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Original Article

The effectiveness of postnatal gymnastics on reducing diastasis rectus abdominis and improving knowledge in postpartum women: A case study

Aisyah[1*], Eni Folendra Rosa[1], Lisdahayati[1], Nelly Rustiati[1], Rahayu Dini Lestari[1]
[1] Program Studi Keperawatan Baturaja, Poltekkes Kemenkes Palembang, Indonesia

***Corresponding Author:**
Aisyah
Program Studi Keperawatan Baturaja, Poltekkes Kemenkes Palembang, Indonesia
Email: aisyah.10210@gmail.com

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Abstract

Background: Diastasis rectus abdominis (DRA) is a common condition in postpartum women characterized by abdominal muscle separation, which may lead to functional disorders and reduced quality of life. One of the effective interventions is postpartum exercise, a simple physical activity designed to strengthen the abdominal muscles and accelerate recovery.

Objective: This study aimed to describe the implementation of education and postpartum exercise to reduce DRA and increase knowledge among postpartum mothers.

Methods: A descriptive case study design with a nursing care approach was applied to two multiparous postpartum mothers with DRA >2.5 cm. Interventions consisted of health education and postpartum exercise training conducted over seven consecutive days. Data were collected through interviews, observations, questionnaires, and DRA measurements using a simple caliper.

Results: The findings showed a reduction in DRA size, from 2.96 cm to 2.78 cm in client I and from 2.86 cm to 2.64 cm in client II. Knowledge scores also increased significantly, with correct responses on the questionnaire improving from 4–5 to 10 out of 10 items.

Conclusion: Education and postpartum exercise with a nursing care approach were proven to reduce DRA size and enhance maternal knowledge. Postpartum exercise can be recommended as a simple, cost-effective, and practical nursing intervention to support abdominal muscle recovery in postpartum mothers.

Background

Every woman who gives birth inevitably undergoes a postpartum period. The postpartum period, also commonly referred to as the puerperium, is the time following childbirth and usually lasts for approximately six weeks. This period requires adequate attention and understanding to ensure the health and recovery of the mother after delivery (Bai et al., 2024). During this stage, women experience various psychological and physiological changes. Physiological changes in postpartum mothers include uterine involution, alterations in the cervix, perineum, vagina, pelvic muscles, and abdominal wall (Susilawati et al., 2024). Excessive stretching of the abdominal wall may lead to diastasis rectus abdominis, resulting in inadequate support for intra-abdominal organs (Gasper et al., 2024).

Diastasis rectus abdominis (DRA) is a condition characterized by the separation of the rectus abdominis muscles caused by thinning and widening of the linea alba. The linea alba is a connective tissue that links the two rectus abdominis muscles. DRA is considered a normal physiological condition in postpartum women, but it is classified as abnormal when the separation of the abdominal wall muscles exceeds 2 cm (Granados et al., 2021).

Several studies have reported that the prevalence of DRA in postpartum women is relatively high. This condition is widespread among both pregnant and postpartum women. The prevalence of DRA has been reported to be approximately 70% in late pregnancy, 60% at six weeks postpartum, and 30% at twelve months postpartum (Chen et al., 2023). In Indonesia, accurate prevalence data on DRA remain unavailable. According to the 2023 Health Profile of Ogan Komering Ulu Regency, the number of childbirths recorded in the working area of Kemalaraja Public Health Center was 539 (Ogan Komering Ulu District Health Office, 2024). This figure indicates a substantial number of postpartum mothers as

potential targets for health interventions, thereby highlighting the need for specific attention to postpartum physical recovery. DRA during the postpartum period can cause various complications that negatively impact maternal physical health and quality of life, including lower back pain, urinary and fecal incontinence, and pelvic organ prolapse. Changes in posture may also occur, increasing the risk of injury or discomfort. Furthermore, women with DRA often experience difficulties in performing physical activities and are more likely to develop body image disturbances and reduced self-confidence (Chen et al., 2023).

One approach to restore the body to its normal condition, maintain maternal health, and prevent DRA after childbirth is through postnatal exercise (Tonasih & Sari, 2019). Postnatal exercise consists of specific physical movements performed by postpartum women once their condition is stable. These exercises aim to accelerate recovery, enhance healing, prevent complications, and restore the elasticity and strength of muscles stretched during pregnancy, such as the back, pelvic floor, and abdominal wall muscles (Admasari et al., 2022; Saputri et al., 2020).

