Effect of The Combination of Roxy Back Massage (RBM) and Lactapressure Interventions on Prolactin Levels and Breast Milk Production: A *Randomized Controlled Trial*

Sri Rahayu[1.2], Suharyo Hadisaputro[2], Syarief Taufik Hidayat[3], Anggorowati[3]

Author Affiliation
[1]Doctoral Program, Faculty of Medicine, University of Diponegoro, Indonesia
[2]Poltekkes Kemenkes Semarang, Indonesia
[3]Faculty of Medicine, University of Diponegoro, Indonesia

Author Emails
[1]yayoek.1974@gmail.com, prof_haryo@yahoo.co.id [3]tofik_obg@yahoo.com,
[3]anggorowati@fk.undip.ac.id
Coresponding author: yayoek.1974@gmail.com

Abstract

Puerperal mothers who are unable to adapt to their new role of caring for babies and breastfeeding have an impact on insufficient milk production. Interventions to increase breast milk productionwere previously carried out with education, breast warm compresses, acupressure, andbackmassage, but still obtained the results of the effect size vary. The combinationof RBMand lactapressure meridian points LU-1, ST-16,SP-18, ST-18, CV-17, and SI-1 is thought to increase breast milk production. The purpose of the study was to prove the effect of the combination of RBM and lactapressure interventions on prolactin levels and breast milkproduction.

The research design is a true experiment (randomized pretest-posttest control group design. The respondents of the study of 61 primiparous puerperal mothers in Semarang City were divided into four groups, namely RBM, lactapressure, a combination of RBM and lactapressure and control. The intervention was given 2 hari once as much as 5 times for 9 days postpartum. The variables measured were prolactin levels and breast milkproduction. Data analysis using One-way Anova and Double linear regression.

The RBM intervention significantly increased prolactin levels (p=0.009) and breast milk production (p=0.000). Lactapressure intervention increases prolactin levels (p=0.000) and breast milk production (p=0.000). The combination of RBM and lactapressure significantly increased prolactin levels (p=0.000) and breast milk production (p=0.000). Great influence in increasing prolactin levels for kelompok RBM 13%, lactapressure 22%, combination RBM and lactapressure 34%. The magnitude of the influence of the increase in breast milk production in the RBM group 29%, lactapressure 38%, the combination of RBM and lactapressure 80%.

The combination of RBM and lactapressure interventions was more effective in increasing prolactin levels and breast milk production than the RBM and lactapressure groups. Intervention ini as an alternative in the management of care pthere are puerperal mothers holisitically in overcoming breastfeeding problems.

Keywords: Breast milk production; Prolactin; Mother Puerperium; Massage; Acupressure

DOI Number: 10.48047/NQ.2022.20.20.NQ109233 **NeuroQuantology2022;20(20): 2318-2333**

Introduction

The first week after giving birth is an important time for puerperal mothers to start giving breast milk to their babies. Breast milk is the best food for babies which is important for growth and development. Studies of various countries show that about 31-60% of mothers delay breastfeeding in the first hour which has an impact on breastfeedingdu rasi and breast milkproduction (Balogun et al., 2016). Breastfeeding alone until the baby is six months old will meet nutritional needs (Fatimah et al., 2021). Studies in Egypt and Saudi Arabia show that about 15-28% of mothers produce less breast milk so as to provide additional food prematurely (Nafee Elsayed & Latifa Abdullah Al-Dossary, 2016). The rate of breast milk insufficiency in Nepal is 24.5%, this results in mothers giving complementary foods to breast milk earlier (Khanal et al., 2016). Research in Australia states that 29% of postpartum mothers stop breastfeeding due toinsufficient breast milk production (Pemo et al., 2020). About 35% of mothers experience breast milk insufficiencyso as to provide additional food before the baby is six months old(Prabasiwi et al., 2015).

Previous studies have shown that maternal psychological conditions, familysupport, health volunteersupport, caloriintake and fluidintake are related to breast milk production(Sri Rahayu et al., 2022). Other factors that influence breast milk insufficiency are age, parity, education, breast anatomy disorders, frequency of breastfeeding and combination hormonal contraceptives (Sultana et al., 2013). A total of 35% of primipara are more likely to experience problems at the beginning of breastfeeding compared to multipara (Hackman et al., 2015). The frequency of breastfeeding that is less than 10-12 times can inhibit the emptying of alveoli mammae and inhibit the hypothalamic response of prolactin secretion (Rahmawati & Prayogi, 2017). The use of hormonal combination contraceptiveswill also decrease the volume of breast milk (Kominiarek & Rajan, 2016).

Exclusive Breastfeeding coverage in Semarang City in 2019 to 2020 has increased from 69.8% to 71.3% still below the national target of 80%.All related components, both health workers, the community and stakeholders, need socialization efforts on the importance of providing exclusive breastfeeding so that the health of infants under five can be more optimal (BPS, 2020). Babies who do not get breast milk adequacy will have an impact on delayed weight gain(Spatz & Conover, 2021).

Efforts to improve breast milk adequacy have been carried out by providing health education about breast milk and giving breast warm compresses. Previous research on health education on breast milk showed a low degree of correlation to the number of mothers who breastfeed early (Balogun et al., 2016). The use of pharmacological drugs in increasing breast milk productioncan be carried out, but it can give certain side effects (Alessandra N. Bazzano, Rebecca Hofer, 2016). Nonpharmacological methods can be an option because they have minimal side effectssuch as *giving massage, acupunctur, acupressure, exercise* and reflexology (Rahnemaie et al., 2019).

