

Efficacy of Kangoo Jump Exercises for Primary Dysmenorrhea in Young Women: Results from a Pre-Post Study

Genç Kadınlarda Primer Dismenore için Kangoo Jump Egzersizlerinin Etkinliği: Ön Test-Son Test Sonuçları

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ABSTRACT

Primary dysmenorrhea is a common menstrual disorder among young women, often resulting in significant pain and reduced quality of life. While non-steroidal anti-inflammatory drugs (NSAIDs) and oral contraceptives are the mainstay treatments, their potential side effects have increased interest in non-pharmacological alternatives such as exercise. To evaluate the effect of Kangoo Jump exercises on pain levels in women aged 18–22 with primary dysmenorrhea, using the McGill Pain Questionnaire. Fifty-one women aged 18–22 years with regular menstrual cycles participated in a single-arm, pre-post interventional study. Participants engaged in Kangoo Jump exercises sessions twice weekly for ten weeks. Menstrual pain was assessed using the McGill Pain Questionnaire before and after the intervention. There was a statistically significant reduction in pain scores across all McGill Pain Questionnaire subscales following the Kangoo Jump exercises program (all $p < .001$). Effect sizes ranged from moderate to large. Kangoo Jump exercises are associated with significant improvements in dysmenorrhea symptoms among young women and may serve as an effective non-pharmacological intervention.

Keywords: Dysmenorrhea, kangoo jumps, exercise, menstrual pain, mcgill pain questionnaire, young women

ÖZ

Birincil dismenore, genç kadınlar arasında sık görülen bir adet bozukluğudur ve genellikle şiddetli ağrıya ve yaşam kalitesinin düşmesine neden olur. Steroid olmayan antienflamatuar ilaçlar (NSAID'ler) ve oral kontraseptifler temel tedavi yöntemleri olmakla birlikte, bunların olası yan etkileri egzersiz gibi farmakolojik olmayan alternatiflere olan ilgiyi artırmıştır. McGill Ağrı Anketi kullanılarak, 18-22 yaşları arasında primer dismenore sorunu olan kadınlarda Kangoo Jump egzersizlerinin ağrı düzeyleri üzerindeki etkisini değerlendirilmiştir. Düzenli adet döngüsü olan 18-22 yaş arası 51 kadın, tek kollu, müdahale öncesi-sonrası bir çalışmaya katılmıştır. Katılımcılar, on hafta boyunca haftada iki kez Kangoo Jump egzersiz seanslarına katılmıştır. Adet ağrısı, müdahale öncesi ve sonrası McGill Ağrı Anketi kullanılarak değerlendirilmiştir. Kangoo Jump egzersiz programı sonrasında, tüm McGill Ağrı Anketi alt ölçeklerinde ağrı puanlarında istatistiksel olarak anlamlı bir azalma gözlemlendi ($p < ,001$). Etki büyüklüğü orta ile büyük arasında değiştiği gözlemlenmiştir. Kangoo Jump egzersizleri, genç kadınlarda dismenore semptomlarında iyileşmelerle önemli seviyede ilişkili ve etkili bir farmakolojik olmayan müdahale olarak hizmet edebileceği düşünülmektedir.

Anahtar Kelimeler: Dysmenorrhea, kangoo jumps, egzersiz, menstrual ağrı, mcgill ağrı anketi, genç kadınlar

Introduction

Dysmenorrhea is a common gynecological condition that affects approximately three-quarters of women at the reproductive age (Armour et al., 2019; L. Wang et al., 2022). It is classified as primary, secondary, or non-specific (Bernardi et al., 2017). Primary dysmenorrhea is defined as pain occurring in the lower abdomen before or during menstruation, in the absence of any underlying pelvic pathology (Morrow & Naumburg, 2009). Secondary dysmenorrhea however; is associated with identifiable pathologies such as endometriosis, adenomyosis, or anatomical abnormalities of the uterus and is typically accompanied by additional symptoms and pelvic findings, such as abnormal uterine bleeding (Osayande & Mehulic, 2014; Shim & Laufer, 2020). Primary dysmenorrhea is particularly prevalent in women under the age of 25 and is the most frequent cause of menstrual pain in this age group (Armour et al., 2019). The etiology of pain involves hypersecretion of prostaglandins (PGs), hypercontraction of uterine muscles, and uterine ischemia (Bernardi et al., 2017; Guimarães & Póvoa, 2020). It typically begins 6 to 12 months after menarche and may persist until a person's forties (Fuentes-Aparicio et al., 2023). This condition can severely restrict daily activities and reduce quality of life (Yahaya et al., 2022). It may also interfere with social life and psychological well-being, leading to decreased productivity in academic and professional settings (Donayeva et al., 2023). Therefore, identifying effective and sustainable strategies to alleviate dysmenorrhea symptoms is of great importance.