A study by Rochmaedah et al. (2021) examining differences in the size of DRA before and after postnatal exercise among 20 postpartum women reported a reduction in DRA measurements. Prior to the intervention, the DRA ranged from 4.30 to 5.75 cm, while after the exercise, the measurements decreased to 4.15 to 5.50 cm. Furthermore, findings by Suparyanto et al. (2024) indicated that postnatal exercise was more effective than corset use in accelerating the recovery of DRA. On day 14, mothers who performed postnatal exercises no longer exhibited abdominal gaps, whereas those using corsets still presented with a 1 cm gap. Based on the aforementioned issues, the purpose of this study is to conduct a case study on health education through postnatal exercise to reduce diastasis rectus abdominis in postpartum women, with a focus on readiness to improve maternal knowledge.

Methods

Study Design

This study employed a descriptive case study design with a nursing care approach to explore the effect of postnatal exercise on reducing diastasis rectus abdominis (DRA) in postpartum women. This design was chosen because it allowed the researchers to provide a detailed description of the intervention process, clinical changes, and patient responses to postnatal exercise during the early puerperium. The case study focus offered a comprehensive illustration of the intervention's impact in a real-life context, thus serving as a foundation for future large-scale quantitative research.

Sampling and Setting

A purposive sampling technique was applied to select participants based on specific criteria relevant to the study objectives. The study included two multiparous postpartum women who met the inclusion criteria. Inclusion criteria were: postpartum women with normal vaginal delivery, aged 20–35 years, within the early puerperium (days 1–7), presenting with DRA greater than 2.5 cm on initial assessment, clinically stable, able to follow exercise instructions, and willing to participate by signing informed consent. Exclusion criteria included: obstetric or medical complications limiting mobility, history of major abdominal surgery or ventral hernia, musculoskeletal or neurological disorders restricting exercise, and psychological or communication barriers that could interfere with the intervention.

Instruments

The research instruments consisted of: (1) postpartum nursing care observation sheets used to record the mothers' general condition, physiological responses, and symptom changes; (2) a DRA measurement tool using the validated finger test method, confirmed with a simple caliper, to measure the distance between the rectus abdominis muscles around the umbilicus; and (3) postnatal exercise documentation sheets to record patient adherence, frequency, and duration of the exercises performed.

Intervention

Participants received a structured postnatal exercise program consisting of specific body movements aimed at strengthening abdominal, pelvic floor, and back muscles. Exercises were initiated on the first postpartum day and performed daily for seven consecutive days, with each session lasting approximately 20 minutes. The intervention was delivered

through demonstration and direct supervision by the researcher/nurse.

Data Collection

Data collection was conducted in two stages: baseline and follow-up. On the first postpartum day, an initial DRA assessment was performed to establish baseline data. Participants then underwent a postnatal exercise intervention for seven consecutive days, with each session lasting approximately 20 minutes. The sessions were guided by the researcher/nurse through demonstration and supervision. During the intervention, physiological responses, comfort levels, and adherence were observed and documented. A follow-up assessment was conducted on the seventh postpartum day to remeasure DRA and document clinical changes.

Data Analysis

Data were analyzed descriptively using both qualitative and simple quantitative methods. Quantitative data, including DRA measurements at baseline and day seven, were compared to identify changes before and after the intervention. Qualitative data, derived from observations, daily notes, and patient responses, were analyzed narratively to illustrate subjective experiences and observed changes. This analysis aimed to provide a holistic understanding of the effectiveness of postnatal exercise for postpartum women with DRA.

Ethical Considerations

Ethical principles were upheld throughout the study, including informed consent, beneficence, non-maleficence, justice, and respect for autonomy. Participants were informed of the study objectives, procedures, benefits, and potential risks before the intervention. Written consent was obtained prior to participation. Data confidentiality was ensured by using participant initials in all documentation and publications. This study was conducted in accordance with nursing research ethics and received ethical clearance from the relevant health research ethics committee before implementation.

