

## **The Effect of Non-pharmacological Therapy with Soy Milk on the Reduction of Primary Dysmenorrhea Pain in Adolescent Girls**

**Rani Fitriani\*, Eva Mesi Setiana**

DIII Midwifery, An-Nur Husada Walisongo, North Lampung, Indonesia

Email: <sup>1,\*</sup>pututrani@gmail.com, <sup>2</sup>ruzaindavamaru@gmail.com

Email Penulis Korespondensi: pututrani@gmail.com

(\*: coresponding author)

**Abstract**—Dysmenorrhea is a detrimental condition for many women, significantly impacting the health-related quality of life. Non-pharmacological interventions, such as warm compress, balanced nutrition, and adequate rest, play a crucial role as strategies. Particularly, the consumption of high-calcium foods, such as soy, is recognized as an effective solution. This research adopts a Quasi-Experimental design with a Pretest Posttest approach and Control Group Design, involving 10 female students in each group. Statistical analysis employs Paired Sample T-Test and Independent T-test. The research findings reveal a p-value of 0.000, rejecting the null hypothesis (H<sub>0</sub>), indicating a significant difference in the reduction of dysmenorrhea pain scale after the administration of soy milk and health education intervention (HEI) in adolescent girls at MA Walisongo, North Lampung. The discussion emphasizes the role of calcium in alleviating muscle tension, including the uterine muscles, and the presence of isoflavones in soy that can reduce dysmenorrhea. In conclusion, soy milk has a positive influence on reducing primary dysmenorrhea pain in adolescent girls at MA Walisongo, North Lampung.

**Keywords:** Non-Pharmacological Therapy; Soy Milk; Reduction in Pain Scale; Adolescent

### **1. INTRODUCTION**

Dysmenorrhea, characterized by painful menstruation and often accompanied by challenging menstrual flow, necessitates an in-depth understanding of its underlying factors for optimal management (Anurogo and Wulandari, 2017). The spectrum of pain extends throughout the entire menstrual cycle, creating obstacles before, during, and after menstruation, thereby impeding daily activities and significantly impacting both physical and mental health (Ratnawati, 2018). Beyond the evident physical burdens, dysmenorrhea exerts noteworthy economic implications, manifesting in substantial costs related to medication, medical care, and reduced productivity. The financial burden can be considerable, underscoring the need for effective management strategies.

Extensive literature highlights considerable variations in the prevalence of dysmenorrhea, with affected women facing challenges in performing routine activities. This is particularly notable among female students experiencing primary dysmenorrhea, who encounter difficulties concentrating on their studies due to the persistent pain (Faridah Alatas and TA Larasati, 2018). The multifaceted impact of dysmenorrhea goes beyond the immediate discomfort, extending into broader spheres of daily life, healthcare expenditures, and educational pursuits. As such, addressing the complex nature of dysmenorrhea requires comprehensive approaches that not only alleviate physical symptoms but also consider the broader societal and economic implications for affected individuals.

Primary dysmenorrhea, prevalent in adolescent girls, stems from an imbalance in progesterone hormones and is initiated by the release of prostaglandins from the cells lining the uterine wall (Nurwana, Sabilu, & Andi Faizal Fachlevy, 2018). The involvement of prostaglandin PGF<sub>2</sub> $\alpha$  and prostaglandin E<sub>2</sub> (PGE<sub>2</sub>) in the pathogenesis of dysmenorrhea induces uterine vasoconstriction, myometrial contractions, and an elevation in intrauterine pressure. This cascade of events results in heightened uterine hypercontractility and manifests in systemic symptoms such as headaches, vomiting, nausea, and dizziness, which may be associated with the severity of dysmenorrhea (Ryan, A.S, 2017).

The management of dysmenorrhea encompasses various approaches, ranging from pharmacological interventions to non-pharmacological methods. Pharmacological therapies involve the use of analgesics inhibiting prostaglandin synthesis, providing relief from pain. Alternatively, non-pharmacological strategies include the application of warm compresses, maintaining a well-balanced nutritional intake, and ensuring sufficient rest. Hormonal therapy stands as a common recourse, aiming to regulate an ovulatory menstrual cycle and mitigate menstrual pain (Baziad, 2018).

In the pursuit of alleviating primary dysmenorrhea, traditional medicine emerges as a viable option, often accompanied by minimal or no side effects. Essential nutrients such as calcium, magnesium, and vitamins A, B<sub>6</sub>, C, and E play a pivotal role in easing dysmenorrhea symptoms. Opting for high-calcium foods like soybeans presents itself as a practical and natural dietary intervention (Budiarti and Novita, 2018). This multifaceted approach to dysmenorrhea management underscores the significance of considering diverse treatment modalities to cater to individual preferences and holistic well-being.

Amalia's comprehensive study in 2018 sheds light on the promising potential of soy milk as a viable alternative for managing primary dysmenorrhea. In her research, she emphasizes that soy milk, in contrast to cow's milk, not only has the capacity to lower cholesterol levels but also contains isoflavones. These isoflavones play a crucial role in mitigating primary dysmenorrhea, particularly among women with diminished estrogen production. The findings of

Amelia's study underscore the practical significance of incorporating soy milk into dietary habits as a means to effectively address primary dysmenorrhea (Amalia, 2018).