Several studies such as massage and acupressure in breastfeedingmothers can increase breast milk production, but results are still varied. Massage is a touch on certainparts of the body by using the hands or certain parts of the body to obtain physiological, prophylactic or

therapeutic effects. Massage on the mother's back makes the body relax in breastfeeding so as to increase the composition and volume of breast milk. Research is limited with a quasi-experimental design and *an effect size of* 0.45 which means an impact in increasing breast milk productionin the moderate category (Patel et al., 2013). Acupressure is a massage or emphasis on certain meridian pathways of thebody that can generate physical stimulation locally through body contact and energy towards the target organ (Mehta et al., 2017) . Acupressure as one of the alternatives with minimal side effectsin increasing serum prolactin levels and breast milk secretion(Chen et al., 2017). This research developed severalback massage methodscalled *Roxy Back Massage* (RBM), namely using rolling techniques, back massage, efflurage, and *finger friction* pointers combined with acupressure at the point of lactation (*lactapressure*). Lactapressure meridian points include ST-16, ST-18, SP-18 CV-17, and Si-1. The purpose of this study was to prove the effect of the combination of RBM and *lactapressure* interventions on prolactin levels and breast milk production of primiparous puerperal mothers in Semarang City.

Method

Research Design, Population and Samples

This type of research is a true experiment using the design of Randomized Pretest and Post Test with Control Group Design. The study population was all puerperal mothers in 37 Health Centers in Semarang City in 2021, 8 puskesmas were selected by cluster random sampling, namely the Ngesrep, Kedungmundu, Bangetayu, Karangdoro, Bandarharjo, Ngaliyan, Sekaran and Mangkang Health Centers. Metode in determining samples with simple random sampling (lottery).Samples were calculated according to the measurement scale of numerical variables of two unpaired groups for an average estimate of 2 populasi. The total sample was 64 respondents divided into 4 groups, namely the RBM intervention group, *lactapressure,* a combination of RBM and lactapressure and the control group. In the process there were 3 mothers who did not complete the study, namely in the lactapressure group, the combination of RBM and lactapressure and the control group, so that the total samplesused were 61 puerperal mothers.

Kriteria inclusion of this study of mothers primipara first to 9th day, giving breast milk only, mother's age is 20-35 years, gestational age is sufficient months, nutritional status is good and pervagina childbirth.

Research Procedure

The study was divided into four intervention groups, namely the RBM group, lactapressure, a combination of RBM and lactapressure and a control group. The intervention of the RBM groupwas carried out with the initial stage of approach to the subject, informed concent, RBM action by rotating the back using the touch of both palms and Finger Friction Pointer press rotate using the index finger under the middlefinger along the spine up to the intercosta bone 5-6 for 30 minutes, the frequency of 2 days once for 9 days begins the 1st day, the 3rd day, the 5th, 7th and 9th day, the morning time.

The lactapressure group intervention began with an approach to the subjects, informed concent, giving lactapressure action with emphasis using the thumb internode on the meridian point area of LU-1, ST-16, SP18, ST-18, CV-17, and SI-1, duration 24 minutes, carried out on day 1, day 3, day 5, 7th and day 9, morning time.

Group 3 interventions combined with RBM and lactapressure began with an approach to the subject, informed concent and gave back massage with Finger friction pointers along the spine to the intercosta bone 5-6 followed by pressing using the thumb segment on LU-1. ST-16, SP-18, ST-18, CV-17 and SI-1 on the ulnar side of the little finger. Emphasis using the thumb on the meridian point area duration 54 minutes, the frequency of 2 days once as much as 5 times on the 1st day, the 3rd day, the 5th, the 7th and the 9th day.

The control group was carried out according toexisting standards, namely health education about breast milk and warm compresses.

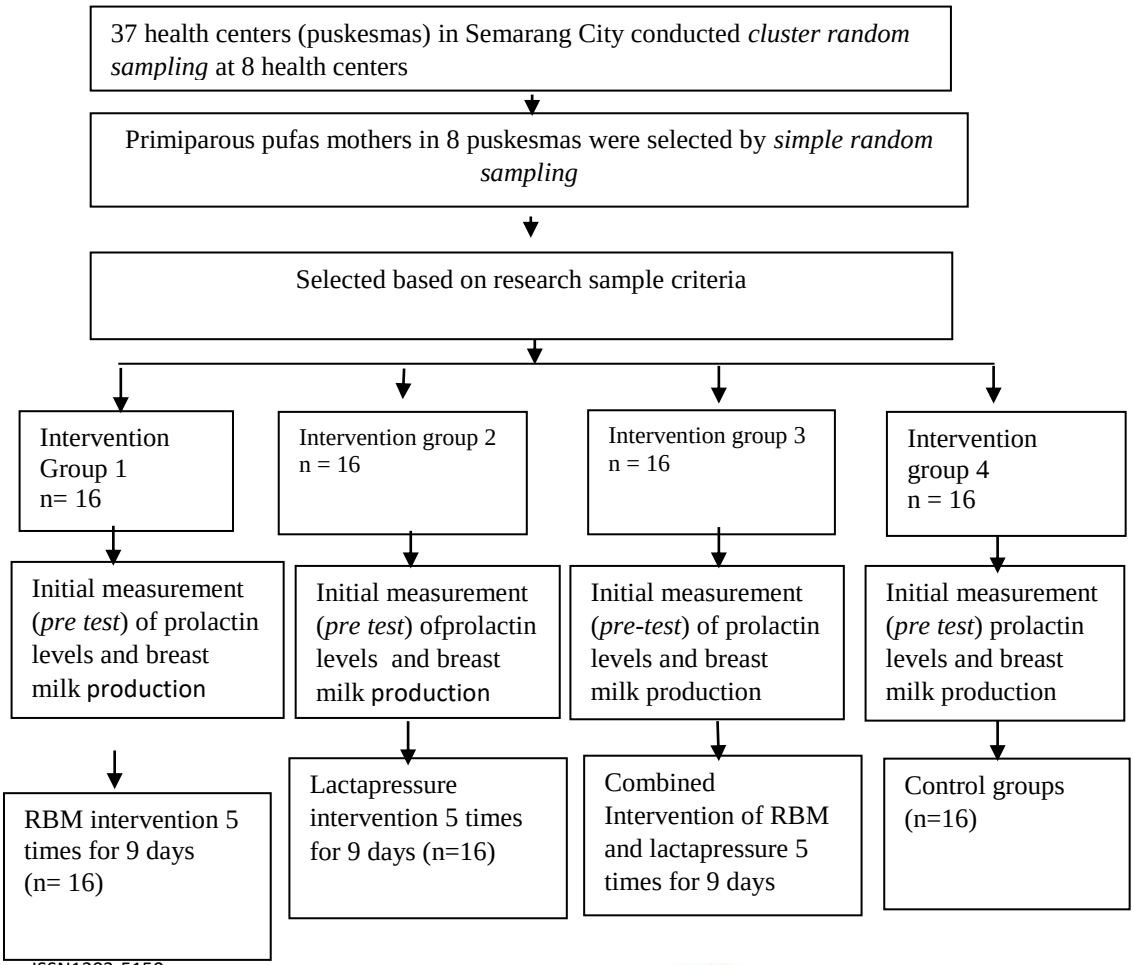
Stomach point 16 (ying chuang) is located above the third intercostal breast, stomach point 18 (ru-gene) is located lateral to the breast, tduck meridian SI-1 (Sao Ce) terl etak side ulnar little finger, tduck meridian CV-17 is located in the sternum sehigh intercostal intercostal fourth, zhongfu (LU-1) is located at the lateral line of the chest at the level of intercostal 1, Tianxi (SP-18) or the meridian of the spleen leg is located as high as the fifthcostal linea axillaris anterior.

