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## REVIEW

# Non-pharmacological that most effective to reduce of primary dysmenorrhea intensity in women childbearing age: a literature review

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**Abstract.** One of the most common female reproductive health problems is primary dysmenorrhea. Data on the incidence of primary dysmenorrhea complained about 50-90% of women in the world. Primary dysmenorrhea data in the US is 30-70%, in Sweden is 30%, in Mexico is 64%, in Italy is 68%, in Jordan is 55.8%, in Turkey is 84.9%, and in Malaysia is 74.5%, in Indonesia is 60-70 and 15% of its, it interferes with daily activities including work. The cause of this is hypercontractility of the myometrium due to excessive secretion of prostaglandins. This study aims to explore the most effective non-pharmacological therapies in reducing the level of primary dysmenorrhea pain in women of childbearing age. The design of this study is a literature review with the PRISMA method. Database Google, Google Scholar, Research gate, Cochran Data Base, Embase, NCBI, Sciendirect, SAGE, Elsevier, Sinta. The population of this study was all full-text international journals indexed by Scopus and national journals indexed by Sinta 1-6 published in 2011-2021 including RCT amount of 114 articles. A sample of 23 articles meets the inclusion criteria and used thematic data analysis. The results of non-pharmacological therapy that effectively overcome primary dysmenorrhea pain, namely the first group with ( $P=0.000$ ). The conclusions showed that Murrotal Qur'an, yoga, acupressure, counter pressure massage, effleurage massage, consume green coconut water and avocado juice combination with massage were proven to be equally effective in overcoming complaints of primary dysmenorrhea pain quickly without being accompanied by side effects.

## Introduction

One of the most common female reproductive health problems is Dismenorrhea. Dysmenorrhea is a pain that occurs in the lower abdomen area or supra pubis before menstruation and occurs during the menstrual phase (1). Primary dysmenorrhea is a type of pain that occurs during the menstrual phase in the absence of disorders of the pathology of the female reproductive organs (2). Primary dysmenorrhea is a reproductive health problem in adolescent females most commonly occurring after nutritional problems. Primary dysmenorrhea usually occurs a few hours before menstruation and continues for up to 12-72 h or during menstruation and is usually felt pain accompanied by cramps in the lower abdomen (3).

Data on the incidence of primary and frequently complained dysmenorrhea is about 50-90% of women in the world and almost occur in every country (4). Data on the incidence of primary dysmenorrhea in women of childbearing age in the United States is about 30-70%, in Sweden about 30%, in Mexico about 64%, in Italy about 68%, in Jordan about 55.8%, in Turkey about 84.9%, and in Malaysia about 74.5% (5). while in Indonesia about 60-70 and 15% of them interfere with daily activities including work (6).

The contributing factor to primary dysmenorrhea is hypercontractility of myometrium due to excessive prostaglandin secretion, causing excessive pain or cramps in the lower abdomen area (7). Age factors, psychological factors, as well as other factors are nutritional factors such as eating too much salt content, animal fats, instant food, low carbohydrates, and low fiber, psychological a person and increased concentration of prostaglandins in the uterus (8).

The impact of primary dysmenorrhea is that for women who are in school, dysmenorrhea is the cause of being absent from school due to excessive pain (9). The incidence of primary dysmenorrhea that occurs in working women causes a loss of about 600 million hours of work and a loss of productivity of about 2 billion US (10).

Primary dysmenorrhea treatment is carried out pharmacologically and non-pharmacologically. Non-pharmacological restraints are known to have relatively minor side effects and even almost no side effects. Non-pharmacological therapies include yoga, pilates, acupuncture, massage, aroma therapy,

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giving fruit juices such as avocado, warm compressed combination with dark chocolate, deep breathing exercises, warm compresses, hypnotherapy, genupectoral positions, murrotals of the Qur'an (4,7,11).

The difference between this study and the previous study is in the non-pharmacological therapy reviewed. In this study, researchers reviewed all non-pharmacological therapies to reduce primary dysmenorrhea pain and examined which therapies were most effective to reduce primary dysmenorrhea pain quickly. The aim is to explore non-pharmacological that most effective to reduce primary dysmenorrhea intensity in women of childbearing age: A literature review.

## Materials and methods

The design used systematic review by PRISMA methods. An aqualitative study was conducted with an articles year limit for literature review is 2011-2021. The literature review was conducted as preferred reporting items for systematic review by PRISMA. The database that searching included Google, Google Scholar, Research gate, Cochran Data Base, Embase, NCBI, Sciendirect, SAGE, Elsevier, and Sinta with search keywords namely the effectiveness of non-pharmacological methods (dysmenorrhea exercise, yoga, pilates, acupuncture, acupressure, massage, aroma therapy, fruit juices such as avocado, warm compressed combination with dark chocolate, deep breathing exercises, warm compresses) to reduce primary dysmenorrhea pain and check the quality of journals. For international articles, it is checked through Scimago JR, and for a national article, it is checked through the Sinta portal and uses the PICO technique for searching eligible journals.

The populations were all reputable international and national articles indexed by Sinta 1-6 on non-pharmacological therapies to reduce primary dysmenorrhea pain amount of 114 Articles. The samples were twenty-three articles that were eligible by the inclusion criteria. Sampling was used purposive sampling. The inclusion criteria were a research article in the form of a full-text article in English related to non-pharmacological therapy in reducing primary dysmenorrhea pain and proceeding full text that has been published and at least has E-ISSN and indexing by Scopus, Wos, Thompson Reuters, Sinta 1-6. The exclusion criteria were articles that were only abstract and articles not in English, and not in reputable international journals and discontinued by Scopus and national journals accredited by Sinta 1-6.

Risk of bias in this study by checking citations and for the relevant topic and various databases to avoid research bias. The data extraction was checked by our team. The data extraction process was carried out by looking for full-text articles in English, titles, years of publication, publisher and indexing, the aim, the populations, interventions, comparisons, research methods, results, and conclusions. Then, the researcher looks at the citation and H index. In addition, journals that were eligible by the inclusion criteria were sampled in this study with consideration from other research teams (Fig. 1).

