



COMPLEMENTARY AND ALTERNATIVE MEDICINE (CAM) ON DYSMENORRHEA: A SYSTEMATIC REVIEW

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Abstract

Objectives: This systematic review aimed to evaluate the current evidence regarding the complementary alternative medicine on primary dysmenorrhea.

Method: This systematic review study used the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 guidelines. The literature search was done using Google Scholar, Pubmed, and Science Direct. Articles that met the inclusion criteria were assessed using the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) Checklist, including an explanation of sample size, explanation of sample methodology, calculation of response rate, findings/results measurement, explanation of the statistical analysis, confounding control, explanation of study limitations, and research ethics. Three independent reviewers participated in data extraction and assessment. Total of 20 out of 3,825 articles met the inclusion and exclusion criteria for review.

Results: This review included 36 RCTs; the meta-analysis included 48 RCTs. Most studies showed a low or unclear risk of bias. The characteristic of the articles is the use of a clinical/controlled trial and quasi-experimental study design with the intervention target being the complementary alternative medicine on primary dysmenorrhea, the quality of the articles is categorized as good, and the measurement tools used are questionnaires and interviews. The cause of primary dysmenorrhea is often associated with high levels of inflammation in the endometrium. Elevated prostaglandin levels respond to the rise and fall of progesterone after ovulation. Overproduction of prostaglandins in the endometrium will result in hypercontractility and vasoconstriction of the myometrium. Vasoconstriction of the uterine blood vessels will reduce blood flow, muscle ischemia, and increase sensitivity to pain receptors, all of which cause period pain. Prostaglandin levels in adolescents with dysmenorrhea were twice as high as those without dysmenorrhea



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Conclusion: The results of this study suggest that acupuncture might reduce menstrual pain and associated symptoms more effectively compared with no treatment or NSAIDs, and the efficacy could be maintained during a short-term follow-up period.

Keywords: complementary and alternative medicine; dysmenorrhea; students

I. INTRODUCTION

Menstrual health is critical to improving the health of the world's population, achieving the Sustainable Development Goals (SDGs), and realizing gender equality and human rights. Although the last decade has seen a growing awareness of the challenges related to menstruation and increased multi-sector investment is needed to comprehensively address the needs of all menstruating people.

Primary dysmenorrhea is a global health problem commonly experienced by women of reproductive age. Primary dysmenorrhea could lead to poor health and socioeconomic problems due to school absenteeism, career breaks, lack of productivity, and poor quality of life. This implies that standardized therapeutic measures are needed for primary dysmenorrhea. From a variety of therapeutic approaches, complementary and alternative therapies for primary dysmenorrhea stand out worldwide.

Primary dysmenorrhea (PD) is a common, neglected, underdiagnosed, and inadequately treated complaint in young and adult women. It is characterized by painful cramping in the lower abdomen, which begins shortly before or at the start of menstruation and can last for 3 days. PD has a negative impact on adolescent girls' quality of life (QoL) and is the main reason behind their absence from school or work. The increased intrauterine secretion of prostaglandin F_{2α} and E₂ is thought to be responsible for the pelvic pain associated with this disorder.

According to the World Health Organization (WHO), between 30% and 40% of Global health types belong to modern conventional medicine, and the rest are classified as complementary and alternative therapies. According to previous studies, these phenomena seem to be due to the increased interest in non-pharmaceutical therapies such as yoga, the practice of Zen meditation, health supplements, and natural therapies. In addition, these were also influenced by factors such as heightened interests in health promotion, positive evaluations of actual efficacy, recognition of the limitations of orthodontic treatments and modern medications in users of alternative and complementary therapies, increased popularity and acceptance of alternative and complementary therapies due to the increase in the elderly population and its chronic and refractory diseases, and the changes in values of people who try to return to nature. The effects of complementary and alternative therapies for menstrual dysmenorrhea have been actively studied in acupuncture, aromatherapy, yoga, and Chinese herbal medicine, among others.

In Indonesia, the incidence of dysmenorrhea is 64.25%, consisting of primary dysmenorrhea at 54.89% and secondary dysmenorrhea at 9.36% (Jama and Azis 2020). According to the data, it is shown that 60-75% of adolescent girls experience primary dysmenorrhea. And three quarters experienced dysmenorrhea with mild or moderate intensity. Meanwhile, the other quarter

experienced severe levels of dysmenorrhea which sometimes made the victim unable to bear the pain (Umami, Lutfiasari, and Pradian 2016).

A systematic review is a review done systematically aiming to compile all empirical evidence according to predetermined criteria. A systematic review can observe the role of complementary alternative medicine on primary dysmenorrhea. Therefore, this systematic review needs to be done to describe the role of complementary alternative medicine on primary dysmenorrhea (Woo HI, 2018).

