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The Effectiveness of Curcuma Longa Drink in Decreasing the Intensity of Dysmenorrhea

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Dysmenorrhea is a disease experienced by almost all women in the world. One cause of dysmenorrhea is related to menstruation in the absence of unidentified organic pathologists. The study tested the use of Curcuma longa drinks to reduce the pain of dysmenorrhea by comparing the home industry and researched concoctions. The method uses experiments with pre-test and post-test research designs. Research subjects are youthful women aged 15-18 years and will support this research project. The subject was 32 students who lived in the dormitory in the Pontianak. The results showed a significant difference in the administration of Curcuma longa drinks to the reduction of dysmenorrhea pain in adolescent girls (p≤0.001).

Keywords: Primary dysmenorrhea, Curcuma longa.

Menstruation is the process of release of the endometrium which causes bloody discharge from the uterus that occurs every 28 days, with average bleeding occurring about 5 days in each cycle[1]. Some women experience pain during menstruation known as "menstrual pain" or "dysmenorrhea"[2]. Dysmenorrhea can occur in menstruating women with symptoms that are felt during dysmenorrhea, such as nausea, vomiting, diarrhea, swelling of the stomach, breast tension, and headaches[3]. This happens because of an imbalance of progesterone, prostaglandin, and vasopressin. The increase of this hormone will cause the uterine muscle to contract so that it will cause pain that will last for several hours and even some cases will last for several days[4].

In women who experience primary dysmenorrhea of 10-15% report experiencing severe dysmenorrhea that causes them to be unable to do anything[5]. Dysmenorrhea is common in the community but its pathology is unclear. Dysmenorrhea can be associated with myometrial ischemia during menstruation. Ischemia is a contraction of the uterus caused by menstrual fluid prostaglandins[6]. Primary dysmenorrhea refers to pain associated with menstruation in the absence of unidentified organic pathologies, whereas secondary dysmenorrhea is present with menstrual pain due to identified medical conditions such as endometriosis, uterine fibroids or pelvic inflammatory disease known pathological conditions and synthesized before menstruation which causes an increase in uterine pain and contractions[7].

Women with primary dysmenorrhea have prostaglandin levels 2 times higher than non-dysmenorrhea women, the release of arachidonic acid during menstruation triggers an overproduction

of prostaglandins and leukotrienes[3]. Higher levels of leukotrienes in dysmenorrhea women can also worsen uterine contractions. Prostaglandins and leukotrienes are powerful mediators of inflammation and are involved in the etiology of many diseases and include cancer[8]. According to the World Health Organization (WHO), there were 1,769,425 people (90%) of women experiencing severe dysmenorrhea in which one of the common gynecological conditions that could involve as many as 50% of women, and 10% suffered severe enough that they were unable to withstand during 1 to 3 days[9].

Dysmenorrhea is often associated with pain conditions, including fibromyolia, low back pain, and irritable bowel syndrome. Furthermore, the inverse association was proven between dysmenorrhea and women's age, parity, use of oral contraceptives, stress and family history, low body mass index, previous menarche, longer menstrual cycles, heavy menstrual flow, pre-menstrual syndrome, sterilization, inflammatory diseases clinically suspected bowel, and psychological symptoms are also predisposing factors for dysmenorrhea[10]. Therefore, treatment of dysmenorrhea can be done to reduce complaints experienced by patients, where primary dysmenorrhea treatment can be done if diagnosed clearly and handled properly and given the right action, whereas if the diagnosis is unclear or vital signs and physical findings are not normal examination. more thorough is needed, including complete laboratory studies, pelvic ultrasonography, and potentially midwife or gynecological consultation[9].

Management of dysmenorrhea consists of two actions, namely by means of pharmacology and non-pharmacology. Pharmacological treatment can be done by consuming analgesic drugs, hormonal therapy, prostaglandin nonsteroidal drugs, and lactical canal lactation, while non-pharmacological treatments that are often used to reduce menstrual pain include supplements such as vitamin E supplements, acupuncture, hypnotherapy, hypnotherapy relaxation of sports and herbal products that have been believed to be useful[4]. Herbal products or phytopharmaca is currently being the main alternative for teens who want to reduce pain without getting side effects. One herbal product that is commonly consumed and that is familiar in the community to reduce dismenorhea pain is a drink made from turmeric. Turmeric in foreign languages is called curcuma longa or curcuma domestica[11]. Curcuma longa is an enduring member of the zingiberaceae family which is cultivated in India and other parts of southeast Asia. Plants belonging to the genus Zingiberracea are the main industrial ingredients of herbal medicine. Naturally turmeric is believed to contain active ingredients that can function as antioxidants and anti-inflammatory[12].