A descriptive data analysis of this study synthesis was conducted in the narrative report or thematic analysis. The results are presented based on the study of journal research conducted a meta-analysis by reading the P-value of each variable and grouping the results. The results of the first

group of studies are non-pharmacological therapies which have  $P=0.000$ , and the second group of non-pharmacological therapies with  $0.020 \leq P \leq 0.010$  and the third group with  $0.030 \leq P \leq 0.05$ . Furthermore, the findings were carried out as a descriptive analysis as a whole. The study was conducted for ethical clearance and approved by the Ethical Committee of STIKES Hafshawaty Pesantren Zainul Hasan under the ethical code of SK: KEPK/039/Stikes-HPZH/VII/2022.

## Results

The results of this literature review show that several non-pharmacological therapies are equally effective and fast in reducing primary dysmenorrhea pain. The first group of non-pharmacological therapy is Murrotal Qur'an therapy, yoga, acupressure, counter-pressure massage, effleurage massage, consuming green coconut water, and administration of avocado juice with  $P=0.000$  at  $\alpha 0.05$ . Furthermore, the second group is giving dry hot compresses using glass bottles, drinking Javanese turmeric, lemon therapy aromas, lavender therapeutic aromas, hypnotherapy, longa Curcuma drinks, giving Clupeonella grimmii fish oil supplements (anchovies), relaxation techniques by taking deep breaths with  $0.020 \leq P \leq 0.010$ . The third group is drinking ginger, aroma therapy combined with massage, physical activity, and nutrition, mat pilates exercises, physiotherapy, acupuncture, aerobic, warm compress combination dark chocolate with a value of  $0.030 \leq P \leq 0.05$  (Table I).

## Discussion

Primary dysmenorrhea usually occurs on average in women aged <25 years old (12). The causes of primary dysmenorrhea are a lack of energy in the uterus, a decrease in the levels of the steroid hormone progesterone in the luteal phase, a condition connected to a lower level of the enzyme lysosomal and the subsequent release of endometrial phospholipase. This event causes an increase in the levels of prostaglandins responsible for the contraction of the uterus and arteries, eventually causing uterine ischemia (13).

Therapy to reduce primary dysmenorrhea pain in this literature review is non-pharmacological therapy. It is the type of therapy in the form of relaxation, positive thinking, herbs, a diet high in fiber, acupressure, physiotherapy, acupuncture, and other types of therapy, in addition to the administration of medical drugs (4). It works as a natural analgesic, antispasmodic, and antioxidant, decreases prostaglandin production, increases beta-endorphin levels, and facilitates uterine circulation (13).

The non-pharmacological therapy research that is most effective and grouped in the first choice of therapy is the Murrotal Qur'an. The Murrotal Qur'an is one of the music that has a positive effect on its listeners. This therapy provides a calming effect when listened to, especially when experiencing primary dysmenorrhea. This is due to the appearance of 63.11% of delta waves on the right and left forebrains and is effective in reducing primary dysmenorrhea pain if listened to for at least 15 min, especially surah Ar-Rahman (6).

Slow Murrotal Qur'an chanting can activate natural endorphin hormones which are hormonal compounds that release



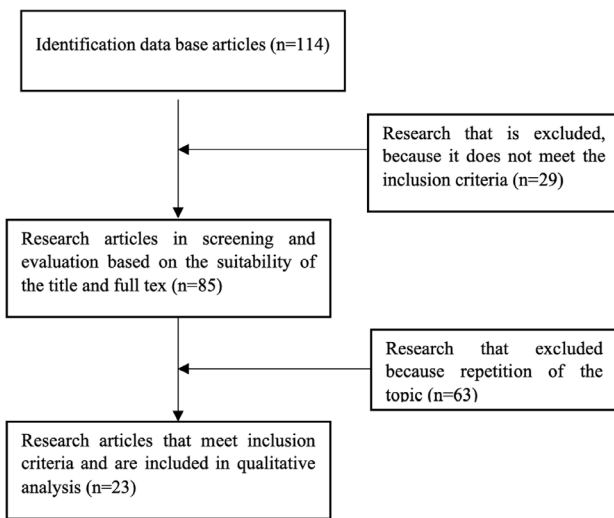


Figure 1. Flowchart of the study selection process (data extraction).

morphine in the body that can trigger stress and pain, increase feelings of relaxation, distract from fear, anxiety, and tension, increase metabolism so that it can reduce blood pressure and slow breathing, pulse rate, and brainwave activity. The rate of breathing to be deeper or slower is very good for producing calmness, emotional control, deep thinking, and improving the metabolism of body so that the pain due to primary dysmenorrhea can be quickly reduced (6).

The next group of non-pharmacological therapies is yoga. Yoga is a mind-body exercise, consisting of physical posture (asana), breathing exercises (pranayama), and meditation (dhyana), which integrates the balance of body and mind. Yoga Nidra is a type of yoga with powerful meditation techniques, where the mind is still conscious during the 'unconscious' state associated with deep sleeping. Yoga Nidra functions to regulate thyroid-stimulating hormone levels, stimulate follicle-stimulating hormone, luteinizing hormone, and prolactin and relax muscles. This yoga is done 2 times a week with the length of each session which is 30 min for 6 months after self-tapping is done for 20 min to permanently reduce primary dysmenorrhea pain (14).

The next non-pharmacological therapy is acupressure. It is similar to acupuncture, but the difference is that acupressure does not use needles. Acupressure is based on traditional Chinese medicine and shares the main principle of opening up and harmonizing the blocked meridians by stimulating the surrounding environment below the acupressure point. The onset of pain is due to the very high levels of PGE-2 and PGF-2 Alpha in the endometrium, myometrium, and menstrual blood of women who have dysmenorrhea. Prostaglandin hormones cause increased uterine activity and pain in excitatory terminal nerve fibers. Experimental studies on acupressure have shown that acupressure effectively reduces discomfort by providing sedative and analgesic effects (15,16).

The next therapy is massage counter pressure. Counter-pressure massage is a massage that is carried out by applying continuous pressure to the patient's sacrum bone with one palm. One-hand massage uses the heel of the hand to clench in the lumbar region where the uterine sensory nerves running with the sympathetic nerves of the uterus enter the

spinal cord through the thoracic nerve 10-11-12 towards the Lumbar. This massage technique can increase endorphins as physiological painkillers. Endorphins can affect the process of impulse transmission which is interpreted as a neurotransmitter that can inhibit pain. How to do a counterpressure massage is done for at least 30 min during the 1-3 days of the menstrual cycle. Therefore, this massage is effective in lowering primary dysmenorrhea pain immediately (17).