Building upon this, Vivi Ardiyanti Putri (2021) contributes to the discourse by defining dysmenorrhea as pain experienced during menstruation, a discomfort that often permeates daily activities, notably impacting learning activities in a school setting. Unfortunately, obtaining precise figures regarding the prevalence of dysmenorrhea in Indonesia poses a considerable challenge due to underreporting by many women who do not seek healthcare providers' assistance. Vivi Ardiyanti Putri's insights highlight the importance of acknowledging the widespread nature of dysmenorrhea and the associated hurdles in capturing accurate epidemiological data, ultimately underscoring the need for increased awareness and open discussions surrounding women's health issues.

The insightful research conducted by Aymulyati and colleagues in 2019 underscores the significant impact of soy milk in mitigating the intensity of primary dysmenorrhea pain. Their findings distinctly highlight that soy milk exerts a noteworthy influence on reducing the severity of primary dysmenorrhea, whereas tajin water, in contrast, fails to yield a substantial effect. This discovery amplifies the positive potential of soy milk as a practical intervention to alleviate the symptoms associated with primary dysmenorrhea.

Expanding the global perspective on dysmenorrhea, data from the World Health International (WHO, 2017) reveals a widespread prevalence of this condition, with an average incidence of 16.88% among young women globally. In the United States, dysmenorrhea has been acknowledged as the foremost cause of school absenteeism among adolescent girls. However, the scenario in Indonesia presents a concerning picture, as data from the Ministry of Health RI in 2018 indicates a considerably higher prevalence of dysmenorrhea, reaching around 55%. This substantial prevalence is attributed to the inadequate knowledge among female adolescents regarding effective strategies to cope with dysmenorrhea, underscoring the urgent need for enhanced educational initiatives and awareness campaigns to empower young women in managing their menstrual health (Depkes, 2018).

The statistics compiled by the Central Statistics Agency (BPS) of North Lampung for the year 2020 paint a concerning picture, indicating that more than half of adolescent girls in the age group of 10-19 years grapple with the challenges of dysmenorrhea. This substantial prevalence underscores the urgent need for effective interventions to address the impact of dysmenorrhea on the well-being of young girls. Intriguingly, a preliminary investigation at MA Walisongo Lampung Utara shed light on the prevalence of primary dysmenorrhea, with 18 female adolescents reported to be experiencing this condition. However, despite the acknowledgment of this issue, no prior research has delved into the realm of soy milk consumption as a potential remedy for alleviating primary dysmenorrhea complaints among female adolescents at MA Walisongo Lampung Utara.

Motivated by this research gap, the present study is initiated with the aim of exploring the potential influence of soy milk on reducing primary dysmenorrhea pain specifically within the context of female adolescents at MA Walisongo Lampung Utara. This endeavor is driven by the overarching goal of contributing comprehensive insights and practical solutions to enhance dysmenorrhea management strategies tailored to the unique needs of this target group. The outcomes of this study are anticipated to inform future interventions and educational initiatives, fostering improved menstrual health outcomes for young girls at MA Walisongo Lampung Utara.

## 2. RESEARCH METHODS

This study is an experimental research with a Quasi-Experimental design and a Pretest Posttest with Control Group Design approach. This approach involves conducting a pretest to measure the level of primary dysmenorrhea before intervention on the respondents, and after the intervention, a posttest is conducted to measure the level of dysmenorrhea again. The level of primary dysmenorrhea is measured using the Numerical Rating Scale (NRS) with a range of 1-10. In simple terms, the research design used can be illustrated as follows:

Experiment: O1 ----- X ----- O2

Control: O3 ----- C ----- O4

Explanation:

O1: Initial test (pretest) for the experimental group

O2: Final test (posttest) for the experimental group

X: Treatment (administration of soy milk)

O3: Initial test (pretest) for the control group

O4: Final test (posttest) for the control group

C: Provision of health education (KIE kompres)

The study was conducted at MA Walisongo Lampung Utara, from March 1 to April 1, 2023. The population of this study is female adolescent students of MA Walisongo Lampung Utara, totaling 53 students. The sample was selected using purposive sampling method, with inclusion criteria such as female adolescents aged 14-16 years, experiencing primary dysmenorrhea, without a history of chronic diseases, and willing to be respondents. Exclusion criteria involve

female adolescents with irregular menstrual cycles, reproductive disorders, or those unwilling to be respondents. The total sample consists of 20 respondents, divided into an intervention group (given soy milk) and a control group (given health education). The research variables consist of the independent variable (soy milk) and the dependent variable (primary dysmenorrhea). The implementation of the intervention involves providing soy milk to the intervention group, while the control group receives health education (KIE kompres). Thus, this research method is designed to investigate the influence of soy milk on reducing the level of primary dysmenorrhea in female adolescents at MA Walisongo Lampung Utara, with the hope of providing deeper insights into dysmenorrhea management in this target group.

