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Effect Gymnastics Postpartum on Milk Production of Postpartum Mother

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ABSTRACT

Breast milk is the main nutrient that must be given to babies. Optimal breastfeeding can prevent more than 823,000 children death and 20,000 maternal death per year(1) . Expenditure of breast milk is closely related to physical and psychological conditions. Exercising through light movements during the postpartum period can have both physical and psychological effect (2) . One type of exercise that is easy to do and can provide physical and psychological benefits to postpartum women is postpartum exercise.

The aimed of this study was find out the influence of postpartum gymnastics on the production of breast milk.

This research method is aquasy experiment with post test only approach. The technique of purposive sampling with a total sample of 32 respondents was divided into 2 groups. The intervention group performed puerperal gymnastics from 2 hours postpartum to 7th days postpartum. The control group received standard care during the postpartum period. Statistical tests used are repeated measure anova test and friedman test with a significance level of 5%.

The results showed that the volume of breast milk in each measurement was more in the intervention group compared to the control group, including day 1 > 11.25 ml, day 3 > 47.5 ml, day 5 > 73.9375 ml, day 7 > 89.1875 ml compared to the control group with an overall p value < 0.005.

So it can be concluded that gymnastics postpartum which starting from 2 hours postpartum to 7 days postpartum is one of the effective efforts to increase the production of breast milk.

Keywords:postpartum gymnastics, breast milk production.

INTRODUCTION

Breast milk is a liquid produced by the *mammary* glands (breasts) which is very important for babies. The components that make up breast milk include fat, water, lactose, protein solutions and inorganic salts(3) . Breast milk should be given at least the first 6 months of life, because during the 6 months only breast milk is easily digested by the baby and fulfills the nutritional needs for the baby's growth and development (3–6) . Breastfeeding has a positive impact on babies and mothers including creating an inner bond between mother and baby, improving the quality of life, and influencing growth and development.

One of the problems of growth and development disorders is stunting. Stunting is a failure of the growth process in children under five years old (infants under five years) which is characterized by being short or very short of age due to chronic malnutrition intrauterine and the early period of newborns who are only seen at the age of at least 2 years [7,8] . The incidence of stunting in Indonesia in 2018 with very short status was 11.5% higher than the previous year, 9.8%[8] . Ginting and Pandiangan's research (2019) states that stunting causes stunted growth and development, thereby reducing children's intelligence[9] . Optimal breastfeeding can prevent more than 823,000 child deaths and 20,000 maternal deaths per year[1] .

The World Health Organization (WHO) in 2016 stated that the average rate of exclusive breastfeeding in the new world was around 38% [10] . According to the 2014 International Baby Food Action Network (IBFAN), Indonesia is in the 3rd lowest rank out of 51 countries in the world that provide exclusive breastfeeding [10] . Exclusive breastfeeding coverage in Indonesia is 68.74% of the 80% national target, in Riau in 2018 it was 35.01% [8] and RokanHilir Regency was 46.3% [11] . The achievement of exclusive breastfeeding at the SedinginanPublic Health Center in January-December 2019 was 53.7% [12].

Various efforts have been made to optimize breastfeeding, such as government policies that include education about lactation since the 3rd trimester of pregnancy, forming breastfeeding support groups and breastfeeding fathers and implementing early initiation of breastfeeding (IMD). However, this has not shown maximum results[8] which can be seen from the achievement of the IMD implementation in several provinces in Indonesia that have not reached the national target, such as in Maluku (34.97%), West Papua (3.06%) of the Indonesia's target planned strategy in 2019 by 50% [13]. Pharmacological therapy can also be given, but it requires additional costs and able to give various side effects to each drug or supplement[14].

Some of the factors that led to the failure of breastfeeding, including social, physical, biological, psychological, first breastfeeding time factor, attitude towards breastfeeding, support and self-efficacy (beliefe in the ability of self-mother) [15,16]. Postpartum mothers experience physical and psychological changes. This greatly affects the production and expenditure of breast milk. Ni Putu Dian, et al (2019) stated that postpartum mothers *exercise* can improve their quality of life [17]. Exercising through light movements during the postpartum period can have both physical and psychological effects[2]. One type of exercise that is easy to do and can provide physical and psychological benefits to postpartum women is postpartum exercise.

