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Original Research

Differences Between Lemon Aromatherapy and Hypnobirthing in Reducing Nausea and Vomiting of Pregnant Women in the First Trimester

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ABSTRACT

Backgrounds: *Nausea and vomiting are discomforts of pregnancy about which 50–90% of pregnant women complain in the first trimester. Hypnobirthing and lemon aromatherapy are complementary therapies that can relax so that endorphins are produced and will reduce nausea.*

Methods: *The study design is a pre-experimental research method. Research conducted in June–August 2022 at Puskesmas Klaten Selatan. A total of 50 pregnant women who suffered nausea and vomiting were recruited using accidental sampling. The data collection technique uses a PUQE-24 score. Data analysis used univariate and bivariate methods. Univariate performed the distribution frequency calculation. Bivariate data analysis using the Wilcoxon test because the data is not normally distributed. Differences in nausea and vomiting between the two groups using the Mann-Whitney test.*

Results: *Lemon aromatherapy effectively reduces nausea and vomiting (p-value < 0.05). Hypnobirthing can effectively reduce nausea and vomiting (p-value < 0.05). We found a significant difference between the score of nausea and vomiting for lemon aromatherapy and hypnobirthing (p-value < 0.05). Both post-tests were in the range of mild nausea and vomiting, but the post-test score of lemon aromatherapy was lower than hypnobirthing, where the average post-test score of lemon aromatherapy was 1.43, while the post-test mean score of hypnobirthing was 6.43.*

Conclusion: *Lemon aromatherapy and hypnobirthing relaxation can effectively reduce nausea and vomiting. There is a significant difference between nausea and vomiting scores in pregnant women who are given lemon aromatherapy and hypnobirthing.*

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INTRODUCTION

Pregnancy is the state of the embryo in the body after the union of the egg and spermatozoa. Conception and implantation (nidation) as the starting point of pregnancy

cause spiritual and physical changes followed by subjective changes such as feeling nauseated, wanting to vomit, having headaches, and having a decreased appetite. One of the complaints felt by pregnant women in the first trimester is nausea and vomiting.

Women in early pregnancy often seek the help of a health worker due to this discomfort. The etiology of emesis gravidarum is the increasing levels of progesterone and estrogen, which are produced by Human Chorionic Gonadotropin (HCG). The occurrence of emesis gravidarum is about 50–90% in pregnant women in the first trimester. Around 60–80% of primigravida are more likely to experience hyperemesis gravidarum, and the occurrence in multigravida is about 40–60% (Kemenkes RI., 2016).

Most pregnant women try their own ways to adapt to the symptoms of nausea and vomiting that they feel. However, some pregnant women are unable to handle it, causing pregnant women to fall into a state of hyperemesis, or what is often referred to as excessive nausea and vomiting. Hyperemesis gravidarum that can't be treated properly can cause side effects in infants such as malformations, premature birth, intrauterine growth retardation (IUGR), and low birth weight (Zainiyah, 2019).

Therapy that is done which is currently carried out by the majority of medical personnel is by giving pharmacological therapy, namely by giving vitamin B6. Vitamin B6 plays a role in body metabolisms such as the normal function of the nervous system, hormone regulation, tissue repair, and the formation of red blood cells, amino acids, and nucleic acids. A deficiency of vitamin B6 causes low serotonin levels so that the sensory nerves will be more sensitive, which causes the mother to easily vomit.

However, studies rarely give significant effects. In addition, the use of anti-emetic drugs during pregnancy can have adverse events such as fatigue, anxiety, stomach ulcers, dry mouth, and constipation. So many pregnant women are rarely willing to take drugs to deal with nausea and vomiting (Yue et al., 2022).

Non-pharmacological therapies that can be used to treat nausea and vomiting include acupuncture therapy, lemon aromatherapy inhalation, and consuming ginger. Based on research results obtained by Munjiah et al., (2015), they conducted a study comparing vitamin B6 and acupuncture in pregnant women who experienced nausea and vomiting in the first trimester. It was found that acupuncture therapy was more potent to treat nausea and vomiting than giving vitamin B6.

The novelty of the study compared to previous research is that researchers used complementary therapy to treat emesis gravidarum by comparing lemon aromatherapy and hypnobirthing relaxation. According to Maternity, Ariska, and Sari, (2017) Cirus lemon or lemon essential oil is a safe aromatherapy frequently used in pregnancy. Based on an earlier study, about 26.5% of the 40% of women who used lemon aromatherapy reported reduced symptoms.

Hypnobirthing relaxation is carried out to overcome psychological changes that occur in first-trimester pregnant women. Hypnobirthing is a natural treatment to deal with pregnancy, and childbirth comfortably and naturally by increasing positive suggestions in the subconscious mind (Kuswandi, 2011). Through positive suggestions to be able to accept her pregnancy and believing that all food and nutrients that enter are healthy and the body can accept them well, whatever we eat can be digested properly by the body. The effectiveness of relaxation to reduce emesis gravidarum in first-trimester pregnant women was investigated (Shakiba et al., 2019). The process of affirmation and suggestions are given to the subconscious mind will be recorded in the subconscious mind so that it really becomes a reality.

The objective of this study is to confirm the difference between lemon aromatherapy and hypnobirthing relaxation in reducing nausea and vomiting in first-trimester pregnant women at the Puskesmas Klaten Selatan. Based on a preliminary study of 10 pregnant women who experienced nausea and vomiting in the first trimester of pregnancy, it was found that as many as 5 (50%) pregnant women greatly reduced the frequency of nausea and vomiting after relaxation and about 4 (40%) pregnant women reduced nausea and vomiting after being given lemon aromatherapy, and the remaining 1 (10%) pregnant women did not feel any changes. Based on this background, it is necessary to investigate "The difference between hypnobirthing relaxation therapy and lemon aromatherapy to reduce nausea and vomiting in first-trimester pregnant women at the South Klaten Health Center".

MATERIALS AND METHOD

This research has gone through an ethical review by the health research ethics committee at the health polytechnic of Surakarta with the No. LB.02.02/1.1/6323/2022 on September 15, 2022. And before starting to collect research data, an explanation regarding informed consent was given to all respondents, both agreeing and not agreeing to become research respondents. These are pre- and post-experimental research methods (Notoatmodjo, 2012). First, we observed (pretested) the frequency of nausea and vomiting in pregnant women and then provided hypnobirthing relaxation therapy and lemon aromatherapy treatment, after which measurements (observations) or posttests were carried out.

The study involved 65 pregnant women who experienced nausea and vomiting at Puskesmas Klaten Selatan. The inclusion criteria were pregnant women who suffered nausea and vomiting with a frequency of >4 times per day, and the exclusion criteria in the study were not agreeing to be respondents and pregnant women whose gestational age was over 13 weeks. The sampling technique was carried out by accidental sampling among pregnant women who suffered nausea and vomiting > 4 times a day in May–August 2022 and was willing to become respondents, and 60 pregnant women were found in 2 intervention groups.

The instrument for measuring nausea and vomiting uses the PUQE-24 score (Pregnancy-Unique Quantification of Emesis). The PUQE scoring system is useful for measuring the severity of NVP (Nausea Vomiting Pregnancy) within 24 hours. This instrument figured out how many hours of feeling nauseated there were, the number of vomiting episodes, and how many incidents of dry vomiting there were in the last 24 hours. The PUQE-24 index has 3 assessment items with 5 Likert scales. The score ranges from 1 to 5, with 4-6 indicating light NVP, 7-12 indicating moderate NVP, and 13-15 indicating heavy NVP.

Data collection by the pre-test and post-test PUQE-24 instrument. Then, to determine which respondents were in the group that was given the lemon aromatherapy intervention or hypnobirthing relaxation, by randomizing using a lottery, an intervention was carried out according to the results obtained. Giving lemon aromatherapy by dripping 4 drops of diluted lemon essential oil into a tissue, then inhaling with 2-3 deep breaths for 5 minutes and doing this 4 times a day.

This intervention was carried out for at least 5 consecutive days and then evaluated for nausea and vomiting on day 5. For the group given the hypnobirthing relaxation intervention, respondents were trained to do basic relaxation and then enter positive suggestions about pregnancy and eating healthy, and they can feel comfortable

consuming all healthy foods. This relaxation and suggestion process was also continued to be carried out independently at each home for at least 5 days, and then the researchers evaluated the intensity of emesis on the 5th day.

Process of data analysis through the normality test of the data. Then, the statistical test used is to measure the difference in mean before and after being given lemon aromatherapy. The Wilcoxon is used because the data distribution is not normal. To measure the difference before and after being given the hypnobirthing intervention because the data distribution was normal, the statistical test was carried out with the paired T-Test. And to find out the difference in mean between the two groups after being given the interventions of lemon aromatherapy and hypnobirthing because the data distribution was not normal, the Mann-Whitney test was used.

RESULTS

Tabel 1 is explained frequency distribution of 60 characteristics subjects study.

