The Comparison of The Effectiveness Back Massage with Clary Sage Essential Oil and Postpartum Exercise for Post Partum Uterus Involution

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Abstract. The postpartum mother needs special care to recovery reproduction organs, an indicator of involution process assessed by measuring hight fundus uteri. If the uterus fails in the uterine involution process, it can cause bleeding and mortality of puerperal mother. Back massage can stimulate hormone oxytocin that causes uterine contractions, that can help accelerate the process of uterine involution, while exercise postpartum is a muscle exercise that can be done immediately after delivery. This study aims to identify the Comparison Effectiveness Back Massage with Clary Sage Essential Oil and Exercise Postpartum to Post Partum Uterus Involution. The research design used quasi-experimental with post test only non-equivalent control group design and using quota sampling with the number of samples 90 respondents divided into three groups, and each of group contains 30 respondents. The bivariable analysis used repeated measurement with clinical significance mean 95% interval with P value <0.05, and multivariable analysis used linear regression. The result of bivariable analysis in this research shows that there is difference of uterus involution in each group, Δoverall mean -1.700 (95% CI: -2,26 - (-1,37) with P value <0.05, from result of uteri involution in group intervention back massage using clary sage essential oil (Salvia sclarea) faster in the process of uterine involution than Exercise postpartum group. The results of multivariable analysis showed back massage interventions by using clary sage essential oil (salvia sclarea) controlled by parity variables, and maternal age predicted a 62.1% reduction in fundal uteri level.

1. Introduction

The leading cause of maternal death is 28.5% bleeding which can occur in labor as well as postpartum period. Treatment of the postpartum period is given to stimulate the release of the hormone oxytocin. Based on research it has been found that Swedish massage therapy can stimulate oxytocin [1] The hormone oxytocin is useful for strengthening and regulating uterine contractions, compressing the blood vessels and assisting the mother's hemostasis thus reducing the occurrence of uterine atony, especially in prolonged labor. Strong uterine contractions will result in a better involution process [2] Oxytocin can be obtained by various means either by oral, intra-nasal, intra-muscular, or by the masses that stimulates the release of the hormone oxytocin Alternative And Complementary Medicine, that from research data shows that massage therapy has a biological effect, if done 2 times a week with a light touch has the effect changes in neuroendocrine that can trigger the release of oxytocin and can maintain the stability of oxytocin. Parvocellular neurons also synthesize oxytocin from the paraventricular nucleus from various directions of the central nervous system including the spinal cord. In the spine, there is a channel that can release oxytocinergic in charge of oxytocin
hormone, in the dorsal horn surface layer of the autonomous region (intermediolateral columns, intermediomedial gray matter, lamina X and sacral parasympathetic nucleus) [2].

Postpartum gymnastics as a form of physical exercise will have an impact on the cardiovascular system, muscle blood flow and cardiac output increase as well as in the respiratory and metabolic systems in the changes of ATP and ADP by releasing energy to the muscles to contract [3]. Until now, the comparison of back massage interventions and gymnastics exercises against the acceleration of uterine involution have not been studied.

Based on research Khayrani that have been done [4] states there is an influence between back massage with involution of uterus, and according to Siregar (2013) denotes there is the influence of gymnastics with involution uteri. Therefore, researchers are interested in conducting research that compares the techniques of back massage and gymnastic massage against involution of uterus of BPM Sidoarjo.

2. Experimental Method

This research uses quantitative design. Moreover, analytical using quasi-experimental with posttest-only non-equivalent control group design. The population in the research were postpartum women who were labour in BPM Sidoarjo during December 2017- March 2018. The instrument of research in taking data using observational until ten days. The statistical test used was Repeated Measurement with significance level P <0.05. Multivariate analysis conducted in this study
ted linear regression statistical analysis with regression coefficient calculation with 95% confidence interval and significance level P <0.05.

3. Results and Discussion

3.1. Distribution of Maternal Frequency of parity, fertility and postpartum mother's nutritional status

| Variable           | Back massage with Clary sage (n=30res) | Puerperal exercise (n=30res) | control (n=30res) | Total | F | P value |
|--------------------|---------------------------------------|-----------------------------|-------------------|-------|---|---------|
| Age 20-35 yo       | n% 30                                 | mean±SD 25.68±4.94          | 30                | 90    | 0.272 | 0.762   |
|                    | 15(42.9%)                            | 10                          | 10                | 35    |     |         |
|                    | 13(41.4%)                            | 12                          | 13                | 38    |     |         |
| Parity 2           | n% 42(52.5%)                          | mean±SD 34.2%               | 34.2%             |       | 0.696 | 0.818   |
|                    | 12(31.6%)                            | 12                          | 11                | 29    |     |         |
| Nutritional Status | n% 34(30.3%)                          | 34                          | 34                | 102   |     |         |

