

Effect of papaya leaf (*Carica papaya*) boiled water and honey to reduce menstrual pain in teenage girls in Indonesia

^{1,3}Handajani, S.H., ^{1,3} Astuti, E.W. and ^{2,3,*}Dewi, I.K.

¹Department of Midwifery, Poltekkes Kemenkes Surakarta, Central Java 57425 Indonesia

²Department of Jamu/Indonesia Traditional Herbals, Poltekkes Kemenkes Surakarta, Central Java 57425 Indonesia

³PUI Pujakesuma, Poltekkes Kemenkes Surakarta, Central Java 57425 Indonesia

Article history:

Received: 15 October 2022

Received in revised form: 25

November 2022

Accepted: 7 August 2022

Available Online: 22

December 2023

Keywords:

Papaya leaf boiled water,

Honey,

Menstrual pain,

Adolescent girls

DOI:

[https://doi.org/10.26656/fr.2017.7\(6\).453](https://doi.org/10.26656/fr.2017.7(6).453)

Abstract

Premenstrual or menstrual cramping can cause pain or discomfort in the lower abdomen. Although it can range from minor to severe, menstrual discomfort can be disruptive to daily life. Both pharmaceutical and non-pharmacological therapies can be used to alleviate menstrual discomfort. Papaya leaves (*Carica papaya*) and honey are two natural components that are thought to be used in one of the ancient remedies to lessen menstruation pain. Vitamin E, which is found in papaya leaves, can lessen menstruation pain. Because honey includes glucose and fructose, which regulate the smooth muscles of the uterus, there is less pain associated with menstruation because the uterine muscles can relax. This research aimed to determine the effect of boiled papaya leaf water and honey on reducing menstrual pain in adolescent girls at Ngawen II Public Health Center Gunungkidul. With a single group pretest-posttest design, this study employs a quasi-experimental methodology. A total of 184 teenage females with menstruation discomfort at the Ngawen II Public Health Center in Gunungkidul participated in this study. The t-paired test was used to process the data. According to the findings, adolescent menstruation pain levels decreased on average from -2.65 to 2.29. The results of statistical testing revealed a p-value of 0.000, indicating that there is a difference between giving teenagers functional drink items made from boiled papaya leaves, water, and honey in reducing menstruation pain. Therefore, boiled papaya leaf water and honey can be an alternative to lessen adolescent girls' menstrual pain.

1. Introduction

Menstrual pain is classified as a passing discomfort that occurs before or during menstruation and lasts for one to several days. Cramping is a common feature of menstrual pain, which is typically located in the lower abdomen. If not treated right away, menstrual discomfort affects everyday activities and might lead to depression and infertility (Reeder *et al.*, 2011; Prawirohardjo, 2012).

Both pharmaceutical and non-pharmacological methods are available to alleviate menstrual discomfort. Nonsteroidal anti-inflammatory medications (NSAIDs) and combination contraceptive tablets are examples of pharmacological therapy. Warm compresses, rest, physical activity, breathing exercises, massages, and conventional medications comprised of natural ingredients are all examples of non-pharmacological therapy used to treat menstrual discomfort. Papaya (*Carica papaya*) leaves with honey are one of the traditional treatments for easing menstrual pain

(Prawirohardjo, 2012).

Vitamin E, found in papaya leaves, eases menstruation pain. The enzyme papain, the alkaloids carpaine and pseudocarpain, glycosides, carposids, saponins, saccharine, dextrose, and levulose are all found in papaya leaves. Carpaine, an alkaloid, has a similar impact to digitalis. Papaya leaves include compounds that are effective for boosting appetite and alleviating menstruation pain. Because honey includes glucose and fructose, which regulate the smooth muscles of the uterus, there is less pain associated with menstruation because the uterine muscles can relax (Ajorpaz *et al.*, 2012).

Five female students reported that they were able to manage their menstrual pain by sleeping, and two students reported that they were able to do so by taking medication, according to a preliminary study conducted by researchers on January 24, 2020, on ten students from

*Corresponding author.