Prostaglandins (PGs) and leukotrienes (LTs) play a significant role in the pathogenesis of inflammation and pain. Two active derivatives of PGs, PGE₂ and PGF₂α, contribute to this process through different mechanisms. PGE₂ promotes vasodilation in endometrial blood vessels, consequently increasing inflammation and edema, and also facilitates the migration of LTs to the site of activity. In contrast, PGF₂α triggers myometrial contractions and vasoconstriction, which intensify ischemia. This ischemic process increases the sensitivity of free nerve endings, leading to the perception of pain. LTs further worsen pain mechanisms by directly supporting vasoconstriction and ischemia. Thus, PGs and LTs act in concert to regulate the inflammatory response and contribute to the development of pain (Dawood, 2006; Jaleel et al., 2022).

PGE₂ significantly affects pain perception in primary dysmenorrhea by triggering the inflammatory response and oxidative stress (Tang et al., 2020). In addition, several other factors may exacerbate the severity of dysmenorrhea, including genetic predisposition (Lee et al., 2022), stress (Ju et al., 2014), depression and anxiety (Dorn et al., 2009), a sedentary lifestyle (Y.-L. Wang & Zhu, 2025), smoking (Jenabi et al., 2019), and dietary habits (Ciołek et al., 2023). Furthermore, deficiencies in certain micronutrients—such as magnesium (Parazzini et al., 2017), vitamin B12, and omega-3 fatty acids (Helbig et al., 2021)—have also been associated with heightening of symptoms.

Traditionally, non-steroidal anti-inflammatory drugs (NSAIDs) and oral contraceptives have been considered as vanguard treatments for primary dysmenorrhea; however, their long-term use may be limited due to potential side effects (Ferries-Rowe et al., 2020; Matsushita et al., 2020). As a result, interest in non-pharmacological alternative treatment methods has been seen to be increasing (López-Liria et al., 2021).

In 1914, Mosler was the first to propose that physical exercise could be effective in the treatment of primary dysmenorrhea by increasing blood flow to the uterus (Carroquino-Garcia et al., 2019). Recent studies have further supported that physical activity may help reduce pain, stress, and prostaglandin levels (Carroquino-Garcia et al., 2019). According to the endorphin hypothesis, β-endorphins released during exercise bind to brain receptors, enhancing opioid activity in the central and peripheral nervous systems, which reduces pain perception and improves mood (Anderson & Shivakumar, 2013). Meta-analyses and systematic reviews reinforce that physical exercise may serve as an alternative therapeutic approach for the treatment of primary dysmenorrhea (Carroquino-Garcia et al., 2019). Low-intensity exercises such as stretching and core strengthening, as well as high-intensity activities like zumba and aerobics, have been shown to be more effective in relieving dysmenorrhea pain compared to no exercise (Armour, Parry, et al., 2019). Additionally, practices such as yoga, isometric exercises, Bosu pilates, and Kegel exercises have been reported to help alleviate pain and improve quality of life in women with primary dysmenorrhea (Fuentes-Aparicio et al., 2023; López-Liria et al., 2021). According to our review of the literature, no single type of exercise has been proven to be superior to others in this regard (Carroquino-Garcia et al., 2019).

Kangoo Jumps has emerged as an innovative form of exercise to meet the growing global demand for physical activity. Branded as a commercial patent for both the activity and the specialized footwear, Kangoo Jumps is a type of aerobic rebounding exercise that can be performed individually or in groups. The exercises involve wearing shoes designed to reduce

gravitational impact by minimizing the force load on the skeletal system. Performed to music, these exercises help participants develop the physical, mental, and emotional fitness levels they require. Kangoo Jump exercises have been reported to enhance cardiovascular endurance (T. I. Mokrova et al., 2018), increase muscular strength, and improve flexibility (T. Mokrova et al., 2018). Additionally, these exercises have been shown to strengthen the musculoskeletal system, support lymphatic circulation, regulate blood pressure during physical activity, improve cardiovascular function, and boost basal metabolic rate (Griban et al., 2021).

To date, no study has specifically investigated the effects of Kangoo Jump exercises on dysmenorrhea symptoms. Therefore, the present study aimed to evaluate the effects of Kangoo Jump exercises on dysmenorrhea using the McGill Pain Questionnaire and to provide new evidence for this non-pharmacological intervention in young women.