Table 1. Characteristics of respondents

Background Characteristic Respondent	Criteria	Aromatheraphy lemon		Hypnobirthing	
		f	%	f	%
Age	20-35 years old	25	41.7	29	48.3
	> 35 years old	5	8.3	1	1.7
Education Level	Primary school	0	0.0	1	1.7
	Middle school	5	8.3	2	3.3
	High school	15	25	14	23.3
	Above High School	10	16.7	13	21.7
Working status	Working	12	20	16	26.7
	Not Working	18	30	14	23.3
Nutrition status (IMT)	Low	4	6.7	0	0.0
	Normal	23	38.3	26	43.3
	High	3	5	3	5
	Obesity	0	0	1	1.7
Parity	Primi	10	16.7	11	18.3
	Multi	20	33.3	18	30.0
	Grande	0	0.0	1	1.7

Based on table 1, the characteristics of age, education, occupation, BMI, and parity between the two groups are similar. This shows that the characteristics of the respondents in the two groups are evenly distributed and do not cause bias in the results of the study.

Table 2. The Result of Wilcoxon test Differences in nausea and vomiting (PUQE-24 score) before and after the lemon aromatherapy intervention

Variabel	n	Mean	Median	SD	Min - max	P
Pre-Test nausea and vomiting	30	10.23	10.00	1.431	7 - 12	0.000
Post-Test nausea and vomiting	30	1.43	1.00	0.504	1 - 2	

Table 2 shows a significant difference between the scores of nausea and vomiting before and after being given lemon aromatherapy (p-value <0.05). The average PUQE score before being given therapy is 10.23, and after being given aromatherapy, it is 1.43.

Table 3. The results of the Paired T-Test Difference between Nausea and Vomiting (PUQE-24 Score) before and after being given the hypnobirthing intervention

Variabel	n	Mean	Median	SD	Min-max	P
Pre-Test nausea and vomiting	30	10.47	11.00	1.57	7 - 13	0.000
Post-Test nausea and vomiting	30	6.43	6.00	2.208	3 - 10	

Table 3 shows a significant difference between nausea and vomiting scores before and after being given hypnobirthing (p-value <0.05). The average PUQE score before being given hypnobirthing was 10.47, and after being given hypnobirthing, it was 6.43.

Table 4. The results of the Mann-Whitney difference test on the difference in nausea and vomiting (PUQE-24 score) after being given the intervention of lemon aromatherapy and hypnobirthing

Variabel	n	Mean	Median	SD	Min - max	*P*
Post-Test Aromatheraphy Lemon	30	1.43	1.00	0.504	1 - 2	0.000
Post-Test Hypnobrthing	30	6.43	6.00	2.208	3 - 10	

Table 4 shows a significant difference between the scores of nausea and vomiting given the lemon aromatherapy intervention and hypnobirthing. The mean of nausea and vomiting intensity after being given lemon aromatherapy was 1.43, while the mean of nausea and vomiting after being given hypnobirthing therapy was 6.43.

DISCUSSION

Based on the study, it is known that there's a significant difference between scores of nausea and vomiting before and after being given lemon aromatherapy. This result is in agreement with other studies. Nassif et al., (2021) found that aromatherapy, herbal medicine, and acupuncture are effective in treating nausea and vomiting during pregnancy.

This is proven in the results of a systematic review and synthesis. Kia et al., (2014) involved 100 pregnant women with nausea and vomiting. The study was carried out using the RCT method. It was found that the mean nausea and vomiting score decreased by 4 points by using lemon aromatherapy inhalation for 4 days.

Aromatherapy is one type of herb that is commonly used as a therapy for nausea because it uses essential oils, according to the complaint. Lemon aromatherapy can reduce the intensity of nausea, increase energy levels, and reduce fatigue during pregnancy (Safajou et al., 2020). Lemon consists of terpineol, linalool, linalyl acetate, citral, and limonene. Lemon plays a role in stabilizing the central nervous system.

This mechanism causes the mother to be happy and calm, have an increased appetite, and have smooth blood circulation. Inhaling lemons produces molecules that

are received by receptors in the nose. This stimulus is forwarded to the emotional and memory centers and then passed back to the circulatory system. This causes the mother to feel calm, relaxed, and comfortable (Maternity, Ariska, and Sari, 2017).

Aromatherapy is also very useful in palliative care. A study was conducted on 66 advanced cancer patients who received 222 applications of lemon aromatherapy with cotton. The study was conducted retrospectively. As many as 73% (149 applications) reported a decrease in symptoms, while 27% (53 applications) reported no reduction in symptoms, so pharmacological therapy had to be given (Kreye et al., 2022).

Other studies with meta-analytic methods provide evidence that lemon aromatherapy is effective in reducing the severity of nausea and vomiting. This is evident from three research articles. Other aromatherapy studies did not report significant results in treating nausea and vomiting during pregnancy, such as mentha (16 studies), peppermint aromatherapy (17 studies), and lavender aromatherapy (18 studies) in combination (Fattah A, Hesarinejad Z, Rajabi Gharaii N, 2019).

Based on this study, it was found that there was a significant difference in the score of nausea and vomiting before and after being given hypnobirthing (p-value <0.05). These results are in accordance with the research of Ozgunai et al., (2022) which was carried out using the RCT method. The study involved 18 people who received standard therapy with additional hypnosis therapy and 23 people who received standard therapy. The intervention was carried out by giving two hypnosis practice sessions, and then the patient was given instructions to practice this method every day.

The data analyzed included sociodemographic characteristics, frequency of vomiting, the severity of nausea and vomiting, nausea and vomiting drugs used, and length of stay. The results showed that the frequency of nausea and vomiting decreased in the hypnosis group. The length of stay in the hypnosis group was shorter than the control group. Thus, hypnotherapy has the potential to overcome hyperemesis gravidarum.

The application of chemotherapy is described in a case study of a 34-year-old woman. The patient was diagnosed with metastatic breast cancer. The primary tumor was removed, and then a biopsy of the sentinel node was performed. Postoperative care with chemotherapy assisted with antiemetic medication. On the second round of chemotherapy, the patient experienced severe nausea and vomiting.

After the chemotherapy is finished, these symptoms continue to be felt, especially when smelling food and the smell of the hospital. Hypnosis therapy began to be given to patients. After the first session, nausea and vomiting reduced significantly, the patient ate well, and she was also able to go to the hospital without feeling nauseated. Hypnosis CDs are given to patients to apply at home. Nausea and vomiting did not occur again after 3 months of receiving hypnosis therapy (Kravits, 2015).

Based on the main findings of this study, we found a significant difference between the nausea and vomiting scores of lemon aromatherapy and hypnobirthing. Where the average score of the lemon aromatherapy test post is 1.43 and the average score of the hypnobirthing test post is 6.43. Both test posts were in the range of mild nausea and vomiting, but the lemon aromatherapy post score was lower than hypnobirthing.

To the best of our knowledge, there are no studies comparing the two therapies to deal with nausea and vomiting during pregnancy. According to Milica, (2021) essential oils in aromatherapy are usually applied through inhalation. Inhalation works through the respiratory system or the olfactory nerves, which can optimize mood and benefit

stress-related depression, anxiety, and other physical illnesses related to immune system dysfunction.

Research on effective complementary therapies for nausea and vomiting continues. In an RCT study of 90 pregnant women with nausea and vomiting who were treated with lemon and ginger aromatherapy, it was found that lemon and ginger aromatherapy were equally effective in reducing emesis gravidarum (Kustriyanti and Putri, 2019). In another study, lemon aromatherapy was combined with acupressure. The results showed that acupressure and acupressure therapy combined with lemon aromatherapy were effective in reducing the emesis of gravidarum (Magfirah, Fatma, and Idwar, 2020).

The mechanism of hypnosis consists of relaxation and response. Relaxation works to reduce the sympathetic nervous system and reduce the state of sympathetic hyperstimulation. The second component is the response to hypnotic suggestions for symptom relief. The response to these suggestions is independent of the sympathetic or parasympathetic system and often does not depend on their awareness or memory of them, but it is necessary to dispel any myths or doubts that patients have about hypnosis treatment (Blake, 1897).

Hypnosis, mindfulness-based cognitive therapy, progressive muscle relaxation, and behavioral therapy were investigated in a systematic review. The sample involved six clinical trials, which were measured using the Oxford Quality Rating System or the Jadad Scale. Based on this systematic review, the current evidence is of low quality regarding the effectiveness of psychosomatic treatments. Behavior therapy and hypnosis rarely involve a control group, and the sample used is small, resulting in research bias.

In the case of mothers with depression, it can interfere with interventions, thereby reducing the effectiveness of those interventions. Psychological intervention plans must also consider side effects, intervention costs, treatment costs, the possibility of psychological disorders, and other therapies used. The need to improve the quality of research is needed to increase study evidence (Emami-Sahebi et al., 2018).

The process of the hypnobirthing mechanism is to reduce nausea and vomiting by teaching the patient to do deep relaxation and positive affirmations about all foods that are healthy and comfortable to eat, and then the patient is asked to do self-hypnosis routinely twice a day according to a time that is convenient for the mother. With the process of relaxation and planting positive suggestions, all the foods eaten that are comfortable and healthy are recorded in the subconscious and become realities.

