

# Comparison of Postpartum Exercises and Consumption of Purple Sweet Potato Leaves on Reduction of Uterine Fundamental Height in Postpartum Women

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**Abstract:** The bleeding after childbirth is caused 50 - 60% by weakness or absence of uterine contractions. It is important to provide postpartum services for mothers as one of the main pillars in the strategy to reduce the Maternal Mortality Rate (MMR). Postpartum exercise and administering decoction of purple sweet potato leaves are non-pharmacological techniques that can accelerate uterine involution. This study aims to determine the comparison of postpartum exercise and giving purple sweet potato leaves to reduce uterine fundal height in postpartum women at the Taman Sari Clinic, Pekanbaru City in 2023. This research is quantitative with a quasi-experimental design using one control group and one experimental group with the two method. The number of samples for this study was 20 people per group. Data collection method using observation method. The test used is the Independent T test with a significance level of 95%. The research results showed that the difference in TFU reduction after giving purple sweet potato leaves to postpartum mothers was 8.85 cm. The difference in TFU reduction after postpartum exercise was 10.4 cm. This shows that there is a difference between postpartum exercise and purple sweet potato in reducing TFU in postpartum women with a value of  $p=0.006$ . It is hoped that decoction of purple sweet potato leaves can reduce TFU in postpartum mothers

**Keywords:** Postpartum Exercise; Purple Sweet Potato Leaves; Uterine Involution

## Introduction

The highest cause of Maternal Mortality Rate (MMR) is bleeding. 50% - 60% of bleeding after childbirth is caused by weakness or absence of uterine contractions. Failure of the myometrium to contract completely will cause serious problems resulting in heavy bleeding after giving birth. For this reason, it is important to provide postpartum services for mothers as one of the main pillars in the strategy to reduce the Maternal Mortality Rate (MMR) (Firoz et al., 2022; Mangiaterra et al., 2023; Marliandiani & Ningrum, 2015).

The success of postpartum maternal health efforts is measured through indicators of postpartum maternal health service coverage (Coverage KF3) (Asmamaw et al., 2023; Gabriela & Cernelev, 2023). The achievement of the KF-3 indicator (3 Postpartum Visits) for Riau

Province from 2010 to 2020 shows a downward trend, starting from 82% in 2019 to 79.2% in 2020. Postpartum maternal health services include sweeping or home visits for those who do not come to health service facilities (Riau Health Profile, 2020). During the postpartum period, the reproductive organs will slowly experience changes to the condition before pregnancy. This change in the reproductive organs is called uterine involution. Postpartum is the period from six hours to 42 days after delivery (Khaerunnisa et al., 2021; Munawwarah et al., 2023).

Involution is a process where the uterus returns to its pre-pregnancy condition and weighs around 60 grams (Kody & Sukartiningsih, 2023; Yorita et al., 2023). This process begins immediately after the placenta is born due to contractions of the smooth muscles of the uterus. Involution is caused by continuous contraction

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and retraction of uterine muscle fibers (Purwati, 2019). If the involution of the uterus fails to return to a non-pregnant state, it will cause sub-involution (Nurafifah & Kusbiantoro, 2019). Symptoms of sub involution include persistent/fresh red lochea, slow descent of the uterine fundus, soft uterine tone, no feeling of heartburn in the postpartum mother, resulting in bleeding (Augustin, 2023; Liu et al., 2023).

The process of restoring reproductive organs during the postpartum period is very important (Chauhan & Tadi, 2020; Vladimirovna et al., 2023). This is what underlies the need to observe Uterine Fundal Height (TFU) and the degree of uterine contractions (Octavariny et al., 2020; Sulistiana et al., 2021). A well-contracted uterus will gradually decrease in size, until it can no longer be palpated above the symphysis pubis (Ayu et al., 2022; Hadianti & Sriwenda, 2019). This condition certainly cannot be separated from the extraordinary physiological changes that occur during pregnancy. Among the factors that play a role in uterine contractions are Hb levels, calcium levels, intrauterine volume, breastfeeding and postpartum exercise (Bayoumi et al., 2021). Postpartum exercise is an effort to increase uterine contractions in the postpartum period, so postpartum mothers are encouraged to do postpartum exercise in order to speed up the process of uterine involution (Loewen et al., 2020).

