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The Effect of Kegel Exercise on Pelvic Floor Muscle Endurance in Postpartum Mothers with Spontaneous Birth with Perineal Tears

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ABSTRACT

Introduction: The Kegel exercise is a non-invasive method that involves the tightening and relaxing of the pelvic floor muscles. This exercise helps to accelerate the healing process of the perineum and enhances the endurance of the pelvic floor muscles**. Method:** The research employed a quasi-experimental design. The study participants were postpartum mothers who had experienced spontaneous births with perineal tears at Rumah Bidan Rina. Twenty respondents were selected and divided into treatment and control groups. The treatment group received Kegel exercises, while the control group received stretching exercises. The intervention was administered twice a day over a period of 14 days, and the Modified Oxford Grading Scale was used for measurement. **Results:** The Wilcoxon test indicated a result of p = 0.004 (<0.05), signifying a significant influence on the endurance of the pelvic floor muscles in the treatment group. Moreover, the Mann-Whitney test revealed a result of p = 0.044 (<0.05), highlighting a difference in the effect on pelvic floor muscle endurance between the two groups. **Conclusion:** The findings suggest that Kegel exercises have a positive influence on increasing pelvic floor muscle endurance in postpartum mothers who have experienced spontaneous births with perineal tears.

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INTRODUCTION

Spontaneous labor refers to the natural process of giving birth through the vaginal canal, facilitated by contractions and the mother's pushing efforts (Driusso et al., 2020). Vaginal delivery can lead to various complications, one of which is perineal tearing (Megadhana et al., 2022). Perineal tears can result in weakened pelvic floor muscles, causing short-term issues such as bleeding, pain, or infection, and long-term problems like urinary incontinence. As a result, mothers who experience perineal tears during the postpartum period may face limitations in their daily activities (Kramná & Vrublová, 2016). In Asia,

perineal tears account for 50% of all perineal ruptures worldwide. The prevalence of perineal tearing in Indonesia is 24% among mothers aged 25–30 and 62% among those aged 32–39 (Kurniawan et al., 2020).

The primary function of the pelvic floor muscles is to provide coordinated support for all pelvic organs (Junaidi & Maharani, 2022). Reduced endurance of these muscles may lead to issues such as incontinence, pelvic organ prolapse, and sexual dysfunction (Martellucci et al., 2015). At 12 months postpartum, the pelvic floor muscles have yet to fully recover compared to their mid-pregnancy state. As a result, postpartum physical therapy may be beneficial, particularly for women who have had vaginal deliveries (Bø et al., 2022).

Kegel exercises are designed to increase strength, endurance, and coordination of pelvic floor muscles (Shinde et al., 2013). This can aid in the healing process of the perineum and help with bladder control (Hassan, 2020). The exercise involves a non-invasive method of tightening and relaxing the pelvic floor muscles (Raddaha & Nasr, 2022). Previous research recommends Kegel exercises be performed in the first and second weeks following childbirth to strengthen the pelvic floor muscles in new mothers (Loewen et al., 2020). However, research on the effects of Kegel exercises on pelvic floor muscle endurance, particularly in postpartum mothers, remains limited. Therefore, the author is interested in conducting a study to assess the impact of Kegel exercises on pelvic floor muscle endurance in spontaneous postpartum mothers at the Rumah Bidan Rina.

LITERATURE REVIEW

Concept of Childbirth

Childbirth is a process involving the delivery of a baby from the womb. There are two primary methods of childbirth: normal vaginal delivery and cesarean section. Vaginal delivery can result in soft tissue trauma for women (Nygaard et al., 2022). Additionally, multiple deliveries can lead to increased stretching of the pelvic floor muscles, potentially causing weakness. This increased stretching can result in injuries to the muscles and supporting tissues, as well as perineal tears (Samosir & Ilona, 2019).

Postpartum Concept

After giving birth, women experience a postpartum period that typically lasts for 42 days or 6 weeks. This period begins after the placenta is released and continues until the mother's reproductive organs return to their pre-pregnancy state (Ritonga et al., 2022). The labor process involves excessive contraction and stretching of muscles, particularly the pelvic and abdominal muscles, which can lead to weakness in these areas (Siregar & Pane, 2017).

Perineal Tear

Perineum is the tissue that connects the vulva to the anus (Cakwira et al., 2022). During vaginal delivery, the perineum may tear naturally or be deliberately cut by medical professionals to assist in the baby's birth (Kurniawan et al., 2020). Perineal tears can lead to discomfort, especially when they are deep or extensive. This discomfort can prevent daily activities and weaken the perineal muscles (Aydin & Rathfisch, 2020).