Results

The first participant, Mrs. S, was a 35-year-old multiparous postpartum mother with a 4-day-old male infant. She reported no history of illness and had a senior high school education background. Initial assessment revealed diastasis rectus abdominis (DRA) measuring 2.96 cm, with visible abdominal protrusion. She also reported urinary incontinence following delivery. The participant had no prior knowledge of DRA and had never performed postnatal exercises. At baseline, her knowledge score was 5 correct answers out of 10 items. She expressed strong interest in learning about DRA and demonstrated enthusiasm toward practicing postnatal exercises.

The second participant, Mrs. Y, was also 35 years old, multiparous, with a 3-day-old female infant. She reported no history of illness and had completed junior high school education. Initial examination showed DRA measuring 2.86 cm, accompanied by complaints of occasional back pain and abdominal protrusion. Similar to the first participant, she had never heard of DRA or performed postnatal exercises. Her baseline knowledge score was 4 correct answers out of 10 items. She expressed motivation to learn more about DRA and postnatal exercise, and was willing to participate in the intervention. Overall, the initial assessment indicated that both participants lacked prior exposure to DRA-related information and had low baseline knowledge, as reflected in their limited questionnaire scores (4–5 correct answers out of 10). Nevertheless, both participants demonstrated high motivation and willingness to engage in education and practice.

During the intervention phase, participants underwent structured postnatal exercise training according to standard operating procedures (SOPs). The exercise program emphasized abdominal and pelvic floor muscle strengthening, and was implemented gradually based on individual capacity. For seven consecutive days, participants were guided and supervised in performing the exercises, followed by reassessment of DRA and knowledge level. The evaluation phase revealed improvements in both knowledge and physical outcomes. After receiving health education and exercise training, both participants achieved a perfect score (10/10) on the knowledge questionnaire and were able to correctly

demonstrate all movements of the postnatal exercise program.

Figure 1 show that reassessment of DRA also showed a reduction in muscle separation. In Participant 1, the DRA measurement decreased from 2.96 cm to 2.78 cm, while in Participant 2, the measurement decreased from 2.86 cm to 2.64 cm. Although the values did not return to the normal range (<2 cm), these findings indicate a positive reduction in abdominal muscle separation following the intervention.

