) extract, the dependent variable was the parameters that were assessed by the author namely the prolactin level and breast milk production. This was a true experimental study with randomized pretest posttest control group design that used consecutive sampling design. The intervention group got the administration of torbangun leaves (Coleus amoboinicus Lour) extract for 14 days. The control group only got normal childbirth care given for 14 days. The samples were 32 respondents who were assigned into 2 groups with 16 samples in each group. The study site was Bergas Community

Health Center Semarang District. The sampling method chosen was consecutive sampling. All subjects who arrived and met the selection criteria were included in the study until the required number of subjects was fulfilled. The samples in this study were normal postpartum women who had met the inclusion criteria. Inclusion criteria included postpartum women from day 1–14, postpartum women with normal childbirth, postpartum women who were willing to be respondents, postpartum women aged 20-35 years, baby birth weight of 2500 - 4000 grams, had normal breasts.

Data Analysis

Univariate analysis was carried out on each variable. The analysis resulted in frequency distribution tables and the percentage of each variable in question namely: age, education level, parity, maternal sleep pattern, breastfeeding frequency, infant weight, prolactin hormone level, defecation frequency, urination frequency, and sleep duration. Bivariate analysis was performed to determine the interaction of independent variables and dependent variables with a 95% confidence level or α value of 0.05. Paired data test used the independent t-test and Man Whitney test. The unpaired data test used Wilcoxon test. Multivariate analysis used linear regression test and repeated anova test.

RESULTS

Univariate Analysis

Respondents' Characteristics

Table 4.1 Frequency distribution of respondents based on age of women and their husbands, mother's education, as well as parity in the intervention group and the control group of postpartum women in the Work of Bergas CHC Area of Semarang District in 2018.

Characteristic	Group		*P value*
	Intervention	Control	
Maternal Age (year)			
Mean±SD	25.50±2.033	26.13±2.363	0.250
Min±Max	24 ± 30	24 ± 31	
Maternal Education			
JHS	3 (18.8%)	4 (25%)	
SHS	12 (75%)	11 (68.8%)	0.697
Higher Education	1 (6.2%)	1 (6.2%)	
Birth Weight			
Mean ± SD	2953±257.85	2825±201.66	
Min ± Max	2500±3400	2500±3200	0.520
Parity			
Multiparous	4 (25%)	5 (31.2%)	0.452
Primiparous	12 (75%)	11 (68.8%)	
Sleep Pattern			0.325
Mean±SD	5.38±0.5	5.50±0.51	
Min±Max	5±6	5±6	
Breastfeeding Frequency			0.860
Mean±SD	7.06±0.68	7.00±0.73	
Min±Max	6±8	6±8	

**Results of Homogeneity Test*

Based on table 4.1, the results of the univariate test showed the characteristics of respondents as follows:

Maternal Age

The mean age of the mothers in the control group was 26.13 years and the mean of the mothers in the intervention group was 25.50 years, with a p value of 0.250 (> 0.05) meaning that there was no significant difference in the maternal age both in the control group and in the intervention group.

Maternal Education

The frequency distribution of maternal education showed that dominant education level in the control group and the intervention group was senior high school, as much as 68.8% in the control group and 75% in the intervention group with a p value of 0.697 (>0.05) meaning that there was no significant difference in maternal education both in the control group and in the intervention group.

Birth Weight

The mean of infant birth weight in the control group was 2825 grams and in the intervention group was 2953 grams with a p value of 0.520 (>0.05) meaning that there was no significant difference in the birth weight both in the control group and in the intervention group.

Parity

The frequency distribution of maternal parity in the control group and in the intervention group showed that the dominant parity was primiparous, as much as 68.8% in the control group and 75%, in the intervention group with a p value of 0.452 (>0.05) meaning that there was no significant difference in maternal parity both in the control and in the intervention group.

Sleep Pattern

The mean of sleep pattern in the control group was 5.3 hours and in the intervention group was 5.5 hours with a p value of 0.325 (>0.05) meaning that there was no significant difference in the sleep pattern both in the control group and in the intervention group.

Breastfeeding Frequency

The mean of breastfeeding frequency in the control group and in the intervention group was 7 times/day with a p value of 0.860 (>0.05) meaning that there was no significant difference in the breastfeeding frequency both in the control group and in the intervention group.