Pelvic Floor Muscles

The pelvic floor muscles, including the levator ani muscles (puborectalis, pubococcygeus, and iliococcygeus muscles) and the coccygeus muscles, provide crucial support to the pelvic organs (Cho & Kim, 2021). Pelvic floor muscle strength refers to the muscles' ability to generate maximum contraction and tension, which in turn contributes to good endurance (Mohamad et al., 2019). Muscle endurance is the capacity of a muscle group to sustain repeated contractions over an extended period, leading to muscle fatigue

(Kojima et al., 2020). Adequate pelvic floor muscle endurance is essential for maintaining continence, supporting pelvic organs, and assisting in childbirth (Martellucci et al., 2015).

Kegel Exercise

Kegel exercises are a series of exercises designed to strengthen the pelvic floor muscles through conscious and repeated contractions and relaxation (Ojukwu et al., 2023). When the muscles are contracted, smaller and weaker muscle fibers are activated, and with repeated contractions, larger and stronger muscle fibers are engaged. Over time, regular exercise results in the adaptation of the muscles through an increase in both the number and size of muscle fibers, thereby enhancing the strength and endurance of the pelvic floor muscles (Marques et al., 2010). This exercise is considered a non-invasive treatment method that can be performed independently at any time and in any place, allowing individuals to do it while engaging in other activities without the need for regular hospital visits (Ojukwu et al., 2023). Kegel exercises are typically performed while lying or sitting in a comfortable position, with relaxed gluteus and abdominal muscles, and by regulating breathing. The technique involves contracting the pelvic floor muscles as if trying to stop the flow of urine (Samosir & Ilona, 2019).

METHOD

This research was conducted at Rumah Bidan Rina in Malang City in November 2023. The study used a quasi-experimental design with pre-test and post-test measurements and involved two groups: the treatment group and the control group. The treatment group received Kegel exercises while the control group received stretching exercises. The study spanned 14 days, with both groups performing exercises twice daily. The endurance of the pelvic floor muscles was assessed using the Modified Oxford Grading Scale, which involved calculating the duration of a single uninterrupted pelvic floor muscle contraction. The study included post-partum mothers who had experienced spontaneous birth with perineal tears at Rumah Bidan Rina and employed a probability sampling technique with simple random sampling to select 20 respondents from a population of 24 samples. The inclusion, exclusion, and dropout criteria were considered during the sample selection process, resulting in 10 samples for both the treatment and control groups.

The research analyzed the data using both univariate and bivariate analysis. Univariate analysis focused on describing the characteristics of the respondents, such as age, parity, and birth spacing. On the other hand, bivariate analysis was used to examine the impact of Kegel exercises on pelvic floor muscle endurance in both the treatment group and the control group, and to compare the effects between the two groups. In this analysis, Kegel exercises served as the independent variable, while pelvic floor muscle endurance was the dependent variable. The research utilized Wilcoxon to assess the impact of pelvic floor muscle endurance before and after Kegel exercises were given to the treatment group and the control group. Additionally, Mann Whitney was used to compare the effects of the 14-day training on pelvic floor muscle endurance between the treatment group and the control group. Lastly, the research adhered to a code of ethics No.E.5.a/312/KEPKUMM/XI/2023.

RESULT AND DISCUSSION

The following presents the results and discussion based on research that has been conducted for 14 days on 20 respondents at Rumah Bidan Rina who are included in the inclusion criteria. Table 1 indicates that the majority of respondents are between 25 and 35 years old (90%). In terms of parity, most are multiparous (75%), and the majority have given birth more than 2 years apart (70%).

Table 1. Frequency Distribution of Respondent Characteristics (N=20)

Characteristics	Total	Percentage (%)
Age Group		
<20	1	5
20-35	18	90
>35	1	5
Parity		
Primipara	4	20
Multipara	15	75
Grandepara	1	5
Birth Spacing		
<2 year	6	30
≥2 year	14	70

