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Yoga Exercises Have an Effect on Accelerating the Recovery of Diastasis Recti Abdominis Muscles in Postpartum Women

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ABSTRACT

Background: diastasis Recti Abdominis Muscle (DRAM), a condition characterized by the separation of the rectus abdominis muscles along the linea alba, commonly occurs postpartum and may impair quality of life. Yoga has been proposed as a non-invasive intervention to address this issue through core muscle engagement and tissue remodeling.
Purpose: this study aims to determine the effectiveness of yoga in accelerating the recovery of diastasis recti abdominis muscle in postpartum women.
Methods: this quasi-experimental study employed a non-equivalent control group pretest-posttest design. Forty-eight postpartum women (4–10 days postpartum) were recruited, with 45 meeting the inclusion criteria and divided into intervention and control groups. The intervention group participated in structured yoga sessions (20 minutes/session, 4 times/week for 3 weeks), while the control group received routine postnatal exercise advice. The sampling technique used was simple random sampling. DRAM width was measured using a digital caliper. Data were analyzed using paired and independent t-tests.
Results: data were analyzed using paired and independent t-tests. A significant reduction in DRAM was observed in the intervention group, with the mean width decreasing from 29.50 ± 3.39 mm to 9.38 ± 2.62 mm (p = 0.000), while the control group showed only a minor decrease (28.09 ± 3.05 mm to 26.03 ± 2.37 mm).
Conclusion: the structured yoga intervention demonstrated consistent results with lower post-intervention variability. Yoga exercise significantly improves DRAM recovery in postpartum women by enhancing abdominal muscle strength and supporting tissue regeneration. Yoga is a safe, effective, and reproducible intervention for postpartum rehabilitation.

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Keywords: abdominal muscle; core rehabilitation; diastasis recti abdominis muscle; postpartum; yoga

BACKGROUND

Diastasis Recti Abdominis Muscle (DRAM) is a common postpartum condition characterized by a separation of the rectus abdominis muscles along the linea alba greater than two finger widths. Its global prevalence ranges from 30–70%, with a local prevalence of 46.3% in Palembang among mothers more than 8 weeks postpartum (Fadilah, 2023).

During pregnancy, the geometry of the abdominal muscles changes to maintain their function. As pregnancy progresses and the uterus enlarges, this affects the shape of the abdomen and the position of the spine. This is characterized by the elongation of the abdominal muscles and changes in the angle of attachment, causing the abdominal wall to become loose (Fairus, 2021; Michalska et al., 2022).

DRAM does not cause pain but can significantly affect muscle function, quality of life, and bodily function in postpartum women. In some cases, the rectus abdominis muscle does not return to its original state, making it an important issue to detect and address. Further research is needed to understand the patterns of occurrence and effective management strategies, particularly in Indonesia. Various physical complaints associated with unresolved DRAM include back pain (33%), pelvic pain (27%), pelvic organ prolapse (19%), urinary incontinence (48%), and fecal incontinence (7%). Considering these risks, it is important to address DRAM (Blankensteijn et al., 2023; Sumarni Sumarni et al., 2023).

Based on the results of quasi-experimental research, a solution that can be applied to accelerate the DRAM recovery process is Pilates exercises that include breathing and core muscle exercises for DRAM. The results of the study show that this can significantly restore DRAM to recover or prevent DRAM in postpartum mothers, but no difference was observed in the thickness of the rectus abdominis muscle. The results show an average of 1.27 before intervention and 0.97 after intervention (Lee et al., 2023; Sumarni et al., 2022).

Postnatal exercise, including abdominal muscle training, has been shown to support DRAM recovery. Yoga, which emphasizes core strengthening and breathing techniques, offers a promising non-invasive intervention. It promotes re-approximation of the rectus abdominis by activating and reinforcing the linea alba, thereby accelerating recovery (Gluppe et al., 2021; Lee et al., 2023).

Given the high DRAM prevalence (61.7%) and low participation in yoga or postnatal exercise (78.7% and 89.4%) in the Cipatat Health Center area, this study aimed to assess the effect of yoga exercise on DRAM recovery in postpartum mothers

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OBJECTIVE

This study aims to determine the effectiveness of yoga in accelerating the recovery of diastasis recti abdominis muscle in postpartum women.

METHODS

This study was a quasi-experimental design with a non-equivalent control group and pretest-posttest approach was employed, with a confidence interval (CI=95). The study was conducted from February to May 2025 in the Cipatat community health center working area. Forty-eight postpartum mothers (day 4-10 postpartum) were recruited with simple random sampling, with 45 meeting inclusion criteria and divided into two groups, namely the intervention group consisting of 23 people and the control group consisting of 22 people.

