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The Effectiveness of Personal Hygiene in Combination with Kegel Gymnastics on the Healing of Perineal Wounds at TPMB Nina Rahayu Gedog Wetan Malang

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ABSTRACT

Background: Perineal lesions are one of the problems that are often experienced by postpartum mothers and are at risk of infection if not treated properly. The combination of personal hygiene and Kegel exercises is believed to speed up the healing of perineal wounds. Objective: To analyze the effectiveness of personal hygiene in combination with Kegel exercises on the healing of perineal wounds in postpartum mothers at TPMB Nina Rahayu Gedog Wetan Turen, Malang Regency. Methods: The study used a quasi-experimental design with a pretest-posttest control group design approach. The number of samples was 32 postpartum mothers who were divided into intervention and control groups using a total sampling technique. The instruments used were the REEDA scale, and data analysis was conducted using the Wilcoxon and Mann-Whitney tests. Results: After the intervention, the intervention group showed a 50% increase in the healing of the well-defined perineal lesion, while the control group remained in the slow-healing category. The results of the Wilcoxon test showed a value of p=0.000, and the Mann-Whitney test showed a value of p=0.000, which means that there was a significant difference between the two groups. Conclusion: Personal hygiene combination Kegel exercises is effective in accelerating the healing of perineal wounds in postpartum mothers.

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INTRODUCTION

The postpartum period is a period of recovery of the reproductive organs after childbirth that lasts for approximately six weeks or 42 days after the placenta is delivered. During this time, the mother's body undergoes various physiological and psychological changes to return to its pre-pregnancy condition (Maryunani, 2018). The recovery process during postpartum requires special attention because the mother is at risk of complications, such as bleeding, infections, and psychological disorders that can affect the health of the mother and baby (Varney, 2018). One of the complications that often occurs in postpartum mothers is perineal injuries due to spontaneous tears or episiotomy during childbirth.

A perineal wound is an injury to the perineal tissue that occurs due to stretching of the birth canal during the delivery process. These wounds can cause pain, discomfort, difficulty mobilizing, and may even hinder the mother's ability to care for the baby and breastfeed (Sulistyawati, 2020). If the wound healing process is slow, the risk of postpartum infection will increase and can lead to serious complications. The World Health Organization (WHO) reports that nearly 90% of vaginal deliveries experience perineal trauma in the form of spontaneous tears or episiotomy (Ghassani et al., 2020). In Indonesia, around 65–75% of postpartum mothers experience perineal lesions of the first to second degree after normal childbirth (Kemenkes RI, 2023).

The healing process of perineal wounds is influenced by various factors, including nutritional status, personal hygiene, early mobilization, psychological conditions, and blood circulation in the perineal area (Cunningham et al., 2020). Good personal hygiene can prevent bacterial contamination in wounds and accelerate tissue regeneration. Cleanliness of the genital area in postpartum mothers must be done regularly using clean water with the correct techniques to prevent infection (Maryunani, 2018). In addition, physical exercise in the form of Kegel exercises is known to increase blood flow to the pelvic floor muscles so as to speed up the wound healing process and improve the tone of the perineal muscles (Prawirohardjo, 2016).

Kegel exercises are exercises for the contraction of the pelvic floor muscles that were first introduced by Arnold Kegel as an effort to strengthen the pubococcygeus muscles and improve blood circulation in the pelvic area. Wulandari and Sulastri (2021) showed that postpartum mothers who routinely performed Kegel exercises experienced faster healing of perineal wounds than the group that did not exercise. Other research by Afni and Ristica (2021) also mentioned that the combination of nonpharmacological treatments had a positive effect on the acceleration of postpartum recovery.

Although various studies have discussed the effects of personal hygiene and Kegel exercises separately, research combining the two interventions is still limited, particularly in independent midwifery services. Therefore, this study was conducted to analyze the effectiveness of personal hygiene in combination with Kegel exercises on the healing of perineal wounds in postpartum mothers at TPMB Nina Rahayu Gedog Wetan Turen, Malang Regency.