Methods

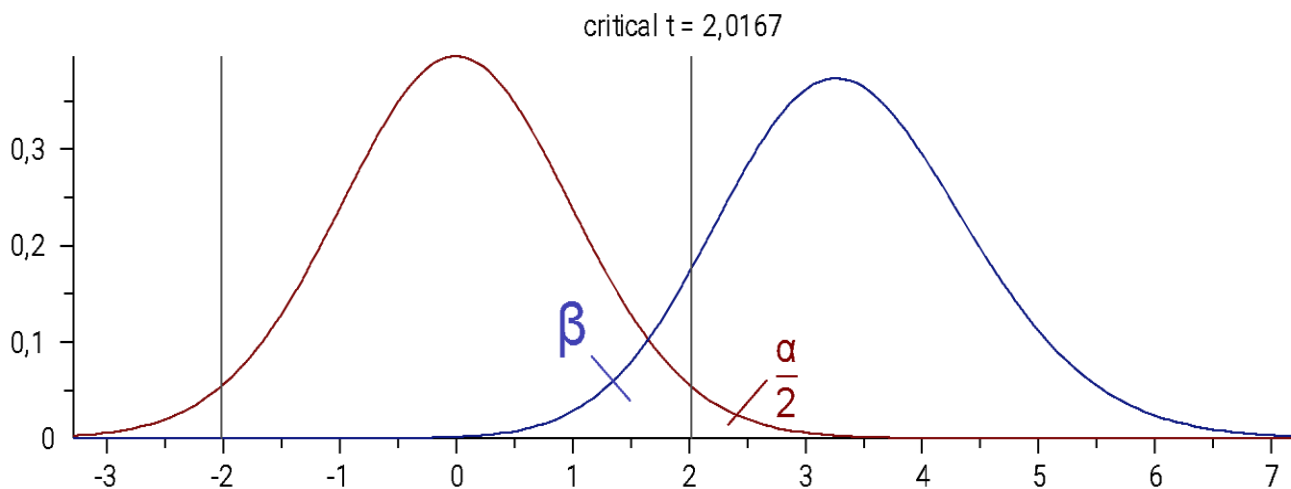
Study Design

This study was conducted using a survey model and aimed to investigate the effects of Kangoo Jump exercises on menstrual pain in women aged 18-22 years. Participants' pain thresholds were evaluated using the same scale at two time points: before and after the exercise intervention. This research has been approved for ethical compliance in accordance with Article 3 of the meeting dated January 7, 2025, with meeting number 2024/12, as stated in the letter dated January 9, 2025, from the Dumlupınar University Social and Humanities Research and Publication Ethics Committee.

A total of 51 women, aged between 18 and 22, with regular menstrual cycles and medically eligible for exercise, voluntarily participated in the study. To assess whether the sample size was statistically sufficient, a power analysis was performed. According to the power analysis results, the critical t value was 2.016, degrees of freedom (df) was 43, the recommended minimum sample size was 44, and the statistical power was calculated as 0.90 (90%). These results indicate that the study had a sufficient sample size to detect statistically significant differences. The graphical results of the power analysis are presented in **Figure 1**.

Figure 1.

Power analysis results illustrating the determination of the required sample size for the study, including Type I error (α), Type II error (β), and statistical power calculations



Exercise Program

Participants engaged in supervised Kangoo Jump exercises sessions twice weekly for 10 weeks, with each session lasting 60 minutes. Sessions followed high-intensity interval training (HIIT) principles and utilized Kangoo Jump rebound shoes. Each session consisted of warm-up, main exercise, and cool-down phases. HIIT workouts are known to have significant metabolic effects in the current literature, particularly as high-intensity exercises. This type of workout, which generally consists of high-intensity intervals, recommends completing the main interval sessions within 30 minutes while limiting the total exercise duration to 1 hour (Briand et al., 2022; Ma et al., 2024).

Pain Assessment

Menstrual pain was assessed using the validated Turkish version of the Short Form McGill Pain Questionnaire (SF-MPQ) (Biçici & Yapucu Güneş, 2012), which provides a comprehensive, multidimensional evaluation of pain. The SF-MPQ includes several core components that were analyzed in this study: the sensory pain subscale, which assesses the physical and qualitative features of pain such as throbbing, stabbing, or sharp sensations; and the affective (emotional) pain subscale, which captures the emotional and psychological responses to pain, including feelings of tiredness or fearfulness. In addition, the total pain score represents the sum of all individual items, reflecting the overall pain experience, while the pain severity score indicates the participant's perception of how intense or severe the pain feels, typically recorded on a numerical or categorical scale. Finally, current pain intensity is used to measure the self-reported level of pain at the exact time of assessment, providing an immediate snapshot of the participant's pain status. Pain assessments were conducted at baseline and again during the first menstrual period following the completion of the exercise program.

Statistical Analysis

Pre- and post-intervention scores were compared using paired sample t-tests. All statistical analyses were performed using the Jamovi software package (The Jamovi Project, Version 2.5.3.0). Statistical significance was set at $p \leq .05$. Results are presented as mean \pm standard deviation, value of "t" and "p" with "Cohen's d".