II. METHODS

Search Strategy

The research method was systematic review, used eight stages, namely determining questions, determining inclusion and exclusion criteria, literature search, article selection, perform critical appraisal, perform data extraction, data synthesis and map the results findings. The sources of the research derived from the literature through the internet in the form of research results obtained about complementary alternative medicine (CAM) against dysmenorrhea.

This systematic review study used the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 guidelines (Page et al. 2021). The literature search was done using Google Scholar, Pubmed, and Science Direct. All eligible literature was collected in one folder with Mendeley. The keywords used in searching the literature were as follows:

- “Primary dysmenorrhoe” OR AND “Dysmenorrhoe”
- “Complementary alternative medicine” OR AND “Complementary alternative therapy”

Inclusion and Exclusion

The inclusion criteria in the selection of articles were as follows: (a) articles primary dysmenorrhoe and complementary alternative medicine; (b) articles use experimental research design; (c) articles are in English; (d) articles published from 1 January 2018 – 31 September 2022; (e) articles are available in full text.

The exclusion criteria in the selection of articles were as follows: (a) literature review articles; (b) articles published in journals not indexed by Scopus; (c) articles use research targets other than secondary dysmenorrhoe.

Data Extraction

The extracted data were variables related to complementary alternative medicine on primary dysmenorrhea. Initially, identified articles were exported to the Mendeley Library, and duplicates were removed. The first author (SN) screened the title and abstract of the articles. In the final stage, SN read the full text of the remaining articles and retained studies that met the inclusion/exclusion criteria.

All data extraction and assessment studies were independently reviewed by SN and MM and all disagreements between the two authors were resolved through discussion and consensus. Selected article studies were noted regarding the author(s) of the selected articles, year of publication,

country of research site, research design, intervention method, quality assessment score, and findings/results.

The articles that appear are sorted so that articles with the same title are not found. The articles are then sorted based on the inclusion and exclusion criteria that have been determined. Articles containing only abstracts will be eliminated. What we have is for dialysis. The items obtained are then extracted. Article extraction was based on the author of the article, the year of publication of the article, the number of samples used, the measuring instrument used, the results of the research carried out and the art database. After reviewing the article, the author conducts a critical evaluation, and the last stage is data evaluation. Filter and select articles through PRISMA Flowchart of the study selection process.

Quality Assessment

The assessment of the quality of the articles used the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) Checklist. Out of the 35 STROBE assessment items, 9 items were taken, including an explanation of sample size, explanation of sample methodology, calculation of response rate, findings/results measurement, explanation of the statistical analysis, confounding control, explanation of study limitations, and research ethics. The quality of the studies (in the articles) category was calculated based on the number of items met. Each item met is given a score of 1. The overall scores are added up to determine the quality of the study. The quality of the study was categorized into poor (0-3), moderate (4-6), and good (7-8).

III. RESULT

A total of 3825 articles were retrieved from three databases. After the removal of duplicates, 2265 articles were left. After reading the title, 2113 articles were removed. Next, after screening (reviewing) the abstract, 568 articles were left. Finally, after screening the full-text articles, 9 articles were obtained (Fig. 1).

No.	Name	Year/ Volume /Issue	Title	Methods (Design, Sample, Variable, Instrument and Analytic)	Results	Database
1	Puji Hastuti, Fajaria Nur Aini, Sumiyati (Hastuti, Sumiyati, and Aini 2017)	2017/ Vol.3/ Issue 1	Carrots Juice For Dysmenorrhea	D: Qualitative and quantitative interviews S: 25 respondents V: Menstrual pain. I: Numeric Rating Scale (NRS) A: Univariate and Bivariate	Before the intervention, 72% of participants had mild pain while 20% had moderate pain and 8% had severe pain. After carrot juice administration, most experienced no pain (68%), 24% mild and 8% moderate pain. No participants reported severe pain. The results of Wilcoxon Match Paired Test analysis showed that there was an effect of carrot juice administration for different levels of dysmenorrhea in students with $p = 0.001$.	Google Scholar URL: https://ejournal.potsmg.ac.id/ojs/index.php/jrk/article/view/1362 DOI: https://doi.org/10.31983/jrk.v5i2.1362