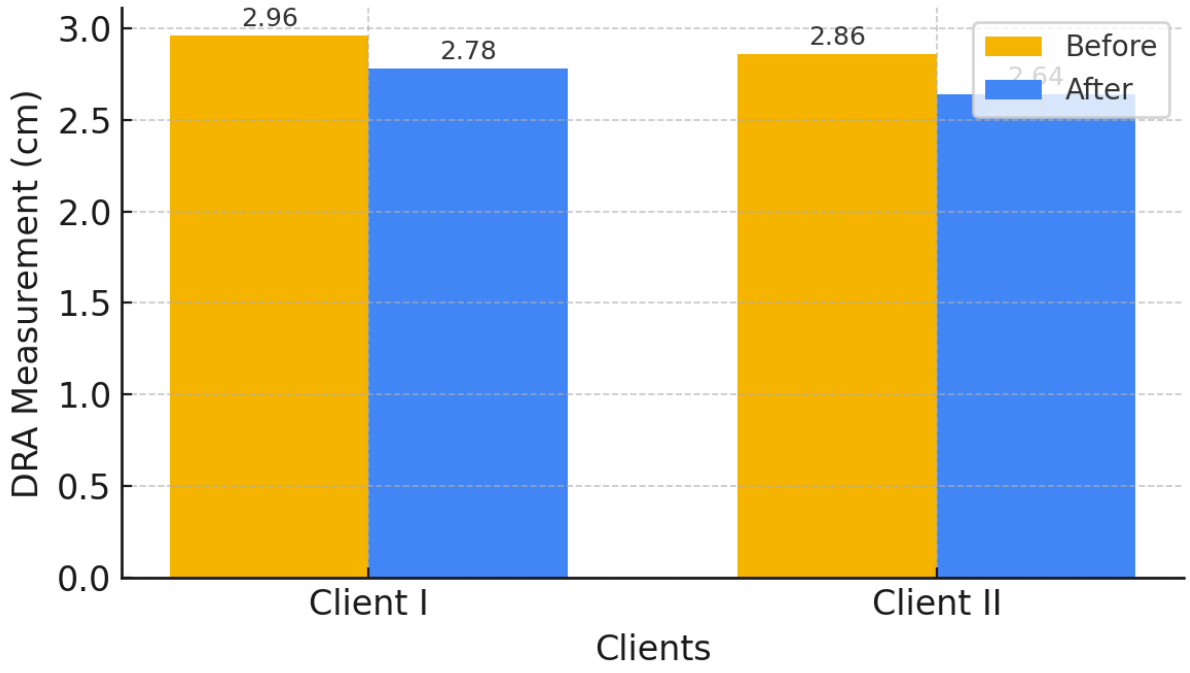

Figure 1. Changes in Diastasis Rectus Abdominis Measurements Before and After Postnatal Exercise

Discussion

This study found that both participants experienced diastasis rectus abdominis (DRA) greater than 2.5 cm during the early puerperium, consistent with Lestari and Fasimi (2023), who emphasized that DRA is a common condition following childbirth. If left untreated, DRA can lead to several complications, including lower back pain, urinary incontinence, pelvic organ prolapse, postural changes, and difficulties in performing daily activities (Chen et al., 2023).

A key risk factor identified in both participants was multiparity. This finding aligns with Suparno et al. (2022), who reported that multiparous women are more likely to experience repeated abdominal muscle stretching, which decreases muscle elasticity. Other risk factors reported in the literature include maternal age, body mass index, and infant birth weight.

The intervention provided in this study, which combined health education and postnatal exercise, proved effective in improving maternal knowledge and abdominal muscle condition. Theoretically, postnatal exercise strengthens stretched abdominal muscles, accelerates uterine involution, improves pelvic floor strength, and corrects posture (Sulistyawati et al., 2023). These results are also consistent with the Indonesian Standard of Nursing Interventions (SIKI, 2018), which emphasizes the importance of tailoring education to clients' readiness to learn.

Improvement in maternal knowledge after receiving health education through booklets, video demonstrations, and interactive discussions highlighted the effectiveness of multimodal learning strategies. According to Notoatmodjo (2005, in Jatmika et al., 2019), the use of multiple senses in receiving information enhances understanding. Similarly, Widayanti et al. (2023) stated that greater access to

information sources contributes to broader knowledge acquisition.

In addition to knowledge improvement, this study also demonstrated a reduction in DRA measurements in both participants. Although the reduction was not substantial, it is consistent with findings by Rochmaedah et al. (2021), who reported a significant decrease in DRA following postnatal exercise ($p = 0.001$). Furthermore, Suparyanto et al. (2024) showed that postnatal exercise was more effective than corset use in reducing DRA, as exercise engages core muscle contractions that support faster recovery and strengthening.

Therefore, the findings of this case study reinforce the evidence that postnatal exercise is a simple, low-cost, and practical intervention to improve abdominal muscle condition in postpartum women. However, larger-scale quantitative studies are needed to validate its effectiveness and ensure broader generalizability.

Conclusion and Recommendation

This case study demonstrated that postnatal exercise had a positive effect on reducing diastasis rectus abdominis (DRA) in postpartum women. In Client I, DRA decreased from 2.96 cm to 2.78 cm, while in Client II it decreased from 2.86 cm to 2.64 cm after seven days of regular exercise. In addition, maternal knowledge and skills regarding DRA and the benefits of postnatal exercise improved, as reflected in higher questionnaire scores and the ability to independently perform the exercises. These findings reinforce that postnatal exercise is a simple, low-cost, and effective intervention to accelerate abdominal muscle recovery in postpartum women.

Based on the findings, it is recommended that healthcare providers, particularly maternal nurses and midwives, integrate education and training on postnatal exercise into routine postpartum care. Educational interventions should be delivered using interactive media such as booklets, video demonstrations, and direct practice to enhance maternal understanding and adherence.

Further studies with quantitative designs, larger sample sizes, and longer intervention periods are needed to comprehensively evaluate the effectiveness of postnatal exercise and to improve the generalizability of findings. In addition, policymakers and healthcare facilities are encouraged to incorporate postnatal exercise into postpartum educational programs as a promotive and preventive strategy to reduce abdominal wall complications among postpartum women.

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The authors declare no competing interests.

Declaration on the Use of AI
No AI tools were used in the preparation of this manuscript.

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