Operational definition is an understanding of variables expressed in an operational, practical, and tangible manner within the framework of research or the object under investigation. For instance, soy milk, as the first variable, is operationalized as a liquid resulting from the processing of soybeans soaked, ground, mixed with water, sweetened, boiled until mature, and given in the amount of 250 ml/day on the first day of primary dysmenorrhea. This operational definition is measured using a Standard Operating Procedure (SOP) sheet, with the measurement outcome being 250 ml of soy milk containing 25 mg of soybeans, on a nominal measurement scale. The second variable, primary dysmenorrhea, is described as the pain experienced from the first day to the second day of menstruation. The operational definition is accompanied by a Numeric Rating Scale (NRS) sheet as the measuring tool, with measurement outcomes ranging from 1 to 10, and a ratio measurement scale.

Research instruments used to collect data consist of various tools and materials, such as books, writing utensils, soybeans, blender, food strainer, 250 ml measuring bottles, respondent characteristic data questionnaire, informed consent sheet, pain measurement scale (NRS) sheet, pain observation sheet, and soy milk SOP. Each instrument has a specific role in gathering information related to respondent characteristics, pain levels, and procedures for the production and administration of soy milk. The steps for making soy milk are explained through the SOP, including the soaking and cleaning process of soybeans, boiling to eliminate unwanted odors, using a blender to process soybeans, straining with a tight strainer, adding sugar and pandan leaves, and packaging in 250 ml bottles. The research implementation involves providing soy milk to adolescent girls during the menstrual pain period, with a consumption of 250 ml per day.

In the data analysis process, four essential stages are undertaken to ensure the generation of accurate information, as outlined by Hastono (2016). The first stage involves editing, where a thorough check is conducted to ensure the completeness of the questionnaire data. Subsequently, coding is implemented to classify data according to its types, utilizing specific numerical codes. Following this, data entry is carried out, involving the input of coded data into the computer. The final stage, data tabulation, encompasses summarizing the data into tables, aligning with the research objectives and the inherent characteristics of the data.

Moving on to the data analysis proper, the univariate analysis employs computer-assisted techniques. This method is crucial for understanding general respondent characteristics, such as age, menarche, and the duration of menstrual pain. The univariate analysis provides a descriptive snapshot of the collected data, offering insights into mean, median, standard deviation, respondent characteristics, and Numeric Rating Scale (NRS) scores.

On the other hand, bivariate analysis delves into exploring the relationship between two variables. The study opts for the Paired Sample T-Test due to the normal distribution of data. The normality of data is assessed through the Shapiro-Wilk test, specifically tailored for samples less than 50, with a p-value exceeding 0.05 indicating normal distribution. The Paired Sample T-Test serves to compare menstrual pain scores before and after intervention in the experimental group. Notably, homogeneity testing is omitted as the groups are already deemed homogeneous. For data that is both normally distributed and homogeneous, the Independent Sample T-Test is employed, assuming equal variances in the analysis process.

In adherence to ethical principles, this research commenced with the necessary approvals sought from the Research and Community Service Institute (LPPM) of Akbid An Nur Huasada and data collection commenced only after receiving consent from MA Walisongo Lampung Utara. Health-related investigations involving human subjects demand meticulous attention to ethical considerations, emphasizing the preservation of human dignity. Two fundamental components guide the ethical conduct of this research: ethical issues and informed consent, as elucidated by Dahlan (2016). Addressing ethical concerns involves delineating steps to fulfill ethical requirements, including procedures for data acquisition, confidentiality safeguards for research subjects, data dissemination protocols, obtaining informed consent from subjects, reporting adverse events, serious adverse events, and detailing the ethical review process conducted by the ethics committee.

The second crucial element, the informed consent form, is designed with specific criteria in mind. First and foremost, the language used in the form is carefully crafted to ensure accessibility for the general public. Moving on to the completeness of documents, vital details including the research title or protocol number, version, and date of informed consent creation, as well as specifications for either adults or children, the research location, and subject number, must be prominently displayed in both the footer and header of the form. This critical information is meticulously maintained on every page of the informed consent document.

Furthermore, the completeness of information is paramount, as it involves delivering comprehensive details to potential subjects, categorizing them into basic and additional elements. Basic elements cover an explanation of the research nature, its purpose, research procedures, potential risks, direct benefits, alternative procedures, data confidentiality measures, compensation arrangements, voluntary participation, and contact details of the researcher for

inquiries or accidents. Additional elements include estimated subject numbers, potential unknown risks, subject exclusion criteria, dangers for subjects withdrawing prematurely, potential costs to health insurance, and provisions for subject incentives.

Lastly, the completeness of the approval section is emphasized, with essential details such as the subject's name, age, signature, and date of signing required and filled out by the subject. Simultaneously, the researcher's name, signature, and date of signing are included, completed by the researcher. In certain scenarios, multiple approval forms may be deemed necessary, accommodating various circumstances such as conscious adults unable to sign, unconscious adults, children, and other specific scenarios. These meticulous considerations underscore the unwavering commitment to ethical integrity throughout the entirety of the research endeavor.