CONCLUSION AND SUGGGESTION

Lemon aromatherapy is effective in relieving nausea and vomiting in pregnant women based on the differences in the results of pre and post-bivariate tests of lemon aromatherapy (p-value < 0.05). Hypnobirthing is effective in alleviating nausea and vomiting in pregnant women based on the difference in the results of the pre-and post-bivariate test of hypnobirthing (p-value < 0.05). There is a significant difference between the nausea and vomiting scores of lemon aromatherapy and hypnobirthing, where both test posts are in the range of mild nausea and vomiting, but the lemon aromatherapy post score is lower than hypnobirthing.

The suggestion is that both interventions, lemon aromatherapy, and hypnobirthing, can be applied to cases of emesis gravidarum. This research is the basis for further research. It is necessary to improve the quality of methods and more samples to increase research evidence.

REFERENCES

Adam, J., & Umboh, J. (2015). Hubungan Antara Umur, Parietas dan Pendampingan Suami Dengan Intensitas Nyeri Persalinan Kala 1 Fase Aktif Deselarasi di Ruang Bersalin RSUD Prof. Dr. H. Aloei Saboe Kota Gorontalo. *Jikmu*, *5*(2a), 361–374

Blake, J. F. (1897). Treatment of hyperemesis gravidarum. *British Medical Journal*, *2*(1923), 1375. https://doi.org/10.1136/bmj.2.1923.1375

Emami-Sahebi, A., Elyasi, F., Yazdani-Charati, J., & Shahhosseini, Z. (2018). Psychological interventions for nausea and vomiting of pregnancy: A systematic review. *Taiwanese Journal of Obstetrics and Gynecology*, *57*(5), 644–649. https://doi.org/10.1016/j.tjog.2018.08.005

Fattah A, Hesarinejad Z, Rajabi Gharaii N, N. M. (2019). The Effect of Aromatherapy on Nausea and Vomiting durring Pregnancy: A Systematic Review and Meta – Analysis. *Int J Pediatr*, *7*(3), 9061–9070. https://doi.org/10.22038/ijp.2018.34857.3068.

Kemenkes RI. (2016). *Profil Kesehatan Indo-nesia*.

Kia, P. Y., Safajou, F., Shahnazi, M., & Nazemiyeh, H. (2014). The effect of lemon inhalation aromatherapy on nausea and vomiting of pregnancy: A double-blinded, randomized, controlled clinical trial. *Iranian Red Crescent Medical Journal*, *16*(3). https://doi.org/10.5812/ircmj.14360

Kravits, MA, RN, K. G. (2015). Hypnosis for the Management of Anticipatory Nausea and Vomiting. *Journal of the Advanced Practitioner in Oncology*, *6*(3), 225–229. https://doi.org/10.6004/jadpro.2015.6.3.4

Kreye, G., Wasl, M., Dietz, A., Klaffel, D., Groselji-Strele, A., Eberhard, K., & Glechner, A. (2022). Aromatherapy in Palliative Care: A Single-Institute Retrospective Analysis Evaluating the Effect of Lemon Oil Pads against Nausea and Vomiting in Advanced Cancer Patients. *Cancers*, *14*(9), 1–11. https://doi.org/10.3390/cancers14092131

Kustriyanti, D., & Putri, A. A. (2019). Ginger and Lemon Aromatherapy To Relieve Nausea and Vomiting in Pregnancy. *Jurnal Keperawatan Soedirman*, *14*(1), 15. https://doi.org/10.20884/1.jks.2019.14.1.868

Kuswandi, L. (2011). *Keajaiban Hypnobirthing*. Jakarta: Pustaka Bunda.

Magfirah, M., Fatma, S., & Idwar, I. (2020). The effectiveness of acupressure therapy and aromatherapy of lemon on the ability of coping and emesis gravidarum in trimester i pregnant women at langsa city community health centre, aceh, indonesia. *Open Access Macedonian Journal of Medical Sciences*, *8*(E), 188–192. https://doi.org/10.3889/oamjms.2020.4008

Maternity, D., Ariska, P., & Sari, D. Y. (2017). Air Rebusan Cengkeh Mengurangi Mual Muntah Pada Ibu Hamil Trimester Satu. *Jurnal Kebidanan*, *2*(3), 115–120.

Milica. (2021). Essential Oils : Inhalation Aromatherapy. *Journal of Agronomy*,

Technology and Engineering Management Review, *4*(2), 547–557.

Munjiah, I., Madjid, T. H., Herman, H., Husin, F., Akbar, I. B., & Rizal, A. (2015). Perbedaan Pengaruh Akupunktur dan Vitamin B6 terhadap Penurunan Intensitas Mual Muntah pada Emesis Gravidarum Berat. *Jurnal Pendidikan Dan Pelayanan Kebidanan Indonesia*, *2*(2), 1–6.

Nassif, M., Costa, I., Moura, C. de C., & Ribeiro, P. (2021). Integrative and Complementary Practices to Control Nausea and Vomiting in Pregnant Women: A Systematic Review Protocol. *Jqwh.Org*, 1–13.

Notoatmodjo, S. (2012). *Metodologi Penelitian Kesehatan (2nd ed.)*. Jakarta: PT Rineka Cipta.

Ozgunai, et. al. (2022). Adjuvant Hypnotherapy for Hyperemesis Gravidarum: A Randomized Pilot Study. *International Journal of Clinical and Experimental Hypnosis*, *70*(3), 277–185.

Safajou, F., Soltani, N., Taghizadeh, M., Amouzeshi, Z., & Sandrous, M. (2020). The effect of combined inhalation aromatherapy with lemon and peppermint on nausea and vomiting of pregnancy: A double-blind, randomized clinical trial. *Iranian Journal of Nursing and Midwifery Research*, *25*(5), 401–406. https://doi.org/10.4103/ijnmr.IJNMR-11-19

Shakiba, M., Parsi, H., Pahlavani Shikhi, Z., & Navidian, A. (2019). The Effect of Psycho-Education Intervention Based on Relaxation Methods and Guided Imagery on Nausea and Vomiting of Pregnant Women. *Journal of Family & Reproductive Health*, *13*(1), 47–55. https://doi.org/10.18502/jfrh.v13i1.1612

Yue, S. W., Huang, Y. Y., Huang, C. R., Huang, W. P., & Ouyang, Y. Q. (2022). Effect of auriculotherapy on nausea and vomiting during pregnancy: A systematic review. *European Journal of Integrative Medicine*, *53*(February), 102130. https://doi.org/10.1016/j.eujim.2022.102130

Zainiyah, Z. (2019). Article Effect of the Aroma of Sweet Orange Peel (Citrus Aurantium) on Emesis Gravidarum in First Trimester Pregnant Women (Study at Health Centre Pasean Pamekasan). *Jurnal Ilmiah Obsgin*, *11*(2).

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Original Research

The Effectiveness of Pregnancy Online Classes (PROCLASS) on the Level of Knowledge and Anxiety Ahead of Labor During the COVID-19 Pandemic

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ABSTRACT

Background: *Restrictions on health services such as prenatal checks and the Pregnant Women Class program during the COVID-19 pandemic in several regions will have an impact on the quality of services for pregnant women. Purpose: Pregnancy online classes can potentially increase knowledge and reduce anxiety ahead of labor during the COVID-19 pandemic.*

Methods: *Quasi-experimental and nonequivalent control group, pretest and posttest design approach Each group of 30 people (purposive sampling technique). Pre-test and PROCLASS provide material every week through videos uploaded to the WhatsApp group. The instrument uses a questionnaire (Google Form). Independent t-test and Mann-Whitney test to compare the PROCLASS and control groups. Dependent t-test and Wilcoxon test to compare the pre-and post-test in the PROCLASS group.*

Results: *There were differences in the pre-post test on the variables of knowledge and anxiety in the PROCLASS group, respectively (p-value 0.000). There was a difference in knowledge between the PROCLASS and control groups (p-value 0.002), with an average knowledge of 88.83 in the PROCLASS group and 85.73 in the control group. There were also differences in anxiety levels between the PROCLASS and control groups (p-value 0.000), with an average anxiety level of 28.17 in the PROCLASS group and 45.70 in the control group.*

Conclusion: *PROCLASS has proven effective in increasing knowledge and reducing the anxiety level of pregnant women before giving birth during the COVID-19 pandemic so that health workers can carry out the process (Puskesmas).*

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INTRODUCTION

Maternal and infant mortality in Indonesia is still a big challenge and needs attention, especially during the COVID-19 pandemic situation. According to data from

the Inter-Census Population Survey in 2015, the Maternal Mortality Rate (MMR) due to pregnancy and childbirth in Indonesia is still high, namely 305 per 100,000 live births (Kemenkes RI, 2019). There were 4.9% of pregnant women confirmed positive for COVID-19 out of 1,483 confirmed cases who had co-morbid conditions. This shows that pregnant women, childbirth, postpartum, and newborns are vulnerable to COVID-19 (Kemenkes RI, 2020b).