Results

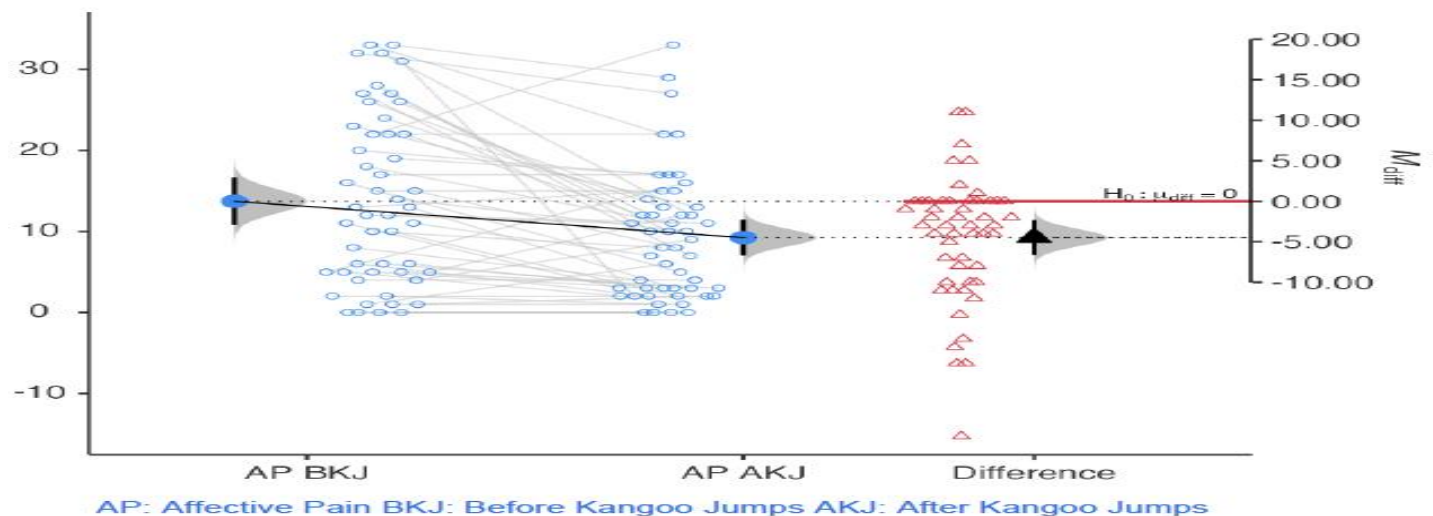
Sensory Pain Subscale

A statistically significant reduction was observed in the sensory pain subscale scores following the Kangoo Jump exercises program. The mean sensory pain score before the intervention was 13.73 ± 10.41 , which decreased to 9.24 ± 7.88 after the exercise program. The difference between pre- and post-exercise means was 4.49 (SE = 1.08), and the 95% confidence interval ranged from 2.33 to 6.65. Paired sample t-test analysis revealed this difference to be statistically significant ($t(50) = 4.17$, $p < .001$). The effect size was calculated as Cohen's $d = 0.584$, indicating a moderate effect.

As illustrated in **Figure 2**, individual participant scores and the distribution of differences are visualized, clearly demonstrating the reduction in sensory pain levels following the Kangoo Jump exercise intervention.

Figure 2.

Mean scores of the sensory pain subscale before and after the Kangoo Jump exercise program. AP BKJ: Affective Pain Before Kangoo Jumps; AP AKJ: Affective Pain After Kangoo Jumps. The plot shows individual data points, paired differences, and the mean difference with confidence intervals



