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Research Article

The Impact of Hegu Point (LI4) Acupressure Therapy and Warm Compress on Menstrual Pain (Dysmenorrhea) in Middle School Students

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ABSTRACT

Introduction: Menstruation often leads to disturbances in women, with menstrual pain, or dysmenorrhea, being a common issue that affects daily activities. Non-pharmacological therapies like acupressure and warm compresses are considered safe and effective in managing dysmenorrhea. This study examines the effect of Hegu Point (LI4) acupressure therapy combined with warm compresses on menstrual pain in students at SMP Wisata Denpasar.

Methods: This quantitative study employed a pre-experimental, one-group pre-test, and post-test design. The sample size was 52 students, selected through purposive sampling. The intervention involved applying a warm compress and acupressure at the Hegu point (LI4). Pain levels were measured using an observation sheet for pain scales, and the data were analyzed using the Wilcoxon rank test.

Results: After the intervention, menstrual pain significantly decreased. Before the intervention, 57.7% of the students experienced moderate pain. After the intervention, 53.8% reported mild pain. The Wilcoxon test yielded a p-value of 0.000, indicating a significant effect.

Conclusion: In students, Hegu Point (LI4) acupressure therapy combined with a warm compress significantly reduces menstrual pain. Healthcare providers should educate students about these non-pharmacological therapies for managing dysmenorrhea.

Keywords: *Acupressure Therapy, Dysmenorrhea, Menstruation, Warm Compress*

Introduction

Menstruation is a complex process regulated by hormones. Once a girl enters puberty, her body produces enough hormones to induce menstrual bleeding. This signifies that the girl has reached the maturity of her sexual organs, which are now functioning as they should [1]. Menstruation can cause significant disturbances for women. Menstrual pain is a common menstrual disorder that most women experience. The nature and intensity of the pain vary from mild to severe; this condition is known as dysmenorrhea, which involves intense pain that can interfere with daily activities [2,3].

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According to the World Health Organisation (WHO) in 2018, the prevalence of dysmenorrhea worldwide is very high, with more than 50% of women in each country experiencing it [4]. According to the 85.4% of adolescent girls in Africa will suffer from primary dysmenorrhea [5]. In Indonesia, the incidence of dysmenorrhea is also significant, affecting 60–70% of women. The incidence of primary dysmenorrhea in Indonesia is 54.89%, while the remaining 45.11% is secondary dysmenorrhea [6].

The Ministry of Education and Culture (2019) recorded that Denpasar ranks highest, with a total of 13,176 middle school students [7]. According to a preliminary study at SMP Wisata Denpasar, there are 107 female students out of a total of 238. According to interviews with 20 randomly selected students, 13 frequently experience menstrual pain, four sometimes experience it, and three do not.

Menstrual pain, also known as dysmenorrhea, is abdominal pain originating from uterine cramps that occur during menstruation. Menstrual pain arises from myometrial dysrhythmia contractions, presenting one or more symptoms ranging from mild to severe pain [8]. One major issue with menstrual pain is the lack of proper management. Only 25.9% of students with menstrual pain consult healthcare professionals about their pain. Most manage the pain with limited measures, such as applying eucalyptus oil or balm and taking over-the-counter pain relievers without a doctor's prescription [9].

Pharmacological and non-pharmacological methods can alleviate menstrual pain. Pharmacologically, this involves administering analgesics, hormonal therapy, and medication. However, pharmacological therapies can have undesirable side effects. Non-pharmacological therapies are safer for women with dysmenorrhea [10]. Non-pharmacological therapies offer the advantages of affordability, ease of use, and home or school performance, enabling clients and their families to effectively manage symptoms and treatment [11]. Non-pharmacological methods include warm compresses or warm baths, massage, physical exercise, sufficient sleep, hypnotherapy, distraction techniques like listening to music, relaxation techniques such as yoga and deep breathing, and acupressure [8,12–14].