Access to quality health services for pregnant women can accelerate efforts to reduce MMR, one of which is through classes for pregnant women (Kemenkes RI, 2020b). Several studies have shown the effectiveness of maternity classes for pregnant women. In Sweden, classes for pregnant women promote feelings of security, help prepare them for childbirth, and help them become parents (Ahldén I et al., 2012). In Laos, maternity classes increase pregnant women's knowledge and understanding of basic neonatal care (Weiner EA et al., 2011). In Indonesia, class activities for pregnant women increase knowledge about childbirth preparation (Lucia, Sorongan et al., 2015).

Classes for pregnant women are useful in preparing them physically and psychologically for childbirth. Pregnant women will experience physiological and psychological adaptations in the form of discomfort in the body (difficulty breathing, back pain, and frequent urination), fear of pain during childbirth, and fear of caring for their baby (Madhavanprabhakaran, Girija Kalayil et al., 2015; Mayo Clinic, 2017; Soma-Pillay, P. et al., 2016).

The condition of the COVID-19 pandemic will certainly add to the fear and anxiety of pregnant women going to healthcare facilities for fear of contracting it (Kemenkes RI, 2020b). Classes for pregnant women can increase mothers' confidence in facing childbirth because mothers are given counseling about childbirth, postpartum and neonatal care, physical activity, and local customary beliefs and can share their experiences with other pregnant women. So that pregnant women can be better prepared and less anxious when facing childbirth (Kemenkes RI, 2018; Kristianingsih & Suryanti, 2019).

The COVID-19 pandemic situation has caused restrictions on routine services, including health services for pregnant women. There are suggestions to postpone antenatal checks and classes for pregnant women, as well as the unpreparedness of services in terms of staff and infrastructure, including personal protective equipment. This has an impact on access to and quality of health services (Kemenkes RI, 2020b).

Implementing online classes for pregnant women as a medium for KIE (Information and Education Communication) is an effort to overcome this problem. Advances in technology in the digital era can be utilized to facilitate access and improve the quality of health services during the COVID-19 pandemic. In India, the online classroom training model has proven effective in increasing knowledge, skills, and satisfaction in maternal and child health management (Ayun Sriatmi, 2020).

The urgency of this research is based on the problems experienced by the local government in implementing pregnancy online classes during the COVID-19 pandemic, considering the positive impact of holding the class for pregnant women. Therefore, this research needs to be conducted to see how effective the implementation of online classes for pregnant women is, especially at the level of knowledge and anxiety before giving birth during the COVID-19 pandemic, which has so far been carried out face-to-face, as faced by the Puskesmas. So the results of this study can be used as a recommendation for the development of the local health center program.

The purpose of this study was to analyze the effectiveness of the pregnancy online classes (PROCLASS) on the level of knowledge and anxiety before delivery during the COVID-19 pandemic so that it could provide recommendations to related parties.

MATERIALS AND METHOD

The research method used is quantitative research with quasi-experimental methods and a nonequivalent control group pretest and posttest design approach. This study was conducted in accordance with Ethical Assessment No. 0219/EA/KEPK/2022. The research was carried out in the working area of the Blora Public Health Center, Central Java, from April to November 2022.

The sample size is 30 for each group. Sampling with the purposive sampling technique. The sample inclusion criteria are third-trimester pregnant women, residing in the COVID-19 pandemic area, owning a cell phone, and having had their first contact with a health worker, while the sample exclusion criteria are high-risk pregnant women with a history of co-morbidities or chronic diseases and pregnant women who refused to participate in this study.

The Community Health Center organizes online classes, providing material every week with an intervention period of one month. The online class intervention group for pregnant women (PROCLASS) is in the form of health education material provided via video (extension text), which is uploaded via the WhatsApp group (WAG), which was previously formed by the facilitating midwife. Material is distributed once a week, with a duration of 10–20 minutes per video.

The discussion and question-and-answer mechanism are carried out through the WA group chat, where the midwife facilitator is responsible as the group administrator and can bring in other resource persons to provide support material in the class for pregnant women. While the control is pregnant women who get information through the KIA book, The Maternal and Child Health Book (KIA Book) contains information sheets and health records as well as special notes on abnormalities in the mother during pregnancy, childbirth, the postpartum period, and in children (fetuses, newborns, infants, and children up to age 6).

The research instrument used a questionnaire to measure knowledge with the Guttman scale and anxiety with the Zung Self-Rating Scale (ZSAS). The anxiety questionnaire instrument has been tested for validity (Pearson correlation) with a result > 0.444 and tested for reliability (Cronbach's alpha) with a result of 0.829. This study used the independent t-test and the Mann-Whitney non-parametric test to compare the PROCLASS and control groups. Dependent t-test and the non-parametric Wilcoxon test to compare the pre- and post-test in the PROCLASS group.

RESULTS

Following are the characteristics of age, gestational age, and parity of respondents in the intervention group (PROCLASS) and the control group (KIA book):

Table 1. Distribution of Respondents by Age, Gestational Age and Parity in the PROCLASS Group and the Control Group

Variable	Mean	Median	Standard Deviation	Minimum-Maximum
PROCLASS Group				
Age	27,43	27	5,137	20 – 41

Variable	Mean	Median	Standard Deviation	Minimum-Maximum
Gestational	30,93	30	2,612	28 – 36
Age Parity	1,83	2	0,950	1 – 4
Control Group				
Age	27,83	27	4,829	22 – 40
Gestational Age	31,07	31	4,685	28 – 35
Parity	1,50	1	0,630	1 – 3

It can be seen from Table 1 that the average age of the PROCLASS and Control groups was almost the same, respectively, 27.43 years and 27.83 years. The average gestational ages of the PROCLASS and control groups were 30.93 weeks and 31.07 weeks, respectively. Meanwhile, the average parity of the PROCLASS and control groups was 1.83 and 1.50.

Table 2. Distribution of Average Knowledge of Pregnant Women Before and After Participating PROCLASS in the Blora Work Area in 2022

Variable	PROCLASS Group	Mean	Mean Rank	Sum of Rank	P value	N
Knowledge	Negatif Rank	78,57	0,00	0,00	0,000	0
Pretest	Positif Rank	88,83	15,00	465,00		30
Postest	Ties					0

The (positive) difference between the results of knowledge before and after taking PROCLASS is 24, so there is an increase in knowledge before and after taking PROCLASS. The mean rank on average for this increase is 15.50, while the total positive ranking or sum of ranks is 465.00. Meanwhile, the (negative) difference between knowledge before and after taking PROCLASS is (0) in pregnant women, meaning that there are no pregnant women who experience a decrease in knowledge before and after taking PROCLASS. There were no (0) pregnant women who experienced an increase or decrease (same value) in knowledge before and after participating in PROCLASS.

Based on the statistical test results, it is known that the significance value is 0.000, which is <0.05, meaning that there is a difference in the knowledge of pregnant women before and after participating in PROCLASS. So it can be concluded that there is also an effect of following PROCLASS with increased knowledge of pregnant women.

Table 3. Distribution of Average Anxiety of Pregnant Women Before and After Participating PROCLASS in the Blora Work Area in 2022

Variable	Mean	SD	SE	P value	N
Pretest	58,27	3,741	0,683	0,000	30
Posttest	28,17	5,584	1,019		30

The anxiety average before joining PROCLASS was 58.27, with a standard deviation of 3.741. After participating in PROCLASS, the average anxiety level was 28.17, with a standard deviation of 5.584. The statistical test results obtained a significance value of 0.000, which is <0.05, so it can be concluded that there is a difference in anxiety in pregnant women before being given the intervention (PROCLASS) and after being given the intervention (PROCLASS).

Table 4. Distribution of Average Knowledge and Anxiety Levels of Pregnant Women Between the Intervention Group (PROCLASS) and the Control Group (KIA Book) in the Work Area of the Blora Health Center in 2022

Variable	Mean	Mean Rangk	Sum of Rank	P value	N
Knowledge					
PROCLASS	88,83	37,52	1125,50		30
Group				0,002	
Control Group	85,73	23,48	704,50		30
Anxiety Level					
PROCLASS	28,17	5,584	1,019		30
Group				0,000	
Control Group	45,70	6,497	1,186		30

Based on the data, it was found that the average knowledge of pregnant women who did PROCLASS was 88.83 (very good knowledge), while pregnant women in the control group (KIA books) had an average knowledge of 85.73 (very good knowledge). Likewise, the results of the mean rank showed that pregnant women who did PROCLASS had a higher average knowledge of 37.53 than pregnant women in the control group (KIA book) of 23.48. Based on statistical tests, it is known that the significance value is 0.002 (p-value <0.05), meaning that there is a difference in knowledge between pregnant women who do PROCLASS and pregnant women from the KIA book (control), with a mean difference of 3.10.

The average anxiety of pregnant women participating in PROCLASS was 28,17 (mild anxiety) with a standard deviation of 5,584, while for pregnant women in the control group (KIA book), the average anxiety was 45,70 (moderate anxiety) with a standard deviation of 6,497. The statistical test results obtained a p-value of 0,000, meaning that at alpha 5% there was a significant difference in the average anxiety between pregnant women who attended PROCLASS and pregnant women who used the KIA book (control).