After counter pressure massage is effleurage massage. Effleurage massage is a non-pharmacological method that is considered effective in reducing pain. The most common dysmenorrhea pain that adolescents experience is stiffness or spasm in the lower abdomen. This is due to an increase in prostaglandins (PG) F<sub>2</sub>-alpha, which are cyclo oxygenases (COX-2), which produce hypertonus and vasoconstriction in the myometrium resulting in ischemia and pain in the lower abdomen. This massage is performed for 3 days with a duration of 3-5 min each time massaging is performed during primary dysmenorrhea to significantly reduce the intensity of pain quickly. This therapy will affect the motor, nervous, and cardiovascular systems, triggering the rest and relaxation phases of the body as well as an effort to restore venous and lymph flow, stimulating sensory receptors in the skin and sub-skin to reduce pain (18).

Then, group one reduces primary dysmenorrhea is consuming green coconut water. A amount of 330 ml green coconut water dose is a more effective dose to decrease primary dysmenorrhea. Green coconut water has a composition of more minerals including magnesium and calcium. Widely known that magnesium has a role in decreasing pain intensity and vasoconstriction relief. Another study about magnesium and calcium showed that both were reported to have an effective effect on pain suppression including primary dysmenorrhea. Based on it, green coconut water is effective as a non-pharmacological therapy for primary dysmenorrhea relief (19). Another study about combination massage and consuming green coconut water can relieve dysmenorrhea pain more quickly. effleurage massage technique aims to improve blood circulation, put pressure, warm the abdominal muscles, and increase physical and mental relaxation. The mechanical effect of the effleurage technique is to help the vein work and cause body heat as warming up. Massage can make patients more comfortable due to muscle relaxation and comfortable feeling. A combination of it and green coconut water can increase  $\beta$ -endorphin levels and overcome the pelvic flush due to muscle relaxant formation of serotonin neurotransmitter that can increase appetite, feelings of happiness, and anti-depression (20).

The last of group one on non-pharmacological therapy as the result of the literature review is the administration of avocado juice. Avocado is a type of fruit that has a high content of vegetable fats compared to other fruits. Avocado is also enriched with antioxidants and nutrients, there is the highest flavonoid content compared to other tropical fruits such as guava, pineapple, mango, papaya fruit, orange, and tamarind. The flavonoid content in avocados is used as an antioxidant due to its ability to reduce the formation of free radicals. The calcium content in avocados can relieve pain. This therapy is administered at a dose of at least 100 mg each time you drink avocado juice during the menstrual cycle (21).

Table I. Literature review of non-pharmacological therapy in women with primary dysmenorrhea.

Author	The title research	The aim	The population/sample	Methods	Finding	Conclusion	(Refs.)
Septianingrum <i>et al</i> 2019	The effect of Murrotal Qur'an on Menstrual Pain in Nursing Student of Universitas Nahdlatul Ulama Surabaya	To know the effect of Murrotal Qur'an on menstrual pain in nursing students	32 students then divided into two groups, 16 into intervention group; 16 into control group	Pre post test design	The listening of Murrotal Qur'an therapy showed that effective in reducing primary dysmenorrhea pain (P=0.000)	The provision of Murrotal Qur'an of Surah Ar-Rahman in 15 min on students can decrease primary dysmenorrhea.	(6)
Ulaa <i>et al</i> 2017	Application of Mind Body Practice: Yoga for reducing long pain primary dysmenorrhea	To know effectiveness of yoga towards long pain of primary dysmenorrhea	88 people and divided into 47 intervention gorup; 41 into control group	Quasy experiment with nonequivalent pretest-posttest control group design	Yoga can effectively reduce long pain in primary dysmenorrhea (P=0.000)	Yoga interventions effective to reduce long pain in primary dysmenorrhea.	(22)
Mirbagher-Ajorpaz <i>et al</i> 2011	The effects of acupressure on primary dysmenorrhea: A randomized controlled trial	To evaluate the effect of acupressure on primary dysmenorrhea in Iranian medical sciences students	Student divided into 15 intervention gorup; 15 into control group	An RCT with pre and post-test design	Scores of dysmenorrhea between the two groups after treatment (P=0.004) and also 3 h after treatment (P=0.000)	Acupressure on the SP6 meridian can be an effective non-invasive intervention to reduce primary dysmenorrhea and its effects last for 3 h post-treatment.	(15)
Santiasari & Christianingsih, 2019	Counterpressure for dysmenorrhea pain in teenagers	To analyze the effect of counter-pressure massage on dysmenorrhea pain in high school students.	n=30	Quasy experimental (one group pre-posttest design)	There is a difference between before and after the intervention, P=0.000	This techniques can decrease dysmenorrhea pain at students.	(17)
Sholihah & Azizah, 2020	The Effect of effleurage massage on primary dysmenorrhea in female adolescent students	To describe the effect of effleurage massage on the primary dysmenorrhea of teens in boarding house of Jenderal Achmad Yani University, Yogyakarta	N=58 (29 intervention group; 29 control group)	Quasy-experimental with pre and post-test two-group design	There was a significant difference after being given an effleurage massage between 3-5 min for 3 days of the menstrual cycle, P=0.000	Effleurage massage gives the effect of reducing dysmenorrhea.	(18)

Table I. Continued.

