Comparison on the Effectiveness of Postpartum Exercise and Oxytocin Massage for Uterine Involution of Postpartum Women in Kebumen, Indonesia

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A B S T R A C T

Maternal mortality rates are caused by several factors, including bleeding. During postpartum, bleeding can be caused by a failure of uterine involution which can cause subinvolution. Oxytocin plays an important role in the uterine involution process. This study aims to compare the effectiveness of postpartum exercise and oxytocin massage for the uterine involution of postpartum women in the Kebumen. This study applied a quasi-experimental design for comparing two treatments. It involved a total of 534 respondents with 267 respondents in each group. Each group received 10 minutes of intervention per day for 9 days. The data were collected through observation sheets. The univariate analysis used frequency distribution and bivariate analysis used an independent t-test. The statistics show that the p-value (0.002) was lower than (0.05) meaning that the postpartum exercise and oxytocin massage provide different uterine involution times. The mean of uterine involution for the postpartum exercise group decreases by 137.60 hours compared to the oxytocin massage group by 159.06 hours. Postpartum exercise can be applied in post-natal care as it can make uterine involution faster.

Kata kunci:
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INTRODUCTION

The postpartum period begins upon delivery of the infant up to the reproductive organs get normal (Rahmadhani & Laohasiriwong, 2020). It is in line with research who stated that the postpartum period lasts for six weeks started from the delivery of the infant till the reproductive organs return to normal (Rahmadhani, 2020). During the postpartum period, women will experience many changes both physically and psychologically (Lemes et al., 2017). The changes occur to the entire system, including the reproductive system (Vas et al., 2019). Both anatomic and physiological changes occur during this period as the processes that occur during pregnancy are restored (Radoff et al., 2013).

The Ministry of Health data show that the number of postpartum women in Indonesia reached 4,975,636 (Kemenkes RI, 2018). Based on the Indonesia Demographic Health Survey (SDKI) data in 2017, the maternal mortality rate (MMR) in this country reached 359 per 100,000 live births (SDKI, 2017). Furthermore, the regional report submitted to the Ministry of Health showed that the number of maternal death due to pregnancy and birth delivery was 5019 in 2013 (Kemenkes RI, 2013). The Ministry of Health includes three main factors causing maternal death, namely bleeding (28%), eclampsia (24%), and infection (11%) (Kemenkes RI, 2018). The most common cause of bleeding after delivery was the weak condition or absence of uterine contractions (50% -60%) (Kemenkes RI, 2017).

Uterine involution is returned of the uterus to condition before pregnancy in form position (Kyathanahalli et al., 2013). Involution could shrink the uterus after delivery to returned to original shape weight about 60 grams (Colin et al., 2019). This process starts after placenta born due to muscle contraction uterine plain (Falomo et al., 2020). Many factors could affect the process of uterine involution, including breastfeeding, early mobilization, nutrition status, parity and age (Lemes et al., 2017). Failure of uterine involution is called sub involution (Kyathanahalli et al., 2013). Subinvolution is often caused by infection and retained placenta in uterus, made uterus involution process does not running normally and hampered (Asyima et al., 2019).

Non pharmacological actions are postpartum exercise and oxytocin massage (Anggarini, 2020). Postpartum exercise is one of action could reduce the problems that occurred to the mother postpartum (Aziz, 2018). Oxytocin massage and postpartum exercise help uterine involution is a process that very urgent, with the process it is expected postpartum mothers are faster in process decrease in uterine fundus height and return of the uterus and prevent uterine sub involution (Susanti & Putri, 2019).