In this study, a Wilcoxon test was performed to assess the impact of Kegel exercises on the treatment group's pelvic floor muscle endurance before and after the intervention. The analysis revealed that the mean change in the treatment group before and after Kegel exercises was 1.7, with a p-value of 0.004, indicating a significant impact of Kegel exercises on pre- and post-test pelvic floor muscle endurance. Kegel exercises can enhance pelvic floor muscle endurance by strengthening and tightening these muscles. This exercise involves regular contraction and relaxation of the pelvic floor muscles, leading to increased muscle strength and endurance (Shinde et al., 2013). Additionally, Kegel exercises improve blood circulation to the pelvic area, promoting better muscle health and function. Regular Kegel exercises can enhance control and coordination of the pelvic floor muscles, which is crucial for preventing urinary incontinence and providing effective support for the pelvic organs in postpartum mothers (Hassan, 2020). With time, Kegel exercises help improve muscle endurance, enabling the muscles to withstand contractions for longer periods, thereby supporting daily activities more effectively (Rahajeng, 2013). Therefore, consistent and correctly performed Kegel exercises can significantly increase pelvic floor muscle endurance.

Table 2. Wilcoxon and Mann Whitney Test Results

	Intervention	Control	P value
Mean Pre-test	2,5	2,5	
Mean Post-test	4,2	3,3	0,044
	P=0,004	P=0,005	
Mean change	1,7	0,8	

Meanwhile, in the control group performing stretching exercises, the average change value from before to after was 0.8, and the Wilcoxon p-value was calculated to be 0.005, which is less than 0.05. This suggests a significant impact on the pre- and post-test pelvic floor muscle endurance in the control group that did not engage in Kegel exercises. Stretching exercises are beneficial for increasing the flexibility and range of motion of muscles and joints that may experience stiffness or tension during pregnancy and childbirth. Major muscle groups such as the back, pelvis, and legs can benefit from stretching, reducing common post-childbirth pain and discomfort (Nadhiroh *et al*., 2022). Furthermore, stretching contributes to improved blood circulation, accelerating the recovery process by delivering more oxygen and nutrients to areas requiring healing (Ranjan *et al*., 2022). Through regular and targeted stretching exercises, mothers in the postpartum period can enhance their posture, reduce stress, and improve overall well-

being, which is crucial in supporting their care for newborns and regaining fitness after giving birth (Anggraeni *et al*., 2019).

Additionally, further analysis was conducted using the Mann Whitney test to compare the impact of Kegel exercises on pelvic floor muscle endurance between the treatment group and the control group. The test yielded a p-value of 0.044, which is <0.05, indicating a significant difference in the effect of Kegel exercises on pelvic floor muscle endurance between the two groups. This disparity may be attributed to the change in median values before and after administering the exercise. Specifically, the median value in the treatment group increased by 1.7, whereas it only increased by 0.8 in the control group. Thus, it can be inferred that the intervention group is more effective in enhancing pelvic floor muscle endurance compared to the control group. According to a study conducted by Yunifitri & Aulia (2022), it was revealed that the pelvic floor muscle strength in postpartum mothers can improve after 5 days of performing Kegel exercises. When engaging in muscle contractions, smaller and weaker muscle fibers are recruited initially, and with repeated contractions, larger and stronger muscle fibers are activated. Through consistent exercise, the muscles will progressively adapt by increasing the number and size of muscle fibers, ultimately enhancing the strength and endurance of the pelvic floor muscles (Marques et al., 2010). The control group that received stretching exercises also demonstrated a significant increase in pelvic floor muscle endurance. However, the increase was not as substantial as the treatment group that practiced Kegel exercises. This is because stretching exercises take longer to fully restore pelvic floor muscle function. In a study by Zhu (2022), stretching exercises were combined with other interventions to expedite the process of increasing pelvic floor muscle strength and endurance. While stretching exercises are safe and beneficial for improving pelvic floor muscle function, Kegel exercises have been found to have a greater impact on endurance in postpartum mothers with perineal tears.

CONCLUSION

The study demonstrates that Kegel exercises have a positive impact on pelvic floor muscle endurance in postpartum mothers who experienced perineal tears at Rumah Bidan Rina. Furthermore, it reveals a notable difference in effectiveness between the group that received Kegel exercises and the control group, indicating that the Kegel exercise group experienced greater improvement in pelvic floor muscle endurance compared to the control group. Despite the underutilization of Kegel exercises in postpartum cases, and the lack of awareness among mothers regarding the significance of pelvic floor muscle endurance, it is hoped that increased awareness of the benefits of Kegel exercises will lead to more mothers incorporating this exercise into their postpartum recovery regimen. Additionally, this study lays the groundwork for further research and the development of more impactful intervention programs to enhance pelvic floor muscle endurance in postpartum mothers who have experienced perineal tears.

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