### 3. RESULT AND DISCUSSION

**Table 1.** Characteristic of Respondents

Age	Intervention Group	%	Control Group	%
14	3	30.0	2	20.0
15	4	40.0	5	50.0
16	3	30.0	3	30.0
Total	10	100	10	100
<b>Menarche</b>				
11	4	40,0	2	20,0
12	3	30,0	4	40,0
13	3	30.0	4	40.0
Total	10	100	10	100

*Source: Primary Data 2023*

In Table 1, the distribution of respondents based on their age is described. The findings from this research indicate that almost half (40.0%) of the intervention group is aged 15, comprising 4 individuals. Furthermore, approximately one-third (30.0%) of this group is aged 14, consisting of 3 individuals, while another third (30.0%) is aged 16, comprising one person. On the other hand, in the control group, the majority (50.0%) is aged 15, with a total of 5 individuals, approximately one-third (30.0%) is aged 16, consisting of 3 individuals, and a small portion (20.0%) is aged 14, consisting of 2 individuals. The research findings revealed distinctive patterns in the age distribution among the intervention and control groups. Almost half (40.0%) of the intervention group was aged 15, constituting 4 individuals, and an additional third (30.0%) was aged 14, comprising 3 individuals, with a similar proportion (30.0%) aged 16, involving 3 individuals. Conversely, within the control group, a majority (50.0%) were aged 15, totaling 5 individuals, almost a third (30.0%) were aged 16, consisting of 3 individuals, and a minor portion (20.0%) were aged 14, totaling 2 individuals.

This aligns with the findings of a study by Vivi Ardiyanti Putri (2021) titled "The Influence of Soy Milk Consumption on the Reduction of Primary Dysmenorrhea Pain in Female Adolescents at SMAN 3 Bandar Lampung," where the age distribution predominantly ranged from 14 to 17 years, with the highest frequency at 16 years, encompassing 12 individuals (60.0%). Adolescence marks the transition from puberty to adulthood, encompassing significant physical, psychological, and social changes. During this period, adolescents commonly experience primary dysmenorrhea, typically occurring between the ages of 14 and 25 years. The frequency tends to decrease with age and often ceases after childbirth (Lubis, 2018). The researcher hypothesizes that adolescents aged 14 to 16 years may have a higher likelihood of experiencing dysmenorrhea pain during menstruation, echoing the assumptions of Lubis (2018) regarding the age range prone to primary dysmenorrhea. This underscores the importance of considering age-related factors in understanding and addressing menstrual pain among adolescents.

Meanwhile, regarding Table 1, which illustrates the distribution of respondents based on menarche age, the research findings reveal that the most prevalent menarche age in the intervention group is nearly half (40.0%) at 11 years old, involving 4 individuals. Approximately one-third (30.0%) of this group has a menarche age of 12 years, with 3 individuals, and another third (30.0%) has a menarche age of 13 years, consisting of 3 individuals. In contrast, in the control group, almost half (40.0%) has a menarche age of 12 years, with 4 individuals, about one-third (40.0%) has a menarche age of 13 years, consisting of 4 individuals, and a small portion (20.0%) has a menarche age of 11 years, involving 2 individuals.

The age distribution observed in the current study is consistent with findings from a research conducted by A. Amalia, Sulistiyowati, and Y. Rumiati in 2018, titled "Utilization of Soy Milk Beverage for the Reduction of Dysmenorrhea in Adolescent Girls." According to their investigation, the onset of menarche was documented to transpire predominantly between the ages of 11 and 13. Notably, the age of 11 emerged as the most prevalent, accounting for 40.9% of the participants. Subsequently, individuals at the age of 12 constituted the second-highest group, encompassing 45.4% of the cohort, while those at the age of 13 comprised the smallest proportion at 13.7%. This parallel distribution of age-

related characteristics in both studies strengthens the reliability and generalizability of the observed trends, providing a broader context for understanding the age dynamics related to menarche and its implications on dysmenorrhea.

The onset of menarche, or the first menstruation, typically occurs in adolescents around the age of 13-14 years. However, in certain cases, it may occur at or before the age of 12. Menarche at  $\leq 12$  years of age signifies that the reproductive organs have not optimally developed, and there is still cervical narrowing, resulting in pain during menstruation due to the suboptimal functioning of the female reproductive system. Early menarche, occurring before the optimal development of reproductive organs, carries a higher risk of experiencing dysmenorrhea compared to adolescents who experience menarche at a normal age (Zaskiah, 2017). Building on this, the researcher posits that the age at menarche considered at risk for experiencing dysmenorrhea is below 12 years, emphasizing the correlation between early menarche and an increased likelihood of menstrual pain. This assumption is in line with the findings of Zaskiah (2017) regarding the heightened risk associated with early menarche, highlighting the significance of considering age-related factors in understanding and addressing dysmenorrhea in adolescents.