Based on these problems, scientific studies need to know the effectiveness of giving drinks containing curcuma longa to reduce the pain of dysmenorrhoea during menstruation.

MATERIAL AND METHODS

Research design

The research design uses Quasi Experimental with pretest-posttes control group design. The variables in this research were administration of ingredients containing curcuma longa home industry and curcuma longa made by researchers. Researchers Observe 4 times, namely before the experiment is called pre-test and after the experiment is called post-test. In this group, menstrual pain levels were measured using the Numeric Ratting Scale (figure 1).

Research subject

Research subjects involved young women in the city of Pontianak, Kalimantan. The inclusion criteria used were adolescent women who had a history of dysmenorrhea when menstruating and were willing to become research respondents. Exclusion criteria were adolescent women who took pain relievers and had gynecological diseases. In this study, the number of samples taken was 32 young women who experienced primary dysmenorrhea.

Respondents were divided into 2 groups, the Curcuma longa home industry drink group and the Curcuma longa drink group by researchers.

Manufacture of drinks containing Curcuma longa

The process of making longa Curcuma drinks involves 2 stages. In the first stage, peel turmeric (Curcuma longa) the rhizome, weighing as much as 250 g, then wash turmeric to remove impurities that are still present in turmeric masters.

Next cut the turmeric rhizome with a thickness of 0.2 mm to enhance the curing process. Add 200ml of water and blend for 1 minute until it becomes turmeric paste. In the second step, turmeric paste is added with 110ml of water and boiled for 10 minutes. When boiling put 125 grams of tamarind, 150 grams of palm sugar, 0.1 grams of salt, and stirring (figure 2). Next filter the stew to separate the pulp and turmeric acid boiled water, so on getting herbal drinks that contain Curcuma longa.

Research flow

Respondents who were willing to sign an informed consent were given a Numeric Rating Scale (NRS) sheet to determine the intensity of menstrual pain before any herbal intervention containing Curcuma longa. Researchers gave Curcuma longa home industry interventions and researchers concocted on the first day of menstruation until the third day twice a day for 100 cc during menstruation. because primary dysmenorrhea occurs for 1-3 days during menstruation (Unsal, A., Ayranc, U., Tozun, M., Arslan.G., 2010).

Data analysis

The hypothesis in this study is a comparative hypothesis with a ratio scale variable. Prior to the analysis, the pre-test and post-test knowledge scores were first tested for normality of data using the Shapiro-Wilk test with the help of computerization. To test the pain scale pre-test and post-test repeated ANOVA test with computerization was used. using repeated ANOVA test to determine changes in dysmenorrhea pain in adolescent girls before and after Curcuma longa, if the requirements are not met then the Friedman test is used. Meanwhile, to test the effectiveness of the administration of the Curcuma longa home industry and concoctions, researchers used paired t-tests. From the results of data analysis, it is known that p serves to test the significance of the relationship between the two variables. The parameter of making a statistical test decision using the unpaired t-test formula with computerized calculations is by looking at the p-value compared to the value of a = 5% (0.05).

Fig. 1. Numeric Ratting Scale

Table 1. Differences in the scale of primary dysmenorrhea pain before and after the administration of curcuma Longa Home Industri and concoction of researchers

Treatment	Median (Min-max)				P[a]
	Pre Test	Post Test 1	Post Test2	Post Test3	
Home industry	5.5 (1-9)	3 (0-8)	0(0-5)	0 (0-2)	≤ 0.001
Concoction	6 (2-9)	3 (0-6)	0(0-4)	0 (0-1)	≤ 0.001

[a] Freiedman Test

Table 2. Differences in the difference in respondent's pain intensity before and after the administration of home industry curcuma and researcher concoctions

Treatment	Range 1			Range 2			Range 3		
	Difference	SE	*P*[a]	Difference	SE	*P*[a]	Difference	SE	P[a]
Home industry	0.3125	0.310	0,32	0.31	0.66	0.64	0.06	0.83	0.94
Concoction									

[a] T- Test

Official permits, ethical licenses, and informed consent

The study protocol was reviewed by the Health Education Ethics Committee and given ethical permission. Official permission was obtained from the Ethics Committee of the Poltekkes Ministry of Health, Pontianak. Written informed consent was obtained from all respondents who were the subjects of the study.