METHODS

The research is quasy experiment with the approach of post test only control group design. This research has received permission from the ethics commission from the Medical/Health Research Bioethics Commission, Hang Tuah College of Health Sciences, Pekanbaru No. 050/II/2021/Bioethics Commission signed February 15, 2021. The population in this study were all postpartum mothers in the working area of the Sedinginan Public Health Center, RokanHilir Regency, Riau Province in February - April 2021 with a sample of 32 people who were divided into 2 groups , namely the control group who was given standard treatment during the postpartum period and the intervention group who was given the treatment. standard of care for the postpartum period and postpartum exercise for 15-30 minutes a day starting at 2 hours postpartum until the 7th postpartum day. The sampling technique was purposive sampling with the following criteria:

Inclusion Criteria

- Postpartum mother with a history of vaginal delivery.
- Postpartum mother with term baby, single and healthy.
- Have relatives or family who are easily contacted by the research team.
- Postpartum mothers aged 20-35 years.
- Postpartum mothers with BMI 23.0-23.9 kg/m^2 .

Exclusion Criteria

- Postpartum mothers who consume cigarettes and alcohol.

- Postpartum mothers who consume supplement for breast milk.
- Postpartum mothers with anatomical problems in the breast.
- Postpartum mothers with obstetric complications.

Drop-out criteria

Postpartum mothers who moved and could not be contacted, and did not comply with the research regulations.

Evaluation of breast milk volume was assessed after given treatment in the intervention group and control group on days 1st, 3rd, 5th and 7th postpartum which can be seen in the following chart:

Chart 1 Research Design

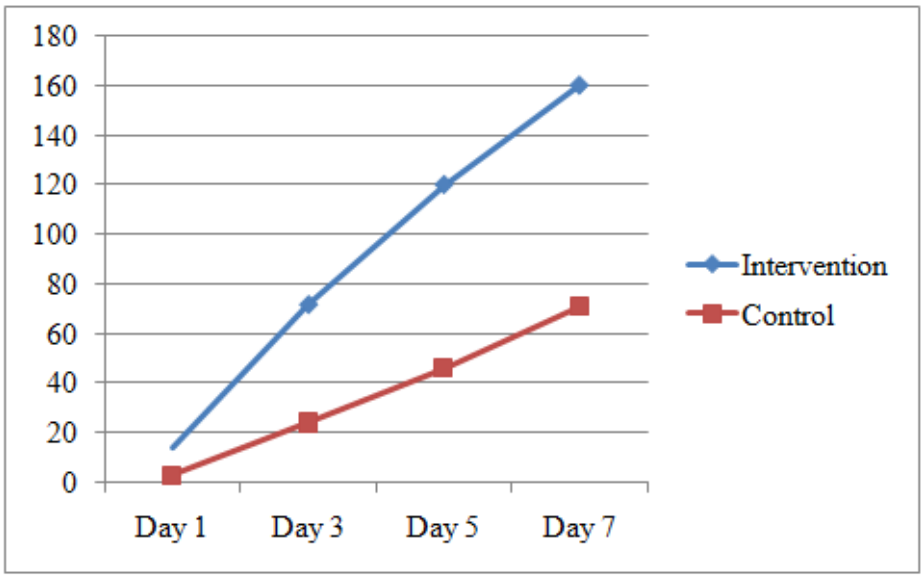
Group		Treatment	Posttest	Posttest	Posttest	Posttest
Intervention	:	X	O1	O2	O3	O4
Control	:	Y	O5	O6	O7	O8

Description

X : Treatment of postpartum care standard and implementation of postpartum gymnastics.
Y : The standard treatment for postpartum care.
O1 : The results of measuring the volume of breast milk (ml) in the intervention group on day 1.
O5 : The results of measuring the volume of breast milk (ml) in the control group on day 1.
O2 : The result of measuring the volume of breast milk (ml) in the intervention group on day 3.
O6 : The results of measuring the volume of breast milk (ml) in the control group on day 3.
O3: The results of measuring the volume of breast milk (ml) in the intervention group on day 5.
O7 : The results of measuring the volume of breast milk (ml) in the control group on day 5.
O4 : The results of measuring the volume of breast milk (ml) in the intervention group on day 7.
O8 : The results of measuring the volume of breast milk (ml) in the control group on day 7.

RESULTS

Average Breast Milk Volume



Graph 1st Average Breast Milk Volume

Based on the graph above, it can be concluded that the average volume of breast milk on the first day of the intervention group was 11.25 ml more than the control group. On day 3 the average volume of breast milk in the intervention group was 47.5 ml more than the control group. Day 5 the average volume of breast milk in the intervention group was 73.9375 ml more than the control group. Examination of the average volume of breast milk on the 7th day of the intervention group was 89.1875 ml more than the control group.

The results of the analysis of average differences in each group, can be seen in the table below.