Author	The title research	The aim	The population/sample	Methods	Finding	Conclusion	(Refs.)
Nugroho <i>et al</i> 2020	Non-pharmacological Randomised control Trial: Green Coconut ( <i>Cocos nucifera</i> L.) Water to Reduce Dysmenorrhoea Pain	To obtain the optimal dose of green coconut water as a magnesium source for reducing dysmenorrhoea pain.	N=21 young women, divided into 3 group, each group with n=7 young women	Randomized control trial	Giving 100 ml of green coconut water every 4 h at least 330 ml during menstrual cycle (P=0.000)	Consume green coconut routinely every menstruation cycle showed it can relieve of primary dysmenorrhoea.	(19)
Tompunuh <i>et al</i> 2021	Effect of Avocado Juice administration on Reduction in Young Women in Junior High School 1 Bone Bolango.	To know about the effect of avocado juice administration on the reduction of dysmenorrhoea pain in adolescents in Junior High School 1 Bone Bolango.	N=98 women student and n=30 women student	Pre experimental design one group pretest posttest	Giving 100 ml of avocado juice every time you drink and during the menstrual cycle can reduce dysmenorrhoea pain (P=0.000)	The administration of avocado juice has been shown to reduce the scale of dysmenorrhoea pain.	(21)
Thabet <i>et al</i> 2020	Effects of two Non-pharmacological Pain Relief Interventions on the Severity of Pain among Adolescent Girls Complaining from Primary Dysmenorrhoea	To assess the effect of two non-pharmacological pain relief interventions on the severity of pain among adolescent girls complaining of primary dysmenorrhoea	N=90 women student, divided into 3 group (30 dry hot compress group, 30 genupectoral position group, 30 control group)	Quasy-experimental research design.	There is a high significant of the difference between before and after the intervention during the menstrual cycle and the second menstrual cycle, P=<0.001 in a dry hot compress using a glass bottle and genupectoral position	Dry hot compress more effective than genupectoral position.	(23)
Ria <i>et al</i> 2021	The Difference of Effectiveness of Ginger Warm Compress and Consumption of Acidic Turmeric on Decreasing Primary Menstrual Pain Scale	To analyze differences of effectiveness of ginger warm compresses and consumption turmeric tamarind in reducing primary menstrual pain scale	Female students experiencing primary dysmenorrhoea; 30 in ginger compress group; 30 in consumption of acidic turmeric	Quasy-experimental type two group pre post test design	Ginger warm compress for 20 min (P=0.004), while consumption of acidic turmeric for 2 days menstrual cycle (P=<0.001)	Consuming turmeric tamarind regularly can be used in primary dysmenorrhoea pain therapy as a non pharmacological therapy.	(5)

Table I. Continued.

Author	The title research	The aim	The population/sample	Methods	Finding	Conclusion	(Refs.)
Widarti <i>et al</i> 2021	Effectiveness of warm water compress with lemon aromatherapy and lavender aromatherapy against primary dysmenorrhea pain levels	To find out the effectiveness of warm water compresses and lemon aromatherapy with lavender aromatherapy against the level of primary dysmenorrhea pain in young women	37 young women	Pre-Experiment with One Group Pre-Post-test design	Young women who are given warm water compresses, lemon and lavender aroma therapy can reduce dysmenorrhea pain, P=0.001	Warm water compress and lemon aromatherapy with warm water compress and lavender aromatherapy are effective against decreased dysmenorrhea pain in young women.	(24)
Laili <i>et al</i> 2021	The Effect of hypnotherapy to reduce dysmenorrhea pain	To determine the effect of hypnotherapy on dysmenorrhoea in high school students	N=117, n=20 female student with primary dysmenorrhea	Pre-experimental with one group pre-test post-test.	Hypnotherapy provides a permanent effect in lowering primary dysmenorrhea pain (P=0,001)	Hypnotherapy can be non pharmacological therapy to reduce primary dysmenorrhea.	(25)
Moghadamnia <i>et al</i> 2011	Effect of Clupeonella grimmii (anchovy/kilka) fish oil on dysmenorrhoea	To investigate-therole of dietary supplementation with C. grimmii oil on symptoms of dysmenorrhoea in young girls.	N=female student amount of 1200. n=38 (18-22 y.o) in Babol University of Medical Sciences.	Randomized control trial	There was a significant difference after 3 months of supplementation with fish oil (visual analog scale score of 20.9 compared to 61.8 for placebo (P=0.001)	It proved significant in reducing ibu profen when using fish oil as a primary dysmenorrhea therapy.	(26)
Hidayatunnafiah <i>et al</i> 2022	The Effect of relaxation techniques in reducing dysmenorrhea in adolescents	To analyze effect of deep respiratory relaxation techniques on the reduction of dysmenorrhea in teens	Teenager (11-24 years old), the publication period of the journal in 2010-2020 was 5 full text articles.	A literature review	Deep breathing relaxation can help reduce dysmenorrhea in adolescents, P=0.001	Relaxation by deep breathing can be used to reduce primary dysmenorrhea pain. Changes can be seen when this technique is put into practice for 5-30 min.	(11)
Utami <i>et al</i> 2020	The Effectiveness of curcuma longa drink in decreasing	The use of Curcuma longa drinks to reduce	Female with 15-18 y.o amount of 32 and stay in Dormitory	Experiments with pre-test and post-test research	Curcuma Longa drink can reduce dysmenorrhea pain	Curcuma longa can be used as a non-pharmacological	(27)

Table I. Continued.

Author	The title research	The aim	The population/sample	Methods	Finding	Conclusion	(Refs.)
	the intensity of dysmenorrhea	the pain of dysmenorrhea by comparing the home industry and researched concoctions	Pontianak, divided into the Curcuma longa home industry drink group and the Curcuma longa drink group by researchers	designs	in teenager, $P \leq 0.001$	therapy to reduce primary dysmenorrhea pain both home industry and concoctions.	
Daily <i>et al</i> 2015	Efficacy of Ginger for Alleviating the symptoms of primary Dysmenorrhea: A Systematic Review and Meta-analysis of Randomized Clinical Trials	This systematic review is to review evidence of ginger's effectiveness in treating primary dysmenorrhea pain	N=29 articles from 12 electronic data base	Systematic review evaluates	This data meta-analysis shows significant effect of ginger in reducing PVAS in subjects having primary dysmenorrhea, $P=0.0003$	Collectively these RCTs provide evidence that drinking 750-2,000 mg ginger powder for the first 3-4 days of the menstrual cycle may lower primary dysmenorrhea pain.	(10)
Marzouk <i>et al</i> 2013	The Effect of Aromatherapy Abdominal Massage on Alleviating Menstrual Pain in Nursing Students: A Prospective Randomized Cross-Over Study	To investigate the effects of aromatherapy massage in a group of nursing students suffering from primary dysmenorrhea	Group 1 (n=48) receive Aromatherapy Abdominal Massage once daily for seven days prior to menstruation using the essential oils (cinnamon, clove, rose, and lavender); group 2 (n=47), receive placebo (almond oil) Kelompok 1 (n=48)	A randomized blind clinical trial of crossover design	Aroma therapy abdominal massage can lower the level and duration of menstrual pain as well as the amount of bleeding, $P=0.007$	Aroma therapy (cinnamon, clove, rose, and lavender) is effective in relieves menstrual pain, its duration and excessive menstrual bleeding.	(28)
Abadi Bavid <i>et al</i> 2018	A comparison of physical activity and nutrition in young women with and without primary dysmenorrhea	To investigate the relationship between physical activity and nutrition with primary dysmenorrhea in students at	N=250 students with and without primary dysmenorrhea	Comparative descriptive study	Average score nutrition was 57.91 in the group with dysmenorrhea and 61.68 in the group without dysmenorrhea, while the average intensity of physical	Healthier nutritional patterns and regular physical exertion can reduce the severity of dysmenorrhea in teens. However, the nutritional patterns is	(8)