METHODS

This study uses a quasi-experimental design with a pretest-posttest control group design approach. This design was used to determine the effectiveness of the combination of personal hygiene and Kegel exercises on the healing of perineal wounds in postpartum mothers by comparing pre- and post-intervention conditions in the intervention group and control group.

The research will be carried out at TPMB Nina Rahayu Gedog Wetan Turen, Malang Regency, in 2025. The study population is all postpartum mothers who have perineal injuries of degrees I and II according to the inclusion and exclusion criteria of the study. The sampling technique used was total sampling with a sample of 32 respondents divided into two groups, namely 16 respondents in the intervention group and 16 respondents in the control group.

The intervention group was given education and personal hygiene actions in the form of cleaning the genital area using clean water after urinating and defecating, changing sanitary napkins regularly, and maintaining the cleanliness of the perineal area. In addition, respondents were also given Kegel exercises, which were carried out twice a day during the observation period. The control group only received standard care according to the obstetric service procedure.

The research instrument used a REEDA (Redness, Edema, Ecchymosis, Discharge, Approximation) scale observation sheet to assess the healing process of perineal wounds. Measurements were taken before the intervention and after the administration of the intervention. The data obtained were analyzed using univariate and bivariate analyses. The Wilcoxon statistical test was used to determine the difference before and after the intervention in each group, while the Mann-Whitney test was used to determine the difference in effectiveness between the intervention group and the control group with a significance level of $p<0.05$.

This research has received ethical approval from the Institutional Review Board of Science and Health Technology RS. dr. Soepraoen with the relevant ethics number No.KEPK-EC/541/III/2026, and all respondents were given informed consent before the research was carried out.

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RESULTS

This study was conducted on 32 postpartum mothers who experienced perineal injuries of all degrees. Il and II TPMB Nina Rahayu Gedog Wetan Turen, Malang Regency. Respondents were divided into two groups, namely an intervention group of 16 respondents who were given a combination of personal hygiene and Kegel exercises, and a control group of 16 respondents who received standard care according to midwifery service procedures.

Karakteristik Responden
Respondent Characteristics

The characteristics of the respondents in this study included age, education, occupation, and parity. The characteristics of the respondents are important to know because they can affect the healing process of perineal wounds in postpartum mothers.

Table 1.1 Frequency Distribution of Respondent Characteristics
Table 5.1 Characteristics of Respondents

Variabel	Category	f	%
Age	<20 Years	5	15,6
	20–30 Years	14	43,8
	≥30 Years	13	40,6
Education	SMP	7	21,9
	SMA	16	50,0
	College	9	28,1
Jobs	Labor	5	15,6
	IRT	16	50,0
	PNS	2	6,3
	Private	5	15,6
	Entrepreneurship	4	12,5
Paritas	Primigravida	14	43,8
	Multigravity	18	56,2
Self-Mobilization	Disturbed	9	28,1
	Uninterrupted	23	71,9
Signs of infection	Ada	6	18,8
	None	26	81,2

Based on Table 1, almost all of the respondents are of a healthy reproductive age, which is 20–35 years. Healthy reproductive age is the optimal age for the wound healing process because cellular regeneration, bodily metabolism, and tissue elasticity are still going well (Manuaba, 2019). At the late stage, the stability of the form collagen and vascularized tissues is better than that of high-risk age.

Judging from the level of education, the majority of respondents have at least high school education. The level of education affects the mother's ability to receive health information and apply the education provided related to personal hygiene and Kegel exercises. Respondents with higher education tend to understand better. Based on parity, almost all of the respondents are primipara. Primipara mothers have a higher risk of perineal tears because the reproductive tissue has never been stretched before, so the elasticity of the perineum is still limited (Prawirohardjo, 2016).

Overview of the healing of perineal wounds before the intervention. The results of the initial observation showed that all respondents in the intervention group and the control group were in the slow wound healing category based on the results of the assessment skala REEDA (*Redness, Edema, Ecchymosis, Discharge, Approximation*).