Email: indri.kusumadewi@gmail.com

grade ten at SMA N 1 Wedi Klaten. Three female students claim that they rarely exercise that 70% of their diet is erratic, including fast food, and that they have not taken any action against the female students who have monthly pain. Another 30% of them have a history of their mother having painful periods when she was a child.

Based on the background above, this research was conducted to see the effect of giving boiled water to papaya leaves and honey to reduce menstrual pain in adolescents at the Ngawen I Gunung Kidul Health Center.

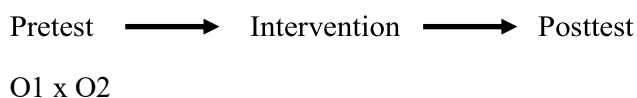
2. Materials and methods

2.1 Materials

Papaya leaves and honey are sourced from regional farmers in Tawangmangu, Central Java, Indonesia.

2.2 Type and design of research

Quantitative research using the quasi-experiment method and a one-group pretest-posttest strategy without a control group was conducted (Notoatmodjo, 2012). treatment involving the ingestion of honey and papaya leaf-infused boiling water. The form research design is as follows:



Where O1: Pretest in the treatment group, x: Treatment/intervention in the treatment group and O2: Posttest after treatment

2.3 Time and place of research

2.3.1 Time

The research was carried out between January and December of 2021.

2.3.2 Research premises

The Ngawen II Public Health Center in Gunung Kidul is where the study was conducted. There are 148 adolescents out of a total of 438 at the Ngawen II Public Health Center in Gunung Kidul who report having menstruation pain.

2.4 Population and sample

2.4.1 Population

All young women who had menstruation pain at the Ngawen II Public Health Center in Gunung Kidul comprised the study's population. A total of 184 teenagers who felt menstruation discomfort in February 2021.

2.4.2 Samples

Sixty teenagers was the bare minimum sample size required for the study.

2.5 Variable research

The administration of boiling papaya leaves and honey water acted as the study's free variable. When menstrual pain starts, 70 mL of water and 15 mL of honey are added to boiling papaya leaves. Menstrual pain serves as his bound variable. The numerical rating scale (NRS) Visual Analog Scale (VAS) Questionnaire measures menstrual pain felt by young women during menstruation. Menstrual pain is grouped into: No pain = 0; Lightweight = 1-3; Medium = 4-6; Weight = 7-9; Very heavy = 10.

2.6 Data analysis

Descriptive statistics were used to assess the data and provide tabular, minimum, maximum, and mean presentations. Using a paired sample t-test with a meaningfulness level of $p = 0.05$, the effect of administering papaya leaf and honey decoction to lessen menstruation discomfort in young women at the Ngawen II Public Health Center, Gunung Kidul. The data analysis program of choice is SPSS version 22.

3. Results and discussion

Table 1 shows that, prior to the investigation, the average pain scale score was 5.821.74, with a minimum value of 3 and a maximum value of 9. According to this study, the individuals' levels of menstruation discomfort ranged from mild to severe.

Table 1. Menstrual pain scale before administration of functional beverage products combination of papaya leaf boiled water and honey.

NRS Scale Pre-Test			
Mean±SD	Median	Minimum	Maximum
5.82±1.74	5.0	3	9

According to Table 2, the mean pain scale score following the study was 2.971.61, with a minimum value of 1 and a maximum value of 6. The minimum and maximum values were changed from the prior values of 3 and 9 to 1 and 6, respectively. According to this study, teenage girls' menstrual discomfort scores have decreased.

Table 2. The scale of menstrual pain after giving functional beverage products combination of papaya leaf boiled water and honey.

NRS Scale Pre-Test			
Mean±SD	Median	Minimum	Maximum
2.97±1.61	3.0	1	6

According to Table 3, the average drop in teenage menstruation pain scores was 2.65 to 2.29. The findings of the statistical test revealed a p-value of 0.000, indicating that the administration of functional beverage products, including papaya leaf-boiled water and honey, can greatly lessen adolescent girls' menstrual pain.

Table 3. Effect of giving functional beverage products a combination of papaya leaf boiled water and honey to reduce menstrual pain in adolescents.