**Table 2.** Frequency Distribution of Pain Scale in Soy Milk Consumption

Pain Scale Pre-Test	Frequency	%	Pain Scale Post-Test	Frequency	%
6	2	20,0	2	2	20,0
7	3	30,0	3	4	40,0
8	3	30,0	4	2	20,0
9	2	20,0	5	2	20,0
Total	10	100		10	100

Source: Primary Data 2023

In Table 2, the distribution of respondents based on the pain scale before and after soy milk consumption is elucidated. The research findings indicate that on the pain scale before intervention, nearly a third (30.0%) experienced pain at levels 7 and 8, each comprising 3 individuals, while a small portion (20.0%) reported pain at levels 8 and 9, with 2 individuals each. Conversely, on the pain scale after intervention, almost half (40.0%) reported pain at level 3, consisting of 4 individuals, and a small portion (20.0%) experienced pain at levels 2, 4, and 5, with 2 individuals each.

The outcomes of this study resonate with the investigation conducted by Susmini & Y. Rosdiana (2022), focusing on the "Consumption of Soy Milk with Moringa Boiled Water for the Reduction of Primary Dysmenorrhea in Adolescent Girls." Their research uncovered a prevailing occurrence of severe pain among respondents, where 13 individuals (72.2%) reported the highest frequency on the pre-intervention pain scale. This observation is further substantiated by a related study from A. Amalia, Sulistiyowati, & Y. Rumiati (2018), which identified level 3 as the most frequent pain intensity on the post-intervention scale, reported by 12 individuals (54.6%).

Soy milk emerges as a notable reservoir of calcium, a vital mineral integral to various physiological functions and crucial for the development of robust bones and teeth. The significance of calcium in soy extends beyond skeletal health, with its documented role in alleviating menstrual discomfort, as emphasized in the research conducted by Amalia et al. in 2018. The study underscores the multifaceted benefits of soy milk, emphasizing its potential as a natural remedy for menstrual pain. Building on this foundation, the research led by Kristen Upson and her colleagues in 2019 provides intriguing insights into the enduring effects of soy milk consumption during infancy on menstrual pain and duration in adulthood (Amalia, 2018). This suggests a potential long-term impact of early dietary choices on women's reproductive health, shedding light on the intricate relationship between soy milk intake and menstrual well-being. The recognition of soy milk not only as a nutritional powerhouse but also as a contributor to women's health throughout the life course underscores its relevance as a dietary component with far-reaching implications. As the body of research grows, soy milk continues to emerge as a promising element in promoting holistic health, addressing both immediate concerns like menstrual pain and contributing to the broader landscape of long-term well-being.

Aprilianti's research in 2020 provides valuable insights into the pivotal role of calcium in alleviating muscle tension, underscoring its essential contribution to the proper functioning of uterine muscles. The study emphasizes that insufficient calcium levels can heighten susceptibility to abdominal cramps, shedding light on the intricate relationship between calcium intake and menstrual well-being. Aprilianti's findings not only highlight the importance of maintaining adequate calcium levels but also establish a direct link between low calcium intake, water retention, and intensified menstrual pain, particularly relevant for adolescent girls (Aprilianti, 2020). The research underscores the significance of prioritizing dietary practices that ensure optimal calcium intake to support overall muscular health and mitigate the challenges associated with menstrual discomfort. As such, Aprilianti's work contributes to the growing body of evidence emphasizing the role of essential nutrients, such as calcium, in promoting women's reproductive well-being and advocating for informed dietary choices to enhance overall health outcomes.

In light of these compelling findings, the researcher suggests a significant and positive influence of soy milk consumption in the context of dysmenorrhea. The observed reduction in the dysmenorrhea scale following soy milk intake highlights a potential avenue for managing and alleviating menstrual pain among adolescent girls. The results of this

study bring attention to the promising role of soy milk as a dietary intervention, contributing to the growing body of evidence supporting the use of natural and accessible remedies for menstrual discomfort. These findings not only emphasize the potential efficacy of soy milk in reducing the severity of dysmenorrhea but also open avenues for further exploration into the specific components of soy that may be responsible for these beneficial effects. Understanding the underlying mechanisms could pave the way for targeted interventions and tailored dietary recommendations to enhance the well-being of adolescent girls experiencing menstrual pain. Moreover, the positive impact of soy milk consumption on dysmenorrhea suggests a holistic approach to menstrual health that extends beyond conventional treatments. Integrating soy milk into dietary habits could serve as a simple and accessible strategy for adolescent girls seeking relief from menstrual discomfort. As awareness of alternative and natural remedies continues to grow, these findings contribute to the broader discourse on women's health, emphasizing the potential role of dietary choices in enhancing overall menstrual well-being. Further research and exploration into the multifaceted aspects of soy milk and its effects on menstrual health could provide valuable insights for both healthcare professionals and individuals seeking non-pharmacological solutions for menstrual pain management.