An innovative, non-pharmacological approach can combine two existing therapies. The easiest and most affordable therapies to perform are acupressure and warm compress therapy. Acupressure is a traditional Chinese therapy method for treating dysmenorrhea by massaging specific meridian points on the body [15]. Acupressure has a high success rate with few or no complications if the disorder is functional, the diagnosis is accurate, the technique is good, and the prognosis is favorable. Additionally, acupressure is simple to perform and inexpensive [16]. When you press on certain acupressure points, they can stimulate the thalamus. The release of endorphin encephalins can simultaneously reduce pain and the psychogenic excitation of the central analgesia system [17]. Acupressure therapy combined with warm compresses can increase muscle relaxation, reduce spasm or stiffness pain, and provide a localised warming effect. Warm compresses can alleviate the cramps or pain caused by excessive myometrial muscle contractions that cause dysmenorrhea. The warmth improves blood circulation, vascularization, and vasodilation, relaxing the muscles as they receive more nutrients carried by the blood, thereby reducing muscle contractions [10].

According to Dzia's [16], acupressure has a greater effect on reducing pain intensity when combined with the correct pressure points, which support each other. Acupressure therapy effectively reduces the intensity and duration of dysmenorrhea pain, enhancing quality of life due to its safety, ease of use, lack of side effects, and independent performance (Dzia, 2021) [16]. Wianti & Karimah stated that warm compress therapy is more effective in reducing pain than deep breathing relaxation therapy, with a difference of 1 point [18].

Considering the need for non-pharmacological management of menstrual pain in students and the high incidence of dysmenorrhea at SMP Wisata, the researcher is interested in conducting a study using both therapies simultaneously to determine the "Effect of Hegu Point (LI4) Acupressure Therapy and Warm Compress on Menstrual Pain (Dysmenorrhea) in Students of SMP Wisata Denpasar."

Research Objective

This study aims to determine whether Hegu Point (LI4) acupressure therapy and a warm compress have an effect on menstrual pain (dysmenorrhea) in students at SMP Wisata Denpasar.

Methods

Design

This research used a quantitative approach with a quasi-experimental design, specifically a one-group pre-test and post-test design. Measurements were taken before and after the therapy to assess the impact of Hegu Point (LI4) acupressure therapy and a warm compress on menstrual pain (dysmenorrhea) in students at SMP Wisata Denpasar.

Sampling

The sampling method used non-probability sampling, specifically purposive sampling, with a total sample size of 52 respondents.

Inclusion and Exclusion Criteria

The inclusion criteria were female students aged 13-15 years, regular menstrual cycles, and experiencing moderate to severe menstrual pain (dysmenorrhea). Meanwhile, the exclusion were students with a history of chronic pelvic pain or other gynecological disorders, those on hormonal treatments or other medications affecting menstrual pain, and allergies to heat or skin conditions prevent the use of warm compresses.

Intervention Process in Detail

Acupressure Therapy:

1. **Preparation:** Ensure a clean and quiet environment. Wash hands thoroughly.
2. **Identification of the Hegu Point (LI4):** Located between the thumb and index finger.
3. **Application:** Apply firm pressure to the Hegu point using the thumb for 3-5 minutes in a circular motion.
4. **Technique:** Use gentle, yet firm pressure, ensuring not to cause discomfort or pain. Rotate clockwise 30 times.
5. **Frequency:** The therapy was administered during the initial days of menstruation when pain was most severe.

Warm Compress:

1. **Preparation:** Fill a hot water bottle with water at 46°C and ensure the cap is tightly sealed. Cover the bottle with a cloth.
2. **Application:** Place the warm compress on the lower abdomen for 20-30 minutes.
3. **Monitoring:** Regularly check for any adverse reactions such as skin redness or discomfort.
4. **Frequency:** Apply the compress as needed during episodes of pain.