RESULTS

Figure 2 shows the administration of Longa Home Industry Curcuma and researchers concoction in the case of dysmenorrhea can reduce the level of pain in young women. Delivery occurs from the beginning of the collection on the first day and continues to experience a decrease in pain levels until the giving of the third day.

Based on table 1 shows that there is a change in the pre-test and post-test values. The results of the analysis using the Friedman Test on respondents obtained the value in the post-test with a value of d" 0.001, so that Ho is rejected Ha is accepted, that is the effect of giving Curcuma manufacturer with the incidence of dysmenorrhea in young women in the polytechnic hostel Pontianak. Based on table 1 shows that there is a change in the pre-test and post-test values. The results of the analysis using the Friedman Test on respondents obtained the value in the post-test with a value of p = 0,000 (P <0.05), so that Ho is rejected Ha is accepted, that is the effect of giving Curcuma manufacturer with the incidence of dysmenorrhea in young women in the polytechnic hostel Pontianak.

Table 2 shows that there is no significant difference between the administration of industrial and manufacturer Curcuma on pain intensity. This means that Curcuma concoction can be used as an alternative treatment for dysmenorrhea if Curcuma longa home industry is not available

DISCUSSION

Curcuma longa drink has a content that can reduce the pain of dysmenorrhea, namely: curcumin, essential oils, anthocyanins, and tannins, Curcuma longa functions to block the prostaglandin production in this case, namely F2a (PGF2a) which causes the amount of prostaglandin hormone to decrease so that the intensity of pain is felt in young women who experience dysmenorrhea begins to decrease. Besides, as a relaxation of contracted muscles, with the muscles becoming relaxed, the pressure decreases so that it can automatically reduce the pain felt because the condition of the muscles is no longer tense[13]. Researchers believe that the content of curcumin and essential oil in anthocyanin combination turmeric can reduce the level of menstrual pain or dysmenorrhea by utilizing the body's biochemical blockade formation system, namely, prostaglandin which is a receptor of the body's pain stimulus so that the pain level in dysmenorrhea can be minimized. Researchers get the average results of the level

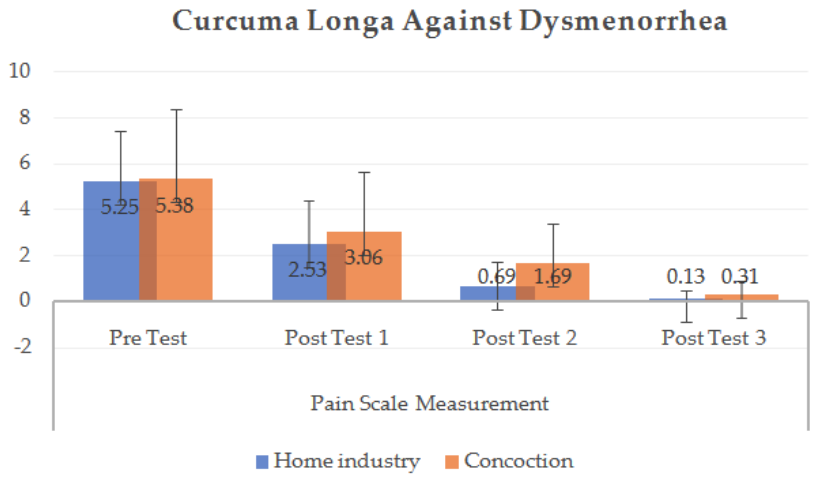

Fig. 2. Proportion in Pain Scale Reduction for Home Curcuma Providers

of pain of respondents before and after given Curcuma longa industry that there is a difference in the decrease in the level of menstrual pain or dysmenorrhea after taking Curcuma longa[14,15].

