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The Effect of Ginger (Zingiber Officinale) on Reducing the Intensity of Hand Pain (Primy Dysmenorrhea) in Adolescent Women: A Systematic Literature Review

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Abstract: Dysmenorrhea is lower abdominal pain that occurs during menstruation. According to the World Health Organization (WHO), 1,769,425 people (90%) experienced dysmenorrhea with an incidence of 10-15% of whom experienced dysmenorrhea with severe pain. Traditional medicine by consuming ginger can be an alternative as an effort to reduce menstrual pain (primary dysmenorrhea). The purpose of this study was to determine whether there was an effect of giving ginger (zingiber officinale) to decrease the intensity of menstrual pain (primary dysmenorrhea) in adolescent girls. The method used in this research is to use Systematic Literature Review (SLR). This study examines 9 journals for 2009-2021 consisting of 7 international journals and 2 national journals. All journals conducted studies related to the incidence of primary dysmenorrhea in adolescent girls. The original journal was obtained from the search results of the PuBmed and Google Scholar databases. The results of this study from 7 international journals and 2 national journals that have been studied can be seen that all research subjects, namely young women after giving the intervention experienced a significant decrease in menstrual pain (dysmenorrhea). This is because the active ingredients such as gingerol, shogaol, zingiberene in ginger rhizome can be used as antioxidants and anti-inflammatory.

Keywords: Ginger (zingiber officinale), Primary dysmenorrhea, Adolescent girls.

1. Introduction

Adolescent girls who are menstruating usually experience complaints, one of which is primary dysmenorrhea. Primary dysmenorrhea is pain during menstruation in the lower abdomen without any abnormalities in the reproductive organs (Ismalia, 2017). Primary dysmenorrhea is usually caused by natural chemicals called prostaglandins that are made in the lining of the uterus. The increased production of uterine prostaglandins stems from the activity of cyclooxygenase (COX)-2. Pain usually occurs just before menstruation begins. This happens because the level of prostaglandins increases in the uterine lining. On the first day of menstruation, prostaglandins are at high levels. However, when menstruation continues and the uterine lining sheds, the level of prostaglandins decreases and is directly proportional to the intensity of pain (Rahnama et al., 2015).

Menstrual pain can be reduced pharmacologically as well as non-pharmacologically. Pharmacologically, pain can be treated with analgesic drugs. Narcotic analgesics at regular doses have side effects including nausea, vomiting, constipation, restlessness, and drowsiness. Non-pharmacologically, it can be done with relaxation, exercise, warm compresses, exercise, distraction, giving sour turmeric drinks and ginger water (Pangestu, et al. 2020).

One of the methods of non-pharmacological therapy to reduce pain during menstruation is by giving herbal ingredients, namely ginger water. According to Kashefi (re menstruating usually experience complaints, one of which is primary dysmenorrhea. Primary dysmenorrhea is pain during menstruation in the lower abdomen without any abnormalities in the reproductive organs (Ismalia, 2017). Primary dysmenorrhea is usually caused by natural chemicals called prostaglandins that are made in the lining of the uterus. The increased production of uterine prostaglandins stems from the activity of cyclooxygenase (COX)-2. Pain usually occurs just before menstruation begins. This happens because the level of prostaglandins increases in the uterine lining. On the first day of menstruation, prostaglandins are at high levels. However, when menstruation continues and the uterine lining sheds, the level of prostaglandins decreases and is directly proportional to the intensity of pain (Rahnama et al., 2015). Menstrual pain can be reduced pharmacologically as well as non-pharmacologically. Pharmacologically, pain can be treated with analgesic drugs. Narcotic analgesics at regular doses have side effects including nausea, vomiting, constipation, restlessness, and drowsiness. Non-pharmacologically, it can be done with relaxation, exercise, warm compresses, exercise, distraction, giving sour turmeric drinks and ginger water (Pangestu, et al. 2020). One of the methods of non-pharmacological therapy to reduce pain during menstruation is by giving herbal ingredients, namely ginger water. According to Kashefi (2014), ginger is one of the herbal supplements that has been used for medical purposes since ancient times and is known as a popular herbal medicine to treat pain in disease. The effect of ginger decoction on dysmenorrhea is because ginger contains 9.38% gingerol, 7.59% shogaol, and 9.24% zingiberen, which can inhibit the work of enzymes in the COX cycle. so that it can inhibit the release of these enzymes into prostaglandins that cause inflammation. In addition, red ginger (zingiber officinale) can inhibit uterine contractions, which can cause pain during menstruation (Mutiara & Pratiwi, 2017).

Herbal products or phytopharmaceuticals are currently the main alternative for women who want to reduce pain without getting side effects. One of the herbal products commonly consumed to reduce menstrual pain is ginger. Ginger tea, according to Rehman et al. (2013), warms the body and acts as an antirheumatic, anti-inflammatory, and analgesic (Rehman et al. 2013).

