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Comparison of Conventional, Complementary and Distraction Therapies to Reduce Dysmenorrhea in Adolescents

Husnul Khotimah[1*], Antika Maulida Rahayu [2], Sri Rahayu[3], Kety Soraya[4]
[1,2,3]Faculty of Health Sciences, Universitas Faletehan, Cilegon Street Km 06 Pelamunan 42161, Serang, Indonesia
[4]Faculty of Education, Universitas Faletehan, Cilegon Street Km 06 Pelamunan 42161, Serang, Indonesia
*Corresponding author: husnulmehu@gmail.com

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ABSTRACT

Menstruation is one of the changes experienced by adolescent girls. During this period, women often experience discomfort such as dysmenorrhea, which can affect physical health and daily activities. The incidence of dysmenorrhea remains high worldwide and in Indonesia, but it can be managed through both pharmacological and non-pharmacological methods. The purpose of this study was to determine the effectiveness of conventional, complementary and diversion therapy in overcoming dysmenorrhea in adolescents. The study design was a retrospective cohort. The sample used was 35 using a purposive sampling technique at MTsN 1 Serang Regency in March-April 2025. Data analysis used in this study was the Wilcoxon Test and Kruskal-Wallis Test. The results showed that there was a significant relationship between post-test results and pre-test in complementary therapy (p = 0.005) and diversion therapy (p = 0.007) with dysmenorrhea, while conventional therapy (p = 0.458) did not have a significant relationship with dysmenorrhea. Overall, the three therapies had a significant effect on dysmenorrhea (p <0.001). The post-test results of the three therapies were analyzed and found that there was no significant relationship with dysmenorrhea (p = 0.812). This indicates that complementary and diversional therapies have comparable effectiveness in reducing dysmenorrhea pain. It is hoped that medical personnel and adolescents can begin to consider integration strategies to treat dysmenorrhea pain.

Introduction

Many changes occur during adolescence because adolescence is actually an important transition from childhood to adulthood. The changes that occur can affect adolescent development both physically and psychologically. These changes include hormonal, physiological, psychological and social changes. This is a process of the adolescent body towards maturation or adulthood (Larasati & Alatas, 2016).

One of the changes in adolescent girls is menstruation. During menstruation, women experience various disorders that can cause physical and activity disorders. One of the discomforts is dysmenorrhea. Dysmenorrhea is a public health problem that means painful menstruation (Acheampong et al., 2019; Al-Matouq et al.,

2019; Chen, Draucker, & Carpenter, 2018; Harris et al., 2015). Dysmenorrhea is a health problem that has a negative impact on physical and emotional health and mostly causes absenteeism from school which affects academic performance. Dysmenorrhea in women can affect students' academic ability, school absence, and loss of daily work (Aboushady & El-saidy, 2016; Hailemeskel et al., 2016; Shehata et al., 2018).

Menstrual disorders such as dysmenorrhea are common complaints experienced by women. There are two types of dysmenorrhea, namely primary and secondary dysmenorrhea. Primary dysmenorrhea is menstrual pain with idiopathic causes or unrelated to gynecological disorders, while secondary dysmenorrhea is related to gynecological disorders, such as chronic salpingitis, endometriosis, uterine cervical stenosis, and others (Suthiwong, Thongsri, & Yenjai, 2017).

The incidence of dysmenorrhea in the world is quite large. According to the World Health Organization (WHO), around 90% (1,769,425 people) of women experience dysmenorrhea and more than 50% of women in each country experience dysmenorrhea. The prevalence of dysmenorrhea varies worldwide with an estimated average of 44% in China, 45-95% in the UK, 51% in Singapore, 52-64% in Mexico, 60-80% in the United States in women of reproductive age, 73% in Sweden, 80% in Western Australia, 84.2% in Thailand, and 94% in Egypt (Organization, 2013). The incidence of dysmenorrhea in Indonesia in 2018 was 107,673 people (64.24%), consisting of 59,671 people (54.89%) experiencing primary dysmenorrhea and 9,496 people (9.36%) experiencing secondary dysmenorrhea. The rate of dysmenorrhea in adolescents in Indonesia is quite high, reaching 76% (Kementrian Kesehatan Republik Indonesia, 2024). Meanwhile, in Banten Province, based on research results in 2016, it was found that 67% experienced dysmenorrhea consisting of 21.3% experiencing mild dysmenorrhea, 36.3% experiencing moderate dysmenorrhea and 9.4% experiencing severe dysmenorrhea (Puspita, 2018).