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2	Hyelin Woo, Hae Ri Ji, Yeon Kyoung Pak, Hojung Lee, Su Jeong Heo, Jin Moo Lee, Kyoung Sun Park (Woo et al. 2018)	2018/ Vol. 97/ Issue 23	The efficacy and safety of acupuncture in women with primary dysmenorrhea	D: Systematic review and meta analysis S: 60 RCTs V:; Acupuncture, Primary Dysmenorrhea I: Review Manager software A: The chi-square and I2 tests were used to assess statistical heterogeneity	The results of this study suggest that acupuncture might reduce menstrual pain and associated symptoms more effectively compared to no treatment or NSAIDs, and the efficacy could be maintained during a short- term follow-up period. Despite limitations due to the low quality and methodological restrictions of the included studies, acupuncture might be used as an effective and safe treatment for females with primary dysmenorrhea	<i>Medicine</i> Pubmed DOI: https://dx.doi.org/ 10.1097/MD.0000 0000000110071
3	Jungtae Leem, Junyoung Jo, Chan- Young Kwon, Hojung Lee, Kyoung Sun Park, Jin Moo Lee (Leem et al. 2019)	2019/ Vol. 98/ Issue 5	Herbal medicine (Hyeolbuchuk eo-tang or Xuefu Zhuyu decoction) for treating primary dysmenorrhea	D: Systematic review and meta analysis of RCT S: 475 publication, 8 RCTs involving 1048 patients V:; Herbal Medicine, Primary Dysmenorrhea I: Visual Analogue Scale (VAS), Review Manager A: V.5.3 Copenhagen: The Nordic Cochrane Centre, The Cochrane Collaboration	The existing trials showed a favorable effect of XZD for the management of primary dysmenorrhea. However, the efficacy of XZD on primary dysmenorrhea is not conclusive owing to the small number of studies and the high risk of bias. Large- scale, long-term RCTs with rigorous methodological input are needed to clarify the role of XZD for the management of primary dysmenorrhea.	<i>Medicine</i> Pubmed DOI: http://dx.doi.org/1 0.1097/MD.00000 000000141701
4	Suci Imaniar Amrullah Hunowu (Hunowu 2019)	2019/ Vol.4/ Issue 1	The Effect of Giving Carrot Juice (Daucus Carota L) on Reducing the Level of Primary Menstrual Pain (Dysmenorrhea) in Adolescent Girls at Sma Negeri 2 Bitung Kota Bitung	D: Qualitative interview S: 20 respondents with 2 groups, one control group and one intervention group V: Menstruation, adolescent girls at school I: Numeric Rating Scalse (NRS) A: Univariate and Bivariate	The results of the study using the paired sample t- test test obtained the mean value of pre-test treatment menstrual pain of 7.00 and post-test 3.10 with a p value of 0.000.	Google Scholar URL: http://repository.p olttekkesmanado. ac.id/33/
5	Fahimeh Tahoonian- Golkhatmy, Sayed Ahmad Emami, Habibollah Esmaily	2019/ Vol 24/ Issue 4	Comparison rosemary and mefenamic-ac id on primary dysmenorrhea	D: Qualitative and Quantitative interview S: 82 respondents V: Menstrual Bleeding and Primary Dysmenorrhea I: Visual Analogue Scale (VAS) A: Univariate and Bivariate	The results of this study explained that Rosemary capsules reduce the menstrual bleeding and primary dysmenorrhea the same as mefenamic acid capsules. Results of the independent paired t-test revealed a significant difference in amount of	Iranian Journal of Nursing and Midwifery Research Pubmed URL: https://www.ncbi. nlm.nih.gov/pmc/

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	(Tahoonian-Golkhatmy et al. 2019)				menstrual bleeding between rosemary (t 41 = 2.60, p = 0.01) and mefenamic acid groups (t 39 = 2.10, p = 0.01)	articles/PMC6621500/pdf/IJNMR-24-301.pdf DOI: https://doi.org/10.4103%2Fijnmr.IJNMR.99.18
6	Zahra Bostani Khalesi, Soheila Pirdadeh Beiranvand, Mahshid Bokaie (Khalesi, Beiranvand, and Bokaie 2019)	2019/ Vol.22/ Issue 4	Efficacy of Chamomile in the Treatment of Premenstrual Syndrome: A Systematic Review	D: Systematic review S: 27 studies, 8 RCTs V: Herbal Medicine, Primary Dysmenorrhea I: PRISMA A: The Consort Statement Checklist	The results of this review show that Chamomile is effective for the treatment of PMS. Chamomile has been used to treat PMS relief because of therapeutic properties such as anti-inflammatory effects (Chamazulene and α -Bisabolol); anti-spasmodic effects (Apigenin, Quercetin, and Luteolin, Metoxicomarin, Matrisin, and Phytoestrogens); anti-anxiety effects (Glycine, Flavonoid) Based on these results, Chamomile can be used as good herbal medicine to treat in women with PMS.	<i>Journal of Pharmacopuncture</i> Pubmed DOI: https://doi.org/10.3831/KPI.2019.22.028
7	Claudia Anggie Anugrahayu, Ninik Darsini, Ashon Sa'adi (Anugrahayu, Darsini, and Sa'adi 2019)	2019/ Vol.5/ Issue 1	Soybean (Glycine max) Drink and Tamarind (Tamarindus indica) with Turmeric (Curcuma domestica) Combination in Reducing Menstrual Pain	D: Qualitative and quantitative interviews S: 27 respondents V: Menstrual pain. I: Numeric Rating Scalse (NRS) and Face Scale A: Univariate and Bivariate	The results of this study explained that there was a decrease in the level of dysmenorrhea pain in adolescent girls after being given soy drinks and tamarind-turmeric. The results of the Wilcoxon Test on soy beverage therapy, obtained a sig. value of 0.023 with a significant level $\alpha < 5\%$ or 0.05, so Ho is rejected, namely there is a difference in the pain scale of students who experience dysmenorrhea before and after soy drinks. In the analysis of tamarind and turmeric drink therapy, the sig. value of 0.006 (<0.05) means that there is an effect of giving a combination of tamarind and turmeric on the level of dysmenorrhea pain.	<i>Jurnal Farmasi dan Ilmu Kefarmasian Indonesia</i> Google Scholar URL: https://e-journal.unair.ac.id/JFIKI/article/view/8673 DOI: https://doi.org/10.20473/jfiki.v5i12.018.1-5
8	Fatemeh Shabani, Mohammad Ali Zareian (Fatemeh Shabani and	2020/ Vol.9/ Issue 4	Evaluation of the Synergism of Medicinal Effects of Chamomile and Ginger on	D: Randomized Controlled Trial S: 400 Respondent with 4 Groups V: Menstrual pain.	In all four groups, pain severity, the number of painful days, low back pain, analgesic consumption, total symptom score, and bleeding loss were	<i>Complementary Medicine Journal</i> Pubmed