The intervention group received yoga sessions, with a sequence consisting of centering, pranayama, right and left side stretches, abdominal muscle stabilization (seated core contractions, crunch v sit-ups, reverse crunches on a bench, scissors), restorative exercises, and savasana, with a frequency of 4 times per week for 3 consecutive weeks, each session last for 20 minutes. While the control group received standard postnatal exercises, 4 times per week for 3 weeks.

Respondents were guided by instructors to perform the exercises and were observed directly and indirectly during each session to ensure that they had performed the exercises. DRAM was measured pre- and post-intervention using a digital caliper during the pretest, 1st week, 2nd week 2, and 3rd week as the posttest measurement. Paired and independent t-tests were used after confirming normal distribution ($p > 0.05$). This study has obtained ethical approval from the Research Ethics Committee of Poltekkes Kemenkes Bandung with No. 13/KEPK/EC/II/2025.

RESULTS

Table 1. Respondent Characteristics

Parity	Intervention		Control	
	F	%	F	%
Primiparity	8	34,8	9	40,9
Multiparity (< 3)	15	65,2	13	59,1
Total	23	100	22	100

The majority of participants in both groups were multiparous 65.2% in the intervention group and 59.1% in the control group.

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Table 2. Diastasis Recti Abdominis Muscle Before Intervention in the Intervention Group and Control Group

Parity	Intervention		Control	
	F	%	F	%
Primiparity	8	34,8	9	40,9
Multiparity (< 3)	15	65,2	13	59,1
Total	23	100	22	100

Pre-intervention DRAM measurements (Table 2) indicated no significant baseline differences between the groups (29.50 mm in the intervention group vs. 28.09 mm in the control group).

Table 3. Pre and Post Intervention DRAM Measurement

	Pre **Mean ± SD**	***Post*** **Mean ± SD**	***P value***
Intervention	29,50 ± 3,39	9,38 ± 2,62	0,001
Control	28,09±3,05	26,03±2.37	

Table 3 presents compelling evidence for the efficacy of yoga in reducing DRAM in postpartum women. The mean DRAM in the intervention group decreased significantly from 29.50 ± 3.39 mm pre-intervention to 9.38 ± 2.62 mm post-intervention. In contrast, the control group showed only a minimal decrease, from 28.09 ± 3.05 mm to 26.03 ± 2.37 mm. The difference in outcomes between groups was statistically significant (p = 0.001), indicating that yoga had a substantial therapeutic effect

Table 4. DRAM Measurement in the Intervention Group and Control Group

Variabel	**Intervensi**	**Kontrol**	***P Value***
	Mean ± SD	**Mean ± SD**	0,001
DRAM Post	9,38 ± 2,62	26,03 ± 2,37	

Table 4 show significant differences in DRAM size post-intervention. The intervention group demonstrated a marked decrease to 9.38 ± 2.62 mm, compared to 26.03 ± 2.37 mm in the control group (p = 0.001). This finding is supported by a paired t-test showing a statistically significant reduction within the intervention group itself (p = 0.001).

	Intervensi	**Kontrol**
	Mean ± SD (mm)	**Mean ± SD (mm)**
Pretest	29,50 ± 3,39	28,09 ± 3,05

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DISCUSSION

The reduction in DRAM is attributed to the structured yoga program, which incorporated breathing exercises, core strengthening poses (such as seated contractions, crunches, and scissors), and isometric holds. These movements specifically target the transversus abdominis (TrA), a key stabilizer of the abdominal wall. Consistent TrA activation improves the integrity of the linea alba and facilitates the approximation of the rectus muscles. This mechanism is consistent with studies by (Gluppe et al., 2021; Rochmaedah et al., 2021; Pereira et al., 2023). The decrease in standard deviation also indicates more consistent results. Thus, yoga has been proven to have a positive impact on the recovery of abdominal muscle structure in postpartum women with diastasis recti abdominis (Fauziyyah, 2025).

Yoga exercises work by activating the deep abdominal muscles through breathing exercises, movement control, and body positions that involve core stabilization. Movements focused on the abdominal muscles gradually strengthen the transversus abdominis, which serves as the primary support for the abdominal wall (Arifin & Sukmawati, 2022). A study by Pereira (2018) explains that repeated activation of deep muscles through a structured exercise program can stimulate tissue regeneration and improve the distance between the rectus abdominis muscles. Additionally, yoga supports improved blood circulation and tissue flexibility, accelerating the healing of the linea alba that has widened. This indicates that yoga exercises are not only safe but also highly effective in the context of DRA rehabilitation (Pereira et al., 2023).