Intruments

The instruments used in this study include standard operating procedures (SOP) for acupressure and warm compress, as well as observation sheets for pain scale assessment. The observation sheet used for pain assessment included a numeric rating scale from 0 to 10, where:

a. 0 indicated no pain,
b. 1-3 indicated mild pain,
c. 4-6 indicated moderate pain,
d. 7-10 indicated severe pain.

Analysis

Data analysis was conducted using univariate and bivariate analysis. The statistical test used Wilcoxon rank test.

Ethical Clearance

This research was ethically reviewed and approved by the Ethics Committee of STIKES Bina Usada Bali with approval number 172/EA/KEPK-BUB-2022. Informed consent was obtained from all participants, ensuring their understanding of the study's purpose, procedures, and their right to withdraw at any time without consequences. Confidentiality and anonymity were maintained throughout the study.

Results

Table 1. Respondent Characteristics Based on Age

Characteristics	Frequency (n)	Percentage (%)
Age		
13	15	28.9
14	11	21,1
15	26	50
Before		
No Pain	0	0
Mild Pain	1	1,9
Moderate Pain	30	57,7
Severe Pain	21	40,4
After		
No Pain	2	3,8
Mild Pain	28	53,8
Moderate Pain	20	38,5
Severe Pain	2	3,8

Based on Table 1, the average age of the respondents is 13.5 years, with a minimum age of 13 years and a maximum age of 15 years. The majority of menstrual pain levels before and after intervention were moderate pain (57.7%) and mild pain (53.8%), respectively.

Table 2. Effect of Hegu Point (LI4) Acupressure Therapy and Warm Compress on Menstrual Pain (Dysmenorrhea) in SMP Wisata Denpasar Students

Variable	**N**	***Z value***	***P value***
Menstrual Pain	52	-6,428	0,000

Based on Table 2, the results showed that the menstrual pain score in students after the intervention has a Z-value of -6.428. From the Wilcoxon sign rank test, the P-value = 0.000 < α 0.05, indicating that the hypothesis of this study is statistically accepted, meaning that there is an effect of Hegu point (LI4) acupressure therapy and warm compress on menstrual pain (dysmenorrhea) in SMP Wisata Denpasar students.

Discussion

Respondent Characteristics Based on Age at SMP Wisata Denpasar

The study results show that the average age of respondents is 13.5 years, with the highest age being 15 years and the lowest being 13 years. This study aligns with research conducted by Restiyana [19], which found that out of 24 respondents, the majority of teenage girls experiencing menstruation were 14 years old, accounting for 14 individuals (58.3%). This is supported by Restiyana [19] who stated that menstruation begins between the ages of 12 and 15, and dysmenorrhea is one of the most common complaints among teenagers during menstruation.

Dysmenorrhea is pain felt in the abdomen due to uterine cramps occurring during menstruation [19]. One factor influencing menstrual pain is age; the older a person, the greater the likelihood of experiencing pain. Pain is more common in teenage girls with dysmenorrhea, with primary dysmenorrhea typically occurring between the ages of 12 and 15 [19].

Menstrual Pain Levels (Dysmenorrhea) Before Intervention

The study results showed that before Hegu Point (LI4) acupressure therapy and warm compresses were administered, 57.7% of the 52 respondents at SMP Wisata Denpasar experienced moderate menstrual pain. This study

aligns with Restiyana [19], who found that before acupressure therapy, 91% of 100 respondents reported moderate pain. Similarly, Restiyana [19] found that before warm compress therapy, most respondents reported moderate pain, typically on a scale of 5–6.

In this study, most students at SMP Wisata Denpasar experienced moderate dysmenorrhea pain before receiving acupressure and warm compress therapy. Therefore, acupressure and warm compress therapy should be administered to reduce the pain scale. According to Rattu [10], dysmenorrhea occurs due to the contraction of the myometrial muscles, which causes excessive contraction leading to abdominal pain, and this pain can be reduced with acupressure and warm compress therapy.