Data Analysis

Data analysis wasanalyzed by testing the normality of responden characteristics and variables of prolactin levels and breast milkproduction, using the Shapiro wilk test. The test results obtained family support characteristics, and fluid intake was abnormally distributed p<0.05, while the other characteristic variables were normally distributed p≥ 0.05. Furthermore, homogeneity tests were carried out for characteristicvariables, prolactin levels and breast milkproduction using the one-way ANOVA test for numerical data and fisher exact for categorical data with p value results of >0.05 which means comparable (homogeneous). Data analysisusing One way ANOVA and Double Linear Regression. Data processing using SPSS version 23, the difference is expressed meaningful when obtained p value < 0.05.

Etical Consideration

This research has received permission fromthe Ethics Commission of the Faculty of Medicine, Diponegoro University onOctober 18, 2021 Number 394/EC/KEPK/FK-UNDIP/X/2021. This research also received administrative permits from 8 puskesmas in Semarang City. Informed concent is given to respondents and families in writing.



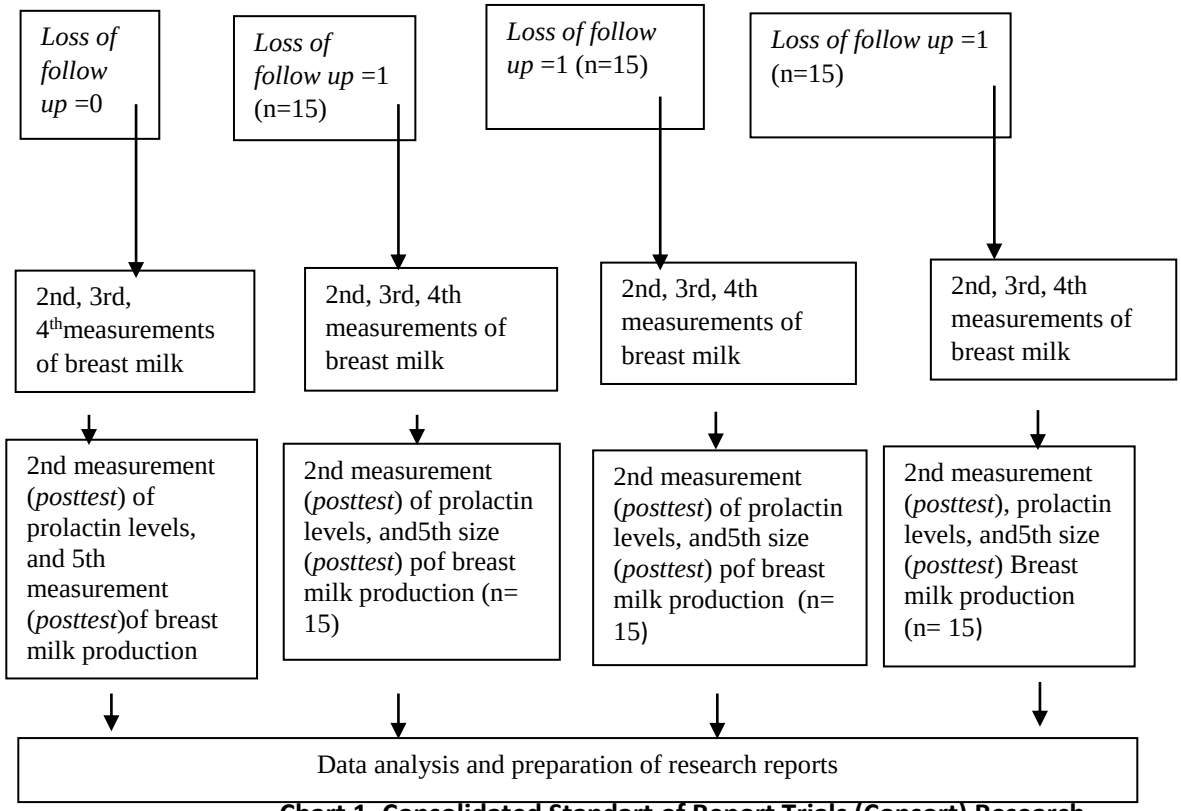


Chart 1. Consolidated Standart of Report Trials (Consort) Research

RESULT

1. Characteristics of the mother

Table 1. Characteristics of Respondents

Variable	RBM (n=16)			*Lactapressure* (n=15)			Combination of RBM and *Lactapressure* (n=15)			Control (n=15)			*p*
	n(%)	*Mean* (min-max)	Sd	n(%)	*Mean* (min-max)	Sd	n(%)	*Mean* (min-max)	Sd	n(%)	*Mean* (min-max)	Sd	
Education Basis Intermediate Tall	1(6.7) 12(75) 3 (22.2)			1(6,7) 11(73,3) 3 (20)			1(6,7) 11(73,3) 3(20)			13(86,7) 2(13,3)			0,958
Family Support		38,9 (32-40)	2,17		37,9(32-40)	2,98		36,4(21-40)	5,27		37,2 (27-40)	3,45	0,258
Anxiety		36,7(31-50)	5,13		37,6(30-48)	4,88		34,4(27-42)	3,58		35,4(29-42)	3,79	0,215
Energy Adequacy Intake (*EAI*)%		93,5(50-146)	8,30		99(50-148)	7,49		104(58-142)	7,55		102(59-145)	5,99	0,596
Protein Adequacy Intake (*PAI*)%		93,9(30-142)	7,89		89,4((40-146)	7,57		108,7 (69-154)	7,18		102,5 (73-152)	6,53	0,262