Mean±SD	SE Mean	P-value*	95% CI
-2.65±2.29	0.296	0.000	-3.242 s.d -2.058

*T Paired Test

The receptors and the presence of activation are directly related to how pain manifests. Nociceptor nerve endings are accessible pain receptors that are dispersed throughout the skin and mucosa, particularly in the visceral joints, artery walls, liver, and gallbladder. Upon activation, pain receptors can react. Histamine, bradykinin, prostaglandins, and other substances that are generated when tissue is damaged by a lack of oxygen can stimulate the nervous system. Various other stimuli include thermal, electrical, and mechanical ones (Kumala et al., 2021).

The actions or activities of women, particularly teenagers, might be affected by menstrual pain. Women who experience menstrual pain cannot engage in typical activities and must get a prescription for medicines. Dysmenorrheic teenage females have significantly worse health-related quality of life (Yoshino et al., 2022). Immediate relief from heavy periods, painful periods, and irregular bleeding signs of menstruation (Petraglia et al., 2017).

According to Harianja and Septyani's research (2021), many cases of menstruation discomfort are rated on a scale of four to nine. According to this study, menstruation pain in adolescents, which can range from problems to screaming, groaning, and whimpering compulsively, might be substantially relieved by diversion before receiving honey therapy.

This finding contrasts with that of Lestari et al. (2010) study, which found that the majority of teenagers (94.5%) reported mild menstrual pain, while just 5.5% had moderate or severe pain. Respondents choose to leave or use non-pharmacological techniques (40.2%) to lessen menstruation pain because they are afraid of the negative side effects of pharmacological medications and because it is still a mild form of pain.

Papaya leaves offer a wealth of advantages. Young papaya leaves are boiled and consumed in several regions of Asia. Additional advantages of papaya leaves include its ability to treat acne, boost appetite, reduce

menstrual cramps, soften meat, and alleviate sickness (Yogiraj et al., 2014). Papaya leaves extract in n-hexane, ethyl acetate, and ethanol at doses of 0.175, 0.35, and 0.70 mg/kg bb for each extract provides defence against acetic acid production brought on by visceral pain. When compared to aspirin, papaya leaves extract exhibits the strongest analgesic efficacy. This study showed that a good possibility for producing a phytomedicine to treat visceral discomfort is an extract from papaya leaves (Hasimun et al., 2014).

Vitamin E is present in the boiled water of papaya leaves (*Carica papaya*), according to research by Ashra (Ashra, 2015). Vitamin E can prevent the cyclooxygenase enzyme from being activated post-translationally, which suppresses the activity of phospholipase A and cyclooxygenase enzyme. On the other hand, vitamin E also boosts the synthesis of prostacycline and PGE2, which act as vasodilators and can relax the uterine smooth muscles. According to a study by Octavianus and Lolo (2014), the boiled water from papaya leaves also possesses analgesic and anti-inflammatory benefits. Research demonstrated that drinking cooked papaya leaf water has analgesic and anti-inflammatory benefits, with 70 mL being the most beneficial dose in people (equivalent to 1 glass of herbal medicine).

According to a study by Rista (2014), 15 mL, or 1 tablespoon, is the recommended daily intake of honey. The best times to ingest honey are in the morning, two hours before meals, or three hours after eating. The nutrients in honey are easily absorbed by the body and do not require a lengthy digestive process if ingested on an empty stomach for about 2-3 hours. Following the post-test, all respondents' pain range scores fell from range one to range six. The taste of fructose honey is sweet (Harianja and Septyani, 2021). Additionally, honey contains enzymes that speed up several metabolisms' chemical operations. Honey's flavonoids prevent the cyclooxygenase enzyme from being produced, which allows it to reduce pain, including menstruation pain.

In this study, the average reduction in the score for teenage menstrual pain was 2.65 to 2.29. The findings of the statistical test revealed a p-value of 0.000, indicating that there is a relationship between the administration of functional drink items along with papaya leaf-boiled water and honey to lessen adolescent girls' menstrual pain. Papaya is already well known for its therapeutic properties. Papaya's anti-inflammatory properties help wounds heal quickly and reduce discomfort. The unripe fruits and young leaves of the papaya contain the alkaloid known as carpaine. The papaya has the glycoside carposide in its leaves, as well as the

glycosides myrosinase, caricin, and sinigrin in its seeds. In particular, papaya extract can influence angiogenic and macrophage wound responses (Elgadir *et al.*, 2014).