Menstrual Pain Levels (Dysmenorrhea) After Intervention

The research results indicated that the level of menstrual pain (dysmenorrhea) in SMP Wisata Denpasar students, after being given hegu (LI4) acupressure therapy and warm compresses, showed that out of 52 respondents, 28 people (53.8%) were in the mild pain category. This study aligns with the research conducted by Restiyana [19], which showed that out of 20 treatment groups, after receiving acupressure therapy, the average menstrual pain was in the mild pain category, having initially been in the moderate pain category. This indicates a reduction in the pain scale after acupressure therapy. Similarly, Restiyana [19] found that among 30 respondents, the average menstrual pain decreased from moderate to mild after being given warm compress therapy.

In this study, non-pharmacological therapy innovation was implemented by combining two existing therapies. The easiest and most affordable therapies to perform are acupressure and warm compresses. Acupressure is known as one of the traditional Chinese methods for treating dysmenorrhea by applying pressure to specific meridian points on the body [15]. This is supported by Rattu et al. [10], who stated that combining acupressure therapy with warm compresses can enhance muscle relaxation, reduce pain from spasms or stiffness, and provide localized warmth.

This study combined two types of non-pharmacological therapy: hegu (LI4) acupressure and warm compresses. Acupressure and warm compresses have a high success rate with few or no complications if the disorders are functional, the diagnosis is accurate, the technique is good, and the prognosis is favorable. Additionally, acupressure and warm compresses are easy to perform and cost-effective [16]. Pressure on acupressure points can activate the thalamus, which then releases endorphin and enkephalin hormones that can alleviate pain and reduce the psychogenic excitation of the central analgesia system, thereby simultaneously reducing pain [17]. Warm compresses can also reduce abdominal pain, as the warmth can improve blood circulation and vascularization, causing vasodilation and muscle relaxation due to the increased nutrients delivered by the blood, thus reducing muscle contractions [10].

This is supported by Dzia [16], who stated that acupressure has a significant effect on reducing pain intensity if performed with the correct combination of points, thereby supporting each other in reducing pain intensity. Acupressure therapy is an effective method for reducing the intensity and duration of dysmenorrhea pain and can improve quality of life because the intervention is safe, easy, without side effects, and can be performed independently. Wianti & Karimah stated that warm compress therapy is also effective in reducing pain intensity in women experiencing dysmenorrhea [18].

The Effect of Hegu (LI4) Acupressure Therapy and Warm Compresses on Menstrual Pain (Dysmenorrhea) in Students at SMP Wisata Denpasar

Based on the analysis of the impact of hegu (LI4) acupressure therapy and warm compresses on menstrual pain (dysmenorrhea) in students at SMP Wisata Denpasar, it was found that there was a difference in the respondents' pain levels before and after the intervention. The statistical test using the Wilcoxon Sign Rank Test showed a P-value of 0.000 ($p < 0.05$), indicating that the null hypothesis (Ho) was rejected and the alternative hypothesis (Ha) was accepted. This means that there is an effect of

hegu (LI4) acupressure therapy and warm compresses on menstrual pain (dysmenorrhea) in students at SMP Wisata Denpasar.

These results are consistent with the research by Husaidah *et al.,* which found that acupressure therapy influenced the intensity of menstrual pain (dysmenorrhea) in midwifery students at the Mitra Bunda Health Institute [15]. A related study by Maidartati, *et al.,* also found a difference in pain reduction before and after warm compress therapy in female adolescents with dysmenorrhea at SMPN 31 Bandung [2].

In this study, non-pharmacological In this study, non-pharmacological therapy was performed by combining two existing therapies: acupressure and warm compresses. The benefits of providing acupressure and warm compress therapy include the reduction of pain sensations through the increase of endorphins, hormones that naturally relax the body and block pain receptors in the brain. The goal of treating dysmenorrhea with acupressure is to balance excessive hormones, as dysmenorrhea is fundamentally related to hormonal imbalances [19]. On the other hand, applying warm compresses to women with dysmenorrhea can soften the muscle tension in the uterine wall due to rhythmic contractions and cause vasodilation of the blood vessels, allowing oxygen to circulate more easily. Consequently, menstrual blood will flow more easily, and the concentration of prostaglandins will decrease, reducing menstrual pain [10].