Fluid Intake (ml)		2647,4(1623-3271)	578,3		2606,6(1131-3278)	788. 7		2776,4(113 8-3400)	154,0		2608,2(1169-3000)	107	0,854
Prolactin (ng/ml)		205,2(83-368)	82,1		234,6(144-327)	71,9		172,2(83-317)	65,4		233,2(83-348)	83	0,106
Milk production (ml)		44,3(17-75)	20,1		36,6(21-66)	10,6		40,2(21-50)	9		40,4(19-63)	11,4	0,689

p=Homogeneity test

2. Effect of Treatment on Breast Milk Production

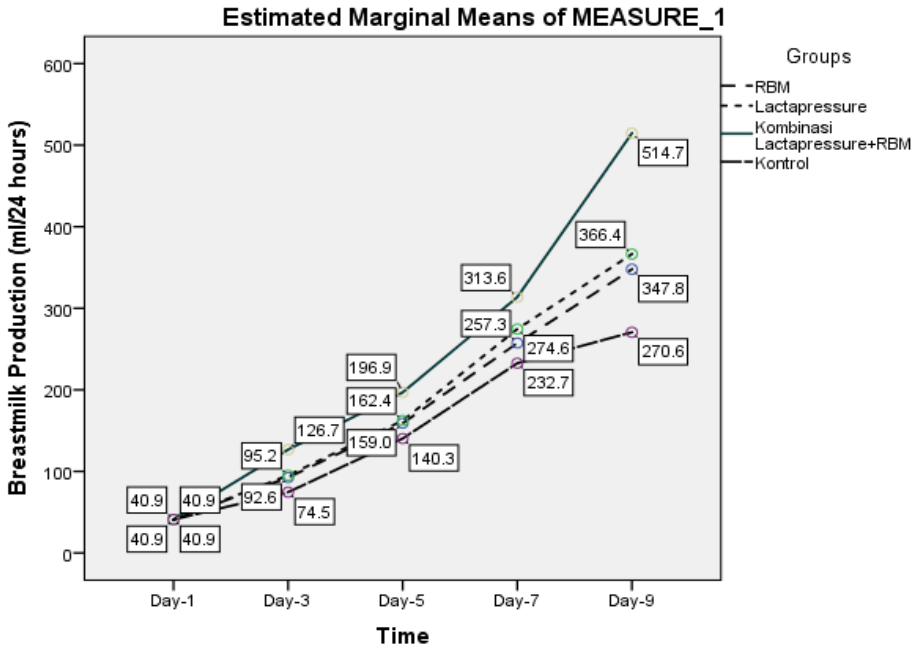


Figure 1:Changes in breast milk production (ml/day) according to the treatment group between pre, day 3, day 5, day 7 and day 9

Figure 1. showed that before treatment all groups had the same milk production of 41 ml / day after being controlled by data on pre-breast milk production, education, family support, anxiety, energy adequacy intake, protein adequacy intake, fluid intake. Of the four groups, the combined treatment of RBM and lactapressure on day 9 could increase the highest breast milk production to 515 ml / day, the lactapressure treatment group to 366 ml / day, the RBM group to 348 ml / day and the control group 271 ml / day.

Table 2. Effect of Treatment on Breast Milk Production (ml / day)

Effect	**Treatment**	B	SE	t	p	95% Confidence Interval		Partial Eta Squared
						Lower Bound	Upper Bound	
Pretest	RBM>< Control	3,9	4,9	0,795	0,430	-5,9	13,7	1%
	Lactapressure><Control	-1	4,9	0,36	0,720	-11,8	8,2	0,02%
	Combination of RBM+lactapressure>< Control	-2	4,9	0,04	0,968	-10,2	9,8	0%
Post 1	RBM>< Control	18	12,1	1,49	0,142	-6,2	42,3	4,3%
	Lactapressure><Control	20,6	12,1	1,70	0,095	-3,7	45	5,5%
	Combination of RBM+lactapressure>< Control	52	11,9	4,36	0,000	28	76,1	27,6%
Post 2	RBM>< Control	18,6	18	1,03	0,306	-17,5	54,9	2,1%
	Lactapressure><Control	22	18,1	1,21	0,229	-14,3	58,4	3%
	Combination of RBM+lactapressure>< Control	56,5	17,7	3,17	0,003	20,8	92,3	17%
Post 3	RBM>< Control	24,7	19,3	1,275	0,208	-14,1	63,5	3,1%
	Lactapressure><Control	41,9	19,4	2,16	0,036	2,9	80,8	9%
	Combination of RBM+lactapressure>< Control	80,9	19	4,24	0,000	42,6	119.2	27%
Post 4	RBM>< Control	77,2	17,2	4,4	0,000	42,6	111	29%
	Lactapressure><Control	95,8	17,3	5,5	0,000	61	130,6	38%
	Combination of RBM+lactapressure>< Control	244	17	14,3	0,000	209	278,3	80%