Table 2. Distribution of Perineal Wound Healing Before Intervention

Categories Healing	Intervention Group f (%)	Control Group f (%)
Good	0 (0%)	0 (0%)
Medium	4 (25%)	3 (18,75%)
Slow	12 (75%)	13 (81,25%)
Total	16 (100%)	16 (100%)

Based on Table 2, almost all of the respondents were in the slow wound healing category. This condition is characterized by redness in the wound area, mild to moderate edema, perineal pain, and wound dehiscence that is not optimal.

In the early postpartum phase, the perineal lesion is still in the inflammatory phase. The inflammatory phase is the initial stage of wound healing,, which is characterized by vasodilation of blood vessels and infiltration of leukocytes, so that the wound area appears reddish and swollen (Cunningham et al., 2020). This inflammatory reaction is the body's physiological response to tissue damage.

In addition, the discharge of fluid during the postpartum period causes the genital area to become more moist, increasing the risk of bacterial growth in perineal wounds. This condition causes postpartum mothers to require optimal wound care to prevent postpartum infections. Some respondents also complained of pain when sitting, walking, and urinating. The pain likely occurred due to postpartum perineal tissue trauma and ongoing inflammatory processes.

Description of the healing of perineal wounds after the intervention

After being given a combination of personal hygiene and Kegel exercises, the intervention group showed a significant improvement in perineal wound healing compared to the control group.

Table 3.1 Distribution of Perineal Wound Healing After Intervention

Categories: Healing	Intervention Group f (%)	Control Group f (%)
Good	8l (50%)	2l (12,5%)
Medium	7l (43,75%)	5l (31,25%)
Slow	1 (6,25%)	9 (56,25%)
Total	16 (100%)	16 (100%)

Based on Table 3, the intervention group experienced a 50% increase in the good healing category, while in the control group most of the respondents were still in the slow healing category.

In the intervention group, the wound appeared drier, the edema and redness were reduced, and the union of the wound tissue improved. Respondents also reported reduced pain in the perineal area,l lwalking, walking, and breastfeeding.

Improvement in wound conditions in the intervention group occurred because personal hygiene helped keep the wound area clean, thereby reducing the risk of bacterial contamination and accelerating the process of tissue epithelialization. According to Maryunani (2018), Maintained cleanliness of the genital area can accelerate tissue regeneration and prevent prolonged inflammation.

In addition, Kegel exercises help increase the contraction of the pelvic floor muscles so that blood circulation to the perineal area becomes smoother. Increased blood flow helps in the distribution of oxygen and nutrients needed for the formation of new tissues and collagen synthesis (Prawirohardjo, 2016).

Meanwhile, in the control group, the respondents were still found with mild edema, perineal pain, and wound union that was not optimal. This lsuggestsl lthatl lstandardl treatment without a combination of interventions has not given optimal results in accelerating the healing of perineal wounds.

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Table 4. Wilcoxon Test Results in the Intervention Group

Variabel	Mean Rank	p-value
Before–After Intervention	8,50	0,000

Based on the results of the Wilcoxon test in Table 4, a value of p=0.000 (<0.05) was obtained, which means that there is a significant influence of the combination of personal hygiene and Kegel gymnastics on the healing of perineal wounds in postpartum mothers.

These results show that the intervention provided is able to speed up the wound healing process compared to the condition before treatment. The combination of both interventions helps to accelerate the transition from the inflammatory phase to the proliferation phase in the wound healing process.

Table 5. Results of the Mann-Whitney Test between the Intervention and Control Groups

Groups	Mean Rank	p-value
Intervention	22,50	0,000
Control	10,50	

Based on the results of the Mann-Whitney test in Table 5, a value of p=0.000 (<0.05) was obtained, so it can be concluded that there is a significant difference in ffectiveness between the intervention group and the control group.The intervention group had a higher *mean rank* than the control group, suggesting that the combination of personal hygie ne and Kegel exercises was more effective in accelerating the healing of perineal wounds than standard care.