Author	The title research	The aim	The population/sample	Methods	Finding	Conclusion	(Refs.)
		Mazandaran University of Medical Sciences			activity was 5,518.75 metrics in groups with dysmenorrhea and 4,666.42 metrics in groups without dysmenorrhea. Physical activity is calculated on a MET scale (minutes/week). P nutrition=0.008; P physical activity=0.011	more effective than physical activity.	
Nikjou <i>et al</i> 2016	The Effect of Lavender aromatherapy on the pain severity of primary dysmenorrhea: A Triple-blind randomized clinical trial	Investigating the effects of lavender aromatherapy on the severity of pain in primary dysmenorrhea	n=200 female student in Ardabil University of Medical Sciences, Iran	Triple-blind randomized clinical trial	There was a significant difference in the average pain severity between the intervention and control groups and less pain felt after the intervention for 2 months (P<0.01)	Lavender aromatherapy uses for 2 months proved effective in reducing the severity of primary dysmenorrhea pain.	(29)
Cahyanto <i>et al</i> 2021	The effect of exercise mat pilates on pain scale, anxiety, heart rate frequency in adolescent principle with primary dysmenorrhea in Surakarta	To strengthen the theory of the relationship between pilates exercise and dysmenorrhea symptoms	n=52, divide into two group: group 1=got pilates exercise treatment 2x a week for 4 weeks; group 2=only got informational support only.	Ekspersimental pre tets post test control group design	There was a difference in the pain and anxiety scale scores with a mean of 4.15 and 27.7, P=0.010	Pilates can be an alternative to complementary care in young women who experience menstrual anxiety and pain.	(30)
Kannan & Claydon, 2014	Some physiotherapy treatments may relieve menstrual pain in women with primary dysmenorrhe: a systematic review	Effects of physiotherapy interventions compared to controls (either no treatment or placebo) on pain and quality of life	The search yielded 222 citations. Of these, 11 were eligible randomised trials and were included in the review	Sistematic review of randomised trials with meta-analysis	Acupuncture (weighted mean difference 2.3, 95% CI 1.6 to 2.9) and acupressure (weighted mean difference 1.4, 95% CI 0.8 to 1.9), when compared to a control group receiving no	Physiotherapists could consider using heat, transcutaneous electrical nerve stimulation, and yoga in the management of primary dysmenorrhea.	(7)

Table I. Continued.

Author	The title research	The aim	The population/sample	Methods	Finding	Conclusion	(Refs.)
Smith <i>et al</i> 2011	Acupuncture to treat primary dysmenorrhea in Women: A randomized controlled trial	To check the effectiveness of acupuncture to reduce the severity and intensity of primary dysmenorrhea	Female 14-25 y.o with primary dysmenorrhea=92 divided into acupuncture group=46, control group=46.	A randomized controlled trial	<p>treatment. However, these are likely to be placebo effects because when the control groups in acupuncture/acupressure trials received a sham instead of no treatment, pain severity did not significantly differ between the groups. Significant reductions in pain intensity on a 0-10 scale were noted in individual trials of heat (by 1.8, 95% CI 0.9 to 2.7), transcutaneous electrical nerve stimulation (2.3, 95% CI 0.03 to 4.2), and yoga (3.2, 95% CI 2.2 to 4.2).</p> <p>Follow-up at 6 months found a significant reduction in the duration of menstrual pain in the acupuncture group compared with the control group, mean difference -9.6, 95% CI -18.9 to -0.3, P=0.040</p>	Although acupuncture improved menstrual mood symptoms in women with primary dysmenorrhea during the treatment phase, the trend in the improvement of symptoms during the active phase of treatment, and at 6 and 12 months was non-significant,	(31)

Table I. Continued.

Author	The title research	The aim	The population/sample	Methods	Finding	Conclusion	(Refs.)
Dehnavi <i>et al</i> 2018	The Effect of aerobic exercise on primary dysmenorrhea: A clinical trial study	To determine the effect of 8 weeks of aerobic exercise on the severity of primary dysmenorrhea	N=70 female student with primary dysmenorrhea	A randomized clinical trial	The intervention group showed significant changes compared to control group after 8 weeks of aerobic exercise (P=0.041)	indicating that a small treatment effect from acupuncture on dysmenorrhea may exist. Doing aerobic exercise can lower primary dysmenorrhea pain.	(32)
Satriawati <i>et al</i> 2020	The Influence of Combination of Warm Compression and Chocolate Against Menstrual Pain Reduction (Dysmenorrhea) in Teens Junior High School 1st Bangkalan	To find out the effect of the combination of warm compresses and chocolate on the reduction of menstruating pain (dysmenorrhea) in teenager in Junior High School 1st Bangkalan	N=54, divided into two group (group 1=27, group 2=27)	Quasy Eksperimental with control time series design	There is an effect of combination of warm compression and chocolate to reduction of menstrual pain (P-value 0.050). In addition, there are other factors that affect the decrease in menstrual pain, namely BMI (P-value 0.032)	The combination of warm compression and chocolate has been shown to be effective to reduction pain of primary dismenorrhea although there is another factor that affects it which is BMI.	(33)



## Limitation

The weakness of this study does not consider the results of research that uses other languages and other data base search besides Google, Google scholar, Research gate, Cochran Data Base, Embase, NCBI, Sciendirect, SAGE, Elsevier, Sinta so that it has the potential to cause bias.