One of the studies on the effectiveness of using ginger rhizome in reducing primary dysmenorrhea pain in adolescents is a study conducted by Rahmana et al. (2014) with the title "Effect of Zingiber officinale R. rhizomes (Ginger) on Pain Relief in Primary Dysmenorrhea." The research states that the administration of ginger extract therapy is proven to be effective

in reducing primary dysmenorrhea pain in adolescents with the results of the treatment group being given ginger extract (n = 56) = 0.015, and P in the placebo group (n = 46) = 0.029.

2. Materials and Methods

The method used in this study is a systematic literature review. Literature studies were obtained from international and national journals. Systematic Review (SR), or what is usually called Systematic Literature Review (SLR), is a systematic way to collect, critically evaluate, integrate, and present findings from various research studies on research questions or topics of interest (Delgado and Sillero, 2018).

Richardson et al. (2013) require a more rigorous and well-defined approach, are more comprehensive, and set out in detail the timeframe within which the literature is selected (Richardson et al., 2013). The SLR method is carried out systematically by following stages and protocols that allow the article writing process to avoid bias and subjective understanding of the researchers. As has been explained, the data collection of research results using the literature review method with a systematic type of literature review is done through searching on the internet (PuBmed and Google Scholar).

3. Results and Discussion

*A placebo-controlled trial of Zingiber officinale R. rhizomes (ginger) for pain relief in primary dysmenorrhea.*In the second protocol, ginger and placebo were administered only during the first three days of the menstrual period. Pain severity was determined by a multidimensional verbal scoring system and a visual analogue scale. There were no differences in baseline characteristics between the two groups (placebo n = 46, ginger n = 56). The results of this study indicate that there is a significant difference in the severity of pain between the ginger group and the placebo group for protocol one (P = 0.015). There was no difference in baseline characteristics of the two groups (placebo n = 46, ginger n = 56). The results of this study indicate that there is a significant difference in the severity of pain between the ginger group and the placebo group for protocol one (P = 0.015) and protocol two (P = 0.029). There was also a significant difference in pain duration between the two groups for protocol one (P = 0.017) but not for protocol two (P = 0.210) (Parvin, R., et al. 2012).

*A cross-over study of the effects of ginger and Novafen on menstrual pain.*This study was conducted with the aim of comparing the effects of ginger and Novafen on menstrual pain. The PVAS is a valid scale that has been applied in many studies to estimate dysmenorrhea. The population is comprised of 168 single female students aged 18 to 26 years at Babol University of Medical Sciences with primary menstrual pain. Pain intensity due to dysmenorrhea decreased in the Novafen and Ginger groups. Before treatment, the mean pain intensity in Novafen and Ginger users was 7.12 2.32 and 7.60 1.84, respectively, and after treatment the pain intensity decreased to 3.10 2.69 and 2.97 2.69. The difference between the two groups each time did not show statistical significance (p > 0.05). Both drugs reduced menstrual pain. Both ginger and Novafen are effective in relieving pain in girls with primary dysmenorrhea (Hajar Adib, et al. 2018).

Use of ginger versus stretching exercises for the treatment of primary dysmenorrhea: a randomized controlled trial . The Gymnastics training program includes 5 minutes of movement warming up in standing position, followed by 10 minutes of stomach and pelvic

stretching exercises.This program is conducted for 15 minutes, 3 times a week, for two consecutive menstrual cycles (8 weeks). In group two, students consumed capsules of ginger 250 mg (Zintoma 250 mg, Goldaru Co., Iran). At the beginning of menstruation and then every 6 hours until the pain is lost for 2 cycles successively . In the second cycle, exercise was significantly more effective than ginger for pain relief (31.57 16.03 vs. 38.19 20.47, P = 0.02), dysmenorrhea severity (63.9% vs. 44.3% dysmenorrhea light, P = 0.02), and decreased menstrual duration (6.08 1.22 vs. 6.67 1.24, P = 0.006) (Marjan Ahmad, et al. 2017).

Study on Dysmenorrhea Among Nursing Students The researcher prepared ginger tea and administered as much as 120 mL to the research subjects on the first 2 days of menstruation in the morning and evening after breakfast and dinner. Before and after tests were carried out before 2 hours after giving the drink. A total of four doses were administered, and ratings were measured eight times. The results of the Mann-Whitney U test revealed that there was a significant difference in pain levels between the experimental and control groups (p 0.05).The Wilcoxon signed rank test showed that there was a significant difference in pain measurements before and after ginger tea administration (*p* 0.05). These findings indicate that ginger tea is effective in reducing painful menstruation (Sheetal Crasta , et al. 2019).