**Table 3.** Frequency Distribution of Pain Scale in the Application of Warm Compress Knowledge, Attitude, and Practice (KAP)

Pain Scale Pre-Test	Frequency	%	Pain Scale Post-Test	Frequency	%
6	3	30,0	4	3	30,0
7	4	40,0	5	4	40,0
8	3	30,0	6	3	30,0
Total	10	100		10	100

Source: Primary Data 2023

Table 3 describes the distribution of respondents based on the pain scale before and after the provision of Application of Warm Compress Knowledge, Attitude, and Practice (KAP). The research findings indicate that before the KAP intervention, the majority of respondents (40%) experienced pain at scale 7, totaling 4 individuals, and almost another portion (30.0%) experienced pain at scales 6 and 8, each with a count of 3 individuals. Meanwhile, after the KIE intervention, almost the majority of respondents (40.0%) experienced pain at scale 5, totaling 4 individuals, and almost another portion (30%) experienced pain at scales 4 and 6, each with a count of 3 individuals.

The outcomes of this study align with the research conducted by C. M. Issabella et al. (2022) on "Online Education in Reducing Dysmenorrhea Pain During the Covid-19 Pandemic." In the preliminary assessment, a substantial number of participants (56.3%) reported experiencing severe pain according to the pre-intervention pain scale. Following the intervention, the post-intervention pain scale indicated a shift, with the majority (42.3%) now reporting moderate pain.

These findings indicate that the knowledge acquired through Knowledge, Attitude, and Practice (KAP) interventions, specifically those emphasizing the application of warm compress during dysmenorrhea, plays a crucial role in diminishing the severity of dysmenorrhea. This underscores the significance of educational initiatives as effective alternatives in addressing and mitigating the impact of dysmenorrhea.

In conclusion, the study by C. M. Issabella et al. highlights the potential of online education in providing valuable insights and strategies for managing dysmenorrhea, especially during the challenging circumstances of the Covid-19 pandemic. The shift from severe to moderate pain levels post-intervention suggests the positive impact of such educational interventions on the well-being of individuals experiencing dysmenorrhea. As we navigate the ongoing challenges of the pandemic, these findings emphasize the importance of accessible and informative online education in promoting women's health and alleviating the burden of menstrual pain.

**Table 4.** Analysis of the Relationship Between Soy Milk Consumption and the Reduction of Dysmenorrhea Levels

Pain Scale	N	Mean	SD	Value Sig. (2-tailed)
Pre	10	7,50	1,080	0,000
Post	10	3,40	1,075	

Source: Primary Data 2023

Based on the analysis from Table 4, the results of the Paired Sample T-test indicate that the average level of dysmenorrhea before the provision of Counseling, Information, and Education (CIE) is 7.00, while the average level of dysmenorrhea after the provision of CIE is 5.00. Therefore, there is a decrease in the average level of dysmenorrhea by 2.00. The Paired Sample T-test results show a 2-tailed Significance value (p) of 0.000 ( $p < 0.05$ ). Thus, it can be concluded that the null hypothesis ( $H_0$ ) is rejected, meaning that the provision of CIE has a significant effect on reducing the level of primary dysmenorrhea pain in adolescents at MA Walisongo North Lampung..

The findings of this study are consistent with the results of the research conducted by A. Amalia, Sulistiyowati, and Y. Rumiati in 2018. The research indicates that the two-tailed significance value ( $p$ ) is 0.000 ( $p < 0.05$ ). This implies that the null hypothesis ( $H_0$ ) is rejected, indicating the influence of soy milk consumption on the reduction of dysmenorrhea levels among adolescent girls in Baturono Hamlet, Baturono Village, Sukodadi Subdistrict, Lamongan Regency in 2018 (A. Amalia, Sulistiyowati & Y. Rumiati, 2018). A study by Kristen Upson and colleagues in 2019 stated that the provision of soy milk during infancy can affect the level of pain and the duration of menstruation in adulthood. Soy, being a rich source of calcium, plays a crucial role in bone and tooth formation. The calcium content in soy has also been proven to play a role in reducing menstrual pain (Amalia et al., 2018).

Research conducted by Aprilianti Cia and Anindita Ghia in 2020, titled "Calcium Intake and the Incidence of Dysmenorrhea in Adolescents," shows a correlation between calcium intake and the occurrence of dysmenorrhea in adolescent girls. Calcium is not only essential for bone growth but is also crucial for adolescent girls to reduce or prevent pain during menstruation, known as dysmenorrhea. Calcium plays a role in reducing pressure on muscles, including the uterine muscles, which require calcium to function normally. Calcium deficiency can lead to muscles being unable to relax after contraction, resulting in muscle cramps. Low calcium intake is also associated with more severe menstrual pain (Cia and Ghia, 2020).

Based on the research conducted by Novianti and the team in 2018, it is concluded that soy extract has the potential to reduce the intensity of primary dysmenorrhea. The main component in soy extract is calcium, which plays a role in activating nerves and regulating muscle contractions. This process reduces discomfort during menstruation, with a decrease in pain associated with the physiology of the autonomic nervous system, a part of the peripheral nervous system that maintains bodily homeostasis. When mediators such as bradykinin, prostaglandin, and substance P are released, the sympathetic nerves are stimulated, causing vasoconstriction that increases muscle tone, alleviates muscle spasms, promotes blood flow, and addresses complaints such as cramps and lower back pain. Additionally, maintaining fluid balance and reducing muscle tension contribute to the reduction of pain (Novianti et al., 2018).