Analysis on Prolactin Hormone

Table 4.2 Bivariate analysis on Prolactin hormone variable, in the intervention group and in the control group in the Work Area of Bergas CHC Semarang District in 2018

Variable	Mean±SD		*P value**
	Intervention	Control	
Prolactin (ng/ml)			
Before	122. 43±33.08	130.13±32.62	**0.196**
After	15. 69±12.78	131.06±23.13	**0.003**
P value*	**0. 005**	**0.796**	
Difference	30.26±27.95	0.935±29.51	**0.007**

**Man Whitney Test **Wilcoxon Test*

Based on table 4.2 the analysis results on the prolactin hormone level in the intervention group before being given treatment showed a mean value of 122.43 ng/ml with a minimum ± maximum value of 62.70-195.03 ng/ml, while the mean of prolactin hormone level in the control group was 130.13 ng/ml with a minimum ± maximum value of 56.43-161.73 ng/ml. The prolactin hormone level in the intervention group after being given treatment obtained a mean value of 152, 69 ng/ml with a minimum ± maximum value of 119. 23-168.91 ng/ml, while the mean of prolactin hormone level in the control group was 131.06 ng/ml with a minimum ± maximum value of 95.86-156.95 ng/ml. The mean difference in prolactin hormone level in the intervention group obtained value of 30.26 ng/ml with a minimum ± maximum value of -42 to 75.11 ng/ml, while the mean difference in prolactin hormone level in the control group was 0.935 ng/ml, with a minimum ± maximum value of -56.85 to -43.23 ng/ml.

From the results of Mann Whitney test, maternal prolactin hormone levels before the treatment was given obtained a p value of 0.196

(p>0.05) which meant that there was no significant difference in the maternal prolactin hormone levels before treatment between the control group and the intervention group. From the results of Mann Whitney test, maternal prolactin hormone levels after the treatment was given obtained a p value of 0.003 (p <0.05) which meant that there was a significant difference in maternal prolactin hormone levels after treatment between the control group and the intervention group.

From the results of Mann Whitney test, the difference in the measurement of maternal prolactin hormone levels obtained a p value of 0.007 (p<0.05) which meant that there was a significant difference in maternal prolactin hormone levels after treatment between the control group and the intervention group. From the results of Wilcoxon test, the prolactin levels before and after treatment in the intervention group showed a p value of 0.005 (p <0.05) which meant that there was a significant difference in prolactin hormone levels before and after treatment in the intervention group. From the results of Wilcoxon test, the prolactin levels before and after treatment in the control group showed a p value of 0.003 (p<0.05) which meant that there was a significant difference in prolactin hormone levels before and after treatment in the control group.

Analysis on Breast Milk Production

The analysis in this study included infant weight, defecation frequency, urination frequency, infant sleep duration, maternal sleep pattern and breastfeeding frequency in the intervention group and control group.

Table 4.5 Distribution frequency of respondents based on infant body weight, BAB, BAK, length of infant sleep, maternal sleep rest and frequency of breastfeeding of infants in the intervention group and control group in the Work Area of Bergas CHC Semarang District in 2018.

Variable	Mean±SD		*P value**
	Intervention	**Control**	
Infant Weight (gram)			
Before	2953±257.85	2825±201.66	**0.073**
After	3229.69±206.42	2980±213.48	**0.002**
****p value***	**0.000**	**0.000**	
Difference	276.56±99.91	155.38±31.37	**0.000**
Urination (time/day)			
Before	6.19±0.4	6.25±0.44	0.780
After	9.44±0.72	8.81±0.83	0.019
****p value***	**0.000**	**0.000**	
Difference	3.25±0.77	2.56±1.03	0.032
Defecation (time/day)			
Before	1.31±0.47	1.44±0.51	0.564
After	3.56±0.62	3.00±0.81	0.043
****p value***	**0.000**	**0.001**	
Difference	2.25±0.77	1.56±0.81	0.032
Sleep duration (hour)			
Before	10.13±0.34	10.38±0.5	0.239
After	11.63±0.5	10.94±0.44	0.003
****p value***	**0.000**	**0.007**	
Difference	1.50±0.51	0.56±0.62	0.001
Maternal Sleep Pattern (hour/day)			
Before	5.38±0.5	5.50±0.51	0.483
After	7.38±0.61	6.50±0.51	0.001
****p value***	**0.000**	**0.003**	
Difference	2.00±0.63	1.00±0.81	0.001
Breastfeeding Frequency (time/hour)			
Before	7.06±0.68	7.00±0.73	0.803
After	11.44±0.51	10.63±0.5	0.000