RESULTS

Table 1
Characteristics of Respondents

| Characteristics       | Postpartum Exercise (n=267) | Oxytocin massage (n=267) | Total (n=534) | p-value |
|-----------------------|-----------------------------|--------------------------|--------------|---------|
|                       | N   | %   | N   | %   | n   | %   |     |
| Age                   |     |     |     |     |     |     |     |
| 20-35                 | 235 | 88.2| 251 | 94.1| 486 | 91.2| 1.000|
| >35                   | 32  | 11.8| 16  | 5.9 | 48  | 8.8 |     |
| Parties               |     |     |     |     |     |     | 0.485|
| Multipara             | 267 | 100 | 237 | 88.2| 504 | 94.1|     |
| Grande multipara      | 0   | 100 | 0   | 100 | 0   | 5.9 |     |
| Education             |     |     |     |     |     |     | 1.000|
| Primary School        | 32  | 11.8| 62  | 23.5| 94  | 17.6|     |
| Junior High School    | 46  | 17.6| 32  | 11.8| 78  | 14.7|     |
| Senior High School    | 157 | 58.8| 141 | 52.9| 298 | 55.9|     |
| University            | 32  | 11.8| 32  | 11.8| 64  | 11.8|     |
| Occupational          |     |     |     |     |     |     | 1.000|
| Housewife             | 157 | 58.8| 141 | 52.9| 298 | 55.9|     |
| Unskilled Worker      | 32  | 11.8| 32  | 11.8| 64  | 11.8|     |
| Government Officer    | 32  | 11.8| 32  | 11.8| 64  | 11.8|     |
| Non-Government officer| 46  | 17.6| 32  | 11.8| 78  | 14.7|     |

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uterine involution process (Rahayu & Solekah, 2019). As the people get older, the elasticity of the muscles of the reproductive organs also decreases (Savitri & ., 2018). It affects the income and purchasing power of daily needs such as staples, health issues, and social status. A person with a low education level does not have a direct effect on the uterine involution process (Tri Utami, 2015). The uterus muscles reduce compared to primipara women because the elasticity of uterine muscles decreases and it may obstruct the uterine involution (Tri Utami, 2015). The uterus muscles of multipara women are often stretched so that they require a longer period for the uterine involution process (Colin et al., 2019).

In general, the majority of respondents have high school education level (55.9%). It is also consistent with the results of that the majority of respondents in her study also have high school and tertiary education levels. Education level (58.8% and 52.9%). The data show that the majority of the respondents are housewives and live in urban areas. Most of them live with the nuclear family and have a moderate financial level without any savings.

Based on Table 2, the highest difference of mean values of uterine fundus between the control and treatment groups is 2.09 occurred on the 7th day.

Table 1 shows that the majority of respondents of each group are 20-35 years old (88.2% and 94.1%). Then, most of the respondents are multipara (100% and 88.2%). The highest education level of respondents in each group is high school level (58.8% and 52.9%). The data show that the majority of the respondents are housewives and live in urban areas.

Table 2
Changes in Height of Uterine Fundus

| Variable                   | Oxytocin Massage | Postpartum Exercise |
|----------------------------|------------------|---------------------|
|                            | Mean             | Median              | Mean             | Median              |
| Height of Uterine Fundus day 1 | 11.84            | 11.85               | 11.87            | 11.85               |
| Height of Uterine Fundus day 4 | 8.30             | 8.20                | 8.29             | 8.25                |
| Height of Uterine Fundus day 7 | 5.42             | 5.50                | 3.33             | 3.35                |
| Height of Uterine Fundus day 10 | 2.04             | 2.00                | 0.87             | 1.00                |

To identify the uterine involution time for postpartum exercise and oxytocin massage groups after the intervention, the study performed an independent t-test. Table 3 shows the average time of uterine involution for the postpartum group is 137.60 hours with a standard deviation of 13.41 hours. Then, for the oxytocin massage group, it reaches 159.06 hours with a standard deviation of 15.52 hours. It indicates that the difference is 22.68 hours. Based on the analysis of the result, the p-value (0.002) is lower than \( \alpha \) (0.05). Thus, it can be concluded that the average time of uterine involution for postpartum exercise group and oxytocin massage group is different. Based on the table above, it can also be concluded that postpartum exercise becomes an effective action to get a minimum uterine involution time with 137.60 hours compared to oxytocin massage with 159.06 hours.

Table 3
Difference in mean time of involution uterine after intervention the postpartum exercise and oxytocin massage

| Variable                        | n    | Mean   | SD    | p-value |
|---------------------------------|------|--------|-------|---------|
| Postpartum Exercise Group       | 267  | 137.60 | 12.41 | 0.002   |
| Oxytocin Massage Group          | 267  | 159.06 | 15.58 |         |