The Effects of Daily Ginger Tea Consumption on Reducing Period Discomfort The results showed a significant decrease in the maximum and average number of symptoms experienced by the subjects before and after the intervention of tea ginger (p = 0.013 and 0.013, respectively). There is also a decrease in the painful maximum and average experienced by subjects before and after the intervention of tea ginger (p = 0.092 and 0.093, respectively). The conclusion of our study shows promising results: that consumption of tea ginger every day could help reduce painful menstruation and discomfort . Kristy, V. et al . (2018).

Efficacy of Mefenamic Acid and Ginger on Pain Relief in Primary Dysmenorrhea Among Basic Sciences Students of Nepalgunj Medical College . Of the 104 students, 87 of them suffered from menstrual pain. These 87 people received mefenamic acid (Meftal) 500mg twice daily for three days, and the same 87 people, the following month, took 500mg ginger (Remezy) capsules twice daily for three days. Treatment started on the first day of their menstruation. The severity of pain before and after treatment was recorded with the help of a multi-dimensional scoring system (MSS). 87 (83,7%) students have experienced menstrual pain. The mean SD of the age of the students was 19.64 1.02, while the mean SD of the age of menarche was 13.21 1.01. The severity of dysmenorrhea pain was significantly reduced (p 0.05) with the intake of methal and ginger in the first month and second in a row. However, the comparison of efficacy between the two treatments did not show a statistically significant difference (p > 0.05). Side effects were found to be significantly higher in students who received mephthalic tablets (Ankita Singh, et al. 2020).

A clinical comparative study of oral and topical ginger on the severity and duration of primary dysmenorrhea. Based on demographic and baseline characteristics, there was no statistical difference between the two groups (*p* > 0.05). Every oral (2.6 3.4) and topical (3 3.2) group experienced a significant decrease in pain severity (p 0.001).decreased severity of pain by similar statistics among oral and topical groups (*p* > 0.05). There is a significant reduction in the duration of pain in the oral (14.5 19.8) and topical (14.5 20.1) groups (*p* 0.001). Subtraction duration was painful by statistics similar among the second group (*p* > 0.05). So a study showing that ginger in oral and topical forms shows an effect similar to positive on the decrease in severity and duration of pain in primary dysmenorrhea . P. Shirooye and colleagues (2017).

The Influence of Giving Ginger Herb on Menstrual Pain in PMC Students In one menstrual cycle, up to 18 research subjects were given a ginger concoction, and menstrual pain was measured before and after the intervention.Meanwhile, in the control group, as many as 17 people only measured pain and no intervention was carried out . The results of statistical tests showed that there was a significant difference in the intensity of menstrual pain in the intervention group and the control group. with a p value of 0.000. The results of this study can prove that ginger concoctions given to adolescents who experience menstrual pain can help reduce menstrual pain. So, ginger tea can be used to reduce menstrual pain in adolescents. (Mona Dewi, 2015).

Decoction of sour fruit and ginger as an effort to reduce dysmenorrhea. A pain assessment was performed again to determine the difference in pain scale before and after the tamarind and ginger decoction intervention.The results showed that respondents who were given sour fruit stew before the intervention experienced 60% moderate pain and after the intervention, 87% experienced mild pain. effective compared to sour decoction (Trio Gustin Rahayu, 2019).

The Effectiveness of Acupressure and Ginger Drink in Reducing the Intensity of Menstrual Pain and Dysmenorrhea. During the study, 15 grams of red ginger drink plus 10 grams of brown sugar and 400 ml of water were boiled until the remaining 200 ml were drunk 2 times a day on the first and second days. menstruation when experiencing menstrual pain. Respondents felt that their menstrual pain was reduced. Respondents also said they were more relaxed and could carry out activities again. The results showed that the difference in giving ginger was more effective than giving acupressure. Effectiveness Before drinking ginger, 13.3% experienced mild pain, followed by moderate pain (66.7%) and severe pain (3%). After drinking ginger, no pain (46%), mild pain (46%), and moderate pain (6.7%). Previously, mild pain was 20%, moderate pain was 60%, and severe pain was 20%; after acupressure, no pain was 3%, mild pain was 60%, and moderate pain was 3%. A ginger drink was more effective than acupressure because of the concentration level in plasma. very short, i.e., between 15 minutes and 1 hour. The patient feels more warm in his stomach, so that it quickly reduces menstrual pain (Dewi and Dwi, 2021).