Adolescent girls will feel pain more often due to primary dysmenorrhea because the hormonal cycle they experience is not yet stable, and adolescent girls do not often experience uterine contractions like young adult women (Wieminaty & Nurvitasari, 2024). The pathophysiology of dysmenorrhea is still unclear, but currently the most believed to increase pain in primary dysmenorrhea are prostaglandins and leukotrienes. Primary dysmenorrhea is related to endometrial prostaglandins and leukotrienes. After the ovulation process occurs in response to increased progesterone production, fatty acids fospholipids in the cell membrane will increase. Then arachidonic acid and other omega-7 fatty acids are released and start the flow of prostaglandin and leukotriene mechanisms in the uterus. Then it produces inflammatory response mediation, menstrual cramps (Fajrin, Alam, & Usman, 2020).

Although dysmenorrhea is normal for every woman, most of them cannot cope with it. Some can still work but with a grimacing face in pain. However, this can affect mental and physical function. If dysmenorrhea is left untreated, it can lead to short-term effects such as decreased quality of life, school or work absenteeism, reduced concentration, fatigue, mood disturbances, and sleep problems (Itani et al., 2022). In the long term, persistent menstrual pain may cause central sensitization ("hyperalgesic priming"), increase the risk of chronic pelvic pain, and be associated with conditions such as endometriosis, which can potentially impair fertility (MacGregor et al., 2023). Most women take pain relievers or prostaglandin inhibitors such as NSAIDs (nonsteroidal anti-inflammatory drugs) in

the form of ibuprofen, mefenamic acid, naproxen and aspirin are widely used as initial therapy for dysmenorrhea. However, this drug has side effects of digestive disorders such as nausea, dyspepsia and vomiting (Ulya et al., 2017).

Treatment of dysmenorrhea is divided into 2, namely pharmacological therapy and non-pharmacological therapy. Pharmacological Therapy, divided into 3 (three), namely: 1) Administration of Analgesic Drugs such as Ibu Profen, Mefenamic acid, Aspirin, and so on, 2) Non-steroidal Anti-Inflammatory Drugs (NSAIDs), 3) Hormone therapy. Non-Pharmacological Therapy is often an alternative when women experience dysmenorrhea to reduce pain intensity. These non-pharmacological treatments include: 1) Deep Breathing Relaxation Techniques, 2) Warm Compresses, 3) Consumption of Dark Chocolate, 4) Music Therapy, 5) Aromatherapy, 5) Distraction and Physical Exercise (Khotimah & Lintang, 2022a)

The potential side effects of some drugs make some women with dysmenorrhea seek alternative treatments such as herbal medicines, diet, fish oil supplements, vitamin E, and low-fat and vegetable diets to control their symptoms (Bajalan, Alimoradi, & Moafi, 2019). Of the various therapeutic approaches, complementary and alternative therapies for primary dysmenorrhea are highlighted worldwide. According to the World Health Organization (WHO), 30-40% of the world's health care types fall into modern conventional medicine, and the rest are classified as complementary and alternative therapies (Kim, 2020).

Some complementary therapies are the use of herbs such as lemongrass containing essential oils that have chemical and pharmacological effects, namely spicy and hot flavors to relieve dysmenorrhea pain (Marisa, 2024), honey containing enzymes, flavonoids, phenolic acids, volatile compounds, sugar, protein (0.5%), water (17.5%), vitamins and minerals. the main components of honey are water, glucose, fructose, sucrose, minerals and proteins which are effective in reducing pain (Handayani et al , 2022; Apriani, 2022; Putri, Arlym, & Widowati, 2024). Aromatherapy, acupressure, warm compresses are also alternative solutions to overcome dysmenorrhea (Khotimah & Subagio, 2021).

Distraction techniques are a type of non-pharmacological therapy that can be used to manage pain by minimizing factors that exacerbate it. Distraction is used to divert attention from painful thoughts, thereby preventing conditions that can increase discomfort due to worry (Hasanah, Sendra, & Wijayanti, 2024; Ituga, Taqiyah, & Agustini, 2020). Some distraction techniques are music therapy, deep breathing relaxation, exercise, reading books, watching videos, or just walking in places that we find fun and are personal pleasures (Hasanah et al., 2024).