The anti-inflammatory qualities of honey are utilized to promote healing. The acidity of the honey, the hydrogen peroxide content, the osmotic action, the nutritional and antioxidant content, the stimulation of immunity, and the effect against unknown chemicals all contribute to this effect. Prostaglandins are inhibited by honey, and nitric oxide is a key player in the inflammatory, microbial killing, and healing processes. Prostaglandin levels were found to be lower and the final nitric oxide product to be higher in those who used honey. These characteristics may explain some of honey's biological and therapeutic benefits, including its effectiveness as an antibacterial or painkilling wound-healing agent (Boroumand *et al.*, 2013).

Papaya leaf decoction combined with honey helps lessen menstruation pain. Papaya leaves contain flavonoids that act as an analgesic. Arachidonic acid, which is created when cell membranes are damaged, is converted to prostaglandins by the key enzyme cyclooxygenase (COX), which lessens pain (Johnston, 2004). Fructose and glucose can be found in honey. This information can ease pain by relaxing smooth muscles. Additionally, honey's sweetness can help study participants tolerate its flavor (Ajorpaz *et al.*, 2012).

The respondent was given a papaya leaf infusion with honey when she had menstrual pain (menstruation). Humans who drink papaya leaf boiling water for two hours experience analgesia. This study provides evidence for (Octavianus and Lolo, 2014), Research demonstrates that within 1-2 hrs of intake, the analgesic effect of papaya leaf boiled water is most efficiently absorbed. Maulani *et al.* (2020) revealed that there is a relationship between papaya leaf decoction and lessening the severity of menstrual discomfort in junior high school students from State 31, Semarang. Additionally, vitamin E boosts the production of prostacycline and PGE₂, which act as vasodilators to relax uterine smooth muscles and lessen the discomfort of menstruation.

According to a study by Abidah (2017), the p-value is 0.000, which means there is a statistically significant difference in prostaglandin levels before and after the intervention. The results of this study demonstrate that papaya leaf extract has a statistically significant impact on lowering prostaglandin levels and menstrual pain. Papaya leaf extract has flavonoids that have aspirin-like analgesic properties. Prostaglandins are the root cause of pain and inflammation; by limiting the function of

cyclooxygenase (COX), prostaglandin synthesis is reduced, and pain is alleviated.

4. Conclusion

Adolescent menstrual discomfort is reduced when papaya leaf heated water and honey are added to functional beverage items. Teenagers experienced a 2.65 on average drop in menstruation pain levels.

Conflict of interest

The authors declare no conflict of interest.

Acknowledgments

The author expresses gratitude to DIPA Poltekkes Kemenkes Surakarta for giving researchers the chance to conduct research using funding sources. The author also thanks everyone who contributed to this work, both directly and indirectly.

References

- Abidah, S., Hadisaputro, S., Runjati, R., Hidayat, S., Suwondo, A. and Mulyantoro, D. (2017). Effect of *Carica papaya* L. Leaf on Menstrual Pain and Prostaglandin Level in Adolescent with Primary Dysmenorrhea: A True Experiment. *Belitung Nursing Journal*, 3(3), 198–204. <https://doi.org/10.33546/bnj.96>
- Ajorpaz, N.M, Hafezi, M., Salehi, S., Tayebi, A., Shenasa, F. and Zahtabchi, S. (2012). Comparing the effect of pure and impure honey on severity of pain, amount of bleeding, and duration and interval of menstrual cycles in female students with primary dysmenorrhea. *Evidence Based Care*, 2(1), 23–33. <https://doi.org/10.22038/ebcj.2012.379>
- Ashra, F. and Lisdawita (2015). The Effect of Papaya Leaf Therapy on Decreasing Dysmenorrhea Rates in Young Women at the Mualimin Sawah Dangka Bukit Tinggi Islamic Boarding School in 2014. *Journal of Health STIKES Prima Nusantara Bukittinggi*, 6(1), 72-76. <https://doi.org/10.35730/jk.v6i1.246> [In Bahasa Indonesia].
- Boroumand, P., Zamani, M.M., Saedi, M., Rouhbakhshfar, O., Motlagh, S.R.H. and Moghaddam, F.A. (2013). Post tonsillectomy pain: Can honey reduce the analgesic requirements? *Anesthesiology and Pain Medicine*, 3(1), 198–202. <https://doi.org/10.5812/aapm.9246>
- Elgadir, M.A., Salama, M. and Adam, A. (2014). *Carica papaya* as a Source of Natural Medicine and Its Utilization in Selected Pharmaceutical Applications. *International Journal of Pharmacy and*