p value	**0.000**	**0.000**	
Difference	4.38±0.8	3.63±0.8	0.015

Based on table 4.3, the results of the study can be explained as follows

The Mean of Body Weight

The mean of infant body weight in the intervention group before treatment was 2953gram with a minimum ± maximum value of 2500-3400 grams, while the mean of infant body weight in the control group was 2825 grams, with a minimum ± maximum value of 2500-3200 grams. The mean of infant body weight after treatment in the intervention group was 3229.69 grams with a minimum ± maximum value of 2763-3600 grams, while the mean of infant body weight after treatment in the control group was 2980 grams, with a minimum ± maximum value of 2600-3400 grams. The mean difference in the infants body weight in the intervention group was 276.56 grams with a minimum ± maximum value of 163-500 grams, while the mean difference in the infant body weight in the control group was 155.38 grams, with a minimum ± maximum value of 100-200 grams. From the results of Mann Whitney test, the infant body weight before treatment showed a p value of 0.073 ($p>0.05$) which meant that there was no significant difference in the infant body weight before treatment between the control group and the intervention. From the results of Mann Whitney test, the infant body weight after treatment showed a p value of 0.002 ($p<0.05$) which meant that there was a significant difference in the infant body weight after treatment between the control group and the intervention group. From the results of Mann Whitney test, the difference in infant body weight showed a p value of 0.000 ($P<0.05$) which meant that there was a significant difference in the difference in infant body weight before treatment between the control group and the intervention group. Results of Wilcoxon test obtained the results of infant body weight before and after treatment in the intervention group with a p value of 0.000 ($p<0.05$) which meant that there was a significant difference in infant body weight before and after treatment in the intervention group. Results of Wilcoxon test obtained the results of infant body weight before and after treatment in the control group with a p value of 0.000 ($p<0.05$) which meant that there was a significant difference in infant body weight before and after treatment in the control group.

The Mean of Urination

The mean of urination in the intervention group before treatment was 6.19 times/day with a minimum ± maximum value of 6-7 times/day, while the mean of urination in the control group was 6.25 times/day, with a value minimum ± maximum of 7-6 times/day. The mean of infant urination in the intervention group after treatment was 9.44 times/day with a minimum ± maximum value of 6-7 times/day, while the mean of infant urination in the control group after treatment was 8.81 times/day, with a minimum ± maximum value of 6-7 times/day. The mean difference of infant urination in the intervention group was 3.25 times/day with a minimum ± maximum value of 2-4 times/day, while the mean difference of infant urination in the control group was 2.56 times/day, with a minimum ± maximum value of 1-4 times/day.

From the results of Mann Whitney test, infant urination before treatment showed a p value of 0.780 ($p>0.05$) which meant that there was no significant difference in infant urination before treatment between the control group and the intervention group. From the results of Mann Whitney test, infant urination after treatment showed a p value of 0.019 ($p<0.05$) which meant that there was a significant difference in infant urination after treatment between the control group and the intervention group. From the results of Mann Whitney test, the mean difference of infant urination between the control group and the intervention group showed a p value of 0.032 ($p<0.05$) which meant that there was a significant difference in the mean difference of infant urination after treatment between the control group and the intervention group.

From the results of Wilcoxon test, infant urination before and after treatment in the intervention group obtained a p value of 0.000 ($p<0.05$). It meant that there was a significant difference in infant urination before and after being treated in the intervention group. From the results of Wilcoxon test, infant urination before and after treatment in the control group obtained a p value of

0.000 (p<0.05). It meant that there was a significant difference in infant urination before and after being treated in the control group.

The Mean of Defecation

The mean of defecation in the intervention group before treatment was 1.31 times/day with a minimum ± maximum value of 1-2 times/day, while the mean of defecation in the control group was 1.44 times/day, with a value minimum ± maximum of 1-2 times/day. The mean of infant defecation in the intervention group after treatment was 3.56 times/day with a minimum ± maximum value of 3-5 times/day, while the mean of infant defecation in the control group after treatment was 3.00 times/day, with a minimum ± maximum value of 2-5 times/day. The mean difference of infant defecation in the intervention group was 2.25 times/day with a minimum ± maximum value of 1-3 times/day, while the mean difference of infant defecation in the control group was 1.56 times/day, with a minimum ± maximum value of 0-3 times/day.