In theory, the wound healing process consists of the phases of inflammation, proliferation, and maturation. In the proliferation phase, there is the formation of granulation tissue, angiogenesis, fibroblast proliferation, and collagen synthesis to repair damaged tissues (Varney, 2018). The combination of personal hygiene and Kegel exercises helps speed up the process as the wound remains clean and tissue vascularization increases.

Personal hygiene helps reduce the number of microorganisms in the wound area so that the risk of infection is lower, while Kegel exercises increase tissue oxygenation through increased blood circulation. Oxygen is needed in collagen formation and epithelial cell regeneration so that wound healing takes place faster.

Interpretation of the Research Results

The results of the study showed that the combination of personal hygiene and Kegel exercises had a positive impact on the healing of perineal wounds in postpartum mothers. This intervention not only speeds up wound healing physiologically, but also improves maternal comfort during the postpartum period.

Postpartum mothers' whole experience is faster wound healing and is more comfortable in early mobilization, breastfeeding, and caring for their babies. In addition, the combination of personal hygiene and Kegel gymnastics is a non-pharmacological intervention that is relatively easy to do, safe, inexpensive, and can be applied independently at home.

Thus, a combination of personal hygiene and Kegel exercises can be recommended as part of evidence-based midwifery care in improving the quality of maternal health services, especially during the postpartum period.

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DISCUSSION

The results of the study showed that the combination of personal hygiene and Kegel exercises was effective in accelerating the healing of perineal wounds in postpartum mothers. This is evidenced by the results of statistical analysis using the Wilcoxon test which shows a value of p=0.000 (<0.05) in the intervention group, as well as the results of the Mann-Whitney test with a value of p=0.000 (<0.05) which shows a significant difference between the intervention group and the control group. These findings suggest that the combination of personal hygiene and Kegel exercises has a significant effect on accelerating the healing of perineal wounds compared to standard treatments.

At the beginning of the study, most of the respondents in both the intervention group and the control group were in the slow wound healing category. This condition is characterized by *redness*, edema, pain, and imperfect wound union based on the REEDA scale assessment. This condition is in accordance with the theory of Cunningham et al. (2020) which states that in the early postpartum phase, the perineal lesion is still in the inflammatory phase. In this phase, there is vasodilation of blood vessels, increased capillary permeability, leukocyte infiltration, and release of inflammatory mediators in response to tissue damage.

The inflammatory process is an important early stage in wound healing because it functions to clean damaged tissue and prevent infection. However, if the inflammation lasts too long, the wound healing process will be hampered. This causes the wound to dry for longer, prolonged pain, and increases the risk of postpartum infection. Therefore, optimal wound care is indispensable to accelerate the transition from the inflammatory phase to the proliferation phase.

After being given a combination of personal hygiene and Kegel exercises, the intervention group showed a significant improvement in wound healing. Most of the respondents experienced a decrease in REEDA score which was characterized by reduced edema, redness, pain, and improved wound tissue unification. In addition, the wounds appeared drier and respondents reported increased comfort when performing daily activities such as sitting, walking, and breastfeeding.

The improvement of the condition of the wound occurs because personal hygiene plays an important role in maintaining the cleanliness of the perineal area so that it can prevent bacterial contamination in postpartum wounds. According to Maryunani (2018), Personal hygiene in postpartum mothers includes body hygiene in general and genital hygiene in particular which is carried out regularly using clean water and correct techniques. Cleanliness of the wound area can reduce the risk of infection and accelerate the tissue regeneration process.

In addition to maintaining wound cleanliness, personal hygiene also helps maintain wound moisture at optimal conditions. Wounds that are too moist can be a medium for the growth of microorganisms, while wounds that are too dry can slow down the process of tissue epithelialization. Therefore, proper perineal care is able to create a wound environment that supports the healing process physiologically.

This study also shows that Kegel gymnastics contributes greatly to the acceleration of the healing of perineal wounds. Kegel exercises are exercises for contracting the pelvic floor muscles that aim to increase the strength and elasticity of the pubococcygeus muscles. According to Prawirohardjo (2016), Contractions of the pelvic floor muscles that are carried out regularly can increase blood circulation to the pelvic and perineal areas so that the distribution of oxygen and nutrients to the wound tissue becomes more optimal.