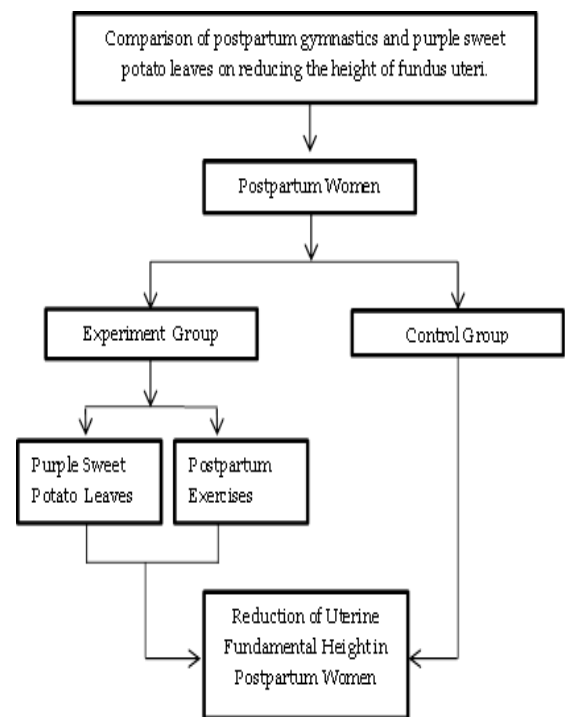
Postpartum exercise functions to restore health conditions, to speed up healing, prevent complications, restore and repair strains in the muscles after pregnancy, especially the muscles of the back, pelvic floor and abdomen. The benefits of doing postpartum exercises are restoring the strength of the pelvic floor muscles, tightening the muscles of the abdominal wall and perineum, forming a good posture and preventing complications (Sobhgol, 2022). A complication that can be prevented as early as possible by carrying out postpartum exercises is post-partum bleeding. When carrying out postpartum exercises, the abdominal muscles contract which will help the involution process which begins after the placenta comes out immediately after the involution process (Anggraeni et al., 2019; Maryunani, 2011).

The impacts that occur if you do not do postpartum exercises include varicose veins, venous thrombosis due to blockage of veins by blood clots that do not flow smoothly due to the mother restricting movement too much during the postpartum period, infections due to poor uterine involution so that remaining blood cannot be expelled, and abnormal bleeding. By doing postpartum exercises you can stimulate better uterine contractions thereby avoiding the risk of bleeding (Alimjanovich et al., 2021).

Apart from postpartum exercise, purple sweet potato leaves (*Ipomoea batatas* var *Ayamurasaki*) can also influence the uterine involution process (Malikha & Prisusanti, 2019). Sweet potato leaves (*Ipomoea batatas* L) are a vegetable that is rich in vitamins and antioxidants (Moura et al., 2021). Sweet potato leaves also contain lactogogum substances, which influence the production of the hormones prolactin and oxytocin. The effect of oxytocin causes uterine contractions. The hormone oxytocin which has been released from the posterior pituitary gland strengthens and regulates uterine contractions, compresses blood vessels and helps the hemostasis process. Contraction and retraction of the uterine muscles reduces the blood supply to the uterus, this process helps reduce bleeding so that lochia in postpartum mothers will decrease and reduce the height of the uterine fundus (Jang & Koh, 2019).

**Method**

This research is quantitative with a quasi-experimental design using one control group and one experimental group with a two group pre test and post test design method. The number of samples for this study was 10 people per group. Data collection method using observation method (Kebede et al., 2019). The test used is the Independent T test with a significance level of 95%. The research was conducted at the Taman Sari Clinic, Pekanbaru City.



**Figure 1.** Conceptual Framework

## Result and Discussion

The average TFU of postpartum mothers in the group given postpartum exercise was 8.85 with a standard deviation of 1.21. The minimum score for the postpartum exercise group was 7 and the maximum score was 11. The average TFU for postpartum mothers in the group given boiled purple sweet potato leaves was 11.5 with a Standard Deviation of 1.32. The minimum value for the boiled purple sweet potato leaf group is 9 and the maximum value is 14 as seen in Table 1.