From the results of Mann Whitney test, infant defecation before treatment showed a p value of 0.564 (p>0.05) which meant that there was no significant difference in infant defecation before treatment between the control group and the intervention group. From the results of Mann Whitney test, infant defecation after treatment showed a p value of 0.043 (p<0.05) which meant that there was a significant difference in infant defecation after treatment between the control group and the intervention group. From the results of Mann Whitney test, the mean difference of infant defecation between the control group and the intervention group showed a p value of 0.032 (p<0.05) which meant that there was a significant difference in the mean difference of infant defecation after treatment between the control group and the intervention group.

From the results of Wilcoxon test, infant defecation before and after treatment in the intervention group obtained a p value of 0.000 (p<0.05). It meant that there was a significant difference in infant defecation before and after being treated in the intervention group. From the results of Wilcoxon test, infant defecation before and after treatment in the control group obtained a p value of 0.001 (p<0.05). It meant that there was a significant difference in infant defecation before and after being treated in the control group

The Mean of Infant Sleep Duration

The mean of infant sleep duration in the intervention group before treatment was 10.13 hours/day with a minimum ± maximum value of 10-11 hours/day, while the mean of infant sleep duration in the control group was 10.38 hours/day, with a value minimum ± maximum of 10-11 hours /day. The mean of infant sleep duration in the intervention group after treatment was 11.63 hours/day with a minimum ± maximum value of 11-12 hours/day, while the mean of infant sleep duration in the control group after treatment was 10.94 hours/day, with a minimum ± maximum value of 10-12 hours/day. The mean difference of infant sleep duration in the intervention group was 1.50 hours/day with a minimum ± maximum value of 1-2 hours/day, while the mean difference of infant sleep duration in the control group was 0.56 hours/day, with a minimum ± maximum value of 0-2 hours/day.

From the results of Mann Whitney test, infant sleep duration before treatment showed a p value of 0.239 (p>0.05) which meant that there was no significant difference in infant sleep duration before treatment between the control group and the intervention group. From the results of Mann Whitney test, infant sleep duration after treatment showed a p value of 0.003 (p<0.05) which meant that there was a significant difference in infant sleep duration after treatment between the control group and the intervention group. From the results of Mann Whitney test, the mean difference of infant sleep duration between the control group and the intervention group showed a p value of 0.001 (p<0.05) which meant that there was a significant difference in the mean difference of infant sleep duration after treatment between the control group and the intervention group.

From the results of Wilcoxon test, infant sleep duration before and after treatment in the intervention group obtained a p value of 0.000 (p<0.05). It meant that there was a significant difference in infant sleep duration before and after being treated in the intervention group. From the results of Wilcoxon test, infant sleep duration before and after treatment in the control group obtained a p value of 0.007 (p<0.05). It meant that there was a significant difference in infant sleep duration before and after being treated in the control group.

The Mean of Maternal Sleep Pattern

The mean of maternal sleep pattern in the intervention group before treatment was 5.38 hours/day with a minimum ± maximum value of 5-6 hours/day, while the mean of maternal sleep pattern in the control group was 5.50 hours/day, with a value minimum ± maximum of 5-6 hours /day. The mean of maternal sleep pattern in the intervention group after treatment was 7.38 hours/day with a minimum ± maximum value of 6-8 hours/day, while the mean of maternal sleep pattern in the control group after treatment was 6.50 hours/day, with a minimum ± maximum value of 6-7 hours/day. The mean difference of maternal sleep pattern in the intervention group was 2.00 hours/day with a minimum ± maximum value of 1-3 hours/day, while the mean difference of maternal sleep pattern in the control group was 1.00 hours/day, with a minimum ± maximum value of 0-2 hours/day.

From the results of Mann Whitney test, maternal sleep pattern before treatment showed a p value of 0.483 ($p>0.05$) which meant that there was no significant difference in maternal sleep pattern before treatment between the control group and the intervention group. From the results of Mann Whitney test, maternal sleep pattern after treatment showed a p value of 0.001 ($p<0.05$) which meant that there was a significant difference in maternal sleep pattern after treatment between the control group and the intervention group. From the results of Mann Whitney test, the mean difference of maternal sleep pattern between the control group and the intervention group showed a p value of 0.001 ($p<0.05$) which meant that there was a significant difference in the mean difference of maternal sleep pattern after treatment between the control group and the intervention group.

From the results of Wilcoxon test, maternal sleep pattern before and after treatment in the intervention group obtained a p value of 0.000 ($p<0.05$). It meant that there was a significant difference in maternal sleep pattern before and after being treated in the intervention group. From the results of Wilcoxon test, maternal sleep pattern before and after treatment in the control group obtained a p value of 0.003 ($p<0.05$). It meant that there was a significant difference in maternal sleep pattern before and after being treated in the control group.