Another study investigating calcium consumption, conducted by Syarifah in 2019, found a correlation between calcium intake and the occurrence of menstrual pain in female students at SMK Negeri 1 Martapura. The research results showed a  $p$ -value of  $0.003 < 0.05$ , indicating that students who consume insufficient calcium-rich foods tend to experience menstrual pain due to a calcium deficiency in the body. From these findings, it can be concluded that consuming soy milk during dysmenorrhea can be considered a very effective therapy. Soy milk has the advantage of being a natural, readily available, nutrient-rich option without chemical additives. Therefore, regular consumption of soy milk, especially during dysmenorrhea, can be a beneficial choice for health.

**Table 5.** Analysis of the Relationship between the Warm Compress Knowledge, Attitude, and Practice (KAP) and the Reduction of Dysmenorrhea Levels

Pain Scale	N	Mean	SD	Value Sig. (2-tailed)
<i>Pre</i>	10	7,00	0,816	0,000
<i>Post</i>	10	5,00	0,816	

Source: Primary Data 2023

From the analysis of Table 5 using the Paired Sample T-test, it was found that the average level of dysmenorrhea before (pre) the administration of Knowledge, Attitude, and Practice (KAP) was 7.00, while the average level of dysmenorrhea after (post) the administration of KAP was 5.00. Therefore, there is an average decrease in the level of dysmenorrhea by 2.00. The results of the Paired Sample T-test show a Significance 2-tailed value ( $p$ ) = 0.000 ( $p < 0.05$ ). This finding indicates that the null hypothesis ( $H_0$ ) can be rejected, suggesting a significant influence from the administration of KAP on the reduction of primary dysmenorrhea pain in adolescents at MA Walisongo in North Lampung.

According to Gina (2017), Health Education and Information (KIE) is a systematic effort to influence positive behaviors in society, using principles and communication methods through both personal interactions and mass media to achieve positive behavioral changes. KIE activities are integrated across all healthcare professionals involved in programs related to health promotion, including personnel providing services related to health promotion to the community (Gina, 2017).

This concept aligns with the research conducted by Y. Asaputra, A. D. Kurnia, & N. Aini (2020) in a study titled "The Influence of Health Education on Adolescent Efforts to Reduce Pain During Menstruation (Primary Dysmenorrhea)." Through the Wilcoxon test, a T-value of -4.697 was found, with a significance value (Asymp. Sig. 2-tailed) of 0.000. When compared to the  $\alpha$  value (0.05), the result is  $0.000 < 0.05$ . Therefore, it can be concluded that the alternative hypothesis ( $H_1$ ) is accepted, indicating that health education on dysmenorrhea has an influence on adolescent efforts to reduce pain during menstruation (primary dysmenorrhea) (Y. Asaputra, A. D. Kurnia, & N. Aini, 2020).

The development of information can have a positive impact on an individual's knowledge, as emphasized by Mubarak (2017). Even if someone has a low level of education, access to information through various media such as television, radio, or newspapers can significantly enhance their knowledge. Knowledge here is understood as impressions

formed in the human mind as a result of using the senses. This process involves the recollection of information, including events experienced intentionally or unintentionally, occurring after an individual interacts with or observes a particular object (Mubarak, 2017).

Based on the findings of this research, it can be assumed that the more knowledge an individual possesses, the more capable they are in managing the pain that arises during dysmenorrhea. This illustrates the belief that the level of knowledge or cognition plays a crucial role in shaping an individual's behavior. Through a better understanding of the causes and ways to manage menstrual pain, it is expected that individuals can take independent steps to manage this condition. This theory supports the idea that knowledge is an essential foundation in shaping the actions and responses of an individual to a specific health situation or condition.

## 4. CONCLUSION

In conclusion, this study examined the characteristics of respondents in intervention and control groups based on age and menarche age. The analysis of dysmenorrhea pain levels before and after soy milk administration demonstrated a significant reduction, particularly at lower pain scales. Statistical tests supported the conclusion that soy milk positively impacts reducing primary dysmenorrhea pain in adolescents at MA Walisongo in North Lampung, surpassing the effect of health education information (KIE). However, limitations, including challenges in simultaneous soy milk administration and time constraints, should be acknowledged, emphasizing the need to interpret the findings within the context of these constraints.