DISCUSSION

Pregnancy and childbirth are phases that every married couple looks forward to. Research from Wulandari S.R. et al., (2020) stated that the impact of the COVID-19 pandemic was in the form of psychological responses of pregnant women during the COVID-19 pandemic in the form of stress, anxiety, and some even experienced depression. The impact of anxiety, if not handled properly, will result in stress that can even lead to depression (Wulandari, S. R., et al., 2020). In addition, during pregnancy, there will be physical and psychological changes, so pregnant women need physical and mental preparation (Varney, 2018).

Physical readiness means having sufficient energy and good health, while mental readiness means having sufficient interest and motivation to carry out an activity (Aprilia Y., 2013; Kemenkes RI., 2020b). Access to quality health services for pregnant women can accelerate reduction efforts, one of which is through classes for pregnant women. Research by Ahldén I et al., (2012) shows the effectiveness of maternity classes for pregnant women. In Sweden, classes for pregnant women increase their feelings of security, help prepare them for childbirth, and help them become parents.

The pregnancy online classes (PROCLASS) are a means of learning together about health for pregnant women in the form of face-to-face meetings in groups that aim

to increase the knowledge and skills of mothers regarding pregnancy, childbirth, postpartum, post-partum family planning, the prevention of complications, newborn care, and physical activity or gymnastics for pregnant women online (Kemenkes RI, 2020a). Based on the results of the study, it was found that there were differences in the knowledge of pregnant women before delivery between the intervention group (PROCLASS) and the control group (KIA Book), with the largest mean difference in the PROCLASS group. The average knowledge in the PROCLASS group was almost the same as the increase in knowledge in the control group.

This is because the PROCLASS group and the control group (KIA Book) both received information related to pregnancy so that it could increase the knowledge of pregnant women. The difference is only in the absorption of information and understanding of each pregnant woman. Health education is a promotive and preventive effort through the dissemination of information and increasing the motivation of a person or community to behave healthily, so that people know how to maintain health, prevent things that are detrimental to health, and where to seek help if they experience health problems (Notoatmodjo S, 2014).

The results showed that there were differences in the anxiety of pregnant women before delivery between the intervention group (PROCLASS) and the control group (KIA Book), with the highest mean difference in the PROCLASS group. The PROCLASS group on average decreased the anxiety level of pregnant women before delivery compared to the control group. The anxiety level of pregnant women in the PROCLASS group decreased more because in the online class for pregnant women, after giving the material, there was a discussion session with health workers.

In the discussion session, pregnant women can share their feelings or worries, ask about complaints they feel, ask questions about the information that is not yet known, and so on, so that they get solutions or answers. Research by Nugroho, Rizki Nursofyanto, and Cahyanti, (2017) after conducting a correlation test, obtained a p-value <0.001, which means that there is a significant relationship between the class participation of pregnant women and the level of anxiety facing childbirth. The same thing was conveyed by Lita et al., (2022) there was an effect of online learning classes for pregnant women on the anxiety level of pregnant women during the COVID-19 pandemic era.

The anxiety pretest scores of the two groups were almost the same, or there was no significant difference (p-value = 0.013). Meanwhile, for the post-test scores in both the experimental and control groups, there was a significant difference (p-value = 0.000). Statistically, if you look at the average difference of (-0.06) or p = 0.000, which is less than 0.05.

Research by Silva-Jose et al., (2022) found that pregnant women receiving online group exercise classes previously had an average anxiety score of 32.23 ± 9.31, ranging from low to moderate levels, due to the COVID-19 pandemic situation. They stated that they felt safe and comfortable exercising at home, the time was more flexible, there was increased adherence to the program, and there were other positive behaviors such as healthier eating patterns. When group exercise classes go online, pregnant women feel connected to other pregnant women and get social support, which has a positive impact on their mental health.

Classes for pregnant women are useful in preparing them physically and psychologically for childbirth. Pregnant women will experience physiological and psychological adaptations in the form of body discomfort (difficulty breathing, back

pain, and frequent urination), fear of pain during childbirth, and fear of caring for their baby (Madhavanprabhakaran, Girija Kalayil et al., 2015; Simbolon, Ganda Agustina Hartati et al., 2021; Soma-Pillay, P. et al., 2016). In Indonesia, class activities for pregnant women increase knowledge about preparation for childbirth (Lucia, Sorongan et al., 2015). Class meetings for pregnant women are usually held 4 (four) times during pregnancy or according to the results of the agreement between the facilitator, participants, and midwives or health workers (Kemenkes RI, 2018).

In general, there are two factors that influence anxiety in pregnant women: internal factors and external factors. Internal factors are divided into two types, namely beliefs about childbirth and feelings before childbirth. In addition to internal factors, external factors are also divided into two types, namely information from health workers and the husband's support (Shodiqoh ER & Syahrul F, 2014).

Advances in technology will provide a variety of mass media that can influence pregnant women's knowledge of innovation or the latest information. As a means of communication, various forms of mass and electronic media such as television, radio, newspapers, magazines, counseling, and social media via WhatsApp, Instagram, YouTube, and others have a major influence on the formation of people's opinions and beliefs (Ilmiyani et al., 2021). During the COVID-19 pandemic, online antenatal education (module application) was widely used by pregnant women. During the COVID-19 pandemic, online antenatal education was well used by pregnant women, with "Pregnancy Care and Fetal Development" courses being the most studied by pregnant women in the early and mid-term, and "Baby Care" courses being the most studied during late pregnancy (Chen et al., 2022).

Implementing online classes for pregnant women as a medium for KIE (Information and Education Communication) is an effort to overcome this problem. Advances in technology in the digital era can be utilized to facilitate access and improve the quality of health services during the COVID-19 pandemic. In India, the online classroom training model has been shown to be effective in increasing knowledge, anxiety reduction skills, and satisfaction with maternal and child health management (Ayun Sriatmi, 2020).

This is supported by research by Wu et al., (2020) showing that online antenatal care can reduce unnecessary hospital visits and limit the potential risk of infection among this vulnerable group during the COVID-19 pandemic. Online antenatal care can be a preferred alternative option because it is beneficial for pregnant women who need basic antenatal care, pregnancy-related information, and mental health consultations. So that it can increase knowledge and overcome mental disorders. In addition, online antenatal care can help provide relatively economical medical services and reduce healthcare inequalities due to its convenience and cost-effectiveness, especially in developing countries or regions.

CONCLUSION

The characteristics of the respondents were the average age of the PROCLASS group at 27.43 years and the control group at 27.83 years, the gestational age of the PROCLASS group was 30.93 weeks and the control group was 31.01 weeks, the parity of the PROCLASS group was 1.83 and the parity of the control group was 1.50. There were differences in pre- and post-test knowledge and anxiety levels in the PROCLASS group with a p-value of 0.000 and a p-value of 0.000, respectively. There was a difference in knowledge between the PROCLASS group and the control group with a p-

value of 0.002 (mean difference: 3.1). There was a difference in anxiety between the PROCLASS group and the control group with a p-value of 0.000 (mean difference: 17.53). In general, it can be concluded that online classes for pregnant women (PROCLASS) are effective in increasing knowledge and reducing anxiety for pregnant women before childbirth during the COVID-19 pandemic.

The online class for pregnant women (PROCLASS) can be used as a medium to increase information in the form of health knowledge or education for pregnant women while at the same time reducing the anxiety of mothers during pregnancy. Apart from that, it can also be used by health workers (midwives, doctors, or other health workers) as a medium to increase knowledge and reduce anxiety for pregnant women before delivery, especially during COVID-19.

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REFERENCES

Ahldén I, Ahlehagen S, Dahlgren L, & Josefsson A. (2012). *'Parents' Expectations about Participating in Antenatal Parenthood Education Classes.'*. J Perinat Educ.

Aprilia Y. (2013). *Persiapan Batin untuk Proses Persalinan*. Http://Www.Bidankita.Com. http://www.bidankita.com.

Ayun Sriatmi, D. (2020). 'Dapatkah Kelas Ibu Hamil Model Virtual Meningkatkan Praktik Pencegahan Risiko Tinggi Kehamilan? *Media Litbangkes*, *30*(1), 1–14. http://ejournal2.litbang.kemkes.go.id/index.php/mpk/article/view/2985

Chen, X. W., Jiang, L. Y., Chen, Y., Guo, L. F., & Zhu, X. H. (2022). Analysis of online antenatal education class use via a mobile terminal app during the COVID-19 pandemic. *BMC Pregnancy and Childbirth*, *22*(1), 1–10. https://doi.org/10.1186/S12884-022-04745-5/FIGURES/7

Ilmiyani, S. N., Yusuf, N. N., & Susilamayanti, D. (2021). Pengaruh Kelas Ibu Hamil Terhadap Peningkatan Pengetahuan Ibu Hamil Tentang Kesehatan Kehamilan di UPTD Puskesmas Bagu. *Jurnal Medika Hutama*, *2*(2), 782–789. https://jurnalmedikahutama.com/index.php/JMH/article/view/171

Kemenkes RI. (2018). *Pedoman Pelaksanaan Kelas Ibu Hamil*.