Improved blood circulation has an important role in the wound healing process. Oxygen carried through the bloodstream is required in the processes of collagen synthesis, fibroblast proliferation, granulation tissue formation, and epithelial cell regeneration.

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Collagen is the main component in the formation of new tissues so that it greatly determines the strength and speed of wound healing. If the oxygen supply to the tissues is not optimal, the collagen formation process will be disrupted and wound healing will be slower.

In addition to improving tissue vascularity, Kegel exercises also help improve the tone of the pelvic floor muscles that are stretched during labor. Strengthening the pelvic floor muscles can help improve the stability of the perineal tissue and reduce postpartum discomfort. This causes postpartum mothers to be more comfortable doing early mobilization, which also plays an important role in accelerating postpartum recovery.

The results of this study are in line with the research of Wulandari and Sulastri (2021) who stated that Kegel gymnastics is effective in accelerating the healing of perineal wounds in postpartum mothers. The study showed a significant decrease in REEDA scores in postpartum mothers who performed Kegel exercises regularly compared to the control group. Research by Afni and Ristica (2021) also states that pelvic floor exercises are able to increase tissue elasticity and speed up the postpartum recovery process.

In addition, the results of this study are also supported by the research of Rohmin et al. (2017) which states that personal hygiene has a significant relationship with accelerating the healing of perineal wounds. Postpartum mothers who maintain the cleanliness of the genital area regularly have a lower risk of infection and experience faster wound healing than postpartum mothers with poor personal hygiene.

The combination of personal hygiene and Kegel exercises provides a more optimal effect than if done separately. Personal hygiene functions to maintain wound hygiene and prevent infection, while Kegel exercises increase tissue vascularity and accelerate cell regeneration. The two interventions work synergistically in supporting the healing process of perineal wounds.

Physiologically, the wound healing process consists of the phases of inflammation, proliferation, and maturation. In the proliferation phase, there is the formation of granulated tissue, angiogenesis, fibroblast proliferation, and collagen synthesis to repair damaged tissues (Varney, 2018). The combination of personal hygiene and Kegel exercises helps speed up the process as the wound remains clean and the blood supply to the tissues increases. Thus, the transition from the inflammatory phase to the proliferation phase can take place faster so that wound healing becomes more optimal.

The results also showed that the control group that only received standard care still experienced relatively slow wound healing. Some respondents still experience mild edema, pain, and wound consolidation that is not optimal. This suggests that standard treatment without additional intervention has not been effective enough in accelerating the healing of perineal wounds.

Other factors that also affect the healing of perineal wounds include age, nutritional status, education level, early mobilization, and the psychological condition of postpartum mothers. Most of the respondents in this study are at a healthy reproductive age, which is 20-35 years old, so the ability to regenerate tissues is still quite good. In addition, the majority of respondents have secondary education which makes it easier to understand education related to wound care and the implementation of Kegel exercises.

Early mobilization also affects the wound healing process because it helps improve blood circulation and prevent venous stasis in the pelvic area. Postpartum mothers who are actively mobile tend to have faster recovery than mothers who do not mobilize. In addition, a good psychological condition can also increase the body's immune response so as to speed up the wound healing process.

The combination of personal hygiene and Kegel exercises in this study has several advantages, namely easy to do, does not require large costs, is safe, and can be applied independently by postpartum mothers at home. This non-pharmacological approach is very suitable to be applied in *evidence-based practice-based* midwifery services to improve the quality of postpartum care and prevent postpartum complications.

However, this study has some limitations. The relatively small number of samples means that the results of the study cannot be generalized widely. In addition, the limited observation time caused researchers to not be able to assess wound healing in the long term. Other factors such as nutritional status, the level of compliance of respondents in performing Kegel exercises, and the psychological condition of postpartum mothers also could not be fully controlled during the study.