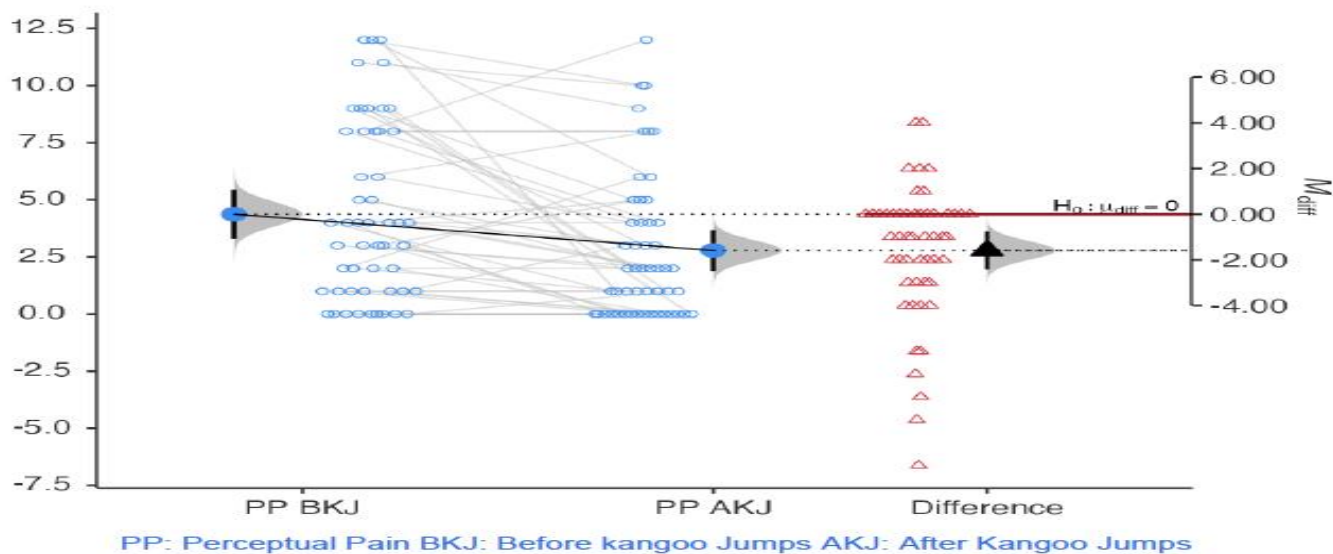
Affective (Perceptual) Pain Subscale

A statistically significant reduction was observed in the affective (perceptual) pain subscale scores following the Kangoo Jumps exercise program. The mean affective pain score before the intervention was 4.37 ± 3.81 , which decreased to 2.78 ± 3.18 after the program. The difference between pre- and post-exercise means was 1.59 (SE = 0.416), with a 95% confidence interval ranging from 0.75 to 2.42. Paired sample t-test analysis demonstrated that this reduction was statistically significant ($t(50) = 3.82, p < .001$). The effect size was calculated as Cohen's $d = 0.535$, indicating a moderate effect.

As illustrated in **Figure 3**, individual participant scores and the distribution of the differences are presented, clearly demonstrating the reduction in affective pain levels following the Kangoo Jumps intervention.

Figure 3.

Mean scores of the affective (perceptual) pain subscale before and after the Kangoo Jumps exercise program. PP BKJ: Perceptual Pain Before Kangoo Jumps; PP AKJ: Perceptual Pain After Kangoo Jumps. The plot displays individual data points, paired differences, and the mean difference with confidence intervals.



Total Pain Score

A statistically significant reduction was observed in participants' total pain scores following the Kangoo Jumps exercise program. The mean total pain score before the intervention was 18.1 ± 13.18 , which decreased to 12.0 ± 10.7 after the exercise. The difference between pre- and post-exercise means was 6.08 (SE = 1.43), with a 95% confidence interval ranging from 3.20 to 8.96. Paired sample t-test analysis confirmed that this decrease was statistically significant ($t(50) = 4.24, p < .001$). The effect size was calculated as Cohen's $d = 0.593$, indicating a moderate effect.

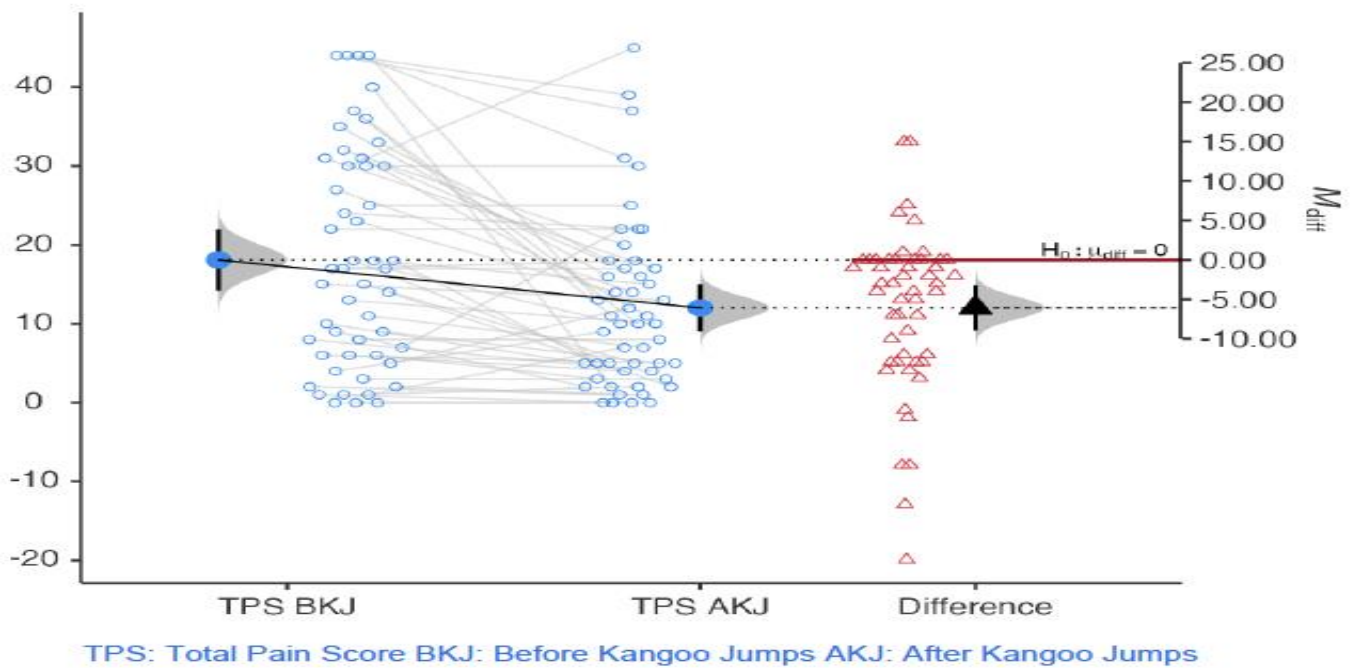
As illustrated in **Figure 4**, individual participant scores and the distribution of the differences are presented, clearly demonstrating the significant reduction in total pain scores after the Kangoo Jumps intervention.