The Mean of Breastfeeding Frequency

The mean of breastfeeding frequency in the intervention group before treatment was 7.06 hours/day with a minimum ± maximum value of 6-8 hours/day, while the mean of breastfeeding frequency in the control group was 7 hours/day, with a value minimum ± maximum of 6-8 hours /day. The mean of breastfeeding frequency in the intervention group after treatment was 11.44 hours/day with a minimum ± maximum value of 11-12 hours/day, while the mean of breastfeeding frequency in the control group after treatment was 10.63 hours/day, with a minimum ± maximum value of 10-11 hours/day. The mean difference of breastfeeding frequency in the intervention group was 4.38 hours/day, while the mean difference of breastfeeding frequency in the control group was 3.63 hours/day.

From the results of Mann Whitney test, breastfeeding frequency before treatment showed a p value of 0.803 ($p>0.05$) which meant that there was no significant difference in breastfeeding frequency before treatment between the control group and the intervention group. From the results of Mann Whitney test, breastfeeding frequency after treatment showed a p value of 0.000 ($p<0.05$) which meant that there was a significant difference in breastfeeding frequency after treatment between the control group and the intervention group. From the results of Mann Whitney test, the mean difference of breastfeeding frequency between the control group and the intervention group showed a p value of 0.015 ($p<0.05$) which meant that there was a significant difference in the mean difference of breastfeeding frequency after treatment between the control group and the intervention group.

From the results of Wilcoxon test, breastfeeding frequency before and after treatment in the intervention group obtained a p value of 0.000 ($p<0.05$). It meant that there was a significant difference in breastfeeding frequency before and after being treated in the intervention group. From the results of Wilcoxon test, breastfeeding frequency before and after treatment in the control group obtained a p value of 0.003 ($p<0.05$). It meant that there was a significant difference in breastfeeding frequency before and after being treated in the control group.

Multivariate Analysis

Table 4.4 Linear Regression Test to Assess the Effect of Dependent Variable on the Independent Variable

Variable	Beta	95% CI		P value
		Min	Max	
Infant Body Weight	-.314	-.001	.000	.004
Sleep Duration	-.277	-.440	-.044	.018
Breastfeeding Frequency	-.441	-.523	-.170	.000
Prolactin Hormone Level	-.334	-.013	-.003	.002

Table 4.4 showed that the p value of each variable was <0.05 which meant that the variables had a relationship with the dependent variable. Therefore, the variables of infant body weight, sleep duration, breastfeeding frequency and prolactin level had a relationship with the dependent variable of Torbangun leaves extract.

Table 4.5 Anova Repeated Test to Assess the Effect of Dependent and Independent Variables

Variable	Age	Education	Parity	Birth Weight	Group
Breastfeeding Frequency	0.185	0.535	0.339	0.044	0.000
Infant Weight	0.000	0.000	0.000	0.000	0.000
Defecation	0.000	0.000	0.662	0.000	0.004
Urination	0.000	0.000	0.409	0.000	0.659
Maternal Sleep Pattern	0.000	0.000	0.000	0.000	0.000
Infant Sleep Pattern	0.003	0.090	0.043	0.000	0.000

Table 4.5 showed that the p value of each variable was <0.05 which meant that the variables had a relationship with the dependent variable. The infant body weight, sleep duration, breastfeeding frequency, BB, urination, maternal sleep and infant sleep duration variables had p values of <0.05. There were relationships with the dependent variable of torbangun leaves extract.

DISCUSSION

Characteristics of maternal age, maternal education, and parity of postpartum women in the Work Area of Bergas CHC, Semarang District

The characteristics that were used as variables in this study were age, education and parity, the age of the respondents included in reproductive age, namely between 20-35 years, with the mean of the age of respondents in the intervention group of 25.5 years with the youngest age of 24 years and the oldest age of 30 years . Whereas the mean of the age of respondents in the control group was 26.13 with the youngest age of 24 years and the oldest age of 31 years. So, all respondents were still in the reproductive age both in the control and intervention groups. Age is one of the factors that can affect breast milk production, mothers who are younger or less than 35 years old will produce more milk than older mothers. [8]