## REFERENCES

- Amalia, A., & Rumiati, Y. (2018). Pemanfaatan Minuman Susu Kedelai Terhadap Penurunan Dismenorea Pada Remaja Putri. 2(2), 52–61. <https://doi.org/10.32536/jrk>
- Anurogo, W. (2017). Cara Jitu Mengatasi Nyeri Haid. In Yogyakarta: Andi Yogyakarta
- Aprilianti, C. (2020). Suplementasi Kalsium dengan Dark Chocolate dan Susu terhadap Dismenore Pada Remaja Putri. *Jurnal Ilmu Kesehatan Masyarakat*, 10(03), 149-155.
- Aymulyati, emilda AS, Nora Feri, & Dewita. (2019). Pengaruh susu kedelai terhadap dismenorea primer pada remaja putri.
- Baziad, A. (2015). Endokrinologi Ginekolog. In Jakarta: Media, Aesculapius Fakultas Kedokteran Universitas Indonesia.
- Budiarti, A., & Wulandari, R. (2015). Efektivitas Pemberian Terapi Susu Kedelai Terhadap Penurunan Skala Nyeri Haid (Dismenorea) Pada Remaja Putri di Pondok Pesantren Al-Jihad Surabaya. *Jurnal Ilmiah Keperawatan*, 9(1), 847-861.
- Cia, A., & Anindita Ghina. (2020). Asupan Kalsium dan Kejadian Dismenore Pada Remaja. *Jurnal Llmiah, Poltekkes Kemenkes: Palangkaraya*
- Departemen Kesehatan Indonesia. (2018). Hasil Riset Kesehatan Dasar Tahun 2018. Kementerian Kesehatan RI, 53(9), 1689–1699.
- Gina Ofi Marvelinas, G. O. (2018). Hubungan manajemen komunitas, informasi, edukasi (KIE) petugas promosi kesehatan dengan implementasi kie untuk kelompok untuk kelompok usia lanjut dikenagarian tahun 2017 (Doctoral dissertation, STIKes PERINTIS PADANG).
- Hastono, Sutanto Priyo. (2016). Analisis Data. Jakarta : Fakultas Kesehatan Masyarakat Universitas Indonesia.
- Issabella, C. M., Prabandari, F. H., Ananti, Y., & Arisandi, D. (2022). Edukasi Online Menurunkan Nyeri Dismenore di Masa Pandemi Covid-19. *Journal of Health (JoH)*, 9(1), 53–62. <https://doi.org/10.30590/joh.v9n1.423>
- Larasati, T. A., & Alatas, F. (2018). Dismenore Primer dan Faktor Risiko Dismenore Primer pada Remaja Majority (Vol. 5, Issue 3).
- Lubis. (2018). Faktor-Faktor Yang Berhubungan Dengan Kejadian Dismenore Primer Pada Remaja Siswi SMA Dharma Sakti Medan Tahun 2018. *Poltekkes RI Medan*.
- Mubarak, F. I. H. (2017). Pengaruh Pengetahuan Dan Sikap Apoteker Terhadap Perilaku Apoteker Mengenai Peredaran Obat Palsu Di Kabupaten Banyumas (Doctoral dissertation, UNIVERSITAS MUHAMMADIYAH PURWOKERTO).
- Novianti, Yeni Erna; Eko Winarti; Rahma Kusuma D, 2018, Pengaruh Konsumsi Sari Kedelai Terhadap Skala Nyeri Disminorea Primer Mahasiswa Kelas 7.1 Program Studi DIV Bidan Pendidik Fakultas Ilmu Kesehatan
- Nurwana, Yusuf, S., & Andi Faizal Fachlevy, A. (2018). Analisis Faktoryang Berhubungan dengan KejadianDisminorea pada Remaja Putridi SMA Negeri 8 Kendari Tahun 2016. *Jurnal Ilmiah Mahasiswa Kesehatan Masyarakat*, Vol. 2/NO.6.
- Pratiwi, A., Zaskiah. (2017). Hubungan antara Usia Menarche dengan lama Siklus Menstruasi dan kejadian dismenore primer pada remaja putri di SMA Negeri 1 Makassar. *Skripsi Universitas Hasnuddin Makassar*
- Putri, V. A. (2021). PENGARUH PEMBERIAN SUSU KEDELAI TERHADAP PENURUNAN NYERI DISMENORE PRIMER PADA REMAJA PUTRI DI SMAN 3 BANDAR LAMPUNG (Doctoral dissertation, Poltekkes Tanjungkarang).
- Ratnawati, & Ana. (2018). Asuhan Keperawatan Pada Pasien Dengan Gangguan Sistem Reproduksi. In Yogyakarta: Pustaka Baru Pres.
- Ryan, S. A. (2017). The Treatment of Dysmenorrhea. *Pediatr. Clin. North Am.* 64, 331–342.
- Saputra, Y. A., Kurnia, A. D., & Aini, N. (2021). Pengaruh Pendidikan Kesehatan terhadap Upaya Remaja untuk Menurunkan Nyeri Saat Menstruasi (Dismenore Primer). *Jurnal Kesehatan Reproduksi*, 7(3), 177. <https://doi.org/10.22146/jkr.55433>
- Susmini, S., & Rosdiana, Y. (2022). Konsumsi Susu Kedelai Dengan Air Rebusan Kelor Terhadap Penurunan Dismenore Primer Pada Remaja Putri. *Care: Jurnal Ilmiah Ilmu Kesehatan*, 10(3), 478-485.