Pain Intensity Score

A statistically significant reduction was observed in participants' pain intensity scores following the Kangoo Jumps exercise program. The mean pain intensity score before the intervention was 2.63 ± 1.80 , which decreased to 1.63 ± 1.37 after the exercise. The difference between pre- and post-exercise means was 1.00 (SE = 0.244), with a 95% confidence interval ranging from 0.51 to 1.49. Paired sample t-test analysis confirmed that this decrease was statistically significant ($t(50) = 4.10, p < .001$). The effect size was calculated as Cohen's $d = 0.574$, indicating a moderate effect.

Figure 4.

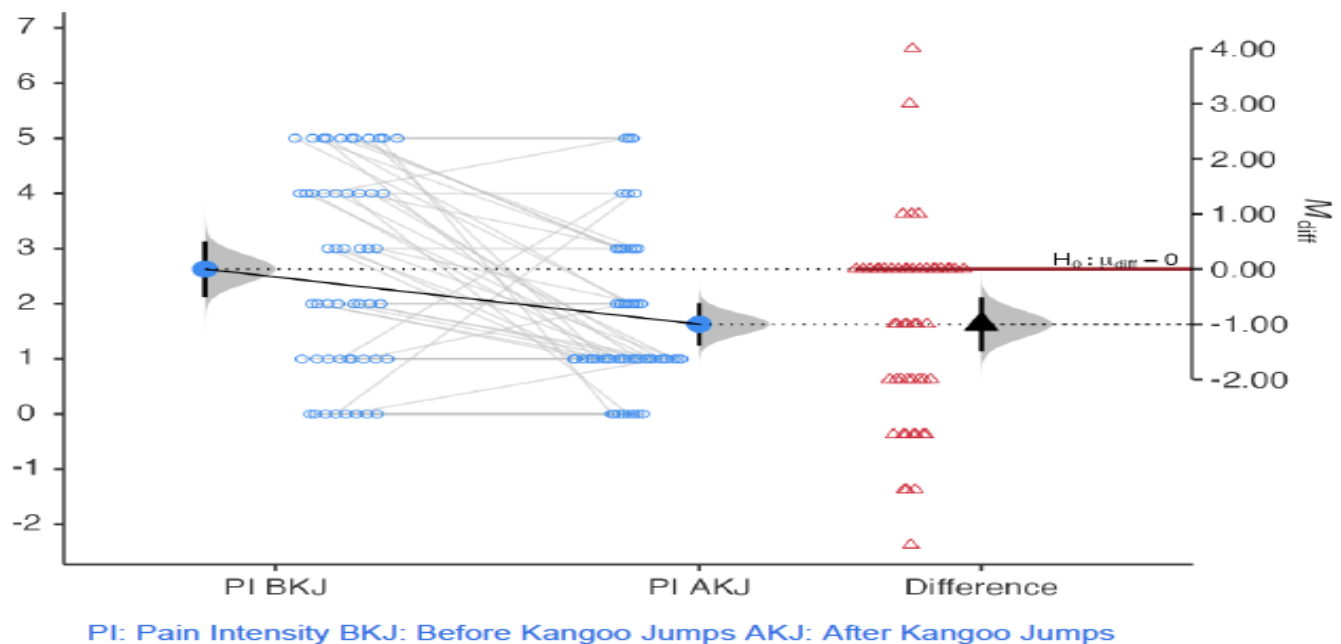
Mean total pain scores before and after the Kangoo Jumps exercise program. TPS BKJ: Total Pain Score Before Kangoo Jumps; TPS AKJ: Total Pain Score After Kangoo Jumps. The plot displays individual data points, paired differences, and the mean difference with confidence intervals.



As illustrated in **Figure 5**, individual participant scores and the distribution of the differences are presented, clearly demonstrating the significant reduction in pain intensity scores after the Kangoo Jumps intervention.

Figure 5.

Mean pain intensity scores before and after the Kangoo Jumps exercise program. PI BKJ: Pain Intensity Before Kangoo Jumps; PI AKJ: Pain Intensity After Kangoo Jumps. The plot displays individual data points, paired differences, and the mean difference with confidence intervals