Based on data of the table were obtained by the number of respondents as much as 90 (100%) of respondents in each age group of 20-35 years, the table shows the comparability of the research subjects are homogeneous and comparable, the age and parity variables obtained p-value> 0.05 variables. Parity and maternal age of homogeneity in each group, i.e. distributed data before the study.
3.2. *The average difference of uterine involution day 1 to day 10 against each group (serial measurement test) n = 90*

| Group | N  | Mean ± Std. Deviation | 95% CI | p-value |
|-------|----|------------------------|--------|---------|
| Day-1 | 1  | 10.26 ± 0.567          | 10.07-10.46 |
|       | 2  | 10.21 ± 0.479          | 10.04-10.37 |
|       | 3  | 10.62 ± 0.604          | 10.41-10.83 |
|       | Total | 10.36 ± 0.557      | 10.25-10.48 |
| Day-2 | 1  | 8.26 ± 1.335          | 7.79-8.73 |
|       | 2  | 8.88 ± 0.409          | 8.74-9.01 |
|       | 3  | 9.65 ± 0.884          | 9.34-9.97 |
|       | Total | 8.93 ± 1.110      | 8.71-9.15 |
| Day-3 | 1  | 7.06 ± 0.694          | 6.77-7.30 |
|       | 2  | 7.68 ± 1.121          | 7.29-8.07 |
|       | 3  | 8.47 ± 1.926          | 8.00-9.97 |
|       | Total | 7.74 ± 1.455      | 7.38-8.02 |
| Day-4 | 1  | 5.94 ± 0.600          | 5.73-6.15 |
|       | 2  | 6.62 ± 1.886          | 6.28-6.83 |
|       | 3  | 7.62 ± 1.167          | 7.09-8.15 |
|       | Total | 6.71 ± 1.247      | 6.46-6.95 |
| Day-5 | 1  | 4.97 ± 0.627          | 4.75-5.19 |
|       | 2  | 5.78 ± 0.669          | 5.50-5.97 |
|       | 3  | 6.82 ± 1.167          | 6.42-7.23 |
|       | Total | 5.84 ± 1.141      | 5.62-6.07 |
| Day-6 | 1  | 4.74 ± 0.567          | 4.54-4.93 |
|       | 2  | 6.03 ± 1.000          | 5.68-6.38 |
|       | 3  | 4.92 ± 1.132          | 4.70-5.14 |
|       | Total | 5.35 ± 1.163      | 5.00-5.70 |
| Day-7 | 1  | 3.71 ± 0.579          | 3.50-3.91 |
|       | 2  | 2.94 ± 0.600          | 2.73-3.15 |
|       | 3  | 5.15 ± 0.925          | 4.82-5.47 |
|       | Total | 3.93 ± 1.163      | 3.70-4.16 |
| Day-8 | 1  | 1.82 ± 0.626          | 1.61-2.04 |
|       | 2  | 2.74 ± 0.567          | 2.54-2.93 |
|       | 3  | 4.26 ± 0.994          | 3.92-4.61 |
|       | Total | 2.94 ± 1.257      | 2.69-3.19 |
| Day-9 | 1  | 0.82 ± 0.626          | 0.61-1.04 |
|       | 2  | 1.74 ± 0.567          | 1.54-1.93 |
|       | 3  | 3.38 ± 1.349          | 2.91-3.85 |
|       | Total | 1.98 ± 1.400      | 1.71-2.26 |

*Retracted*
Based on Table 2 using Serial Measurement Analysis obtained from the observation result for 10 days in each group that is the average change of fundus uteri for 10 days can be seen on the 10th day looks the average high value of fundus uteri in the intervention group close to the number 0, i.e., the back massage intervention group using clary sage essential oil (Salvia sclarea): 0.09 cm, puerperal group: 0.56 cm, while in the control group still has an average value of 2.18 cm, this point group 1 compared with groups 2 and 3 had a very significant difference obtained, with a value of P <0.001 (P <0.05). This showed that group 1, i.e., intervention group with back massage using clary sage essential oil, has a faster process of uterine involution through the shrinking of the fundus uteri compared to other groups. As in the following picture:

![Clary Sage Essential Oil](image-url)

**Figure 1. Clary Sage Essential Oil**

### Table 3. Salvia sclarea

| Variable      | Coefficient (95% CI)        | p-value |
|--------------|----------------------------|--------|
| Back Massage | 4.492 (0.935 - 0.789)       | <0.001 |
| Age          | -0.023 (-0.048 - 0.002)     | 0.265  |
| Parity       | 0.071 (0.73 - 1.15)         | 0.618  |

Table 3: Multivariable Analysis of the Effect of Back Massage Using Essential Oil of Clary Sage (Salvia sclarea) with parity variable and another age to involution of uteri.
Table 3 shows how large the influence of intervention groups on uterine involution after controlled by parity variables and maternal age is included in the analysis. The regression coefficient was 0.935 (CI-0.789-1.081). With a value of $p < 0.05$ this indicates a significant effect of back massage using clary sage essential oil (salvia sclarea) to a decrease in fundal height of uteri. This means that the uterine involution is faster in the group with intervention with a difference of 0.935 after controlled by parity variables and maternal age. The coefficient increases when compared to the intervention group coefficients before it is controlled by the parity variable and the mother's age. The adjusted R$^2$ value is 0.621, meaning that back massage interventions using clary sage essential oil (salvia sclarea) controlled by parity variables and maternal age can predict a 62.1% reduction in fundal uteri level in a day.