DISCUSSION

The results of the study of 534 respondents show that most of the respondents in both postpartum exercise and oxytocin massage groups are 20-35 years old (91.2%). It is consistent with the statement from Anggraini that women aged 20 - 24 years and 25 - 29 years have the highest birth rate as they are still in the productive period (Anggraini et al., 2019). This is also supported by the Indonesian Ministry of Health data (2014) that the highest number of women in productive age group aged 25-29 (KEMENKES, 2014). Besides, the results of the current research are in line with a previous study conducted by Sari in which age is closely related to the decrease of uterine fundus height in postpartum women (Sari et al., 2020). The older the people, the less productive the reproductive organs. It is typically found in women older than 35 years old (Sari et al., 2020). As women get older, the elasticity of the muscles of the reproductive organs also decreases (Rahayu & Solekah, 2020). Most of the respondents are multipara (94.1%). The uterine involution process of multipara women tends to decrease compared to primipara women because the elasticity of uterine muscles decreases and it may obstruct the uterine involution (Tri Utami, 2015). The uterus muscles of multipara women are often stretched so that they require a longer period for the uterine involution process (Colin et al., 2019).
education levels tend to pay more attention to their health (Hadianti & Sriwenda, 2019).

Based on the results of statistical tests using the independent t-test, the average time of uterine involution after postpartum exercise is 137.60 hours with a standard deviation of 13.41 hours. Meanwhile, for oxytocin massage is 159.06 hours with a standard deviation of 15.52 hours. According to Bobak, Lowdermilk, and Jensen (2005), a week after birth delivery, the uterus is inside the pelvis and cannot be palpated to the abdomen on the ninth day of postpartum. This statement shows that the average time to get normal uterine involution ranges from 158 - 216 hours. Based on the results of the study, it is found that the uterine involution time after the intervention of postpartum exercise and oxytocin massage is at a normal range (Bobak, 2001).

After the postpartum exercise, it is found that the average time of uterine involution is 142.37 hours. The fastest time of uterine involution for postpartum exercise is 121.71 hours. It is consistent with the theory that postpartum exercises are beneficial for postpartum mothers. The result of this study is in line with the previous study conducted by Yuliani, Mato, and Sjafaraenan (2012) in which postpartum exercises are effective to achieve minimum uterine involution time p values (0.00) < α (0.05). Postpartum exercises can strengthen muscle contractions due to an increase in calcium ions of extra cells that bind with calmodulin and will increase myosin kinase and phosphorylase (Istikhamoh, 2014). This causes continuous muscle pulling and uterine contractions (Asyima et al., 2019). The continuous contractions and retractions of the uterus will cause blood vessel constriction and rupture. Then, it will disturb the blood transmission to the uterus. Therefore, muscle tissue will lack the necessary substances so that their size will be smaller. Besides, poor blood circulation to the uterus also causes the atrophy and return to its original size (Ibrahim, 1996; Masruroh, 2012).

This study is also coherence with a study conducted by Rullinyl, Ermawati, and Ervareny (2014) which focuses on the effect of postpartum exercise on the decrease of the height of uterine fundus. The study found that postpartum exercise affects the decrease in the height of the uterine fundus with p-value (0.00). The postpartum exercise helps to strengthen uterine muscle contractions (Kythehanahalli et al., 2013). This results in ischemia with blood vessel constriction affecting low blood transfer to the uterus. The size of the tissues will get smaller and followed by a decrease of uterus size (Rahayu & Solekah, 2020).

In this study, the interventions are gymnastics exercise and oxytocin massage. The results of the study show that respondents who receive oxytocin massage also have faster uterine involution time with the fastest time of 128,917. This study is also coherence with a study conducted by Rullinyl, Ermawati, and Ervareny (2014) which focuses on the effect of postpartum exercise on the decrease of the height of uterine fundus. The study found that postpartum exercise affects the decrease in the height of the uterine fundus with p-value (0.00). The postpartum exercise helps to strengthen uterine muscle contractions (Kythehanahalli et al., 2013). This results in ischemia with blood vessel constriction affecting low blood transfer to the uterus. The size of the tissues will get smaller and followed by a decrease of uterus size (Rahayu & Solekah, 2020).

CONCLUSION AND SUGGESTION

Based on the results of the study, it is found that the average uterine involution time for the postpartum exercise group is 137.60 hours and 159.06 hours for the oxytocin massage group. Independent t-test results show p-value (0.002) < α (0.05) meaning that there the effective time of uterine involution is different between the postpartum exercise group and oxytocin group. The difference is 22.68 hours. After analyzing the time of uterine involution in both groups, it can be concluded that postpartum exercise becomes the most effective way to get minimum uterine involution time for postpartum women.

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Conflict of Interest Statement

Authors declare there is no conflict of interest in this research.

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