Curcuma longa drinks have basic properties as analgesic and anti-inflammatory. The active agent in turmeric that functions as an anti-inflammatory and antipyretic is curcumin while an analgesic is a curcumin. The tamarind fruit has a natural active agent anthocyanin as an anti-inflammatory and antipyretic. Contents of Javanese acid are apple acid, citric acid, grape acid, tricrat acid, succinic acid, pectin, and invert sugar[16,17] of some of these contents which functions as an analgesic are apple acids and grape acids. Acid is abortion (causes/stimulates miscarriage), and pain relief. Polysaccharide compounds (complex carbohydrates) from acidic fruit have high biological activity, affect the immune system (immunity) of the body, increase blood flow, and help the metabolism system in the body, to reduce menstrual pain or dysmenorrhea caused by prostaglandin production.

The results showed differences in pain in the two groups, and it was seen that the administration of the Curcuma longa home industry and concoctions were no significant differences. Both interventions are equally effective at reducing the intensity of dysmenorrhea pain. The content in the production of the curcuma longa home industry and the concoction of researchers there is no difference, but only what distinguishes the processing method using standardized equipment and household industrial equipment. Curcuma longa is known as herbal medicine that can overcome in various diseases, one of which is menstrual pain[18,19]. Curcumin in turmeric is a phenolic compound that has the ability as an antioxidant. The antioxidant activity that is produced tends to increase with more and more concentrations of tamarind acid and sprouts added. The combination of spices and tamarind can increase the antioxidant resistance of â-carotene during heating. The addition of tamarind can maintain the stability of antioxidants contained in turmeric. Antioxidants can stabilize hormones in the body, so menstrual pain is reduced. This results in an endometrium condition that has been prepared in advance for implantation of the results of fertilization into a whole. All the glands decay, there is a decrease in nutrition and vasospasm of blood vessels in the endometrium[16,17,20].

Curcumin works by modulating the inflammatory response by regulating the activity of cyclooxygenase-2 (COX-2) lipoxygenase, and nitrite oxygenase (iNOS) which can. So that it will reduce or even inhibit uterine contractions. The mechanism of blocking uterine contractions through curcumin is by reducing the influx of calcium ions (Ca2 +) into the calcium canal in uterine epithelial cells.The content of tannins, saponins, sesquiterpenes, alkaloids, and phlebotomies will affect the autonomic nervous system so that it can reduce the brain to be able to influence uterine contractions and as an analgesic agent, curcumin will inhibit the excessive release of prostaglandins[19,21].

CONCLUSION

Based on the results of the study showed that giving of curcuma longa drinks can reduce the intensity scale of dysmenorrhoea. Statistically, there are significant differences before and after the release of Durga longa. Curcuma longan home industry and researcher concoctions. There is no significant difference in reducing the pain scale in dysmenorrhea. Both types of Curcuma drinks are effective in reducing dysmenorrhea pain.

Conflicts of interest

There are no conflicts of interest.

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No Applied

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REFERENCES

1. Sharma S, Deuja S, Saha CG. Menstrual pattern among adolescent girls of Pokhara Valley: A cross sectional study. *BMC Womens Health.*; **16**(1):1–6 (2016).
2. Grandi G, Ferrari S, Xholli A, Cannoletta M, Palma F, Romani C, *et al*. Prevalence of menstrual pain in young women: What is dysmenorrhea? *J Pain Res.;* **5**:169–74 (2012).
3. Zecchillo D, Acquati A, Aquino R, Pisa V, Uberti

S, Ratti S. Osteopathic Manipulative Treatment of Primary Dysmenorrhea and Related Factors: A Randomized Controlled Trial. *Int J Med Res Heal Sci.*; **6**(11):165–74 (2017).