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	Mohammad Ali Zareian (2020)		Pain and Symptoms of Primary Dysmenorrhea: A Randomized Controlled Trial	I: Visual Analogue Scale (VAS), symptoms based on the Andersch-Millsom Verbal Scale, and bleeding rates were measured using the Pictorial Blood Loss Assessment Chart (PBACs). A: Univariate, Bivariate and Multivariate	significantly decreased (P=0.001). However, there was no significant difference between groups, excluding total symptom score and bleeding loss. Ginger-chamo- mile combination was better than other interventions in decreasing total symptom score (P=0.02). Mefenamic acid also had a better effect on reducing bleeding loss than other interventions (P=0.008)	DOI: https://doi.org/10.32598/cmja.9.4.351.3
9	Husna Sari, Erlina Hayati (SARI and Hayati (2021)	2020/ Vol. 6/ Issue 3	Decreasing Dysmenorrhea Pain Level by Giving Carrot Juice to Young Women	D: Qualitative and quantitative interviews S: 25 respondents V: Menstrual pain. I: Numeric Rating Scalse (NRS) A: Univariate	The results of this study explained that the difference in the decrease in dysmenorrhea pain levels in adolescent girls before being given carrot juice on average was 1.80 with a sig value. 0.001 after consuming carrot juice the average decrease in dysmenorrhea pain levels in adolescent girls is 1.32 with a sig value. 0,001. Based on the results of the Wilcoxon Test, obtained a sig. value of 0.001 with a significant level $\alpha < 5\%$ or 0.05, it means Ho is rejected, namely there is a difference in the pain scale of students experiencing dysmenorrhea before and after drinking carrot juice.	CABI (Global Health) URL: https://jurnal.htp.ac.id/index.php/keskom/article/download/579/261/4107
10	Shinta Amelia, Fitra Juwita, Anidaul Fajriyah (Astuti, Juwita, and Fajriyah (2020)	2020/ Vol.3/ Issue 2	The Effect of Giving Turmeric Acid on Reducing the Intensity of Menstrual Pain	D: Qualitative and quantitative interviews S: 14 respondents V: Menstrual pain. I: Numeric Rating Scalse (NRS) A: Univariate and Bivariate	The results of this study, explained that the difference in the decrease in the level of dysmenorrhea pain in adolescent girls before being given turmeric acid on the first day of moderate pain as many as 14 respondents and on the third day 14 respondents experienced mild pain. Based on the results of the Wilcoxon Test, obtained a sig. value of 0.001 with a significant level $\alpha < 5\%$ or 0.05, it means Ho is rejected, namely there is a difference in the pain scale of students experiencing dysmenorrhea before and after drinking turmeric acid.	<i>Indonesian Journal of Midwifery (IJM)</i> Google Scholar URL: https://jurnal.unw.ac.id/index.php/ijm/article/view/618/pdf DOI: https://doi.org/10.35473/ijm.v3i2.618