**Table 1.** Average decrease in TFU for postpartum mothers

Groups	Mean	Std. Deviation	Min	Max
Decoction of Purple Sweet Potato Leaves	11.5	1.32	9	14
Postpartum Exercise	8.85	1.21	7	11

Based on Table 2, it is known that TFU in postpartum exercise has an average of 8.85 with a Standard Deviation (SD) of 1.32 and a mean rank of 13.9. The average TFU value in boiled purple sweet potato leaves is 11.5 with a Standard Deviation (SD) of 1.32 and a mean rank of 7.1. The statistical test results obtained a p value of  $0.000 < \alpha (0.05)$ , so that there was a difference between postpartum exercise and giving purple sweet potato leaves in reducing uterine fundal height in postpartum mothers at the Taman Sari clinic, Pekanbaru City in 2023.

**Table 2.** Comparison of postpartum exercise and giving purple sweet potatoes to reduce TFU.

Groups	n	Mean	Std. Deviation	Mean Rank	P
Decoction of purple sweet potato leaves	20	11.5	1.32	7.1	0.000
Postpartum exercise	20	8.85	1.21	13.9	

The involution process is a change in the overall genitalia, both internal and external, which gradually returns to its pre-pregnancy state. Uterine involution can occur due to ischemia, namely contraction and retraction of uterine muscle fibers that occur continuously, autolysis, namely excess cell cytoplasm will be digested by itself and atrophy due to cessation of estrogen. According to research conducted by (Fairus & others,

2017), the process of uterine involution is influenced by the mother's age at birth number of parities, early mobilization, knowledge and nutrition consumed during the postpartum period.

Fulfillment of nutrition during the postpartum period functions to help the process of recovering the mother's body condition after giving birth, helps speed up and increase breast milk production, uterine contractions and helps wound healing. Sweet potato leaves (*Ipomoea batatas* L) are a vegetable that is rich in vitamins and antioxidants. Sweet potato leaves also contain lactogogum substances, which influence the production of the hormones prolactin and oxytocin. The effect of oxytocin causes uterine contractions. The hormone oxytocin which has been released from the posterior pituitary gland strengthens and regulates uterine contractions, compresses blood vessels and helps the hemostasis process. Contraction and retraction of the uterine muscles reduces the blood supply to the uterus, this process helps reduce bleeding so that postpartum maternal lochia will decrease and reduce the height of the uterine fundus (Kuswanti & Wulandari, 2021).

Postpartum exercise is a movement exercise that is carried out as quickly as possible after giving birth, so that the muscles that have been stretched during pregnancy and childbirth can return to their normal condition as before (Maryunani, 2011). According to Sampelle et al. (1999), postpartum exercise is physical exercise carried out by mothers after giving birth, where the function is to restore health conditions, to speed up healing, prevent complications, restore and repair strains in the muscles after pregnancy, especially the muscles of the back, pelvic floor and abdomen.

During pregnancy, several muscles experience stretching, especially the uterine and abdominal muscles. After giving birth, the uterus does not quickly return to its original state, but goes through a process to return to its original condition which requires exercise, known as postpartum exercise. Postpartum exercise is a series of body movements carried out by mothers after giving birth which aims to restore and maintain muscle strength associated with pregnancy and childbirth. Exercises on the pelvic floor muscles will stimulate the nerve fibers in the uterine muscles, namely the sympathetic and parasympathetic nerve fibers which go to the cervical ganglion of the Frankenhauser which is located at the base of the uterine sacro ligament. Munawwarah et al. (2023) stated that postpartum exercise affects physical aspects to improve the quality of life of postpartum mothers. There is a significant influence in the group of mothers who do physical exercise on the well-being of postpartum mothers. Regular physical exercise is an important factor for

maintaining physical health as well as maintaining maximum muscle function and strength, including the reproductive organs.