3.4. Discussion
The results showed that there was a difference of uterine involution measurement of uterine fundus height reduction between the back massage intervention group using Clary sage (salvia sclarea) essential oil with the control group, the results of the study indicating that combination of back massage interventions using Clary sage essential oil had an effect on uterine involution through measurement of uterine fundus high decrease compared with control group. Back massage is done to stimulate the oxytocin reflex or let down reflex melalui stimulasi sensori somatic dari system aferen [5]. Research conducted showed that the increase in oxytocin in primiparous postpartum mother who gave birth spontaneously pervaginam who get back massage intervention for 15 minutes proved to increase milk production and uterine involution compared with the control group. The results of this study support the research conducted by researchers at BPM Sidoarjo on postpartum mothers with a history of normal labor by combining back massage by using Clary sage essential oil (salvia sclarea) for 10-15 minutes with frequency massage for 2 times a day from day to-1 in a row until day 10 during postpartum [6].

The use of Clary sage (salvia sclarea) essential oil through back massage, or when massage techniques use essential oils, essential oil components will be evaporated and inhaled by the client. The benefits of using aromatherapy through inhalation and topical applications can be felt synergistically. Other benefits when essential oils are used through gentle massage or touch, allowing clients to relax, reduce muscle tension, can help smooth breastfeeding and speed up the process of uterine[7] The results showed that back massage interventions using Clary sage essential oil were effective in effect on uterine involution through measurement of uterine fundus huge decrease in postpartum mother. Aromatherapy is used extensively as a complementary therapy aimed at improving relaxation, comfort, lowering pain, and improving the well-being of both pregnant women and postpartum mothers [5]. The use of aromatherapy along with massage provides a psychological and physiological effect that can make the mother relax and feel comfortable so that the implementation of intervention in postpartum mothers can improve uterine involution.

The results showed that maternal parity affected uterine involution by measuring the decrease of fundal uteri height. Where it can be known that $p$-value of mother parity variable $<0.05$ with coefficient value $-0.172$ means that the smaller the number of parity the higher the value of fundus uteri high-value decrease, this proves that there is a difference of proportion to uterine involution in parity of both primipara and multipara. In multipara / grand multipara the reduce elastic muscles of the uterus, thereby the possibility of obstacles in the process of involution uteri. In multipara uterus fully stretched twice that the contraction of the uterus is
stronger to produce a faster uterine involution. [7] also argues that parity influences the involution of the uterus, muscles that are too tightly stretched for a long time to return to a condition like before pregnancy. This opinion is by the results of research showing that there is a relationship between parity to the progress of uterine involution based on the measurement of uteri fundus height [9].

The result of this research shows that maternal age has no effect on uterine involution through measurement of high fundus uteri decrease, where p value of mother age> 0.05 with coefficient value 0.023 means that there is no difference of proportion to uterine involution through measurement of high decrease fundus uteri in mother age 20-35 years old [4], the results P 0.394 (P> 0.05) thus concluded that age does not affect the age of the mother with involution of uteri both in the intervention group and the control group, but obviously affect the reproductive system. Argues that the aging process heavily influences older mothers. In the aging process occurs changes in metabolism that is an increase in the amount of fat, muscle elastic decline and decreased absorption of fats, proteins and carbohydrates [3]. With a decrease in muscle strain will affect the reduction of the uterus muscle after delivery and takes a long time compared to mothers who have better muscle strength and strain. Age is one factor that can affect uterine involution. This opinion is different from the results of the study which showed no difference in maternal age on the progress of uterine involution based on the measurement of uteri fundus height. Age is one factor that can affect uterine involution, but many other factors can affect uterine involution [10]. The results showed uterine involution through measurement of uterine fundus huge decrease in the intervening gymnastics intervention group. Mothers who received postnatal gymnastic intervention experienced uterine involution more rapidly than the control group. States that postnatal gymnastics affects the physical aspects that can help restore the condition of postpartum mothers. There was a significant influence on the postpartum group of women who did postnatal exercises on the condition of postpartum mother recovery. Exercise postpartum regularly can maintain physical health and maintain maximum muscle function and strength including postpartum mother's reproductive organs [3].

Based on the results of this study, puerperal exercises affect uterine involution by measuring the decrease in uterine fundus height compared to the control group, but with the back massage intervention group using clary sage uterine involution essential oil occurs faster than the exercise postpartum intervention group. Many factors that can influence the success of exercise postpartum there are internal and external factors. Internal factors include the internal readiness concerning physical and psychological readiness. While external factors include the external readiness of the mother to take care of the baby because of the condition of the baby is very vulnerable, so it needs the attention of the mother, the physical factors of the mother are fatigue and the trauma after delivery process, the health personnel is less available in teaching postpartum exercise, the nearest family, so make exercise post-partum is not carried out with the maximum [10].

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