Conventional, complementary, and diversion therapies each have unique advantages that justify research into their effectiveness for managing dysmenorrhea. Conventional therapy, such as NSAIDs and hormonal contraceptives, directly targets prostaglandin-induced uterine contractions and remains the first-line treatment, although some patients experience limited relief or side effects (Damm et al., 2019; Juntu & Ananta, 2023; Kirsch et al., 2024). Complementary therapies, including acupuncture, herbal remedies, exercise, and heat application, provide holistic, low-risk alternatives that can improve pain and overall well-being, as supported by systematic reviews and meta-analyses showing significant reductions in pain intensity (Wijaya et al., 2024; Zhao et al., 2025). Diversion therapies, such as relaxation, distraction, and guided imagery, help regulate pain perception through psychological mechanisms, reducing anxiety and enhancing coping abilities in adolescents

with menstrual pain (Wijayanti & Kusmiwiyati, 2019). Since dysmenorrhea is influenced by biological, emotional, and social factors, investigating the comparative and integrative effectiveness of these three approaches is essential for developing comprehensive, evidence-based pain management strategies.

The purpose of the study was to determine the comparative effectiveness of conventional, complementary and distraction therapies to reduce dysmenorrhea in adolescents.

Method

Observational study design with a retrospective cohort approach. The study was conducted for 2 months at MTsN 1 Serang Regency in March-April 2025. The population of this study was 288. The sampling technique used a non-probability sampling approach (saturated sampling). Determination of sample size was carried out using the G*Power application for calculating one tails, effect size dz of 0.5 (moderate effect size), α value of 0.05, and power (1-β error probability) of 0.8 (minimal statistical power), so that the number of samples was 27 rounded up to 35 students, who had met the inclusion criteria: students who had experienced menstruation, had experience of menstrual pain, students who were still actively attending school. While the exclusion criteria were: unwilling to be respondents and not present during the data collection process. Sampling used a purposive sampling technique.

The dependent variable in this study is dysmenorrhea which consists of 5 categories, namely: no pain (scale 0), mild (1-3), moderate (scale 4-6), severe (scale 7-9), very severe/unbearable (scale 10), while the independent variable is intervention in overcoming dysmenorrhea includes 3 categories, namely conventional, complementary and distraction therapy. The data collection instrument used a pain scale measurement questionnaire using the Numeric Rating Scale (NRS).

The supporting data in this study were primary data through direct intervention to respondents. This study used the instrument. The pain intensity scale is seen with a pain scale range of 0-10: 0 = No pain, 1-3 = Mild pain, 4-6 = Moderate pain, 7-9 = Severe pain, 10 = Very severe / Unbearable. Respondents were given a questionnaire regarding their experience in overcoming dysmenorrhea including pre-test dysmenorrhea pain (before undergoing therapy), then determining what therapy had been used according to their personal experience and then refilling the post-test dysmenorrhea pain after they had carried out the intervention.

The data analysis used in this study was the Wilcoxon test to determine the differences in each group and then conducting the Kruskal-Wallis Test to analyze the differences between intervention groups. Previously, a normality test using Shapiro-Wilk was conducted because the sample size was less than 50 with the results of dysmenorrhea pain data before ($p = 0.003$) and after ($p = 0.001$) therapy being distributed abnormally. This study has obtained research ethics permission from the Research Ethics Commission of Faletehan University with the number 179/KEPK.UF/IV/2025

Results and Discussion

Table 1. Effect of intervention on dysmenorrhea pain in each group (n=35)

Variable	Median Pre	Median Post	Z	p-value
Conventional therapy	2.5 (2.0–3.0)	2.0 (1.0–3.0)	-0.743	0.458
Complementary therapy	3.0 (1.5–3.8)	1.5 (0.3–2.0)	-2.807	0.005*
Distraction therapy	3.0 (3.0–4.5)	3.0 (1.0–3.8)	-2.701	0.007*
Combination of three therapies	3.0 (2.0–4.0)	2.0 (1.0–3.0)	-3.738	<0.001**

Table 1 shows that there was a significant decrease in pain scores after complementary therapy (Z = -2.807, p = 0.005), diversion therapy (Z = -2.701, p = 0.007), and a combination of the three therapies (Z = -3.738, p < 0.001). However, this was not the case with conventional therapy, which did not reduce pain scores (Z = -0.743, p = 0.458).