Description:
Pretest = breast milk production before treatment (ml /day), *post* 1 = 3rd day of breast milk production, *post* 2 = 5th day of breast milk production, *post* 3 = 7th day of breast milk production, *post* 4 = 9th day of breast milk production

Table 2 shows that the combined amount of RBM and lactapressure since day 3 of the treatment has been effective in increasing breast milk production and is highest among the RBM group, lactapressure is 244 ml compared to the control group. The magnitude of the influence of the type of treatment in increasing breast milk production varies, the RBM treatment can significantly increase the volume of breast milk production by 29% (p= 0.000), *lactapressure* treatment by 38% (p= 0.000) and the combination of RBM and *lactapressure* by 80% (p = 0.000).

Table 3 Differences in Average Milk Production (ml/day) between treatments

Treatment		*Mean Difference*	SE	p	95% *confident interval for difference*	
					Lower Bound	*Upper Bound*
RBM	*Lactapressure*	-8,3	8,1	0,307	-24,6	7,9
	Combination of RBM and *Lactapressure*	-59	8,6	0,000	-76,4	-41
	Control	27,7	8,3	0,002	11,1	44,3
Lactapressure	Combination of RBM and *Lactapressure*	-50,6	8,6	0,000	-68	-33
	Control	36	8,2	0,000	19,4	52
Combination of RBM and *Lactapressure*	Control	86,7	8,1	0,000	70	103

Table 3 on analysis to see the difference in the effects of the three types of treatment using the *Least Significant Different* (LSD) test showed that between the three groups, the intervention of RBM and *lactapressure* there was no difference in the increase in breast milk production (p=0.307), but there was a significant difference in breast milk production between RBM and the combination of RBM and *lactapressure* (p<0.0001) or *lactapressure* and a combination of RBM and *lactapressure* (p<0.0001).

3. Effect of Treatment on Prolactin Levels

The impact of increasing levels of prolactin berbeda according to the treatment group given, isshown in figure 2 below:

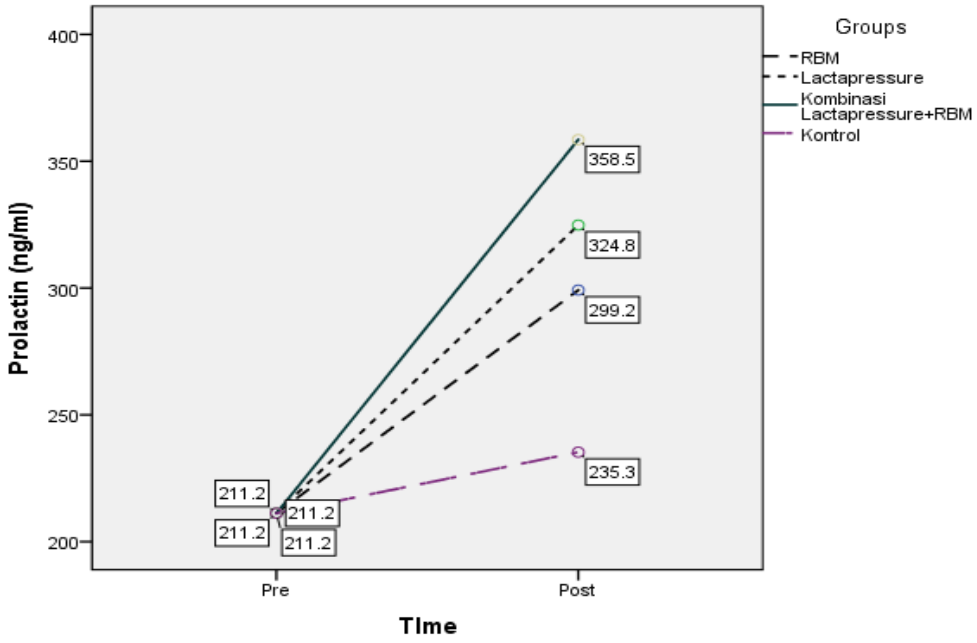


Figure 2. Changes in Prolactin levels according to the Treatment group between *Pre* and *Post*.

Figure 2 shows that initially all treatment groups had prolactin levels controlled by prolactin pre levels, education, anxiety, energy adequacy intake, protein adequacy intake, fluid intake of 211.2 ng/ml. Group given a combination treatment of RBM and *lactapressure* experienced an increase of 358.5 ng/ml higher than the *lactapressure* group increased to 324.8ng/ml ; the RBM group increased by 299.2 ng/ml and the control group 235.3ng/ml.

Tabel 4. Effect of Treatment on Prolactin Levels

Treatment	B	One	t	p	*95% Confidence Interval*		*Partial Eta Squared*
					Lower Bound	*Upper Bound*	
RBM>< Control	63,9	23,5	2,72	0,009	16,7	111,1	13%
Lactapressure>< Control	89,5	23,7	3,77	0,000	41,8	137,2	22%
Combination of RBM and *lactapressure*><Control	123,2	24,4	5,04	0,000	74,1	172	34%

Table 4. showed that the groupgiven a combination of RBM and lactapressure treatment was 157.2 ng/ml higher than the control group and was statistically meaningful (p=0.000). The magnitude of the effect of the type of treatment in increasing prolactin levels varied, the treatment of RBM was 13%, lactapressure was 22% and the combination of RBM and lactapressure was 34%.

