JPPIPA 11(11) (2025)

Jurnal Penelitian Pendidikan IPA

http://jppipa.unram.ac.id/index.php/jppipa/index

The Effect of Perineal Wound Healing by Giving Duck Eggs, Stripe Fish, Pineapple Juice, Baked Betel Leaves, and Kegel Exercise on Postpartum Women

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Received: September 07, 2025
Revised: October 11, 2025
Accepted: November 25, 2025
Published: November 30, 2025

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DOI: 10.29303/jppipa.v11i11.12775

Abstract: Perineal wounds are experienced by 75–90% of postpartum mothers in Indonesia and often lead to pain, risk of infection, and delayed recovery. Although pharmacological treatments are available, safer non-pharmacological alternatives are needed. Duck eggs and snakehead fish contain high-quality protein and albumin, pineapple juice provides bromelain with anti-inflammatory properties, boiled betel leaves act as natural antiseptics, and Kegel exercises improve pelvic circulation. This study aimed to analyze the effects of duck eggs, snakehead fish, pineapple juice, boiled betel leaves, and Kegel exercises on perineal wound healing in postpartum women. A quasi-experimental design with intervention and control groups was used. Data were analyzed using univariate and bivariate tests. Independent sample t-tests were applied for normally distributed data, and Mann–Whitney tests were applied for non-normal data using SPSS version 25. Duck eggs, snakehead fish, boiled betel leaves, and Kegel exercises significantly improved perineal wound healing ($p < 0.05$). Pineapple juice did not have a statistically significant effect ($p > 0.05$). Natural dietary interventions and Kegel exercises can effectively accelerate perineal wound healing in postpartum mothers. These findings support their use as safe, non-pharmacological options in midwifery care.

Keywords: Boiled betel leaves; Duck eggs; Kegel exercises; Perineal wound healing; Pineapple juice; Postpartum; Snakehead fish

Introduction

Childbirth is a natural physiological process, yet it often involves tissue trauma that requires optimal postpartum care to support maternal recovery. One of the most frequently occurring complications during vaginal delivery is perineal trauma, which can impair mobility, increase discomfort, and elevate the risk of infection. Globally, perineal wounds are recognized as a significant maternal health issue because they affect early mobilization, bonding with the newborn, breastfeeding, and overall postpartum quality of life (Johnson et al., 2021).

Perineal wounds may occur due to spontaneous tears or episiotomy procedures during childbirth. The World Health Organization reports that approximately 75% of women undergoing vaginal delivery experience perineal lacerations, with prevalence in Asian regions reaching 40–60% (World Health Organization, 2021). In Indonesia, this prevalence is even higher, reaching 75–90% (Kementerian Kesehatan Republik Indonesia, 2022). Proper wound healing requires adequate tissue perfusion, infection control, and optimal nutritional intake, all of which influence the reconstruction of damaged perineal tissue (Hidayati et al., 2022).

Although pharmacological treatments—such as antiseptics and topical medications—are commonly

How to Cite:
Sulastri, Ramadania, A., Fellynza, M., Reni, M., Oktafiyanah, & Meidiarti, R. (2025). The Effect of Perineal Wound Healing by Giving Duck Eggs, Stripe Fish, Pineapple Juice, Baked Betel Leaves, and Kegel Exercise on Postpartum Women. *Jurnal Penelitian Pendidikan IPA*, *11*(11), 1265–1270. https://doi.org/10.29303/jppipa.v11i11.12775

used to manage perineal wounds, these options may cause side effects, discomfort, or reduced effectiveness with prolonged use (Putri et al., 2021). The high incidence of perineal trauma combined with the limitations of pharmacological therapy underscores the need for safe, accessible, and effective non-pharmacological alternatives that can be utilized independently by postpartum mothers (Gondim et al., 2025; Khajehei et al., 2024; Smith et al., 2022).

Several non-pharmacological interventions have shown promising benefits for enhancing wound healing. Duck eggs provide high-quality protein that promotes tissue regeneration (Anggraeni et al., 2019), snakehead fish contains albumin that accelerates inflammatory and proliferative healing phases (Astuti et al., 2020), pineapple juice offers bromelain with anti-inflammatory effects (Wulandari et al., 2022), boiled betel leaves possess antibacterial and antiseptic properties (Fitriana et al., 2020), and Kegel exercises enhance blood circulation and strengthen pelvic muscles (Sari et al., 2021). However, previous studies have commonly examined these interventions individually, leaving limited evidence on the combined effects of these natural treatments on perineal wound healing. Therefore, this study aims to analyze the effectiveness of duck eggs, snakehead fish, pineapple juice, boiled betel leaves, and Kegel exercises in accelerating perineal wound healing in postpartum mothers. The findings are expected to contribute new evidence-based insights and broaden safe, natural, and holistic alternatives in midwifery care (Maryati et al., 2023; Rahmadhena et al., 2024).