4. Conclusion

Based on the results of a study in 15 journals with the aim of knowing the effect of giving ginger (*Zingiber officinale*) to decrease the intensity of menstrual pain (*primary dysmenorrhea*) in adolescent girls using a *systematic literature review method* , it can be concluded as follows: From 7 international journals and 2 national journals that have been reviewed, it can be seen that all research subjects, namely young women before giving their intervention complained of moderate to severe pain at the beginning of the menstrual cycle. From 7 international journals and 2 national journals that have been studied, it can be seen that consuming Ginger (*Zingiber officinale*) is as effective as taking mefenamic acid and ibuprofen in relieving pain in women with *primary dysmenorrhea.*

They should treat *dysmenorrhea pain non* -pharmacologically and independently, such as consuming herbal drinks, one of which is ginger water decoction. Check with a health worker if you feel excessive menstrual pain *(dysmenorrhea).*

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Conflict of Interest
The author declares that there is no conflict of interest regarding the publication of this article

References
Gustin, T. (2019). *Rebusan Buah Asam dan Jahe Sebagai Upaya Mengurangi Dismenore.* Faletehan Health Journal, 6(1), 11-15.

Ismalia, N. (2017). *Hubungan Gaya Hidup Dengan Dismenore Primer Pada Mahasiswi Fakultas Kedokteran* Universitas Lampung Angkatan 2015.

Kashefi, F., Khajehei, M., Tabatabaeichehr, M., Alavinia, M., & Asili, J. (2014). *Comparison of the effect of ginger and zinc sulfate on primary dysmenorrhea: a placebo-controlled randomized trial*. *Pain Management Nursing*, *15*(4), 826-833.

Mona. D.U. 2015. *Pengaruh Pemberian Ramuan Jahe Terhadap Nyeri Haid Mahasiswi STIKES PMC.*

Mutiara, H., dan Pratiwi, L. A. (2017). *Pengaruh Jahe terhadap Nyeri Saat Menstruasi.* Medical Journal of Lampung University .

Pangestu, J. F., Kartina, D., & Akbarini, O. F. (2020). *Efektifitas Pemberian Minuman Kunyit Asam dan Air Jahe terhadap Penurunan Dismenorea Primer pada Remaja Putri di Pondok Pesantren Nurul Jadid Kumpai Kabupaten Kubu Raya. Jurnal Kebidanan Khatulistiwa*, *6*(1), 48-55.

Rahnama, P., Montazeri, A., Huseini, H. F., Kianbakht, S., & Naseri, M. (2012). *Effect of Zingiber officinale R. rhizomes (ginger) on pain relief in primary dysmenorrhea: a placebo randomized trial*. *BMC complementary and alternative medicine*, *12*(1), 1-7.

Rad, H. A., Basirat, Z., Bakouei, F., Moghadamnia, A. A., Khafri, S., Kotenaei, Z. F., ... & Kazemi, S. (2018). Effect of Ginger and Novafen on menstrual pain: a cross-over trial. *Taiwanese Journal of Obstetrics and Gynecology*, *57*(6), 806-809.

Rajan, J. K. (2018). Effect of Ginger tea on Dysmenorrhea among nursing students in Indore, Madhya Pradesh, India. *Journal of Bioscience and Applied Research*, *4*(4), 361-376.

Rahnama, P. et al. (2015) *'Effect of Zingiber officinale R . rhizomes (ginger) on pain relief in primary dysmenorrhea : a placebo randomized trial', BMC Complementary and Alternative Medicine.* BMC Complementary and Alternative Medicine, 12(92), pp.

Rehman, H. et al. (2013) '*Approach to Dysmenorrhoea in Ancient Ages and its Current Relevance', International Journal of Herbal Medicine,* 1(4), pp. 88–91.

Rahnama, P., Montazeri, A., Huseini, H. F., Kianbakht, S., & Naseri, M. (2012). *Effect of Zingiber officinale R. rhizomes (ginger) on pain relief in primary dysmenorrhea: a placebo randomized trial*. *BMC complementary and alternative medicine*, *12*(1), 1-7.

Shirooye, P., Hashem-Dabaghian, F., Hamzeloo-Moghadam, M., Afrakhteh, M., Bioos, S., & Mokaberinejad, R. (2017). *A clinical comparative study of oral and topical ginger on severity and duration of primary dysmenorrhea. Research Journal of Pharmacognosy*, *4*(1), 23-32.

Singh, A., Aryal, B., & Deo, S. (2020). *Efficacy of Mefenamic acid and Ginger on Pain Relief in Primary Dysmenorrhea Among Basic Sciences Students of Nepalgunj Medical College. Europasian Journal of Medical Sciences*, *2*(1), 4-10.

Shirvani, M. A., Motahari-Tabari, N., & Alipour, A. (2017). *Use of ginger versus stretching exercises for the treatment of primary dysmenorrhea: A randomized controlled trial. Journal of integrative medicine*, *15*(4), 295-301.

Valencia, K., & Kartika, S. (2018). *The Effects of Daily Ginger Tea Consumption in Reducing Period Discomfort.*