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11	Widia Natalia, Sri Komalaning sih, Osman Syarief, Firman F.W., Achmad Suardi (Natalia et al. 2020)	2020/ Vol.5/ Issue 3	Comparison of the Effectiveness of Sanyinjiao Point Acupressure Therapy with Deep Breath Relaxation Techniques to Reduce Menstrual Pain in Teenage Girls at Pesantren Asshiddiqiyah 3 Karawang	D: Qualitative and quantitative interviews S: 16 respondents V: Menstrual pain. I: Numeric Rating Scalse (NRS) A: Univariate and Bivariate	The results of this study explain that the average pain level before being given Sanyinjiao Point acupressure therapy and deep breath relaxation techniques is relatively the same as evidenced by the results of the Mann Whitney test sig. 0,843 (>0,05). While after the intervention, the average pain level of the two therapies has different results where the acupressure group has an average of 25.23 and the relaxation group 53.77. Based on the results of the Wilcoxon Test, obtained a sig. value of 0.000 with a significant level $\alpha < 5\%$ or 0.05, it means Ho is rejected, namely there is a difference in the pain scale of students experiencing dysmenorrhea before and after acupressure and deep breath relaxation.	<i>Jurnal Sistem Kesehatan</i> Google Scholar URL: http://jurnal.unpad.ac.id/jsk_ikm/articel/view/28772 DOI: https://doi.org/10.24198/jsk.v5i3.28772
12	Marta Sanchez, Elena Gonzales Burgos, M. Pilar Gomez-Serranillos (Sánchez, González-Burgos, and Gómez-Serranillos 2020)	2020/ Vol.1/ Issue 1	The pharmacology and clinical efficacy of matricaria recutita L.: a systematic review of in vitro, in vivo studies and clinical trials	D: Systematic review S: 86 paper V:; matricaria recutita I: Original papers and case reports published during 2014–2018 in PubMed, Science Direct and Scopus were included A: <i>in vitro</i> , <i>in vivo</i> studies, clinical trials	The results of this study show that matricaria recutita effective to improving health. All clinical trials have evaluated the activity of extracts and essential oil. Several of these clinical trials validate the pharmacological activities (diabetes mellitus, hypertension and pain) demonstrated in these in vitro and in vivo studies and others clinically evaluate other activities such as the effect on enuresis.	<i>Food Review International</i> Google Scholar DOI: https://doi.org/10.1080/87559129.2020.1834577
13	Nurdahlia , Fitriani (Nurdahlia a 2021)	2021/ Vol.2/ Issue 2	Effectiveness of carrot and red ginger juice administration in relation to primary dysmenorrhea in adolescent girls	D: Qualitative interview S: 20 respondents with 10 in the intervention group and 10 in the control group V: Menarche and menstrual experiences, adolescent girls at school I: Numeric Rating Scalse (NRS) A: Univariate and Bivariate	The results showed that there was a difference in the intensity of primary dysmenorrhea before and after the administration of carrot juice ($p = 0.007$) and also through the administration of red ginger juice ($p = 0.005$). Red ginger juice has better effectiveness in reducing menstrual pain (primary dysmenorrhea) than carrot juice.	Google Scholar URL: https://ejournal.poletekesaceh.ac.id/index.php/gikes/article/view/690/245 DOI: https://dx.doi.org/10.30867/gikes.v2i2.6

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14	Isramilda, Ferry Daniel Martinus (Daniel Martinus, Gunawan, and Frida Utari 2022)	2022/ Vol.12/ Issue 2	The Effect of Giving Carrot Juice on Decreasing the Degree of Dysmenorrhea in Adolescent Girls	D: Qualitative interview S: 66 respondents V: Menstruating, adolescent girls at school and not taking pain medication. I: Numeric Rating Scalse (NRS) A: Univariate and Bivariate	The results of statistical tests using the Dependent t-test test p value = 0.000 (p < 0.05), namely there is an effect of giving carrot juice on reducing the degree of dysmenorrhea in adolescent students of SMA Negeri 9 Pekanbaru in 2021.	Google Scholar URL: http://ejournal.univbatam.ac.id/index.php/zonabidan/article/view/961
15	Fatemeh Shabani, Fereshteh Narenji, Katayon Vakilian, Mohammad Ali Zareian, Mahbubeh Bozorgi Soodabeh Bioos, Fatemeh Nejatbakhsh (Shabani et al. 2022)	2022/ Vol.15/ Issue 1	Comparing the Effect of Chamomile and Mefenamic Acid on Primary Dysmenorrhea a Symptoms and Menstrual Bleeding: A Randomized Clinical Trial	D: Qualitative and quantitative interviews S: 25 respondents V: Menstrual pain. I: Visual Analog Scale (VAS) A: Univariate, Bivariate, Multivariate	The results of this study explained that chamomile extract can reduce the level of pain and bleeding during menstruation. The level of effectiveness of chamomile extract is similar to the way mefenamic acid works which can reduce dysmenorrhea symptoms. Based on the results of the Friedman statistical test, the sig value was obtained. 0.001 (P < 0.05) which means both chamomile extract and mefenamic acid are equally effective in reducing symptoms and bleeding in primary dysmenorrhea.	<i>The Open Public Health Journal</i> Pubmed URL: https://openpublichealthjournal.com/VOLUME/15/ELCATOR/e187494452205190/FULLTEXT/ DOI: http://dx.doi.org/10.2174/18749445-v15-e2205190
16	Yayuk Mundriyast utik, Islami, Sella Ayu Oktarinda (Mundriyast utik, Islami, and Oktarinda 2022)	2022/ Vol.13/ Issue 1	Giving Green Coconut Water as a Natural Therapy to Reduce Primary Dysmenorrhea in Adolescent Girls	D: Qualitative and quantitative interviews S: 33 respondents V: Menstrual pain. I: Numeric Rating Scalse (NRS) A: Univariate and Bivariate	The results of this study explained that there were differences in the level of dysmenorrhea pain before and after being given green coconut water. Before being given green coconut water, the majority of dysmenorrhea pain levels were in moderate to severe pain as many as 28 respondents. After being given green coconut water, the majority of dysmenorrhea pain levels were painless to mild, namely 31 respondents. Based on the results of the Wilcoxon Test, the sig value was obtained. 0.000 (p < 0.05) which means there is an effect of giving green coconut water on reducing the level of dysmenorrhea pain in adolescent girls.	<i>Jurnal Ilmu Keperawatan dan Kebidanan</i> Google Scholar URL: https://ejr.umku.ac.id/index.php/jikk/article/view/1324 DOI: https://doi.org/10.26751/jikk.v13i1.1324
17	Veronica Silalahi,	2022/ Vol.5/ Issue 1	Effectiveness of the self- tapping	D: Qualitative and quantitative interviews S: 35 respondents	In the self-tapping pre- intervention, most of the participants (51%)	<i>Malahayati International Journal of</i>