Table 2. Effect of intervention on dysmenorrhea pain between groups (n=35)

Variable	Group	N	Media	Mean Rank	p-value
Post-intervention pain score	Conventional therapy	4	2	18.0	0.812
	Complementary therapy	15	1.5	19.2	
	Distraction therapy	16	3.0	16.9	

able 2 shows the results of the Kruskal-Wallis Test showing no significant difference between the three intervention groups on post-intervention pain scores (p=0.812). This finding suggests that the type of intervention does not affect the level of dysmenorrhea pain. Further testing is needed to determine which pairs of groups differ significantly.

Dysmenorrhea

Until now, the exact cause of primary (idiopathic) dysmenorrhea is unknown. However, several factors are thought to cause menstrual pain, including psychological factors. Teenage adult women who are emotionally unstable are more susceptible to dysmenorrhea. Endocrine factors: excessive uterine contractions are thought to be the cause of menstrual pain. According to the prostaglandin factor theory, the uterine wall produces more prostaglandins during menstruation, which causes menstrual pain. This theory underlies the treatment of menstrual pain with antiprostaglandins (Prawirohardjo et al., 2011)

Almost every woman who has reached puberty experiences menstrual problems. A woman's quality of life can decrease as a result of menstrual disorders, which must be evaluated thoroughly. The effects of dysmenorrhea on female students can cause class absences or truancy and stay in bed for one to two days. Most women seek treatment or therapy, both pharmacological and non-pharmacological, because of this discomfort (Rusyanti et al., 2023).

Every woman has different complaints of menstrual pain, ranging from very mild, mild, moderate, severe, or very severe. Women can even experience neurogenic shock due to enduring pain. Dysmenorrhea can reduce a woman's quality of life because it can cause decreased academic achievement, enthusiasm, attendance, and

achievement at work (Samba Conney et al., 2019).

Conventional therapy

Premenstrual syndrome and dysmenorrhea are problems that are often experienced by adolescents. Dysmenorrhea experienced by adolescent girls since their first period is a normal condition. However, most women consider dysmenorrhea to interfere with their daily activities. In the medical world, the use of drugs is the main method for treating dysmenorrhea. However, pharmacological methods can cause side effects if used in the long term. There are several ways that can be done to reduce dysmenorrhea and menstrual pain pharmacologically by giving drugs that are classified as analgesics such as Antalgin, Mefenamic Acid, Femina (Rusyanti et al., 2023).

Complementary therapy

Non-pharmacological methods such as acupuncture can be an alternative to reduce dysmenorrhea. Side effects from drug use can be prevented with acupuncture, which is beneficial for patients because it can prevent side effects of drugs, especially in the long term (Rusyanti et al., 2023).

One non-pharmacological method that women can use to reduce the symptoms of dysmenorrhea is exercise, which can also eliminate their dependence on the use of analgesic drugs. Exercise can help a person avoid and overcome pain. The body produces large amounts of endorphin hormones when exercising. The central nervous system and spinal cord produce this hormone, which can make the body more relaxed (Sugiharti & Sumarni, 2018)

Honey has flavonoids that can clean free radicals, act as anti-inflammatories, and inhibit oxidative enzymes, thereby reducing menstrual pain. Flavonoid content can also control uterine smooth muscles, which reduces pain during menstruation (Rusyanti et al., 2023).

REMAKUDA Juice (Lemongrass, Honey, and Fruit) can be used as an alternative non-pharmacological treatment to increase hemoglobin levels in dysmenorrhea. In addition, lemongrass contains antioxidants from geraniol and citronellal compounds, which function to reduce pain during menstruation. In addition, lemongrass can be used as an antidepressant to suppress and relieve stress, making you feel relaxed both physically and mentally. Lemongrass has ingredients that are considered to have antipyretic, analgesic, anti-inflammatory antioxidant, and anti-antidepressant properties. By stimulating the happiness hormone, this lemongrass plant can relax the body. This is done by stopping pain receptors so that pain is sent to the cortex and reducing pain perception. Ethical licensing barriers and type c and dela a fiber barriers can appear in the commudorsal. In addition, dates contain iron that is absorbed by the intestines and carried to the blood for the hemopoiesis process, which is the process of forming red blood cells. Coconut water also contains folic acid, which can help the formation of red blood cell nuclei during the blood formation process (Mawaddah, 2019).