Tabel 5. Differences in Prolactin Levels between treatments

Treatment		*Mean Difference*	SE	p	95% *confident interval for difference*	
					Lower Bound	*Upper Bound*
RBM	*Lactapressure*	12,8	11,56	0,274	-36	10,4
	Combination of RBM and *Lactapressure*	29,7	12,24	0,019	-54,2	-5,07
	Control	31,9	11,74	0,009	8,36	55,5
Lactapressure	Combination of RBM and *Lactapressure*	16,8	12,89	0,197	-42,75	9,03
	Control	44,7	11,8	0,000	20,9	68,6
Combination of RBM and *Lactapressure*	Control	61,6	12,2	0,000	37	86,1

Table 5 on analysis to see the difference in effects tothe three treatment types using the Least Significant Different (LSD) test showed that the RBM treatment compared to lactapressure had the same ability to increase prolactin (p=0.274), as well as the lactapressure treatment compared to the combined treatment of RBM and lactapressure has the same ability to increase prolactin levels (p=0.197), while the combined treatment of RBM and lactapressure can increase prolactin levels significantly compared to RBM (p=0.019).

Discussion

The results showed that the combination of RBM and lactapressure had a significant effect on breast milk production. Theimplementation of the combination of RBM and lactapressure experienced an increase in breast milk production after being given an intervention 5 times for 9 days, there was an increase from 41 ml to 515 ml. The increase in breast milk production in the combined RBM and lactapressure group was highest compared to the RBM group, lactapressure group, and control group.

Previous research mentioned that back massage to helpsmothers feel more relaxed and comfortable so that mothers can rest optimally and this can affect breast milk production. In addition, massage done after childbirth is proven to improve sleep quality (Ko et al., 2014). Research by Goker, et al states that back massagecan increase visfatin levels higher than controls. Visfatin is a growth factor that the mother transfers to the baby while breastfeeding, so visfatin is beneficial in increasing the production and content of

breast milk. The study was conducted on 60 puerperal mothers, 30 back massage treatment groups and control groups(Goker et al., 2021).

The study of Dagli, et al stated that puerperal mothers who gave birth to premature babies were given oxytocin massage 3 times for 3 days with a duration of 5 minutes, obtained the results of oxytocin massage had a significant influence in increasing breast milk production compared to the control group (Dagli & Celik, 2022). Oxytocin massage is effective in stimulating the release of oxytocin, and is used to increase the production of breast milk in mothers who are in the breastfeeding period. This massage can increase breast milk production by up to 11.5 times by stimulating the muscles of the spine, and can lower cortisol levels by up to 28%. The neurotransmitter stimulates the medulla oblongata and sends a message to the hypothalamus to secrete posterior pituitary oxytocin. Massaging of the spinal muscles can reduce tension and relieve stress and stimulate the milk production reflex (Siti Roudhatul Jannah, 2017). Another study mentioned that there was a difference in the increase in breast milk production in nursing mothers after oxytocin massage and breast treatment. The production of breast milk and the process of breastfeeding require the stimulation of the breast muscles to the breast glands for the necessary contractions in the lactation process (Triansyah et al., 2021).

Esfahani, *et all* explained that acupressure at points Si-1, Li-4 and Gb-21 was more effective in increasing breast milk production compared to the control group given education (Esfahani et al., 2015). Akupressur will improve balance, blood circulation and providethebody with the necessary qi energy. This will trigger the secretion of the neurotransmitter increasing the hormone adrenocorticotropin released from the anterior pituitary (Solt Kirca & Kanza GulL, 2022). Acupressure at certain meridian points will activate the secretion of chemicals such as beta endorphins, serotonin, dopamine and noradrenaline into the bloodstream (Yu et al., 2013).

In accordance with the results of this study, the RBM was carried out on the back with arolling massage techniqueon the back using the touch of both palms (effleurage) slowly, gently coupled with Finger Friction Pointer for 30 minutes and combined with lactapressure meridian point LU-1 stomach (ST-16), SP18, stomach (ST-18),CV-17andSI-1in a duration of 24 minutes can have the highest effect on breast milk production.

The increase in breast milk production given a combination ofRBM and lactapressure on day 3, day 5, day 7 and day 9 was statistically significant, when compared with the intervention of RBM showed signification on day 9 and the lactapressure intervention group on day 7. This means that to get an increase in breast milk production in puerperal mothers, it will be faster to produce milk when RBM is combined with lactapressure.

The results showed that the combination of RBM and lactapressure had a significant effect on increasing prolactin levels in primiparous puerperal mothers. Average prolactin levels in the combined group intervency of RBM and lactapressure increased from 211.2 ng/ml to 358.5 pg/ml. This result was higher compared to the increase in the control group with a large influence of 33.7%. The increase in prolactin levels in the combined group of

RBM and lactapressure 123.2 ng/ml was highest compared to the RBM group, lactapressure group and control group.

Previous research Kosovo et al. stated that back massage can increase levels of oxytocin, prolactin, and noradrenaline effectively in the production anddistribution of breast milk (Kosova et al., 2016). Jahdi, et al noted that mothers who perform postpartum back massage feel comfortable and their stress levels decrease (Jahdi et al., 2016).

Solis (2021) stated that the administration of massage by couples as one of the non-pharmacological therapies in puerperal mothers to provide comfort and reduce anxiety (Dominguez-Solis et al., 2021). Another study that various methods of breast massage can reduce the engorgement ofbreastfeeding mothers (Anderson et al., 2019). Massage provides a biomechanical effect that is, touch on the skin can provide friction and stimulation of muscle pressure and is passed on to the nervous system through neurotransmitters so that serotonin is secreted. The psychological effect occurs changes in tissues or organs and harmonizes between body and mind. The potential mechanism of the neurological effect is that relaxation occurs when massage and skin friction will increase the productivity of vagal activity and afferents stimulate the limbic system to deliver receptors in the hypothalamus to increase the secretion of serotonin and endorphins and lower cortisol (Baljon et al., 2020). Massage can stimulate the release of oxytocin levels and inhibit the release of ACTH (Morhenn et al., 2012).