## Conclusions

In the literature review research of all scientific journals containing the most important determinants in non-pharmacological therapies. The results of the literature review of non-pharmacological therapies that are most effective in reducing the intensity of primary dysmenorrhea pain in women of childbearing age are non-pharmacological therapies that are classified as in the first group. It is murrotal therapy of Qur'an, yoga, acupressure, counter pressure massage, effleurage massage, consuming green coconut water and consume of avocado juice have been proven to be equally the most effective to treat complaints of dysmenorrhea pain quickly.

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## Contributions

WSI, finalization of the research paper, support the database search, data screening, data extraction, major contributor to writing this manuscript; IA, organized the administration, and helped with the manuscript review and modification; JK, supported the database search, support the manuscript writing. All authors have read and approved the final version to be published.

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## Ethical approval and consent to participate

The study was conducted with ethical clearance and was approved by the Ethical Committee of STIKES Hafshawaty Pesantren Zainul Hasan under the ethical code of SK: KEPK/039/Stikes-HPZH/VII/2022.

## Conflict of interest

The authors declare no potential conflict of interest.

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# Non-Pharmacological That Most Effective to Reduce of Primary Dysmenorrhea Intensity in Women Childbearing Age: A Literature Review

*by* Widia Shofa Ilmiah

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# Non-Pharmacological That Most Effective to Reduce of Primary Dysmenorrhea Intensity in Women Childbearing Age: A Literature Review

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Keywords: Non Phamacology, Level of Pain, Primary Dismenorhea, Women Childbearing Age

## Abstract

One of the most common female reproductive health problems is primary dysmenorrhea. Data on the incidence of primary dysmenorrhea complained about 50-90% of women in the world. Primary dysmenorrhea data in the US is 30-70%, in Sweden is 30%, in Mexico is 64%, in Italy is 68%, in Jordan is 55.8%, in Turkey is 84.9%, and in Malaysia is 74.5%, in Indonesia is 60-70% and 15% of its, it interferes with daily activities including work. The cause of this is hypercontractility of the myometrium due to excessive secretion of prostaglandins. This study aims to explore the most effective non-pharmacological therapies in reducing the level of primary dysmenorrhea pain in women of childbearing age. The design of this study is a literature review with the PRISMA method. Database Google, Google Scholar, Research gate, Cochran Data Base, Embase, NCBI, Scindirect, SAGE, Elsevier, Sinta. The population of this study was all full-text international journals indexed by Scopus and national journals indexed by Sinta 1-6 published in 2011-2021 including RCT amount of 114 articles. A sample of 23 articles meets the inclusion criteria and used thematic data analysis. The results of non-pharmacological therapy that effectively overcome primary dysmenorrhea pain, namely the first group with (p= 0.000). The conclusions showed that Murrotal Qur'an, yoga, acupressure, counter pressure massage, effleurage massage, consume green coconut water and avocado juice combination with massage were proven to be equally effective in overcoming complaints of primary dysmenorrhea pain quickly without being accompanied by side effects.

## Contributions

WSI: finalization of the research paper, support the database search, data screening, data extraction, and synthesis. She was a major contributor to writing this manuscript; IA: organized the administration, and helped with the manuscript review and modification; JK: supported the database search, support the manuscript writing. All authors have read and approved this final manuscript.

## Introduction

One of the most common female reproductive health problems is Dysmenorrhea. Dysmenorrhea is a pain that occurs in the lower abdomen area or supra pubis before menstruation and occurs during the menstrual phase (1). Primary dysmenorrhea is a type of pain that occurs during the menstrual phase in the absence of disorders of the pathology of the female reproductive organs (2). Primary dysmenorrhea is a reproductive health problem in adolescent females most commonly occurring after nutritional problems. Primary dysmenorrhea usually occurs a few hours before menstruation and continues for up to 12-72 hours or during menstruation and is usually felt pain accompanied by cramps in the lower abdomen (3).

Data on the incidence of primary and frequently complained dysmenorrhea is about 50-90% of women in the world and almost occur in every country (4). Data on the incidence of primary dysmenorrhea in women of childbearing age in the United States is about 30-70%, in Sweden about 30%, in Mexico about 64%, in Italy about 68%, in Jordan about 55.8%, in Turkey about 84.9%, and in Malaysia about 74.5% (5). while in Indonesia about 60-70% and 15% of them interfere with daily activities including work (6).

The contributing factor to primary dysmenorrhea is hypercontractility of myometrium due to excessive prostaglandin secretion, causing excessive pain or cramps in the lower abdomen area (7). Age factors, psychological factors, as well as other factors are nutritional factors such as eating too much salt content, animal fats, instant food, low carbohydrates, and low fiber, psychological a person and increased concentration of prostaglandins in the uterus (8).

The impact of primary dysmenorrhea is that for women who are in school, dysmenorrhea is the cause of being absent from school due to excessive pain (9). The incidence of primary dysmenorrhea that occurs in working women causes a loss of about 600 million hours of work and a loss of productivity of about 2 billion US (10).

Primary dysmenorrhea treatment is carried out pharmacologically and non-pharmacologically. Non-pharmacological restraints are known to have relatively minor side effects and even almost no side effects. Non-pharmacological therapies include yoga, pilates, acupuncture, massage, aroma therapy, giving fruit juices such as avocado, warm compressed combination with dark chocolate, deep breathing exercises, warm compresses, hypnotherapy, genupectoral positions, murrotals of the Qur'an (7); (4); (11).

The difference between this study and the previous study is in the non-pharmacological therapy reviewed. In this study, researchers reviewed all non-pharmacological therapies to reduce primary dysmenorrhea pain and examined which therapies were most effective to reduce primary dysmenorrhea pain quickly. The aim is to explore non-pharmacological that most effective to reduce primary dysmenorrhea intensity in women of childbearing age: A literature review.