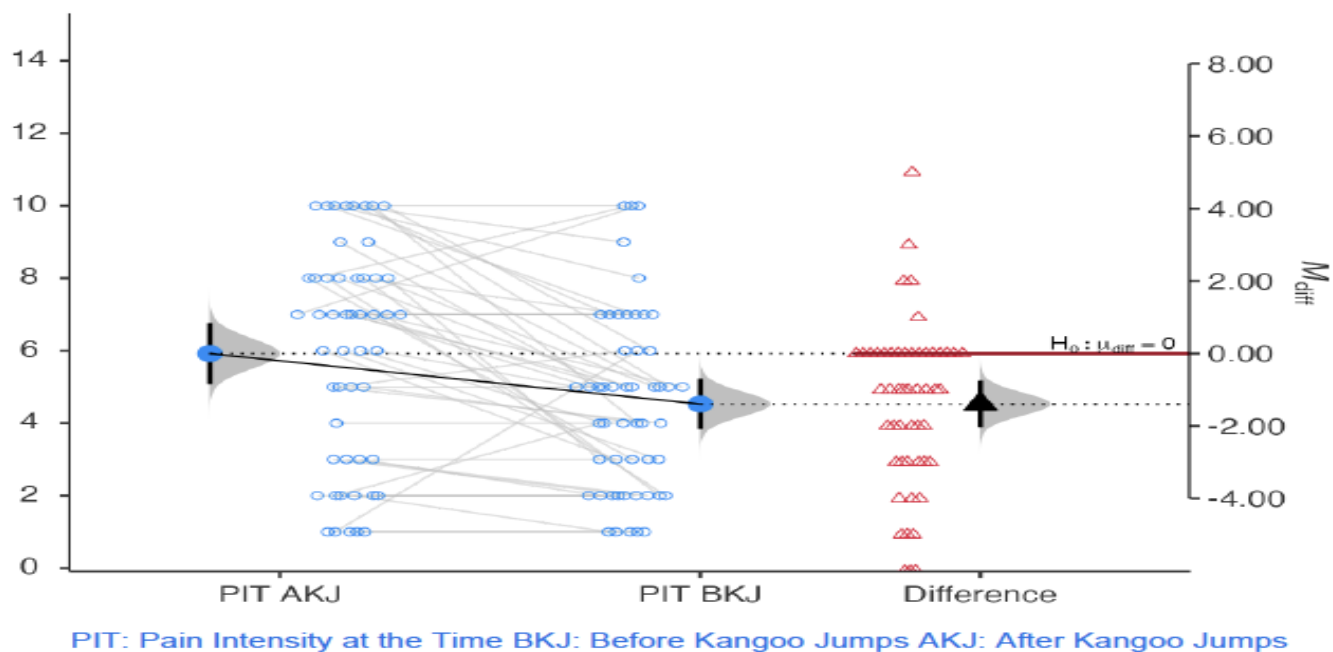
Current Pain Intensity Score

A statistically significant reduction was observed in participants' current pain intensity scores following the Kangoo Jumps exercise program. The mean current pain intensity score before the intervention was 5.92 ± 3.01 , which decreased to 4.53 ± 2.48 after the exercise. The difference between pre- and post-exercise means was 1.39 (SE = 0.321), with a 95% confidence interval ranging from 0.75 to 2.04. Paired sample t-test analysis confirmed that this decrease was statistically significant ($t(50) = 4.34, p < .001$). The effect size was calculated as Cohen's $d = 0.608$, indicating a moderate effect.

As illustrated in **Figure 6**, individual participant scores and the distribution of the differences are presented, clearly demonstrating the notable reduction in current pain intensity scores after the Kangoo Jumps intervention.

Figure 6.

Mean current pain intensity scores before and after the Kangoo Jumps exercise program. PIT BKJ: Pain Intensity at the Time Before Kangoo Jumps; PIT AKJ: Pain Intensity at the Time After Kangoo Jumps. The plot displays individual data points, paired differences, and the mean difference with confidence intervals



Discussion

Our findings demonstrate that Kangoo Jumps exercises are effective in reducing dysmenorrhea pain in young women through multiple dimensions. Evaluation using the McGill Pain Questionnaire revealed significant and moderate reductions in the Sensory Pain Subscale (DA), Affective Pain Subscale (AA), Total Pain Score (TAS), Pain Intensity Score (AŞ), and Current Pain Intensity (AAY) following the exercise intervention (Figures 1–6). These results highlight the impact of exercise on both the physical and psychological components of menstrual pain.

In our study, the significant reduction in the sensory pain subscale (**Figure 1**) indicates that Kangoo Jumps exercises effectively alleviate the physical and qualitative aspects of menstrual pain. This aligns with existing literature showing that regular physical activity and aerobic exercise reduce sensory pain in dysmenorrhea, primarily by lowering prostaglandin levels and minimizing uterine contractions (Araújo et al., 2012; Armour, Ee, et al., 2019; Dehnavi et al., 2018; Elbandrawy & Elhakk, 2021). Notably, a meta-analysis by Armour et al. (2019) further confirms the efficacy of exercise in relieving physical menstrual pain symptoms (Armour, Ee, et al., 2019), supporting our findings.

Additionally, the observed decrease in the affective (emotional) pain subscale (**Figure 2**) suggests that Kangoo Jumps exercises may also reduce the emotional and psychological burden of menstrual pain. Prior studies have demonstrated the

effectiveness of yoga and group-based exercise interventions in lowering stress, anxiety, and other dysmenorrhea-related emotional disturbances (McGovern & Cheung, 2018; Patterson et al., 2021, 2025). Our results build on this evidence by highlighting Kangoo Jumps exercises as a promising tool for both physical relief and psychosocial support.