Previous research mentioned that the combination of Danzhong (CV-17), Rugen (ST-18), Zusanli (ST-36), Shaoze (SI-1) and Taichong (LR-3) points is effective in overcoming hypogalactia in postpartum mothers by increasing and strengthening qi and blood and activating circulation in the lactation process (Fan ZL, Yang MF, Yin RP, n.d.).

This analysis, the combination of RBMand *lactapressure* is more effective in increasing the kadar of prolactin and breast milk production. This intervention as an alternative in the management of providing care to puerperal mothers holisitically, so that problems related to the breastfeeding process can be minimized.

Conclusion

The combination of RBM and lactapressure interventions contributed well in the improvement of prolactin and breast milk production. It is necessary to socialize and train health workers, both midwives and nurses, to use this intervention as an innovation in services to postpartum mothers. Subsequent research can control the use of breast milk-promoting drugs and developRBM and lactapressure asone way to overcome breastfeeding problems.

REFERENCES

Alessandra N. Bazzano, Rebecca Hofer, and K. P. T. (2016). A Review of Herbal and Pharmaceutical Galactagogues for Breast-Feeding. *The Ochsner Journal*, *16*(4), 511–524.

Anderson, L., Kynoch, K., Kildea, S., & Lee, N. (2019). Effectiveness of breast massage for the treatment of women with breastfeeding problems: A systematic review. *JBI Database of Systematic Reviews and Implementation Reports*, *17*(8), 1668–1694. https://doi.org/10.11124/JBISRIR-2017-003932

Baljon, K. J., Baljon, K. J., Romli, M. H., Ismail, A. H., Khuan, L., & Chew, B. H. (2020). Effectiveness of breathing

exercises, foot reflexology and back massage (BRM) on labour pain, anxiety, duration, satisfaction, stress hormones and newborn outcomes among primigravidae during the first stage of labour in Saudi Arabia: A study protocol for . *BMJ Open*, *10*(6), 1–13. https://doi.org/10.1136/bmjopen-2019-033844

Balogun, O., Sullivan, E., Mcfadden, A., Ota, E., Gavine, A., Garne, C., Renfrew, M., & Macgillivray, S. (2016). Interventions for promoting the initiation of breastfeeding (Review) Summary of findings for the main comparison. *Cochrane Database of Systematic Reviews*, *11*, 102. https://doi.org/10.1002/14651858.CD001688.pub3.www.cochranelibrary.com

Bps. (2020). *Health Profile of Semarang City* (H. P. Suhito (ed.); pp. 56–57). Semarang City Health Office.

Chen, M. L. S., Tan, J. Y., & Suen, L. K. P. (2017). Auricular therapy for lactation: A systematic review. *Complementary Therapies in Clinical Practice*, *29*, 169–184. https://doi.org/10.1016/j.ctcp.2017.09.006

Dagli, E., & Celik, N. (2022). The effect of oxytocin massage and music on breast milk production and anxiety level of the mothers of premature infants who are in the neonatal intensive care unit: A self-controlled trial. *Health Care for Women International*, *43*(5), 465–478. https://doi.org/10.1080/07399332.2021.1947286

Dominguez-Solis, E., Lima-Serrano, M., & Lima-Rodriguez, J. S. (2021). Non-pharmacological interventions to reduce anxiety in pregnancy, labour and postpartum: A systematic review. *Midwifery*, *102*(August). https://doi.org/10.1016/j.midw.2021.103126

Esfahani, M. S., Berenji-Sooghe, S., Valiani, M., & Ehsanpour, S. (2015). Effect of Acupressure on Milk Volume of Breastfeeding Mothers Referring to Selected Health Care Centers in Tehran. *Iranian Journal of Nursing and Midwifery Research*, *20*(1), 7–11.

Fan ZL, Yang MF, Yin RP, S. L. (n.d.). Exploration on the acupoint selection rule for the treatment of postpartum hypogalactia with acupuncture and moxibustion based on the set visualization analysis systeme. *Zhongguo Zhen Jiu.*, *40*(10), 1138–1142. https://doi.org/10.13703/j.0255-2930.20190814-0001

Fatimah, Massi, M. N., Febriani, A. D. B., Hatta, M., Permatasari, T. A. E., Hidayati, E., Hamidah, Khumaidi, M. A., Akaputra, R., Turrahmi, H., & Anggraini, R. P. (2021). Effect of breastfeeding on children's health and its relationship to NRAMP1 expression: A cross-sectional study. *Annals of Medicine and Surgery*, *71*(September), 103017. https://doi.org/10.1016/j.amsu.2021.103017

Goker, A., Kosova, F., Koken Durgun, S., & Demirtas, Z. (2021). The effect of postpartum period back massage on serum ghrelin, leptin, adiponectin and visfatin levels. *Complementary Therapies in Clinical Practice*, *42*(November 2020), 101284. https://doi.org/10.1016/j.ctcp.2020.101284

Hackman, N. M., Schaefer, E. W., Beiler, J. S., Rose, C. M., & Paul, I. M. (2015). Breastfeeding outcome comparison by parity. *Breastfeeding Medicine*, *10*(3), 156–162.
https://doi.org/10.1089/bfm.2014.0119

Jahdi, F., Mehrabadi, M., Mortazavi, F., & Haghani, H. (2016). The effect of slow-stroke back message on the anxiety levels of Iranian women on the first postpartum day. *Iranian Red Crescent Medical Journal*,

18(8). https://doi.org/10.5812/ircmj.34270

Khanal, V., Lee, A. H., Scott, J. A., Karkee, R., & Binns, C. W. (2016). Implications of methodological differences in measuring the rates of exclusive breastfeeding in Nepal: Findings from literature review and cohort study. *BMC Pregnancy and Childbirth*, *16*(1), 1–10. https://doi.org/10.1186/s12884-016-1180-9