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	Irine Yunila Prastyawati (Silalahi and Prastyawati 2022)		relaxation technique on dysmenorrhea pain among nursing students	V: Menstrual pain. I: Numeric Rating Scalse (NRS) A: Univariate and Bivariate	experienced severe pain. After being given self-tapping more than 50% (51%) of the participants experienced mild pain. Wilcoxon test results showed = 0.05 and p = 0.000. p-value < then Ho is rejected, which means that there is an effect of self-tapping on the decrease in the level of primary dysmenorrhea.	<i>Nursing and Health Science</i> Google Scholar URL: http://repositori.stkvinc.ac.id/id/epri/nt/281/1/Artikel%203.pdf
18	Nur Hayati Saud, Aryadi, Andi Nilawati Usman, Siti Rafiah, Mardiana Ahmad, Muh Tamar (Saud et al. 2022)	2022/ Vol.1/ Issue 1	The Effectiveness of Aromatherapies with Lavender and Cinnamon Essential Oils on Prostaglandin E2 Levels in Adolescent Girls with Primary Dysmenorrhea	D: Randomized experimental design S: 36 respondents V: Prostaglandin E2 Levels in Adolescent Girls I: ELISA kits A: Univariate and Bivariate	There is a significant decrease in prostaglandin E2 levels in both aromatherapies with lavender and cinnamon groups (p0.05). Conclusion: Aromatherapies with Lavender and Cinnamon Essential Oils effectively reduce prostaglandin E2 levels	<i>International Journal of Health Science</i> Google Scholar DOI: https://dx.doi.org/10.53730/ijhs.v6nS1.8377
19	Mika Oktarina, Nuril Absari, Choralina Eliagita, Nurobikha (Oktarina et al. 2023)	2023/ Vol.1/ Issue 1	The Effect of Administration of Ginger Decil Water on Reduce the Levels of Disminore Pain in Adolescent Women at SMAN 03 Bengkulu City	D: Qualitative and quantitative interviews S: 16 respondents V: Menstrual pain. I: Numeric Rating Scalse (NRS) A: Univariate and Bivariate	The results of this study explained that the difference in the decrease in dysmenorrhea pain levels in adolescent girls before being given ginger drinks on average was 4.38 and after consuming ginger drinks the average decrease in dysmenorrhea pain levels in adolescent girls was 3.38. Based on the results of the Wilcoxon Test, obtained a sig. value of 0.000 with a significant level $\alpha < 5\%$ or 0.05, it means Ho is rejected, namely there is a difference in the pain scale of students who experience dysmenorrhea before and after drinking ginger drinks.	<i>Indonesian Journal of Health Research and Development</i> Google Scholar URL: https://ejournal.gomit.id/index.php/ijhrd/article/view/34 DOI: https://doi.org/10.58723/ijhrd.v1i1.34
20	Lis Della Anggraini Saputri, Enny Yuliaswati (Lis Della Anggraini Saputri and	2023/ Vol.6/ Issue 2	The Effect Of Giving Carrot Juice On Decreasing Degrees Of Dysmenorrhea In Adolescent	D: Qualitative and quantitative interviews S: 21 respondents V: Menstrual pain. I: Numeric Rating Scalse (NRS) A: Univariate and Bivariate	The results of this study explained that there were differences in the level of dysmenorrhea pain before and after being given carrot juice. Before being given carrot juice, the majority of dysmenorrhea pain levels	<i>Journal for Quality in Women's Health</i> Google Scholar