Kemenkes RI. (2019). *Profil Kesehatan Indonesia Tahun 2018*. Jakarta. https://pusdatin.kemkes.go.id/resources/download/pusdatin/profil-kesehatanindonesia/PROFIL_KESEHATAN_2018_1.pdf

Kemenkes RI. (2020a). *Pedoman Bagi Ibu Hamil, Ibu Nifas dan Bayi Baru Lahir Selama Social Distancing*. Dirjen Kesga dan Kesmas Kemenkes RI.

Kemenkes RI. (2020b). *Pedoman Pelayanan Antenatal, Persalinan, Nifas dan Bayi*

Baru Lahir di Era Adaptasi Kebiasaan Baru. Jakarta. https://covid19.go.id/storage/app/media/Materi Edukasi/2020/Oktober/revisi-2-a5- pedoman-pelayanan-antenatal-persalinan-nifas-dan-bbl-di-era-adaptasi-kebiasaan-baru.pdf

Kristianingsih, A., & Suryanti, E. (2019). Hubungan Keikutsertaan Kelas Ibu Hamil Terhadap Kecemasan Ibu Dalam Menghadapi Persalinan Pada Ibu Hamil Trimester III Di Desa Branti Raya Kecamatan Branti Lampung Selatan Tahun 2019. *Jurnal Kesehatan Masyarakat Mulawarman (JKMM)*, *1*(2), 64–72. https://doi.org/10.30872/jkmm.v1i2.2961

Lita, K. V. N., Susilo, Joko, & Estiwidani, D. (2022). *Pengaruh Pembelajaran Daring Kelas Ibu Hamil terhadap Tingkat Kecemasan Ibu Hamil pada Era Pandemi COVID-19 di Puskesmas Cangkringan*. Poltekkes Yogyakarta.

Lucia, Sorongan, Purwandari, Atik, & Pesak, E. (2015). Pengaruh Pelaksanaan Kelas Ibu Hamil Terhadap Pengetahuan Tentang Persiapan Persalinan. *Jurnal Ilmiah Bidan*, *3*(1), 61–65. https://ejurnal.poltekkesmanado.ac.id/index.php/jidan/article/view/361

Madhavanprabhakaran, Girija Kalayil, D'Souza, Melba Sheila, & Nairy, K. S. (2015). Prevalence of pregnancy anxiety and associated factors. *International Journal of Africa Nursing Sciences*, *3*, 1–7. https://doi.org/10.1016/j.ijans.2015.06.002

Mayo Clinic. (2017). *Pregnancy Week by Week*. Https://Www.Mayoclinic.Org/Healthy-Lifestyle/Pregnancy-Week-by-Week/in- Depth/Pregnancy/Art-20046767?P=1. https://www.mayoclinic.org/healthy-lifestyle/pregnancy-week-by-week/in-depth/pregnancy/art-20046767?p=1

Notoatmodjo S. (2014). *Promosi Kesehatan, Teori Dan Aplikasi*. Rineka Cipta.

Nugroho, Rizki Nursofyanto, & Cahyanti, R. D. (2017). Hubungan Partisipasi Kelas Ibu Hamil Terhadap Tingkat Kecemasan Menghadapi Persalinan Pada Ibu Hamil Risiko Tinggi. *Diponegoro Medical Journal (Jurnal Kedokteran Diponegoro)*, *6*(2), 1166–1177.

Shodiqoh ER, & Syahrul F. (2014). Perbedaan Tingkat Kecemasan Dalam Menghadapi Persalinan Antara Primigravida dan Multigravida. *Jurnal Berkala Epidemiologi*, *2*(1), 141–150.

Silva-Jose, C., Nagpal, T. S., Coterón, J., Barakat, R., & Mottola, M. F. (2022). The 'new normal' includes online prenatal exercise: exploring pregnant women's experiences during the pandemic and the role of virtual group fitness on maternal mental health. *BMC Pregnancy and Childbirth*, *22*(1), 1–11. https://doi.org/10.1186/s12884-022-04587-1

Simbolon, Ganda Agustina Hartati, Urhuhe Dena Siburian, & Paruhum Tiruon Ritonga. (2021). Pengaruh Kelas Ibu Hamil terhadap Kecemasan Menghadapi Persalinan

pada Ibu Hamil Beresiko. *Jurnal Endurance : Kajian Ilmiah Problema Kesehatan*, *6*(1), 180–189. https://doi.org/https://doi.org/10.22216/jen.v6i2.38

Soma-Pillay, P, Nelson-Piercy, C., Tolppanen, H, & Mebazaa, A. (2016). Physiological changes in pregnancy. *Cardiovascular Journal of Africa*, *27*(2), 89–94. https://doi.org/http://doi.org/10.5830/CVJA-2016-021

Varney, H. (2018). *Varney's Midwifery*. Jones & Bartlett Learning.

Weiner EA, Billamay S, Partridge JC, & Martinez AM. (2011). 'Parents' Expectations about Participating in Antenatal Parenthood Education Classes.'. *J Perinatol*, *31*(2), 92–97.

Wu, H., Sun, W., Huang, X., Yu, S., Wang, H., Bi, X., Sheng, J., Chen, S., Akinwunmi, B., Zhang, C. J. P., & Ming, W. K. (2020). Online antenatal care during the COVID-19 pandemic: Opportunities and challenges. *Journal of Medical Internet Research*, *22*(7), 1–5. https://doi.org/10.2196/19916

Wulandari S.R, Melina F, Kuswanti I, Rosyad Y.S, & Rias Y.A. (2020). Respon Psikologi Perempuan Hamil Selama Masa Pandemi COVID-19. *Jurnal Kesehatan*, *11*(Spesial HKN).

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Systematic Review

The Effect of Birth Ball Therapy on the Intensity of Spontaneous Labor Pain

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ABSTRACT

Background: *Labor pain is physiological, with different intensities in each individual, and intermittent. Birth-ball exercises are more comfortable and safer in labor. The birth ball promotes maternal delivery by assisting the mother's posture and assisting the fetus's position to be optimal in order to facilitate the birth process under normal circumstances. This study aimed to define the effect of birth ball therapy on reducing pain intensity in spontaneous labor.*

Methods: *The method of determining the framework uses PICO. Google Scholar, Pubmed, Science Direct, and Sage Journal were used to search for literature. The inclusion criteria were an original experiment study published in English in 2017–2021. The terms "birth ball" and "labor pain" were used. The database was filtered using the PRISMA method until the relevant articles were obtained, then a content review and discussion were carried out.*

Results: *There were a total of 5 articles regarding the effect of birth ball therapy on spontaneous labor pain. This article mainly carried out birth ball therapy in first-time mothers. The assessment process used to measure pain intensity in this study used the Visual Analog Scale (VAS).*

Conclusion: *Giving birth ball therapy for 10–20 minutes three times a week can lower pain intensity in mothers with spontaneous labor.*

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INTRODUCTION

Labor is the process of birthing the fetus that occurs at term (37–42 weeks). Physiologically, pregnant women experience contractions that result in the thinning and opening of the cervix. In a normal delivery, the pain is intermittent. Attacks of pain begin at the peak of the contraction and disappear when the uterus relaxes (Isye et al., 2017).

Labor pain is a process of protection from the mother's body in childbirth to notify the mother of danger signs. It will increase sympathetic nerve activity and then cause changes in heart rate pressure, respiratory disorders, muscle tension, and stress (Rotenstein et al., 2022). Labor pain can also cause hyperventilation, increasing oxygen

demand and blood pressure, and decreasing bowel and bladder motility. These conditions can stimulate an increase in catecholamines that cause uterine inertia, prolonged labor, fetal distress, and maternal or fetal death (Solehati, 2018).

In the early stages of normal labor, the pain felt is driven by involuntary contractions of the uterine muscles. At the beginning of the labor process, the contractions felt by the mother tend to be in the lower back. The more advanced the labor process, the more pain the mother feels in her abdomen and back. Labor contractions generally last about 45 to 90 seconds. When labor progresses, the intensity of contractions increases, making the pain stronger (Reeder, 2011).

Pain management in labor can be done pharmacologically or non-pharmacologically. Non-pharmacological methods are easier and safer, one of them is birth ball therapy. Birth ball therapy is one of the non-pharmacological methods that can be used to reduce labor pain without using drugs.

A birth ball is a therapy carried out by the mother sitting on the ball during delivery. The birth ball encourages the mother's intense energy. They help the mother's posture to be upright to allow the fetus to be in an optimal position for childbirth under normal conditions (Sutriningish et al., 2019).

According to the description of the background above and several journals that discuss birth ball therapy, few literature reviews still examine the effect of a birth ball on pain in spontaneous birth. Thus, this study aimed to analyze the impact of birth ball therapy on spontaneous labor pain.