Mothers aged <20 years and > 35 years have a risk factor for complications during pregnancy, labor and postpartum period. The mothers aged <20 years have physical and psychological development which tend to be unprepared and unstable to get pregnant, give birth and care for their babies, while mothers aged > 35 years tend to have relaxed reproductive organs, so that women at that age tend to experience problems in breastfeeding. The age of mothers who gave birth at Bergas CHC Semarang District in the intervention group and the control group showed equal distribution which was in the healthy reproductive age of 20-35 years, the age group has a greater tendency to successfully breastfeed. [9]

The education level characteristic of respondents in this study showed that the dominant education was secondary education, with the lowest education of Senior High School and the highest of Higher Education. Education is one of the factors that can support the convenience of a person to receive information and be motivated towards a better direction, so that it is expected that the higher the mother's education, the better the motivation in making decisions to breastfeed her baby, low education will hamper the interpretation of information obtained and women with low education tend to have low motivation in facing and responding to problems during breastfeeding. [8]

The distribution of postpartum women education who gave birth at Bergas CHC Semarang District showed that the control group and the intervention group had the same distribution between senior high school and higher education. Based on the study results there was no relationship between the level of education with breastfeeding duration and breast milk production (p value = 0.697). [9]

The respondents' parity in the study showed that the dominant parity was primiparous. Primiparous women had more breast milk production than multiparous on the fourth day of postpartum, but after the breastfeeding patterns could be established properly there was no significant difference between primiparous and multiparous mothers, an increase in parity caused changes in breast milk production although it was not significant [28] there was a significant relationship between parity and the intake of breast milk by infants in mothers who were well nourished, further analysis showed that there was no relationship between parity and breast milk production (p value = 0.452). The distribution of parity of postpartum women who gave birth at Bergas CHC in Semarang District in the intervention group and the control group showed the same distribution between multiparous and primiparous.

The Effect of Giving Torbangun Leaves Extract on the Changes in Prolactin Hormone Levels among Normal Postpartum Women in Bergas CHC Semarang District

The difference in the mean of prolactin hormone level after treatment between the intervention and control groups was 152.69 ng/ml. Aignificancy value or p value = 0.03 which meant that H0 was rejected, it can be concluded that the group of normal postpartum women who consumed torbangun leaves extract had an effect on the increase in prolactin hormone level.

The normal prolactin hormone value is 95-473 ng/ml, while the study results showed that the mean of prolactin hormone level in the intervention group before treatment was 122.43 ng/ml while the eman of prolactin hormone level in the control group was 130.13 ng/ml. Those values were within normal limits. Based on the theory, in the first week after giving birth, prolactin levels in breastfeeding women decrease by 50% from the normal level. The amount of milk produced in the initial puerperium period correlates with the amount of prolactin released during breastfeeding after birth. The main stimulus that maintains prolactin secretion is released after breastfeeding, the main stimulus that maintains prolactin secretion is sucking, milk production continues as long as the baby continues to suck the nipple of the mother. Every time a mother breastfeeds her baby, nerve signals from the nipple to the hypothalamus will cause a surge of prolactin secretion about 10 to 20 times that lasts about 1 hour, this prolactin acts on the mother's breast to maintain the mammary gland in order to secrete milk [11]

This is supported by the study results that prolactin levels differed in each period, the results of the study were conducted on 16 breastfeeding mothers who had different serum prolactin levels between the breastfeeding mothers in the groups of 1 week postpartum, 4 weeks postpartum, 8 weeks postpartum, during the first menstruation after birth and after weaning. The prolactin level of the breastfeeding mothers during 4 weeks postpartum is higher than the others. [12]

The mean increase in prolactin hormone levels in the intervention group was greater than in the control group, because torbangun leaves capsules contain alkaloid, flavonoid and tannin chemical compounds. Torbangun leaves also containe three main components which have characteristics galactagogue, nutrients and pharmacoseutics.[10] Those active compounds play a role in increasing prolactin levels, in addition 100 grams of torbangun leaves contain 279 mg of calcium, 13.6 mg of iron and total carotene of 13288 µg. The component of steroids active compounds is also contained in torbangun leaves which are steroid chemical messengers synthesized in the gland and delivered by blood flow to the target tissues to stimulate or inhibit a process. The presence of steroid content in torbangun leaves is thought to be related to the effect of increasing breast milk levels among breastfeeding mothers who consume torbangun leaves.