## Materials and Methods

The design used systematic review by PRISMA methods. An aqualitative study was conducted with an articles year limit for literature review is 2011-2021. The literature review was conducted as preferred reporting items for systematic review by PRISMA. The database that searching included Google, Google Scholar, Research gate, Cochran Data Base, Embase, NCBI, Sciendirect, SAGE, Elsevier, and Sinta with search keywords namely the effectiveness of non-pharmacological methods (dysmenorrhea exercise, yoga, pilates, acupuncture, acupressure, massage, aroma therapy, fruit juices such as avocado, warm compressed combination with dark chocolate, deep breathing exercises, warm compresses) to reduce primary dysmenorrhea pain and check the quality of journals. For international articles, it is checked through Scimago JR, and for a national article, it is checked through the Sinta portal and uses the PICO technique for searching eligible journals.

The populations were all reputable international and national articles indexed by Sinta 1-6 on non-pharmacological therapies to reduce primary dysmenorrhea pain amount of 114 Articles. The samples were twenty-three articles that were eligible by the inclusion criteria. Sampling was used purposive sampling. The inclusion criteria were a research article in the form of a full-text article in English related to non-pharmacological therapy in reducing primary dysmenorrhea pain and proceeding full text that has been published and at least has E-ISSN and indexing by Scopus, Wos, Thompson Reuters, Sinta 1-6. The exclusion criteria were

articles that were only abstract and articles not in English, and not in reputable international journals and discontinued by Scopus and national journals accredited by Sinta 1-6.

Risk of bias in this study by checking citations and for the relevant topic and various databases to avoid research bias. The data extraction was checked by our team. The data extraction process was carried out by looking for full-text articles in English, titles, years of publication, publisher and indexing, the aim, the populations, interventions, comparisons, research methods, results, and conclusions. Then, the researcher looks at the citation and H index. In addition, journals that were eligible by the inclusion criteria were sampled in this study with consideration from other research teams (Figure 1).

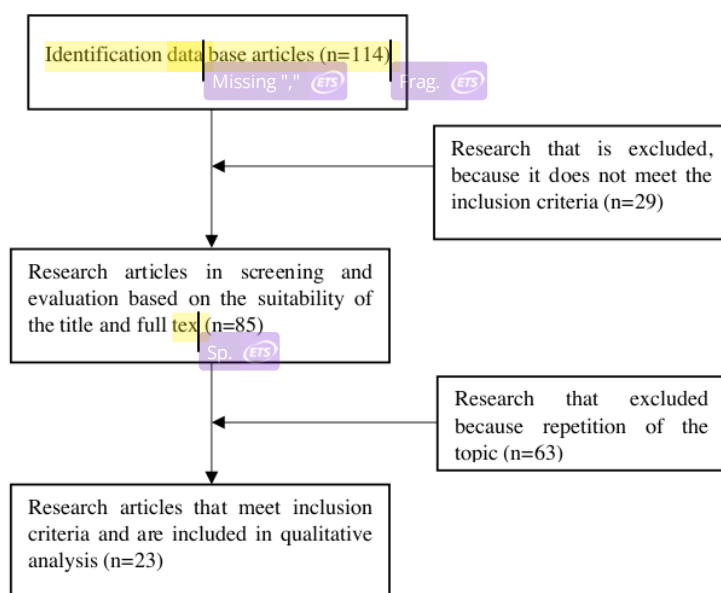


Figure 1. Flowchart of the study selection process (data extraction)

A descriptive data analysis of this study synthesis was conducted in the narrative report or thematic analysis. The results are presented based on the study of journal research conducted a meta-analysis by reading the p-value of each variable and grouping the results. The results of the first group of studies are non-pharmacological therapies which have  $p=0.000$ , and the second group of non-pharmacological therapies with  $0.020 \leq p \leq 0.010$  and the third group with  $0.030 \leq p \leq 0.05$ . Furthermore, the findings were carried out as a descriptive analysis as a whole. The study was conducted for ethical clearance and approved by the Ethical Committee of STIKES Hafshawaty Pesantren Zainul Hasan under the ethical code of SK: KEPK/039/Stikes-HPZH/VII/2022.

## Results

The results of this literature review show that several non-pharmacological therapies are equally effective and fast in reducing primary dysmenorrhea pain. The first group of non-pharmacological therapy is Murrotal Qur'an therapy, yoga, acupressure, counter-pressure massage, effleurage massage, consuming green coconut water, and administration of avocadd juice with  $p = 0.000$  at  $\alpha 0.05$ . Furthermore, the second group is giving dry hot compresses using glass bottles, drinking Javanese turmeric, lemon therapy aromas, lavender therapeutic aromas, hypnotherapy, longa Curcuma drinks, giving Clupeonella grimmi fish oil supplements (anchovies), relaxation techniques by taking deep breaths with  $0.020 \leq p \leq 0.010$ . The third group is drinking ginger, aroma therapy combined with massage, physical activity, and nutrition, mat pilates exercises, physiotherapy, acupuncture, aerobic, warm compress combination dark chocolate with a value of  $0.030 \leq p \leq 0.05$  (table 1).



## Discussion

Primary dysmenorrhea usually occurs on average in women aged < 25 years old (12). The causes of primary dysmenorrhea are a lack of energy in the uterus, a decrease in the levels of the steroid hormone progesterone in the luteal phase, a condition connected to a lower level of the enzyme lysosomal and the subsequent release of endometrial phospholipase. This event causes an increase in the levels of prostaglandins responsible for the contraction of the uterus and arteries, eventually causing uterine ischemia (13).

Therapy to reduce primary dysmenorrhea pain in this literature review is non-pharmacological therapy. It is the type of therapy in the form of relaxation, positive thinking, herbs, a diet high in fiber, acupuncture, physiotherapy, and other types of therapy, in addition to the administration of medical drugs (4). It works as a natural analgesic, antispasmodic, and antioxidant, decreases prostaglandin production, increases beta-endorphin levels, and facilitates uterine circulation (13).

The non-pharmacological therapy research that is most effective and grouped in the first choice of therapy is the Murrotal Qur'an. The Murrotal Qur'an is one of the music that has a positive effect on its listeners. This therapy provides a calming effect when listened to, especially when experiencing primary dysmenorrhea. This is due to the appearance of 63.11% of delta waves on the right and left forebrains and is effective in reducing primary dysmenorrhea pain if listened to for at least 15 minutes, especially surah Ar-Rahman (6).