MATERIALS AND METHOD

This article is a systematic literature review concerning the Preferred Reporting Items for Literature Review and Meta-Analyses (PRISMA). The systematic review was carried out according to the PICO model, namely: P (patient, population, problem), I (intervention, prognostic factor, exposure), C (comparison, control), and O (outcome). The PICO formulations in this article are P (mother giving birth), I (birth ball therapy), C (articles reviewed without using a comparison intervention), and O (reducing labor pain).

Search for primary articles using an electronic database that aims to provide relevant articles. The databases used include Google Scholar, Science Direct, Pubmed, and Sage Journal. The keywords in the search for evidence-based research in this literature review are "birth ball" and "labor pain". The selected article is an article the author can download or open access to. The inclusion and exclusion criteria for the reports that the authors compiled in this literature review are presented in Tables 1 and 2.

The article search flow begins with collecting articles according to keywords from various databases. After checking for duplication of titles, the same title is eliminated from the article search process. The search is continued by eliminating articles with titles not relevant to the topic to be reviewed.

The selection is then followed by abstract screening according to the predetermined inclusion criteria, and pieces that do not match have been eliminated from the search process. Furthermore, articles were screened up to this stage and then rescreened through full-text screening. Reports that have met the inclusion criteria and have no problems with the research methodology are involved in the review process for further article evaluation.

RESULTS

Based on search results in Google Scholar, Science Direct, Pubmed, and Sage Journal with the keywords "birth ball" and "labor pain", the author found as many as 380 articles. The screening was completed, and 14 journals were obtained. A feasibility assessment of 31 full-text journals was carried out. However, because the journals did not follow the intervention and methodology, only five journals were reviewed according to applicable regulations (Figure 1).

Figure 1. The Stage for Article Selection

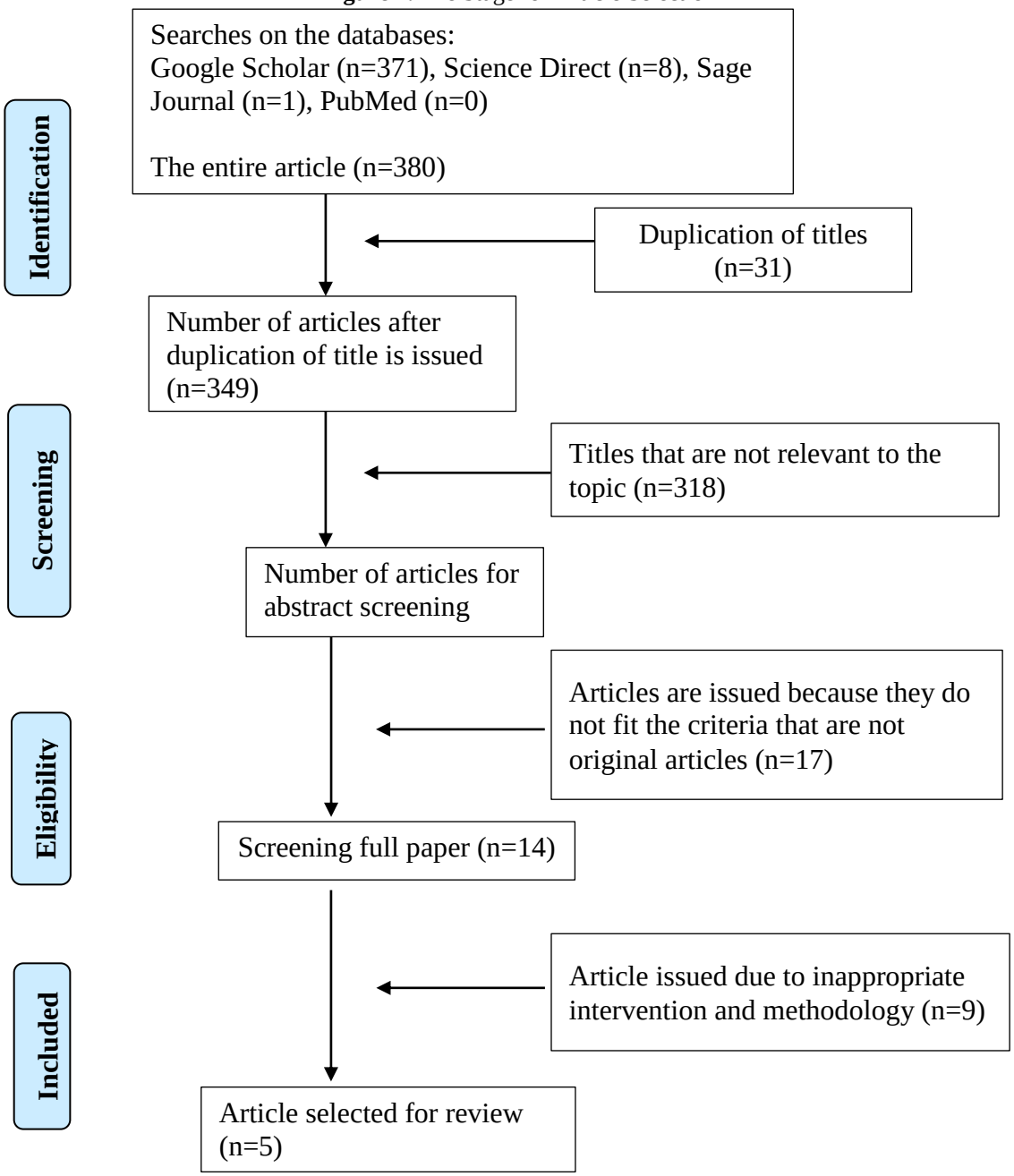

Table 1. Inclusion Criteria

Criteria	Inclusion
Period	Published less than 5 years (2017-2021)
Language	English
Subject	Mother giving birth
Article type	Original article, research article, and full text, experimental research
Research design	Experimental (RCT and Quasi Experiment)

Table 2. Exclusion Criteria

Criteria	Exclusion
Period	Published before 2017
Language	Indonesian and other than English
Subject	Not a mother giving birth
Article type	Review articles such as literature, systematic, meta-analysis, and similar article reviews
Research design	Non-experimental (review articles, descriptive research, and the like)

After assessing the quality of articles using The Joanna Briggs Institute (JBI) checklist for quasi-experimental studies (Tufanaru et al., 2020) and the checklist for randomized control trial studies (RCT) (Moola et al., 2017). The assessment process involves answering the question points contained in the questionnaire in accordance with the contents of the article in question using yes/no/unclear/not applicable answers. There are 13 question items for quasi-experimental research (nonrandomized).

The answer "yes" will get a value of 1 and the other answers will get a value of 0, then the result is divided by the total number of questions and multiplied by 100%. Good quality if the score is 80-100%, sufficient quality is 50-79%, and less quality <50%. The results of the article quality assessment are that the five articles have good quality, with a value of 92% for articles 1, 3, and 4, a value of 85% for article 2, which is an RCT-type article, and a value of 100% for article 5, which is a quasi-experimental article (Table 3).

Table 3. Randomized Controlled Trial Article Assessment

Items	Assessment			
	1	2	3	4
Was true randomization used for assignment of participants to treatment groups?	Y	Y	Y	Y
Was allocation to treatment groups concealed?	N	N	N	N
Were treatment groups similar at the baseline?	Y	Y	Y	Y
Were participants blind to treatment assignment?	Y	Y	Y	Y
Were those delivering treatment blind to treatment assignment?	Y	Y	Y	Y
Were outcomes assessors blind to treatment assignment?	Y	Y	Y	Y
Were treatment groups treated identically other than the intervention of interest?	Y	N	Y	Y
Was follow up complete dan if not, were differences between groups in terms of their follow up adequately described dan analyzed?	Y	Y	Y	Y

Items	Assessment			
	1	2	3	4
Were participants analyzed in the groups to which they were randomized?	Y	Y	Y	Y
Were outcomes measured in the same way for treatment groups?	Y	Y	Y	Y
Were outcomes measured in a reliable way?	Y	Y	Y	Y
Was appropriate statistical analysis used?	Y	Y	Y	Y
Was the trial design appropriate, dan any deviations from the standard RCT design (individual randomization, parallel groups) accounted for in the conduct dan analysis of the trial?	Y	Y	Y	Y

Table 4. Quasi Experimental Article Assessment

Items	Assessment
Is it clear in the study what is the 'cause' dan what is the 'effect' (i.e. there is no confusion about which variable comes first)?	Y
Were the participants included in any comparisons similar?	Y
Were the participants included in any comparisons receiving similar treatment/care, other than the exposure or intervention of interest?	Y
Was there a control group?	Y
Were there multiple measurements of the outcome pre dan post the intervention/exposure?	Y
Was follow up complete dan if not, were differences between groups in terms of their follow up adequately described dan analyzed?	Y
Were the outcomes of participants included in any comparisons measured in the same way?	Y
Were outcomes measured in a reliable way?	Y
Was appropriate statistical analysis used?	Y