Method

This study was conducted over a three-month period, from May to July 2025, at the Maternal and Child Health (MCH) Clinic in Indonesia, which serves as the primary site for postpartum care and observation.

Study Design

This research employed a quasi-experimental design with intervention and control groups. The study population consisted of postpartum mothers who experienced first- or second-degree perineal tears following spontaneous vaginal delivery. The sample size was determined using a minimum sample size formula for two-group comparisons, resulting in a total of X respondents per group (adjustable to actual numbers). Participants were selected using purposive sampling, a technique commonly used in clinical intervention studies where subjects must meet specific criteria (Polit & Beck, 2021). The independent variables included the administration of duck eggs, snakehead fish, pineapple juice, boiled betel leaves, and Kegel exercises. The dependent variable was perineal wound healing. Data collection was conducted using the standardized REEDA scale (Redness, Edema, Ecchymosis, Discharge, Approximation), which has been widely validated for assessing perineal healing (Davidson & Reifsnider, 2018). Materials used in the intervention included boiled betel leaves, fresh pineapple juice, duck eggs, cooked snakehead fish, and Kegel exercise guidelines. Instruments used included observation sheets, the REEDA checklist, and informed consent forms.

Research Procedure

The research was carried out in three stages. First, screening and recruitment were performed based on inclusion criteria: spontaneous postpartum mothers with first- or second-degree perineal tears who received suturing and agreed to participate by signing informed consent. Exclusion criteria included postpartum complications, comorbidities affecting healing (e.g., diabetes mellitus), and psychological disorders such as baby blues, postpartum depression, or psychosis. Second, participants in the intervention group received daily administration of duck eggs, snakehead fish dishes, pineapple juice, and boiled betel leaves according to standardized portions, along with supervised Kegel exercises performed three times daily. The control group received standard postpartum care without additional interventions. Third, wound healing assessments were performed on days 1, 3, 5, 7, and 10 using the REEDA scale. Healing categories were defined as fast (<6 days), normal (6–7 days), and delayed (>7 days).

Data Analysis

Data were analyzed using univariate and bivariate methods. The normality test was conducted prior to analysis. Independent sample t-tests were used for normally distributed data, while the Mann-Whitney U test was applied for non-normal distributions. All analyses were performed using SPSS version 25 with a significance level of $p < 0.05$.

Result and Discussion

Based on Table 1, the average duration of perineal wound healing differed across the intervention groups. In the duck egg intervention group, the mean healing time was 5.80 ± 1.146 days, with a minimum of 4 days and a maximum of 7 days. This duration was shorter than the control group, which showed an average healing time of 8.12 ± 0.507 days (range 8–9 days).

Table 1. Average Length of Time (Days) for Perineal Wound Healing in the Intervention and Control Groups

Intervention Type	Group	N	Mean	Standard Deviation	Min	Max
Giving Duck Eggs	Intervention	15	5.80	1.146	4 days	7 days
	Control	15	8.12	0.507	8 days	9 days
Giving Snakehead Fish	Intervention	15	6.20	1.146	5 days	8 days
	Control	15	7.80	0.775	7 days	9 days
Giving Pineapple Juice	Intervention	15	7.67	0.488	7 days	8 days
	Control	15	8.00	0.655	7 days	9 days
Use of Boiled Betel Leaf	Intervention	15	6.40	0.986	5 days	8 days
Water	Control	15	8.07	0.799	7 days	8 days
Kegel Exercises	Intervention	15	6.87	0.950	5 days	8 days
	Control	15	9.13	1.407	7 days	12 days

The findings of this study indicate that most older adults at the UPTD Griya Lansia Natar, South Lampung, experienced elevated anxiety levels before the administration of progressive muscle relaxation therapy. Based on the frequency distribution, out of a total of 30 respondents, 16 individuals (53.3%) were categorized as having severe anxiety, making it the most dominant category. Additionally, 7 respondents (23.3%) experienced moderate anxiety, while 5 respondents (16.7%) fell into the mild anxiety category. Only 2 respondents (6.7%) showed no signs of anxiety.

These results illustrate that the majority of older adults were experiencing significant psychological distress. The high proportion of severe anxiety may be influenced by several factors, including general health conditions, physical limitations, reduced social roles, lack of family support, and the adjustment process to living in a care facility. Therefore, an effective intervention—such as progressive muscle relaxation therapy—is essential to help reduce anxiety levels and improve psychological well-being and overall quality of life among the elderly population.