4. Lina M, Kumalasari F. Efektivitas Senam Dismenore Sebagai Terapi Alternatif Menurunkan Tingkat Nyeri Haid. *J Heal Scence Prev.*; **1**(1):10–4 (2017).
5. Wieser F. Evolution of medical treatment for endometriosis. Human Reproduction Update-Oxford Journals. 2007;
6. Shaviv H, Rosen DJD, Ezra Y. Dysmenorrhea: A randomized controlled clinical trial evaluating a novel treatment approach. *Cogent Med.;* **5**(1):1–12 (2018).
7. Payne LA, Rapkin AJ, Seidman LC, Zeltzer LK, Tsao JCI. Experimental and procedural pain responses in primary dysmenorrhea: A systematic review. *J Pain Res*.; **10**: 2233–46 (2017).
8. Babic A, Cramer DW, Titus LJ, Tworoger SS, Terry KL. Menstrual pain and epithelial ovarian cancer risk. *Cancer Causes Control.;* **25**(12):1725–31 (2014).
9. Sultana A, Lamatunoor S, Begum M, Qhuddsia QN. Management of Usr-i-Tamth (Menstrual Pain) in Unani (Greco-Islamic) Medicine. *J Evidence-Based Complement Altern Med*.; **22**(2):284–93 (2017).
10. Slater H, Paananen M, Smith AJ, O'Sullivan P, Briggs AM, Hickey M, *et al*. Heightened cold pain and pressure pain sensitivity in young female adults with moderate-to-severe menstrual pain. *Pain.*; **156**(12):2468–78 (2015).
11. Bulus T, David S I, Biblis L S, Babando A. in Vitro Antioxidant Activity of N-Butanol Extract of Curcuma Longa and Its Potential To Protect Erythrocytes Membrane Against Osmotic-Induced Haemolysis. *Sci World J*.; **12**(1):13–7 (2017).
12. Jurenka JS. Anti-inflammatory Properties of Curcumin, a Major Constituent of. *Altern Med Rev.*; **14**(2):141–54 (2009).
13. Marsiad, Nurjayanti, Rimbago, Yocyikha A. efektifitas pemberian ekstrak kunyit asam terhadap penurunan dismenorhea pada remaja putri di desa tambang kecamatan pudak kebupaten ponorogo.; **2** (2017).
14. Banafshe HR, Hamidi GA, Noureddini M, Mehdi S, Mokhtari R, Shoferpour M. Effect of curcumin on diabetic peripheral neuropathic pain/ : Possible involvement of opioid system. *Eur J Pharmacol* [Internet].; **723**:202–6 (2014). Available from: http://dx.doi.org/10.1016/j.ejphar.2013.11.033
15. Li S, Wang P. Chemical composition and product quality control of turmeric (Curcuma longa L .). *28 Pharm Crop.;* **2**: 28–54 (2011).
16. Fanaei H, Khayat S, Kasaeian A, Javadimehr M. Neuropeptides Effect of curcumin on serum brain-derived neurotrophic factor levels in women with premenstrual syndrome/ : A randomized , double-blind , placebo-controlled trial. Neuropeptides [Internet]. 2015; Available from: http://dx.doi.org/10.1016/j.npep.2015.11.003
17. Ahmad M, Narges S. The effect of mefenamic acid and ginger on pain relief in primary dysmenorrhea/ : a randomized clinical trial. *Gen Gynecol.* (2014).
18. Bagad AS, Joseph JA, Bhaskaran N, Agarwal A. Comparative Evaluation of Anti-Inflammatory Activity of Curcuminoids , Turmerones , and Aqueous Extract of Curcuma longa. *Adv Pharmacol Sci*. 2013; (2013).
19. Noorafshan A, Ashkani-esfahani S. A Review of Therapeutic Effects of Curcumin. *Curr Pharm Des*. 2013; (I):2032–46.
20. Wulandari A, Sari RDP, Dan K, Kandungan P, Kedokteran F, Lampung U. Pengaruh Pemberian Ekstrak Kunyit (Curcuma longa linn) dalam Mengatasi Dismenorea Effect of Tumeric Extract (Curcuma longa linn) for Overcoming Dysmenorrhoea. *Majority.*; **7**:193–7 (2018).
21. Rahnama P, Montazeri A, Huseini HF, Kianbakht S, Naseri M. Effect of Zingiber officinale R . rhizomes (ginger) on pain relief in primary dysmenorrhea/ : a placebo randomized trial. *BMC Complement Altern Med*.; **92**(12):1–8 (2012).