No.	Name	Year/ Volume /Issue	Title	Methods (Design, Sample, Variable, Instrument and Analytic)	Results	Database
	Enny Yuliaswati (2023)		Women In Middle School Islam Amanah Ummah Mojolaban		were in moderate to severe pain as many as 15 respondents. After being given carrot juice, the majority of dysmenorrhea pain levels are painless to mild, as many as 17 respondents. Based on the results of the Wilcoxon Test, the sig value was obtained. 0.000 ($p < 0.05$) which means there is an effect of giving carrot juice on reducing the level of dysmenorrhea pain in adolescent girls in high school.	URL: https://jqwh.org/index.php/JQWH DOI: https://doi.org/10.30994/jqwh.v6i2.222

Table 1 shows a summary of the studies (in the articles); 1 in America, 6 in Asia, 1 in Australia, and 2 in Europe. The sample size used in the studies range from 40 to 262 participants. The studies use clinical/controlled trials and quasi-experimental designs. All studies are rated as high-quality (categorized as good with a score of ≥ 7). Based on Table 1., it is known that 9 articles reviewed use face-to-face and online complementary alternative medicine on primary dysmenorrhea. This systematic review was aimed to summarize and evaluate acupuncture treatment to reduce menstrual pain and its associated symptoms. As a result, we suggest that acupuncture might have beneficial effects for improvement of dysmenorrhea and remain efficacious after short-term follow-up. We conducted comparisons separately according to the characteristics of interventions and controls. MA was significantly more effective than no treatment, and NSAIDs for reduction of menstrual pain and its associated symptoms and remained effective after a short-term follow-up compared to no treatment and NSAIDs. The MA-induced analgesic effect could be explained by C-fiber involvement during the practitioners' manipulation for the de-qi response. However, no significant difference was observed between MA and placebo acupuncture or between MA and OCs. It was difficult to determine the superior effect of OCs compared to MA because there was only one relevant study.

IV. DISCUSSION

The cause of primary dysmenorrhea is often associated with high levels of inflammation in the endometrium. Elevated prostaglandin levels respond to the rise and fall of progesterone after ovulation. Overproduction of prostaglandins in the endometrium will result in hypercontractility and vasoconstriction of the myometrium. Vasoconstriction of the uterine blood vessels will reduce blood flow, muscle ischemia, and increase sensitivity to pain receptors, all of which cause period pain. Prostaglandin levels in adolescents with dysmenorrhea were twice as high as those without dysmenorrhea (Saud et al, 2022).

CET might also be effective for primary dysmenorrhea. CET is a therapeutic modality based on acupuncture theory and continuous stimulation of acupoints with embedded thread, and its continuous stimulation prolongs the effects of acupuncture. In addition, the embedded thread gradually liquefies and is absorbed, and stimulates the points physically and chemically. With this mechanism, CET might be considered to demonstrate analgesic effects and maintain the effects for short-term follow-up. Severe AEs of acupuncture were not observed. Thirteen of the 60 studies reported AEs of acupuncture. Most of the reported AEs were regional pain or discomfort, hematoma, and dizziness. Those mentioned were mild, like previously known AEs. The applicability of acupuncture to primary dysmenorrhea in other settings is unclear. Fifty-seven of the trials were conducted in Asian countries: 55 in China, 1 in Thailand, and 1 in South Korea. The acupuncture practitioners might have different treatment skills according to the nations in which they were trained, and the participants might have different preconceptions and familiarity with acupuncture according to their cultures. In addition, the variability of the details of interventions and controls could make applicability unclear.

Cinnamon aromatherapy is an alternative solution to reduce the intensity of primary dysmenorrhea pain through inhalation because it acts by stimulating cells, emotions, or the limbic system, which produces a calming effect and increases blood circulation thereby reducing the intensity of primary dysmenorrhea pain. Another chemical component of cinnamon, because it is widely used in the pharmaceutical world, is eugenol, which has pharmacological properties such as antimicrobial, analgesic, and anti-inflammatory. Eugenol works by inhibiting the cyclooxygenase enzyme to reduce the production of prostaglandins (Saud et al, 2022).

The results showed that EA was significantly more effective at reducing menstrual pain than no treatment, placebo acupuncture, but not effective at improving its associated symptoms. The results comparing with NSAIDs were insufficient to determine the efficacy of EA. The mechanism of EA-induced analgesia could be explained by inducing the release of endorphins and the decrease of the pulsatility index in the uterine arteries,[88] which might be related to primary dysmenorrhea. The reason that there was no difference between MA and placebo acupuncture and the relatively small difference between EA and placebo acupuncture was thought to be that placebo acupuncture also had positive effects. Several factors might explain the positive effects. First, some participants receiving placebo acupuncture may want pain relief, and it may affect the outcome psychologically. Second, placebo acupuncture may stimulate cutaneous touch receptors and/or skin nociceptors and modulate the activity in the brain areas associated with pain management.[90] WA was significantly more effective at reducing menstrual pain than NSAIDs, but the efficacy for the associated symptoms was inconclusive due to the small sample size. The results showed WA with NSAIDs might also relieve menstrual pain compared to NSAIDs alone. WA increases the circulation of qi and blood through the needle body during thermal heating. It provides analgesic effects by stimulating nerve transfer and relaxing uterine muscle spasms.