The method of acupressure involves rotating clockwise 30 times for 3–5 minutes. The pressure should not be too high to avoid causing the patient pain. Proper massage should create a comfortable sensation, including feelings of soreness, warmth, itching, stinging, or tingling. Achieving these sensations ensures smooth circulation of chi (energy) and xue (blood) and stimulates the release of endorphins, hormones similar to morphine, produced naturally by the body to provide a sense of calm [16,20]. It is essential to maintain the cleanliness of the therapist's hands to avoid transmitting diseases between the therapist and the patient. Massage should not be performed on broken skin, directly over a broken bone, or on swollen areas [16].

The procedure for applying warm compresses involves first preparing the equipment, washing hands, and filling a hot water bottle to 46°C, ensuring the cap is tight. The bottle is then covered with a cloth and placed on the painful lower abdomen for 20–30 minutes. The client's condition should be regularly assessed to check for any adverse reactions, such as leakage or redness. The process can be repeated if the client feels comfortable with the hot water bottle. Afterward, the equipment should be cleaned, and the hands should be washed. Warm compresses work on the principle of heat transfer through conduction, where heat from the bottle transfers to the abdomen, reducing dysmenorrhea pain by relaxing the uterus and smooth muscles [8].

In this study, acupressure and warm compress therapy were found to be easy, economical, affordable, and effective. Acupressure can influence the production of endorphins in the body, which control the activity of the endocrine glands where these molecules are stored. The acupressure point stimulation instructs the endocrine system to release the necessary amount of endorphins, which act as the body's natural painkillers. According to Traditional Chinese Medicine (TCM) principles, acupressure at points LI4, SP6, B27-B34, and LR3-LV3 strengthens the spleen and restores the balance of Yin and blood, liver, and kidneys, leading to changes in dysmenorrhea pain in the treatment group [15]. Warm compresses can also enhance muscle relaxation, reduce pain from spasms or stiffness, and provide localised warmth. Applying warm compresses to women with dysmenorrhea can soften the muscle tension in the uterine wall due to rhythmic contractions and cause vasodilation, allowing oxygen to circulate more easily, facilitating menstrual blood flow, and reducing prostaglandin concentration [10].

The study results showed a significant difference in respondents' pain levels before and after the intervention, with pain levels decreasing from moderate to mild after the intervention. This indicates that hegu (LI4) acupressure therapy and warm compresses significantly affect menstrual pain (dysmenorrhea) in students at SMP Wisata Denpasar. This finding is supported by Dzia [16], who stated that

acupressure and warm compress therapy have a high success rate with few or no complications if the conditions are functional, the diagnosis is accurate, the technique is good, and the prognosis is favorable. Additionally, acupressure and warm compress therapy are easy to perform, cost-effective, and can be done at home or school, enabling clients and their families to manage pain symptoms effectively.

Limitations of the Study

1. **Sample Size and Generalizability:** The study's sample size was limited to 52 respondents from one school, which may not be representative of the wider population.
2. **Subjectivity in Pain Reporting:** Pain perception is subjective, and self-reported measures may vary among individuals.
3. **Short-term Follow-up:** The study only assessed immediate pain relief post-intervention without long-term follow-up to determine sustained effects.

Implications of the Study

The findings suggest that combining acupressure therapy at the Hegu point (LI4) with warm compresses can significantly reduce menstrual pain in adolescents. This non-pharmacological approach can be integrated into school health programs to help students manage dysmenorrhea effectively, thereby improving their quality of life and academic performance. Further studies with larger sample sizes and diverse populations are recommended to validate these results.

Conclusion

There is a significant effect of Hegu Point (LI4) acupressure therapy and warm compresses on menstrual pain (dysmenorrhea) in students at SMP Wisata Denpasar.

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