Table 1 : Analysis of Differences in The Amount of Breast Milk Volume Between The Intervention Group and The Control Group

Breast Milk Volume Measurement Time (ml)	Group	Mean ± SD	*P value*
Day 1	Intervention Control	14.0625±10.70494 2.8125±3.39055	0,000
Day 3	Intervention Control	71.5625±52.48488 24.0625±32.65878	0,002
Day 5	Intervention Control	120.0000±78.59177 46.0625±53.57670	0,001
Day 7	Intervention Control	160.0625±79.73830 70.8750±68.22402	0,001

From table 1 above, it can be concluded that there is an average difference in the amount of breast milk volume in each measurement of the intervention group and the control group with the overall p value is < 0.005. This means that there is an average difference in breast milk volume between the intervention group and the control group at each time of statistical measurement.

DISCUSSION

The average volume of breast milk on day 1st of the intervention group was 14.0625 ml and the control group was only 2.8125 ml. On day 3rd, the volume of breast milk in the intervention group was 71.5625 ml and the control group was only 24.0625 ml. On day 5th, the measurement of the volume of breast milk in the intervention group was 120.0000 ml and the intervention group was only 46.0625 ml. The same measurement results were also shown in the average volume of breast milk on day 7th in the intervention group of 160.0625 ml and the control group 70,8750 ml. The results of this study indicate that the average volume of breast milk has increased at each measurement time. The increase in breast milk volume in each measurement was greater in the intervention group than the control group. The results of the repeated measures ANOVA test in the intervention group showed that there was a difference in the volume of breast milk in each measurement with an overall p value of < 0.05.

The results of this study are in line with the research of Savitri and Suryanti (2017) which states that postpartum exercise performed on day 4 to day 7 can increase breast milk production with a p value of 0.000[18]. Research by Ni Putu Dian AyuAnggraeni, et al (2019) shows that exercises during the postpartum period that can be done to improve quality of life, including yoga, pelvic floor muscle training (PFMT), Pilates, postpartum gymnastics, aerobics and progressive muscle relaxation (PMR)[17]. Yang and Chen's research (2018) shows that aerobic exercise performed by 70 postpartum mothers 3 times a week for at least 15 minutes can reduce stress, fatigue and improve sleep quality of postpartum mothers [19]. The research of Kusparlina and Sundari (2019), as well as the research of Nurafifah and Kusbiantoro (2019) regarding early exercise in normal *postpartum* mothers can accelerate the decline in fundus and lochea with *p value* < *0.005* [20.21]. The same results were shown in the

study of Mariza Elvira and Hendrawati (2017) of 10 people who carried out postpartum exercises, 80% of them experienced faster uterine involution with a p value of 0.004 [22].

Movements performed during puerperal exercise cause contraction and relaxation of the muscles. Postpartum exercise can increase heart contractions, so that blood flow and metabolic processes become smooth[23-25] . The research of Ningtyas, Pujiastuti and Indriyawati (2017) shows that progressive mobilization such as head adjustment 30^0, performing passive range of motion (ROM) 2 times, lateral rotation therapy with left tilted and right tilted positions can stabilize hemodynamic status [26]. Smooth blood circulation and metabolism along with a relaxed body condition will optimize the performance of the endocrine system[25] . This condition will certainly cause a feeling of calm and happiness that stimulates the release of the hormone oxytocin and endorphins[27,28]. Endorphin hormones lead to the knowledge that thoughts and emotions have a strong influence on the brain that takes place in the brain stem, limbic system and cerebral cortex. In the brain, A-10 neural processes are involved in cognitive and emotional functions. The A-10 nerve is also known as the feeling of pleasure, happiness and arousal[29]. This condition will certainly cause a feeling of calm and happiness that stimulates the release of the hormone oxytocin[27,28] .

The hormone oxytocin plays an important role in the production of breast milk. The secretion of the hormone oxytocin is influenced by stimulation such as the frequency of the baby's sucking and the frequency of issuing breast milk [30–32]. The results of Kamariyah's research (2014) state that there is a relationship between the mother's psychological condition on the smooth production of breast milk with *p value = 0.002* [28] . The hormone oxytocin that reaches the alveoli will affect the myoepithelial cells. Contraction of the cells will squeeze the milk that has been made out of the alveoli and into the ductular system which then flows through the lactiferous ducts[27]. Movements around the breast muscles will cause muscle contractions around the *mammary* glands so that it will increase the production and expenditure of breast milk.

CONCLUSION

Postpartum exercise is one of the effective, safe, simple and economical efforts because it does not require any cost to increase breast milk production. *Postpartum* gymnastics carried out from 2 hours *postpartum* to day 7 *postpartum* increased the average volume of breast milk, including day 1^{st}> 11.25 ml, day 3^{rd}> 47.5 ml, day 5^{th}> 73.9375 ml, day 7^{th} >89.1875 ml with an overall *p value* < 0.005.

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