V. CONCLUSION

The results of this study suggest that acupuncture might reduce menstrual pain and associated symptoms more effectively compared with no treatment or NSAIDs, and the efficacy could be maintained during a short-term follow-up period. However, the efficacy of acupuncture compared to a placebo was not convincing. The safety of acupuncture appeared because a few mild AEs were reported. Our suggestions had limitations because the quality of the included RCTs was low, and methodological restriction existed in this study. More rigorously designed trials are required to confirm our findings.

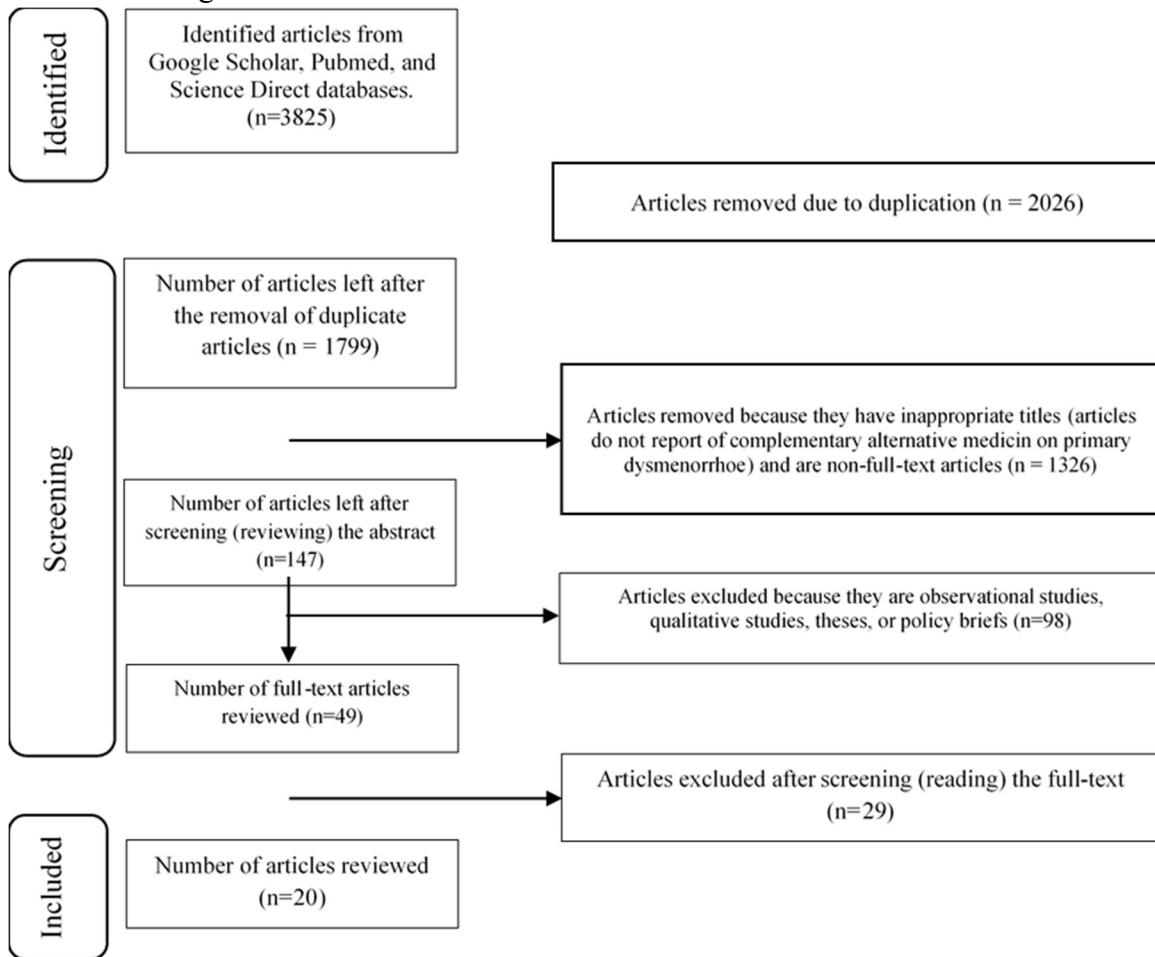


Figure 1. Flow chart for study based on PRISMA 2020 guidelines

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