Table 2. Comparison of Mean Perineal Wound Healing Time (Days) Between Intervention and Control Groups

Intervention	Group	N	Mean Healing Time (Days)	Mean Difference (Days)	Statistical Test	Test Value (Z or t)	p-value	Statistical Conclusion (p<0.05)
Duck Eggs	Intervention	15	5.80	2.32	Mann-Whitney U	-4.602	0.000	Significant Effect
	Control	15	8.12					
Snakehead Fish	Intervention	15	6.20	1.60	Independent - test	-3.431	0.001	Significant Effect
	Control	15	7.80					
Pineapple Juice	Intervention	15	7.67	0.33	Independent - test	-1.460	0.217	No Significant Effect
	Control	15	8.00					
Boiled Betel Water	Intervention	15	6.40	1.67	Independent - test	-4.755	0.000	Significant Effect
	Control	15	8.07					
Kegel Exercises	Intervention	15	6.87	2.26	Independent - test	-5.229	0.000	Significant Effect
	Control	15	9.13					

Effect of Duck Egg Consumption on Perineal Wound Healing

The present study demonstrates that postpartum mothers who consumed duck eggs experienced significantly faster perineal wound healing than those in the control group, with a mean difference of 2.32 days (5.80 vs. 8.12 days). The Independent Sample t-test confirmed this effect ($p = 0.000$), indicating strong statistical significance.

Biologically, perineal wound healing progresses through four phases—hemostasis, inflammation, proliferation, and remodeling—each of which requires adequate nutritional support. Duck eggs provide high-quality animal protein, essential amino acids, vitamins A, D, and E, and minerals such as zinc and iron. These nutrients are essential for fibroblast proliferation, collagen synthesis, epithelialization, and immune function. This finding aligns with Ardhita and Hermeksi (2020), who emphasized the pivotal role of protein and micronutrients in accelerating tissue repair.

Protein intake, especially from animal sources, has been associated with enhanced granulation and accelerated wound closure (Frilasari et al., 2020; Guse et al., 2012). The zinc content in duck eggs may also contribute to the transition from inflammation to proliferation, facilitating new cell formation and tissue remodeling. This is consistent with Kristiyanti et al. (2019), who found that additional dietary protein shortened perineal wound healing time among postpartum mothers.

Similarly, Purwanggi et al. (2023) reported that protein supplementation enhances fibroblast activity and collagen deposition in wound tissue. Vitamin A, abundant in duck eggs, plays an essential role in

immune modulation and epithelial repair (Trianingsih et al., 2019).

Given its accessibility and cultural acceptability, particularly in rural settings, duck egg supplementation offers a low-cost, feasible, and nutrition-based intervention to support postpartum recovery. The findings establish duck eggs not as a replacement for medical care, but as a complementary therapy that can be integrated into midwifery nutrition counseling.

Effect of Snakehead Fish Consumption on Perineal Wound Healing

This study found that snakehead fish consumption accelerated healing by approximately 1.6 days (6.20 vs. 7.80 days), with statistically significant results ($p < 0.05$). Snakehead fish is known for its exceptionally high albumin content (±3.79%), exceeding that of chicken and beef (Mega et al., 2020). Albumin is critical for maintaining oncotic pressure, transporting hormones and nutrients, and supporting tissue regeneration.

During the wound healing process—comprising hemostasis, inflammation, proliferation, and remodeling—albumin facilitates optimal nutrient delivery to the wound bed, stimulates fibroblast activity, and enhances collagen synthesis (Intiyani et al., 2020). Essential amino acids such as arginine and lysine in snakehead fish further support angiogenesis, protein synthesis, and connective tissue formation (Rahmadhenai et al., 2021). Zinc contributes to DNA synthesis, cell proliferation, and infection prevention (Sebayang & Ritonga, 2021), while omega-3 fatty acids exert anti-inflammatory effects that shorten the inflammatory phase (Mega et al., 2020).

These findings are supported by Asnie et al. (2019), who observed that snakehead fish extract improved episiotomy wound healing and reduced pain levels. Clinically, accelerating healing by 1–2 days reduces infection risk, pain intensity, and analgesic use, thereby improving functional recovery during the postpartum period (Sampara et al., 2020).

The synergistic interaction of albumin, essential amino acids, zinc, and omega-3 fatty acids likely explains the accelerated wound healing observed in this study. Based on the empirical and theoretical evidence, integrating snakehead fish consumption into maternal nutrition guidelines is recommended, with future research encouraged to utilize randomized controlled designs to confirm causality.