Slow Murrotal Qur'an chanting can activate natural endorphin hormones which are hormonal compounds that release morphine in the body that can trigger stress and pain, increase feelings of relaxation, distract from fear, anxiety, and tension, increase metabolism so that it can reduce blood pressure and slow breathing, pulse rate, and brainwave activity. The rate of breathing to be deeper or slower is very good for producing calmness, emotional control, deep thinking, and improving the metabolism of body so that the pain due to primary dysmenorrhea can be quickly reduced (6).

The next group of non-pharmacological therapies is yoga. Yoga is a mind-body exercise, consisting of physical posture (asana), breathing exercises (pranayama), and meditation (dhyana), which integrates the balance of body and mind. Yoga Nidra is a type of yoga with powerful meditation techniques, where the mind is still conscious during the "unconscious" state associated with deep sleeping. Yoga Nidra functions to regulate thyroid-stimulating hormone levels, stimulate follicle-stimulating hormone, luteinizing hormone, and prolactin and relax muscles. This yoga is done 2 times a week with the length of each session which is 30

minutes for 6 months after self-tapping is done for 20 minutes to permanently reduce primary dysmenorrhea pain (14).

The next non-pharmacological therapy is acupressure. It is similar to acupuncture, but the difference is that acupressure does not use needles. Acupressure is based on traditional Chinese medicine and shares the main principle of opening up and harmonizing the blocked meridians by stimulating the surrounding environment below the acupressure point. The onset of pain is due to the very high levels of PGE-2 and PGF-2 Alpha in the endometrium, myometrium, and menstrual blood of women who have dysmenorrhea. Prostaglandin hormones cause increased uterine activity and pain in excitatory terminal nerve fibers. Experimental studies on acupressure have shown that acupressure effectively reduces discomfort by providing sedative and analgesic effects (15); (16).

The next therapy is massage counter pressure. Counter-pressure massage is a massage that is carried out by applying continuous pressure to the patient's sacrum bone with one palm. One-hand massage uses the heel of the hand to clench in the lumbar region where the uterine sensory nerves running with the sympathetic nerves of the uterus enter the spinal cord through the thoracic nerve 10-11-12 towards the Lumbar. This massage technique can increase endorphins as physiological painkillers. Endorphins can affect the process of impulse transmission which is interpreted as a neurotransmitter that can inhibit pain. How to do a counterpressure massage is done for at least 30 minutes during the 1-3 days of the menstrual cycle. Therefore, this massage is effective in lowering primary dysmenorrhea pain immediately (17).

After counter pressure massage is effleurage massage. Effleurage massage is a non-pharmacological method that is considered effective in reducing pain. The most common dysmenorrhea pain that adolescents experience is stiffness or spasm in the lower abdomen. This is due to an increase in prostaglandins (PG) F2-alpha, which are cyclooxygenases (COX-2), which produce hypertonus and vasoconstriction in the myometrium resulting in ischemia and pain in the lower abdomen. This massage is performed for 3 days with a duration of 3-5 minutes each time massaging is performed during primary dysmenorrhea to significantly reduce the intensity of pain quickly. This therapy will affect the motor, nervous, and cardiovascular systems, triggering the rest and relaxation phases of the body as well as an effort to restore venous and lymph flow, stimulating sensory receptors in the skin and sub-skin to reduce pain (18).

Then, group one reduces primary dysmenorrhea is consuming green coconut water. A mount of 330 ml green coconut water dose is a more effective dose to decrease primary dysmenorrhea. Green coconut water has a composition of more minerals including magnesium

and calcium. Widely known that magnesium has a role in decreasing pain intensity and vasoconstriction relief. Another study about magnesium and calcium showed that both were reported to have an effective effect on pain suppression including primary dysmenorrhea. Based on it, green coconut water is effective as a non-pharmacological therapy for primary dysmenorrhea relief (19). Another study about combination **massage** and consuming green coconut water can relieve dysmenorrhea pain more quickly. **effleurage massage technique aims to improve blood circulation, put pressure, warm the abdominal muscles, and increase physical and mental relaxation.** The mechanical effect of the effleurage technique is to help the vein work and cause body heat as warming up. **Massage can make patients more comfortable due to muscle relaxation and comfortable feeling.** A combination of it and green coconut water can increase  $\beta$ -endorphin levels and overcome the pelvic flush due to muscle **relaxant** formation of serotonin neurotransmitter that can increase appetite, feelings of happiness, and anti-depression (20).

The last of group one on non-pharmacological therapy as the result of the literature review is the administration of **avocado** juice. Avocado is a type of fruit that has a high content of vegetable fats compared to other fruits. Avocado is also enriched with antioxidants and nutrients, there is the highest flavonoid content compared to other tropical fruits such as guava, pineapple, mango, papaya fruit, orange, and tamarind. The flavonoid content in avocados is used as an antioxidant due to its ability to reduce the formation of free radicals. The calcium content in avocados can relieve pain. This therapy is administered at a dose of at least 100 mg each time you drink avocado juice during the menstrual cycle (21).

### **Limitation**

The weakness of this study does not consider the results of research that uses other languages and other data base search besides Google, Google scholar, Research gate, Cochran Data Base, Embase, NCBI, Sciendirect, SAGE, Elsevier, Sinta so that it has the potential to cause bias.

### **Conflict of interest**

The authors declare no potential conflict of interest. **Funding of this study was funded by ITSK RS dr. Soepraoen Kesdam V/ Brawijaya.**

### **Conclutions**

In the literature review research of all scientific journals containing the most important determinants in non-pharmacological therapies. The results of the literature review of non-

17  
pharmacological therapies that are most effective in reducing the intensity of primary dysmenorrhea pain in women of childbearing age are non-pharmacological therapies that are classified as in the first group. It is murrotal therapy of Qur'an, yoga, acupressure, counter pressure massage, effleurage massage, consuming green coconut water and consume of avocado juice have been proven to be equally the most effective to treat complaints of dysmenorrhea pain quickly.

### Acknowledgement

The author would like to thanks to ITSK RS dr. Soepraoen Kesdam V/ Brawijaya that giving social and funding support in this study.

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