The results of this study are in accordance with the results of research by Siregar (2014), where after postpartum mothers did postpartum exercises for 3 days with correct movements, the average decrease in uterine fundal height was 5 cm per day. Meanwhile, the decrease in fundal and uterine height in post partum mothers who did not do postpartum exercise was an average of 2 cm per day. From the results of calculations using the t-test, namely the Independent Sample T-Test, the t count was  $11.02 > t$  table 1.70. This means that  $H_0$  is rejected, which shows that there is an influence of postpartum exercise on uterine involution in post partum primiparous vaginal mothers on days 1-3 at the Tutun Sehati Maternity Clinic, Tanjung Morawa. The revealed that there was an influence of postpartum exercise on uterine fundal height with  $p=0.000 (<0.05)$ . There was an effect of postpartum exercise on the type of lochea on days 4 and 7 with  $p = 0.000 (< 0.05)$ . There was an effect of postpartum exercise on decreasing uterine fundal height on the 2nd, 4th and 7th days with  $p = 0.000 (< 0.05)$ . There was an effect of postpartum exercise on the type of lochea on day 7 with a value of  $p = 0.001 (< 0.05)$ .

The results of this study are in line with the results of research by (Usman et al., 2019) where before postpartum exercise was carried out, the average TFU of the treatment group was 10.9 cm and the average TFU of the control group was 10.9 cm. The results of statistical tests using the Mann Whitney test obtained a p value = 0.457, which means there is no difference in average TFU between the treatment group and the control group. Meanwhile, after postpartum exercise, the average TFU in the treatment group was 0.9 cm and the average TFU in the control group was 7.3 cm. The results of statistical tests using the Mann Whitney test obtained a p value  $<0.001$ . Conclusion: There is an influence of postpartum exercise on the speed of uterine involution. Research by Andriyani found that out of 15 postpartum mothers who did postpartum exercise, 13 (86.7%) experienced an appropriate decrease in the height of the uterine fundus. Meanwhile, of the 15 postpartum mothers who did not do postpartum exercise, 4 people (26.7%) experienced a decrease in uterine fundal height which corresponds to a p value of  $0.03 \leq (0.05)$ . The conclusion is that there is an effect of postpartum exercise on reducing the height of the uterine fundus in post-partum mothers. In research by (Andriyani et al., 2017; Ineke, 2016), the mean TFU on day 1 in the treatment group was  $12.37 \pm 0.72$  and  $12.42 \pm 0.54$  in the control group. The mean TFU on day 3 in the treatment group was  $9.00 \pm 0.94$  and  $9.87 \pm 0.75$  in the control group. Meanwhile, the average TFU

on day 6 in the treatment group was  $5.72 \pm 0.88$  and  $7.37 \pm 0.68$  in the control group. There was a significant difference in decrease in uterine fundal height between the two groups on day 3 ( $p=0.00$ ) and day 6 ( $p=0.00$ ). From the research results, it can be concluded that postpartum exercise has an effect on reducing the height of the uterine fundus. The decrease in uterine fundal height in the treatment group was lower than in the control group.

Based on the data obtained, by giving postpartum exercises, the mother's TFU can decrease more quickly than when given boiled purple sweet potato leaves. The benefits of doing postpartum exercises are restoring the strength of the pelvic floor muscles, tightening the muscles of the abdominal wall and perineum, forming a good posture and preventing complications. When carrying out postpartum exercises, the abdominal muscles contract which will help the involution process which begins after the placenta comes out immediately after the involution process.

## Conclusion

The decrease in TFU after giving purple sweet potato leaves to postpartum mothers at the Taman Sari Clinic was 11.5 cm. The decrease in TFU after the postpartum exercise group in postpartum mothers at the Taman Sari Clinic was 11.5 cm. There is a difference between postpartum exercise and purple sweet potato in reducing TFU in postpartum women at the Taman Sari clinic with a value of  $p=0.001$ .

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## Author Contributions

This article was prepared by three authors, namely F.A, Y.A, and A.S. All authors worked together from planning, conducting research, to preparing this article.

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## Conflicts of Interest

The authors declare no conflict of interest.

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