Components of ethyl-3hydroxy-5-alpa andostran-17-one, 3, 4-dimethyl-2-oxocyclopent-3-enylacetic acid, monomethyl succinate and methylpyro glutamate, sterol compounds, steroids, fatty acids, organic acids in torbangun leaves have the power of the galactagogue effect. The mechanism of the galactagogue power of compounds can occur, among others, by: directly stimulating the activity of protoplasm secretory cells of the mammary gland, stimulating the nerve endings of secrotis in the mammary gland so that milk secretion increases, or stimulating prolactin hormone that acts on alveolar epithelial cells. Prolactin or luteotropin or LTH is a lactogenic and proliferative hormone against the mammary gland. Prolactin in humans or mammals has an effect in stimulating lactation. In addition, the galactagogue function can also increase glucose metabolism for lactose synthesis so that milk production increases.

The Effect of Giving Torbangun Leaves Extract on the Changes in breast milk production (indication of the mran of infant weight and the mean of sleep duration) among postpartum women who gave birth at Bergas CHC, Semarang District

The mean of infant sleep duration after breastfeeding obtained p value of 0.239 (p>0.05) which meant that there was no significant difference in the sleep duration before treatment between the control group and the intervention group. After giving the treatment and Mann whitney test was conducted, the results obtained p value of 0.003 (p <0.05) which meant that there was a significant difference in the infant sleep duration after treatment between the control and the intervention group and Mann Whitney test obtained p value of 0.001 (p<0.05) which meant that there was a significant difference in the difference of infant sleep duration after treatment between the control and intervention groups.

It is in accordance with the theory that the assessment indicator of breast milk production can use several criteria as a reference to determine the breast milk secretion and a sufficient amount for the baby, including an increase in infant body weight, frequency and characteristics of urination, frequency, color and characteristics of defecation, sleep duration or the baby is calm after breastfeeding. [8]

Most infants experience weight loss during the first week after birth, and it is expected that in 10-14 days the infant weight will reach the birth weight. Data from the study results showed normal range of body weight decrease by 3% -7%, although a 10% decrease is stated as the normal upper limit. If the lactation process cannot fulfil the baby's needs, especially when the baby needs a larger amount of milk on the third and fourth days, this may cause the baby is in a greater risk of losing weight in the first week.

Based on the analysis results the difference in the mean increase in breast milk production (indication of body weight and sleep duration) the infant weight in the 7th day of the control group showed babies who experienced a decrease of more than 10% due to the amount of milk of the mother could not meet the babys' needs. Neonates have brown adipose tissue, which helps metabolize heat sources (called free fatty acids and glycerol). Weight loss will have an impact on the supply of brown tissues so that the baby's ability to control body temperature will be disrupted (susceptible to hypothermias), besides the ability the baby to shiver is still limited and baby is unable to increase the contraction of the vascular muscles to produce heat.

Brown fat burning requires three times more oxygen than other body tissues, which has an unexpected effect that is the flow of oxygen and glucose from vital regulatory centers such as the brain and heart, besides vasoconstriction results in decreased lung function and respiratory acidosis when pH and PaO2 increase which may result in respiratory distress characterized by tachypnea. All of the above conditions can result in the reopening of the left to right shunt across the arterious duct. Anaerobic glycolysis (glucose metabolism in the absence of oxygen) causes acid production which aggravates the condition by increasing the incidence of metabolic acidosis.

Breast milk is the best baby food. Breast milk production will be faster and more when stimulated as early as possible by breastfeeding from birth to as long as possible. [1] The administration of torbangun leaves extract is one of the alternatives in increasing breast milk production. The study result showed that infant body weight in the intervention group increased, it might reduce the risk of metabolic acidosis disorder.

Based on the independent test of t test on the infant weight in 14th day, the results before and after treatment and the Wilcoxon test showed a p value of 0.00 (p <0.05) which meant that there was a significant difference in the infant body weight before and after treatment in the intervention group. Infant body weight before and after treatment in the control group and Wilcoxon test obtained a p value of 0.000 ($p<0.05$) which meant that there was a significant difference in the infant body weight before and after treatment in the control group. Prentice observed the relationship of infant weight and breast milk production. Breast milk production is influenced by the prolactin hormone which is continuously secreted into the breast alveoli, but milk cannot flow easily from the alveoli into the ductal system so that milk does not drip continuously in the nipple. The draining of milk from the alveoli to the duct requires the merging process of neurologic and hormonal reflexes involving the posterior pituitary hormone namely the oxytocin hormone, when the oxytocin reflex does not work, the baby will not get adequate breast milk, even though the milk production is sufficient. [1]