The significant reductions in the total pain score (**Figure 3**) and pain intensity score (**Figure 4**) indicate that the intervention not only affected specific subdimensions, but also provided overall relief in participants' general pain experience. Clinical studies have similarly shown that aerobic exercise, isometric relaxation, and Pilates can significantly lower total pain scores in women with dysmenorrhea (Araújo et al., 2012; Dehnavi et al., 2018; Elbandrawy & Elhakk, 2021).

Furthermore, a marked and statistically significant reduction was observed in both current pain intensity (**Figure 5**) and general pain severity (**Figure 4**) following exercise. Non-invasive interventions such as massage, relaxation exercises, acupuncture, and similar modalities have been shown to decrease pain perception by increasing parasympathetic activity and stimulating endorphin release (B. Chen et al., 2024; Y.-S. Chen et al., 2019; Demirtürk et al., 2016; Lin et al., 2022; Wu et al., 2022; Yildiz & Acaroğlu, 2022). It is conceivable that Kangoo Jumps exercises may reduce both acute and momentary pain perception through comparable neurophysiological mechanisms.

Dysmenorrhea is known to be bidirectionally associated with poor sleep quality, impaired social relationships, sedentary lifestyle, academic difficulties, and negative emotions (Armour, Parry, et al., 2019; Morrow & Naumburg, 2009; L. Wang et al., 2022). In addition, heightened psychological stress may induce neurobiological changes that increase pain sensitivity (Rogers et al., 2023). The improvements observed in both the physical and psychological/emotional subdimensions in our study indicate that Kangoo Jumps exercises can support quality of life in young women in a multidimensional manner. The literature also underscores the positive impact of group exercise interventions on social support and anxiety reduction (Patterson et al., 2021, 2025).

Kangoo Jump shoes may enhance isokinetic strength in the musculoskeletal system, improve balance, and increase stability of the lower extremity joints. In the context of dysmenorrhea, exercise is thought to act by counteracting elevated prostaglandin levels, uterine ischemia, and hypersensitivity of pain fibers (Dehnavi et al., 2018). Our findings suggest that Kangoo Jumps exercises may function via similar mechanisms. However, it should be noted that these mechanisms were not directly measured in the present study, and future research evaluating biochemical and physiological parameters will be important to strengthen the evidence.

Conclusion and Recommendation

Limitations of the present study include the relatively small sample size, absence of a control group, and lack of biochemical measurement. Comparative studies with other exercise types or sedentary control groups are needed to better clarify the unique contribution of Kangoo Jumps exercises. Larger studies with more diverse sociodemographic groups would enhance the generalizability of the findings. Additionally, since the intervention period was limited to 10 weeks, long-term follow-up studies are required to evaluate the sustainability of observed benefits.

In conclusion, Kangoo Jump exercises significantly reduced dysmenorrhea-related pain in multiple dimensions. The intervention appears to improve cardiovascular endurance, strengthen the musculoskeletal system, and ameliorate pain both physically and psychosocially. Kangoo Jumps may represent a natural, side-effect-free alternative that can help reduce reliance on medication.

Implications, Kangoo Jump activities should be viewed as an effective approach that supports the natural mechanics of human movement and yields substantial benefits consistent with movement norms. However, further comprehensive, long-term, and biochemically supported studies are needed to fully elucidate its efficacy. Considering Kangoo Jumps activities, the fact that a large number of jumping activities that cannot be performed during a normal workout can be done without causing damage to the musculoskeletal system in particular, it is thought that Kangoo Jumps activities significantly help individuals who are condemned to today's sedentary lifestyle achieve maximum gains in a unit of time.

Etik Komite Onayı: Bu çalışma için etik komite onayı Dumlupınar Üniversitesi'nden (Tarih: 9 Ocak 2025, Karar No: 7, Protokol No: 2024/12) alınmıştır.

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Hakem Değerlendirmesi: Dış bağımsız.

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Çıkar Çatışması: Yazarlar, çıkar çatışması olmadığını beyan etmiştir.

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Yapay Zekâ Kullanımı: Yazarlar, bu çalışmada hiçbir yapay zeka (YZ) aracının kullanılmadığını beyan eder.

Ethics Committee Approval: Ethics committee approval was received for this study from the ethics committee of Kütahya Dumlupınar University (Date: January 09, 2025, Decision Number: 7, Protocol No: E-67750228-050.04-357932).

Informed Consent: Verbal consent was obtained from all the participants.

Peer-review: Externally peer-reviewed.

Author Contributions: Concept-B.R.E.; Design- A.E.; Supervision- B.R.E.; Resources-U.K.O.; Data Collection and/or Processing-A.E. ; Analyses and/or Interpretation -B.R.E.; Literature Search-U.K.O. ; Writing Manuscript - U.K.O, A.E.; Critical Review - A.E., B.R.E.

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