Therefore, further research is recommended to use a larger sample count, longer observation time, and consider other factors that can affect the healing of perineal wounds in order to obtain more comprehensive and representative research results.

CONCLUSION

Based on the results of research that has been conducted on the effectiveness of personal hygiene in combination with Kegel gymnastics on the healing of perineal wounds in postpartum mothers at TPMB Nina Rahayu Gedog Wetan Turen, Malang Regency, it can be concluded that the combination of personal hygiene and Kegel gymnastics has been proven to be effective in accelerating the healing process of perineal wounds in postpartum mothers. This is evidenced by the results of statistical analysis that show significant differences before and after the administration of the intervention in the intervention group with a value of p=0.000 (<0.05), as well as a significant difference between the intervention group and the control group based on the results of the Mann-Whitney test with a value of p=0.000 (<0.05).

Before the intervention was given, most of the respondents in the intervention group and the control group were in the slow wound healing category. This condition is characterized by redness, edema, perineal pain, and wound union that is not optimal based on the REEDA scale assessment.After all the combination of personal hygiene and Kegel exercises, the intervention group showed a significant improvement in wound healing, characterized by reduced signs of inflammation, decreased pain, drier-appearing wounds, and better wound tissue consolidation than the control group.

Personal hygiene plays an important role in maintaining the cleanliness of the perineal area so that it can prevent bacterial contamination and reduce the risk of postpartum infection.Maintaining cleanliness of the genital area helps to create optimal wound conditions for the epithelial process and tissue regeneration. Meanwhile, Kegel exercises help improve blood circulation to the pelvic and perineal areas so that the distribution of oxygen and nutrients to the wound tissue becomes more optimal. The increase in vascularization plays a role in accelerating collagen formation, fibroblast proliferation, and the formation of new tissues in the wound healing process.

The combination of these two interventions provides mutually supportive effects in accelerating the healing of perineal wounds. Personal hygiene works by maintaining hygiene and preventing infections, while Kegel exercises help improve pelvic floor muscle tone and increase blood flow to the perineal tissue. Thus, the combination of personal hygiene and Kegel gymnastics is able to accelerate the transition from the inflammatory phase to the proliferation phase in the wound healing process.

In addition to accelerating wound healing physiologically, the combination of personal hygiene and Kegel exercises also has a positive impact on the comfort and quality of life of postpartum mothers. Postpartum mothers who experience faster wound healing tend to be more comfortable when sitting, walking, performing early mobilization, breastfeeding, and caring for their babies. This condition is very important in supporting the mother's adaptation process in the postpartum period and improving the quality of midwifery care.

This intervention also has several advantages, namely it is easy to do, safe, does not require large costs, and can be applied independently by postpartum mothers at home. Therefore, the combination of personal hygiene and Kegel gymnastics can be recommended as a form of evidence-based nonpharmacological obstetric care in an effort to improve the quality of maternal health services, especially during the postpartum period.

Although this study showed significant results, the study still has some limitations, including the relatively small number of samples and limited observation time so that the results cannot be generalized widely. Therefore, researchers are further advised to conduct studies with a larger sample count, longer observation time, and consider other factors that can affect the healing of perineal wounds, such as nutritional status, activity level, and psychological condition of postpartum mothers.

Overall, this study proves that the combination of personal hygiene and Kegel gymnastics is an effective intervention in accelerating the healing of perineal wounds in postpartum mothers and can be used as one of the recommendations in the practice of obstetric services to improve the health and welfare of postpartum mothers.

AUTHOR'S STATEMENT

Authors' contributions and responsibilities

IPS: Formal Data Collection and Analysis, Original Draft Writing, Conceptualization, Supporting Drafts, Review, and Editing; **RDP**: Writing supporting drafts, reviewing and editing, validation; **WSI**: Writing supporting drafts, reviewing and editing, validation.

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Personal expenses.

Availability of data and materials

All data and supporting materials for this study are available and can be requested directly from the authors of the correspondence.

Competing interests

The author states that there are no competing interests.

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