Improvements in DRA are not only evident from the reduction in the average separation of the muscles but also impact the enhancement of function and quality of life for postpartum mothers (Kurniatin et al., 2024). With the improvement in core muscle structure, body stability and posture also improve, thereby reducing the risk of lower back pain and urinary incontinence. According to research by Rochmaedah (2021), the restoration of abdominal muscle integrity contributes to the overall recovery of neuromuscular function (Rochmaedah et al., 2021).

In this study, exercises such as seated core contractions, crunch v sit-ups, reverse crunches on a bench, and scissors helped improve the stability and strength of the deep abdominal muscles. The primary focus on abdominal muscle stabilization movements involves several abdominal muscles: the transverse abdominis muscle plays a role in stabilizing the core and is primarily responsible for contraction, the rectus abdominis muscle activates and tightens the abdominal area, and the internal and external oblique muscles strengthen the core muscles to maintain balance and body stability.

The movements in this study emphasize abdominal muscle stabilization, which is part of isometric exercise (Pamungkas et al., 2025). Isometric exercises are performed without changes in muscle length or joint movement but still produce significant muscle tension (Oranchuk et al., 2021). This yoga exercise provides resistance/contraction in

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each movement for approximately 2–30 seconds by activating the transverse abdominis, rectus abdominis, and internal and external oblique muscles.

Isometric exercises through yoga provide increased muscle strength by activating these muscles. This is the primary mechanism for achieving muscle strength. The use of contraction by applying resistance over a period of time enhances the effectiveness of isometric movements. Thus, through isometric contraction, it can help improve strength and strengthen core muscles in supporting the recovery process of diastasis recti abdominis muscle (Oranchuk et al., 2021).

According to Pereira (2023), the consistent activation of these muscles can improve the integrity of connective tissue in the linea alba, which is the primary structure subjected to stretching during DRA. Activation of the transverse abdominis can protect the linea alba and help prevent or reduce the distance between the rectus muscles, thereby accelerating recovery. The increase in muscle strength after abdominal exercise is due to the metabolic capacity of the muscles. Muscles become stronger as a result of muscle fiber hypertrophy. Additionally, this has a significant impact on metabolic requirements related to muscle strength production, leading to increased endurance and muscle strength (Pereira et al., 2023; Li et al., 2022).

This study aligns with the findings of Rustanti & Zuhri (2021), who demonstrated that an exercise program incorporating abdominal muscle exercises is more effective in DRAM recovery compared to a control group. Abdominal muscle exercises can improve muscle elasticity, strength, and endurance. Increased abdominal muscle elasticity contributes to a reduction in diastasis recti abdominis muscle. Thus, yoga can be a safe and effective alternative for DRA rehabilitation (Rustanti & Zuhri, 2021; Evrianasari & Yantina, 2022).

This study presents several strengths. The intervention was implemented during the early postpartum period (days 4-10), a critical window when tissue remodeling is active and responsive to physical stimulation. The use of digital calipers ensured objective and precise measurement of DRAM, enhancing the validity of the findings. Furthermore, the structured and supervised nature of the yoga intervention improved participant compliance and ensured consistency in the exercise protocol. However, some limitations should be noted. The relatively small sample size and short intervention duration may limit the generalizability of the results and preclude long-term outcome assessment. Additionally, the study was conducted in a single community health center, which may not represent broader regional or demographic variations. Finally, the lack of blinding introduces the potential for measurement bias, particularly in the assessment of physical outcomes such as muscle separation.

This study supports the integration of yoga into postpartum rehabilitation protocols. Yoga is a safe, low-cost, and effective intervention to reduce DRAM and improve core muscle function. Early implementation may reduce the risk of long-term

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musculoskeletal complications and enhance quality of life. Yoga exercises are safe to perform after childbirth without postpartum complications. This aligns with research by Rustanti on abdominal muscle exercises for postpartum women on day 1 (Rustanti & Zuhri, 2021; Aisyah et al., 2025; Lin et al., 2025).

Future studies should include larger, multi-center samples and longer follow-up periods to evaluate sustained benefits and functional outcomes, such as improvements in back pain, continence, and daily mobility.

CONCLUSION

Based on the findings of this study, yoga exercise has a highly significant effect on the recovery of Diastasis Recti Abdominis Muscle (DRAM) in postpartum mothers. A three-week yoga intervention effectively reduced the inter-rectus distance, as evidenced by a significant decrease in mean DRAM from 29.50 mm to 9.38 mm (p=0.001).

This reduction indicates that yoga not only strengthens core muscles-particularly the transversus abdominis but may also facilitate muscle repair and regeneration through satellite cell activation. Therefore, yoga represents an effective and promising non-invasive rehabilitation method for DRAM in postpartum women, contributing to the restoration of abdominal wall integrity and improved postpartum quality of life.

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