There are also options for non-pharmacological therapy, such as warm compresses. During menstruation, uterine muscle contractions cause spasms or cramps. To relieve these spasms, warm compresses on the lower abdomen can increase blood vessel circulation and capillary pressure. In addition, this compress can relax the uterine muscles and reduce spasms. However, warm compresses should not be used for too long, such as more than an hour. This is because it can cause irritation to the skin it and causes pain in the abdomen (Susanti et al., 2016).

Aromatherapy can help reduce dysmenorrhea pain. Women with dysmenorrhea can use aromatherapy in various ways. Among them are through

massage or application, which affects the body physiologically, or through inhalation, which affects the olfactory system. Aromatherapy is a method of treatment or care that uses fragrant essential oils. In addition to physiological effects, aromatherapy can have an impact on a person's mental health, memory, and emotions. so that it can improve mood and health. Lavender, lemon (citrus), and others are some examples of aromatherapy (Rambi & Bajak, 2019).

Diversion therapy

One alternative to overcome dysmenorrhea is music therapy. Music therapy must be adjusted to the respondent's pleasure and interests. Various sources state that classical music is the most effective type of music to reduce pain. Classical music can reduce pain because its tempo is comparable to the human heartbeat, which ranges from 60 to 80 beats per minute. However, it does not fit the cultural conditions and interests of the Indonesian people who are mostly Javanese, where the respondents themselves are teenagers who really like pop music. Therefore, the music therapy used must be in accordance with the client's preferences (Martin-Saavedra & Ruiz-Sternberg, 2020).

One way to relax is to exercise or exercise. Exercise that is done regularly and with high intensity can increase blood flow throughout the body, including to the reproductive organs, thereby reducing pain associated with dysmenorrhea. Exercise can increase blood levels of β-endorphins four to five times. Endorphins, natural analgesics, are made when the body feels comfortable and relaxed, so they can reduce pain during menstrual contractions (Rachmawati & Safriana, 2020).

Breathing slowly and using the diaphragm is a deep breathing relaxation technique. This allows the abdomen to lift slowly and the chest to fully expand. These techniques can not only reduce the intensity of pain but can also increase the lung window and increase blood oxygenation. Doing deep breathing relaxation techniques also helps people become calmer, calmer, and less anxious. This technique is also easy to do and does not require costs (Rusyanti et al., 2023).

Comparison of the three therapies

Complementary therapy, diversion, and a combination of the three therapies have been shown to be effective in reducing dysmenorrhea pain. In practice, these three approaches can be considered as alternatives or complements to dysmenorrhea pain therapy. Significant results in combined therapies open up opportunities for the development of multimodal interventions that can be more effective than one type of therapy alone. Conventional therapy may be less statistically effective, and needs to be re-evaluated or combined with other approaches for maximum results.

This study has several limitations, including the limited number of samples, which reduces the power of the statistical test. In addition, individual variation in pain perception and the relatively short duration of the intervention can affect the results. It is recommended that further research increase the number of samples, extend the duration of the intervention, and control external factors that can affect dysmenorrhea pain. Further research can be developed regarding the effectiveness of non-conventional therapies, especially complementary therapies (such as aromatherapy, yoga, acupressure, etc.) and diversion therapies (such as relaxation, distraction, or visualization).

Conclusion

Complementary therapy, diversion, and a combination of the three therapies were shown to be effective in reducing dysmenorrhea pain, but conventional therapy was not shown to be effective in reducing dysmenorrhea pain. The results

of the statistical analysis showed no significant difference between groups. This indicates that the three interventions have comparable effectiveness in reducing dysmenorrhea pain, or that the differences between interventions were not strong enough to be detected in this study. Further research with a larger sample size or longer intervention duration is needed to confirm these findings.

Not all therapies have the same effect, and non-conventional approaches have the potential to be more effective in reducing dysmenorrhea pain. This indicates the need for a paradigm shift in the management of menstrual pain. Health institutions and medical personnel can start considering an integrative approach in the management of dysmenorrhea pain.

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