The results are in line with the study conducted by Ade Chandra Iwansyah entitled The potency of torbangun leaves (coleus amboinicus l.) ethyl acetate fraction in increasing breast milk production, maternal body weight, and infants in mice which showed a gradual increase in the growth and significant body weight gain. [14]

The results are in line with the study conducted by Tiurlan Farida Hutajulu entitled The benefits of the bangun bangun leaves extract (Coleus Amboinicus Lour) to increase the production of breast milk among female mice which showed that there was a significant effect of bangun bangun leaves extracts on the weight of experimental mice. The weight of the mothers that received fresh bangun bangun leaves extract still experienced a slight increase during the breastfeeding process, while the weight of the mothers that did not receive bangun bangun leaves extract decreased with the largest decrease compared to the weight of the mothers that given bangun bangun leaves extract. Weight gain of the mice babies whose mothers were given bangun bangun leaves extract powder was 5% which showed a higher growth compared to other treatments. [15]

The study results are in accordance with a study conducted by Rizal Damanik entitled Effect of consumption of torbangun (Coleus amboinicus Lour) soup on the micronutrient intake of the bataknese lactating women which showed that torbangun leaves soup could increase the consumption of micronutrients of the study subjects. The average consumption of micronutrients (calcium, magnesium, potassium and iron) increased beyond the recommended dietary allowances rate (RDA). The study results indicated that torbangun leaves soup could improve the micronutrient status of breastfeeding mothers. [16]

The production of breast milk by the breast glands does not have the same time. The breast milk that is firstly sucked by a baby in the first minute is different compared to the last minute production. First-minute breast milk dilutes faster, then it will be thicker. Mother's milk at the last minute contains 4-5 times of protein and 1.5 times more than the first minute milk. So, the right breastfeeding technique and proper suck of the baby may lead the baby to get all the benefits of breast milk in each phase of breastfeeding from the first minute to the last minute.

The study results in the intervention group showed that the mean of infant sleep duration in the intervention group before and after treatment in the control group had a p value of 0.007 ($p <0.05$) which meant that there was a significant difference in the sleep duration before and after treatment in the control group. Based on the above theory it is possible that infants in the intervention group received all the benefits of breast milk in each phase of breastfeeding from the first minute to the last minute. A higher fat content at the end of the suckle gives the baby a feeling of satisfaction, so that the baby will calm down or fall asleep 2-3 hours after breastfeeding. The study result related to infant sleep duration showed a significant value but it could not describe smooth breast milk production, because breast milk production is said to be smooth if at least 4-7 indicators observed in the infants are met. In addition to breastfeeding habits, weight gain and sleep patterns of each baby are not the same because every baby is a unique individual and there are wide variations.

Study Limitations

This study only assessed prolactin hormone and breast milk production through infant birth weight, urination frequency, defecation frequency and sleep duration of the infants. The author did not monitor other factors that might influence prolactin level in the postpartum women's body such as food, peace of mind and soul, the use of contraception devices, physiological factors and consumption of cigarettes and alcohol. The author did not examine the content of substances, other vitamins and the side effects of torbangun leaves which could affect breast milk production.

CONCLUSION

Prolactin level in the intervention group was 152.69 ng/ml, higher than in the control group of 131.06 ng/ml (p value = 0.003), infant birth weight in the intervention group was 3229.69 grams, higher than in the control group of 2980 (p = 0.000), urination frequency in the intervention group was 9.44 times/day, more often than in the control group of 8.81 times/day (p value = 0.019), defecation frequency in the intervention group was 3.56 times/day, more frequent than in the control group of 3.00 (p value = 0.043). The duration of sleep in the intervention group was 11.63 hours/day, longer than in the control group of 10.94 (p = 0.003). The breastfeeding frequency in the intervention group was 11.44 times/day, more often than in the control group of 10.63 times/day (p = 0.003)

RECOMMENDATION

CHCs and Midwifery Service Centers are expected to develop complementary care by giving torbangun leaves extract as an alternative management to increase breast milk production among postpartum women as an integration program between a mothers class with complementary midwifery care. The community is expected to actively participate in obtaining postpartum health information related to the management of breast milk production and to consume torbangun leaves as an alternative treatment for problems in increasing breast milk production. For future researchers, they can continue this study by conducting other studies on mothers and fostering a relationship of trust with family members who accompany the mothers while giving information on the consumption of torbangun leaves. Educational Institutions can provide input for the development of science as learning material to improve the soft skills of health care providers.

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