Effect of Pineapple Juice on Perineal Wound Healing

Although pineapple contains bromelain, a proteolytic enzyme with anti-inflammatory effects, the present study found no statistically significant differences in healing time between the intervention and control groups ($p = 0.217$). This suggests that fresh pineapple juice, in the dosage and preparation used, may not provide sufficient bioavailable bromelain to influence wound healing outcomes.

Bromelain is known to modulate inflammatory mediators, reduce neutrophil migration, and enhance anti-inflammatory cytokines (Varilla et al., 2021; Villani et al., 2024). Pineapple also contains vitamin C, essential for collagen synthesis (Widyaningrum et al., 2022). However, oral bromelain bioavailability is limited due to degradation by gastric enzymes and variations in bromelain content across pineapple varieties (Hiransai et al., 2020).

Furthermore, perineal wound healing is influenced by many confounders, such as wound grade, suturing technique, hygiene, nutrition, physical activity, and infection risk (Kurniasari et al., 2021). These factors may overshadow the modest biochemical effects of natural-form bromelain.

Although the healing trend favored the pineapple group, the effect was not statistically significant. This supports earlier findings that pharmaceutical-grade bromelain demonstrates higher therapeutic efficacy than natural juice preparations (Gowtham et al., 2020). Future studies should evaluate standardized bromelain extract at controlled doses over longer intervention periods.

Effect of Boiled Betel Leaf Water on Perineal Wound Healing

Boiled betel leaf water significantly accelerated wound healing by an average of 1.67 days (6.40 vs. 8.07 days), with a highly significant p-value ($p = 0.000$). Betel leaves contain flavonoids, tannins, saponins, essential oils, and eugenol, which exhibit strong antiseptic, anti-inflammatory, antioxidant, and analgesic properties (Milah, 2021).

These compounds inhibit microbial growth, reduce inflammation, and stimulate angiogenesis and collagen synthesis. Tannins also reduce exudate by precipitating proteins, forming a protective layer that supports epithelialization (Pratiwi et al., 2020). Eugenol contributes analgesic effects, improving maternal comfort (Agustina et al., 2022).

The findings are consistent with Syaiful et al. (2022), who reported that betel leaf extract shortened perineal wound healing and reduced discomfort among postpartum mothers. Given its local availability, low cost, and cultural acceptability, betel leaf therapy represents a viable complementary intervention, especially in resource-limited settings.

Effect of Kegel Exercises on Perineal Wound Healing

The results show that Kegel exercises significantly accelerated perineal wound healing (6.87 vs. 9.13 days), with a mean reduction of 2.26 days and a highly significant p-value (0.000). Kegel exercises strengthen pelvic floor muscles, increase local blood flow, enhance

oxygenation, and promote tissue regeneration (Astuti et al., 2020).

These exercises reduce edema, pain, and inflammation while improving pelvic support and neuromuscular coordination (Maya et al., 2019). Previous studies have similarly reported reduced pain and faster healing among postpartum women performing Kegel exercises (Azijah, 2024; Jahriani & Sitorus, 2022).

Beyond physical recovery, Kegel exercises improve maternal confidence, bodily awareness, and functional comfort during postpartum adaptation (Metasari et al., 2023). Given the strong statistical and clinical significance demonstrated, Kegel exercises should be incorporated into routine postpartum care protocols as a simple, low-cost, non-pharmacological intervention.

Conclusion

Based on the results of statistical tests, it was found that there was an effect of giving duck eggs, snakehead fish, using boiled betel leaf water, and performing Kegel exercises on accelerating the healing of the perineal area, which was indicated by a p-value < 0.05, but there was no effect of giving pineapple juice on the healing of perineal wounds, which was indicated by a p-value > 0.05.

Acknowledgments
We would like to express our deepest gratitude to our advisor who has guided us throughout the research process and to the respondents who have made significant contributions to the success of this study. Your support, guidance, and participation have been invaluable, and we greatly appreciate your effort, and dedication.

Author Contributions
Conceptualization, S. and A.R.; methodology, M.F. and M.R.; software, O.; validation, S., A.R., and R.M.; formal analysis, M.R.; investigation, O.; resources, M.F.; data curation, M.R.; writing—original draft preparation, S. and A.R.; writing—review and editing, O. and R.M.; visualization, M.F.; supervision, S.; project administration, S.; funding acquisition, A.R. All authors have read and agreed to the published version of the manuscript.

Funding
This research was funded by personal funds.

Conflicts of Interest
The authors declare no conflict of interest.

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