- Pharmaceutical Sciences*, 6(1), 881–884.
- Harianja, W.Y. and Septyani, A. (2021). The Effect of Giving Pure Honey Drink on the Reduction of Menstrual Pain (dysmenorrhea) in Adolescent Private Vocational School. *Jurnal Profesi Bidan Indonesia (JPBI)*, 1(1), 15–21.
- Hasimun, P., Suwendar and Ernasari, G.I. (2014). Analgetic Activity of Papaya (*Carica papaya* L.) Leaves Extract. *Procedia Chemistry*, 13, 147–149. <https://doi.org/10.1016/j.proche.2014.12.019>
- Johnston, S.A. (2004). Osteoarthritis. In Harari, J. (Ed.) *Small Animal Surgery Secrets (Second Edition)*, p. 343–347. Amsterdam, Netherlands: Hanley & Belfus, Inc. <https://doi.org/10.1016/B978-1-56053-579-9.50092-5>
- Kumala, T.F., Oyoh, Badrujamaludin, A. and Yanny, Y. (2021). Comparison the Use of Pure Jelly Lubricant with Xilocain Gel in the Installation of Urine Catheters for the Patient's level. *Jurnal Keperawatan Komprehensif*, 7(2), 7–12
- Maulani, F.M., Wulandari, P. and Kustriyani. (2020). Effect of Papaya Leaf Decoction on the Intensity of Menstrual Pain in Junior High School Students. *Jurnal Ners Widya Husada*, 5(3), 79–86. <http://stikeswh.ac.id:8082/journal/index.php/jners/article/view/336>
- Notoatmodjo, S. (2012). *Metodologi Penelitian Kesehatan*. Jakarta, Indonesia: Rineka Cipta. [In Bahasa Indonesia].
- Octavianus, S. and Lolo, W.A. (2014). Uji Efek Analgetik Ekstrak Etanol Daun Pepaya (*Carica papaya* L.) pada Mencit Putih Jantan (*Mus Muculus*). *Pharmacon*, 3(2), 87–92. <https://doi.org/10.35790/ebm.2.1.2014.3691> [In Bahasa Indonesia].
- Petraglia, F., Bernardi, M., Lazzeri, L., Perelli, F. and Reis, F.M. (2017). Dysmenorrhea and Related Disorders. *F1000Research*, 6, 1–7. <https://doi.org/10.12688/f1000research.11682.1>
- Prawirohardjo, S. (2012). *Obstetrics*. Indonesia: PT Bina Pustaka.
- Reeder, S.J., Martin, L.L. and Griffin, D. (2011). *Keperawatan Maternitas : Kesehatan Wanita, Bayi dan Keluarga*. Vol. 2, 18th ed. Indonesia: EGC. [In Bahasa Indonesia].
- Rista, Y. (2014). Efektifitas Madu terhadap Peningkatan Hb pada Tikus Putih. *JESBIO*, 3(5), 7–13. [In Bahasa Indonesia].
- Yogiraj, V., Goyal, P.K. and Chauhan, C.S. (2014). *Carica papaya* Linn. An Overview *International Journal of Herbal Medicine*, 2(5), 1–8.
- Yoshino, O., Takahashi, N. and Suzukamo, Y. (2022). Menstrual Symptoms, Health-Related Quality of Life, and Work Productivity in Japanese Women with Dysmenorrhea Receiving Different Treatments: Prospective Observational Study. *Advances in Therapy*, 39(6), 2562–2577. <https://doi.org/10.1007/s12325-022-02118-0>
- [https://doi.org/10.26656/fr.2017.7\(6\).453](https://doi.org/10.26656/fr.2017.7(6).453)