Ko, Y., Associate, E., Lee, H., Vice, M. S. N., & Nurse, H. (2014). *Randomised controlled trial of the effectiveness of using back massage to improve sleep quality among Taiwanese insomnia postpartum women*. *30*, 60–64. https://doi.org/10.1016/j.midw.2012.11.005

Kominiarek, M. A., & Rajan, P. (2016). Nutrition Recommendations in Pregnancy and Lactation. *Medical Clinics of North America*, *100*(6), 1199–1215. https://doi.org/10.1016/j.mcna.2016.06.004

Kosova, F., Demirtas, Z., Seldalldan Calim, & Sapmaz, L. (2016). The Effect on Lactation Of Back Massage Performed in The Early Postpartum Period. *Journal of Basic and Applied Research*, *2*(2), 113–118.

Mehta, P., Dhapte, V., Kadam, S., & Dhapte, V. (2017). Contemporary acupressure therapy: Adroit cure for painless recovery of therapeutic ailments. *Journal of Traditional and Complementary Medicine*, *7*(2), 251–263. https://doi.org/10.1016/j.jtcme.2016.06.004

Morhenn, V., Beavin, L. E., & Zak, P. J. (2012). Massage increases oxytocin and reduces adrenocorticotropin hormone in humans. *Alternative Therapies in Health and Medicine*, *18*(6), 11–18.

Nafee Elsayed, H. M., & Latifa Abdullah Al-Dossary. (2016). Exclusive Breastfeeding, Prevalence and Maternal Concerns : Saudi and Egyptian Mothers. *Journal of Education and Practice*, *7*(3), 5–11.

Patel, D. U., Gedam, D. D. S., & Verma, M. M. (2013). Effect of back Massage on Lactation among Postnatal Mothers. *International Journal of Medical Research and Review*, *1*(1), 5–11. https://doi.org/10.17511/ijmrr.2013.i01.02.

Pemo, K., Phillips, D., & Hutchinson, A. M. (2020). Midwives' perceptions of barriers to exclusive breastfeeding in Bhutan: A qualitative study. *Women and Birth*, *33*(4), e377–e384. https://doi.org/10.1016/j.wombi.2019.07.003

Prabasiwi, A., Fikawati, S., & Syafiq, A. (2015). Exclusif Breasfeeding and Perception of Insufficient Milk Suply. *Kesmas: National Public Health Journal*, *9*(3), 282.

Rahmawati, A., & Prayogi, B. (2017). Analysis of Factors Affecting Breastmilk Production on Breastfeeding Working Mothers. *Journal of Ners And Midwifery (Journal of Ners and Midwifery)*, *4*(2), 134–140. https://doi.org/10.26699/jnk.v4i2.art.p134-140

Rahnemaie, F. S., Zare, E., Zaheri, F., & Abdi, F. (2019). Effects of complementary medicine on successful breastfeeding and its associated issues in the postpartum period. *Iranian Journal of Pediatrics*, *29*(1). https://doi.org/10.5812/ijp.80180

Siti Roudhatul Jannah, M. N. W. (2017). Comparing Effectiveness Of Palm Dates And Oxytocin Massage In Stimulating Breastmilk Production Of Post Partum Mother. *International Conference On Applied Science and Health*, *33*, 63–69.

Solt Kirca, A., & Kanza GulL, D. (2022). Effects of acupressure and shower applied

in the delivery on the intensity of labor pain and postpartum comfort. *European Journal of Obstetrics and Gynecology and Reproductive Biology*, *273*(April), 98–104. https://doi.org/10.1016/j.ejogrb.2022.04.018

Spatz, D. L., & Conover, N. M. (2021). Case report: Managing growth failure while maintaining exclusive breastfeeding. *Journal of Pediatric Nursing*, *61*, 47–50. https://doi.org/10.1016/j.pedn.2021.03.014

Sri Rahayu, Suharyo Hadisaputro, Syarief Taufik Hidayat, & Anggorowati. (2022). Characteristics and Related Factors to Breast Milk Production of Postpartum: Preliminary Study at Public Health Center of Semarang City. *Embryo*, *14*(1), 118–125. https://doi.org/10.36456/embrio.v14i1.5292

Sultana, A., Rahman, K. U. R., & Manjula, S. (2013). Clinical Update and Treatment of Lactation Insufficiency. *Medical Journal of Islamic World Academy of Sciences*, *21*(1), 19–28. https://doi.org/10.12816/0000207

Triansyah, A., Stang, Indar, Indarty, A., Tahir, M., Sabir, M., Nur, R., Basir-Cyio, M., Mahfudz, Anshary, A., & Rusydi, M. (2021). The effect of oxytocin massage and breast care on the increased production of breast milk of breastfeeding mothers in the working area of the public health center of Lawanga of Poso District. *Gaceta Sanitaria*, *35*, S168–S170. https://doi.org/10.1016/j.gaceta.2021.10.017

Yu, J. S., Zeng, B. Y., & Hsieh, C. L. (2013). Acupuncture stimulation and neuroendocrine regulation. In *International Review of Neurobiology* (1st ed., Vol. 111). Elsevier Inc. https://doi.org/10.1016/B978-0-12-411545-3.00006-7

Author's Biographies

Sri Rahayu is a Phd student in Doctoral Program of Medicine and Health Sciences, Faculty of Medicine, University of Diponegoro, Indonesia. ORCID ID: https://orcid.org/0000-0002-2640-8421

Suharyo Hadisaputro is a professor at Faculty of Medicine, University of Diponegoro, Indonesia

Syarief Thaufik Hidayat is an associate professor at Faculty of Medicine, University of Diponegoro, Indonesia.

Anggorowati is an assistant professor at Nursing Departement, Faculty of Medicine, University of Diponegoro, Indonesia.