Table 5. Results of Article Quality Assessment

Article Title	Writer	Year	Critical appraised RCT/Quasi experiment	Evaluation quality
Effect of Birth Ball Exercising for the Management of Childbirth Pain in Turkish Women	Aktaz D, Kolsuz S, Mukadder M, Besirli EG, Gundogan FR	2021	(12/13) 92%	Well
Effect of Pelvic Movement using Birth Ball and Listening to Nature sounds and Honey Syrup Consumption on Labor Pain in Nulliparous	Taavoni S, Charkamyani F, Hashemdabaghian F, Ekbatani N	2018	(11/13) 85%	Well

Article Title	Writer	Year	Critical appraised RCT/Quasi experiment	Evaluation quality
Women: A Randomized Clinical Trial				
Experience of Childbirth with Birth Ball: A Randomized Controlled Trial	Shirazi MG, Kohan S, Firoozehchian F, Ebrahimi E	2019	(12/13) 92%	Well
Effect of Birthball Usage on Profit Outcome and Perinatal Outcome	BSCS Jothirathne, UDP Ratanasiri	2021	(12/13) 92%	Well
Using of Birthing Ball during the First Stage of Labor: It's Effect on the Progress of Labor and Outcome among nulliparous Women	Farrag RE,	2018	(9/9) 100%	Well

Table 6. Summary of Article Review

Journal	Desain	Population	Intervention	Compare/Control	Results/Findings
Effect of Birth Ball Exercising for the Management of Childbirth Pain in Turkish Women	RCT	Sixty respondents aged 18-35 years, following routine check-ups and antenatal care, 35-week gestation, single pregnancy, normal birth weight with vertex position, planned spontaneous birth, maximum cervical dilatation of 2 cm, and delivery at term.	The birth ball therapy program includes eight exercises in 4 different positions: sitting, standing, kneeling, and squatting. Birth ball exercises are carried out once a week with a duration of 20-25 minutes in each session of the initial training program. Then proceed with exercise at least three times a week for 20 minutes at a time of 6-8 weeks.	The control group received no birth ball training and performed no birth ball exercises, only prenatal care (average 7-9 times) and routine hospital care.	The results showed that the pain of participants in the intervention group who applied birth ball training were lower than those in the control group when cervical dilatation was 4, 6, and 8 cm.
Effect of Pelvic Movement using Birth Ball and Listening to Nature sounds and Honey Syrup Consumption on Labor Pain in Nulliparous Women: A Randomized Clinical Trial	RCT	This study used a sample of 60 with the provisions of sampling that is in the age between 20-35 years old, gestational age 38-42 weeks, cephalic presentation, good physical and mental health, no history of infertility, vaginal delivery, cervical dilatation with a speed of 5 inches for less than 6 hours, no history of honey allergy, not afraid	In the birth ball intervention, the respondent moved the pelvis, tilted and rotated it, onward and back, and left and right in the birth ball. However, in this article, an intervention is added, namely, after birth ball therapy, followed by giving 150 ccs of water and 2.5 teaspoons of honey syrup every 60-30 minutes to provide energy. The intervention group respondents also heard natural sounds such as ocean waves,	The women in the control group received routine care in the same environment.	This article showed that the two groups differed in the mean pain score ($p = 0.001$). The severity of pain in the intervention group was lower than in the control group in the first 30 minutes to 120 minutes after the intervention. The severity of pain in the control group tended to increase.

Journal	Desain	Population	Intervention	Compare/Control	Results/Findings
		to listen to natural sounds like ocean waves, etc.	rain, and soothing birds through headphones to prevent distraction from the surrounding environment. For the volume of natural sounds to be heard, the respondents set their own according to their respective comfort levels. Pelvic movement intervention with a birth ball, listening to nature sounds.		The mean pain intensity in the intervention group was 7.61 ± 1.17 and in the control group was nine ± 0.0.
Experience of Childbirth with Birth Ball: A Randomized Controlled Trial	RCT	This research used a randomized controlled trial design with a total sample of 89 with a gestational age of 30-32 weeks, had a normal pregnancy, had no history of disease or complications based on standard prenatal lines.	In this study, the intervention used four types of positions with eight exercises being taught, including sitting, standing, kneeling, and squatting. The intervention was conducted approximately 20 minutes every three times a week for 6-8 weeks.	Routine standard intervention.	In this study, it was found that birth ball exercise significantly increased self-efficacy, labor pain in the intervention group was less than in the control group (p <0.001. Self-efficacy scores were higher in the intervention group.
Effect of Birth ball Usage on Profit Outcome and Perinatal	RCT	Total sample is 84 singleton pregnancy respondents, gestational age 24-30 weeks and primigravida.	The birth ball intervention was given by instructing the respondent to sit on the birth ball and move in a circle for at least 15 minutes.	The control group underwent routine labor management and was given analgesics when pain	In this study, it was found that birth ball exercise significantly reduced labor pain

Journal	Desain	Population	Intervention	Compare/Control	Results/Findings
Outcome			Respondents in the intervention group were also given a video clip demonstrating the birth ball exercise and leaflets related to the exercise.	relief was needed.	($p<0.001$). The average pain score recorded were 3.76 (intervention group) and 6.54 (control group)
Using of Birthing Ball during the First Stage of Labor: Its Effect on the Progress of Labor and Outcome among Nulliparous Women	Quasi experiment	The total sample was 120 people with normal low risk nulliparas, spontaneous delivery without anesthesia, late latent phase, healthy term more than 37 weeks gestation, singleton fetus, and cephalic presentation.	Birth ball exercises are given in several positions, namely a sitting position (pelvic rocking-forward and backward, sideways, and rocking), sitting with legs bent 90 degrees with legs outstretched. The next position is the squat position (leaning on the ball on the wall). After this teaching session, respondents were instructed to do birth ball therapy for an early stage of labor every hour for at least 10-20 minutes up to 10 cm dilatation.	The women in the control group just receiving the routine care of the hospital.	In the fifth article, the results of the pain level during the first stage of labor showed no difference between the two groups before the intervention $p = 0.07$ and 0.09. However, after the intervention during the active and transition phases, the intervention group experienced less pain with a statically significant difference compared to the control group.

DISCUSSION

This study consisted of five articles on birth ball exercises to reduce labor pain. Labor pain is a pain that all pregnant mothers feel. When the delivery mother focuses her attention on the pain, felt, it will affect her perception of pain, which will make the pain felt will increase.

Pain in this process needs good treatment and does not cause trauma and complications that interfere with childbirth (Sintya Dewi et al., 2020). Several studies mention interventions to reduce labor pain, one of which is birth ball therapy (Henderson, 2006). A birth ball is a ball therapy that helps mothers in the first stage of labor, and mothers can use various positions (Kurniawati et al., 2017).

Giving birth ball therapy in the first study Aktaz et al., (2021), the second Taavoni et al., (2018), the third Jothirathne & Rathnasiri, (2021), and the fifth (Farrag, 2018). The birth ball therapy program includes four types of positions with eight exercises taught, including standing (leaning forward on the ball and leaning on the ball against the wall, up and down), sitting (pelvic rocking, forward and backward, hula-hula, side to side, and rocking), squatting (leaning against the ball and wall), and kneeling (hugging the ball and swinging the hips). Birth ball exercises are carried out once a week, with a duration of 20–25 minutes in each session of the initial training program.

Then proceed with the activity at least three times a week for 20 minutes for 6–8 weeks. Meanwhile, in the fourth study Jothirathne & Rathnasiri, (2021), the birth ball intervention was given by instructing the respondent to sit on the birth ball and move in a circle for at least 15 minutes. While the second article Taavoni et al., (2018) added intervention after birth ball therapy, followed by giving 2.5 teaspoons of honey syrup in 150 ccs of water every 30–60 minutes to provide energy.

The intervention group respondents also heard natural sounds such as ocean waves, rain, and soothing birds through headphones to prevent distraction from the surrounding environment. For the volume of natural sounds to be heard, the respondents set their own according to their respective comfort levels. Those interventions continued from the active phase to the transitional phase.

From the research results of each journal, it was found that birth ball therapy can help pregnant women, especially primigravida and nulliparous women, reduce the intensity of spontaneous labor pain, especially during the first stage. One of the movements of birth ball therapy is to sit on the ball and rock to feel comfortable and help the improvement of labor using gravity while raising the curvature of the ball, stimulating the receptors of the hip that are responsible for producing endorphins (Kurniawati et al., 2017). Using a birth ball during labor prevents the mother from continuously being in a supine position and contributes to improving maternal self-efficacy during delivery, and reduces pain.

As much as 60% reported decreased pain levels after using birth balls, 8% said more pain than before, and 26% reported no change in pain levels (Gau, 2011). Mothers who can rest in time with uterine contractions will feel comfortable during the delivery process. In addition, the birth ball is handy for powerfully pushing the mother's energy needed during childbirth, and the fetus's position feels optimal, making it easier for normal birth.

Mothers sit as comfortably as possible, and the form of the ball that can alter the mother's body shape creates relaxation. In addition, ligaments and muscles, especially those in the pelvic area, become loose, reducing pressure on the sacroiliac joints,

bladder, back, waist, tailbone, and perineum (Irawati et al., 2019). Based on this theory, using a birth ball is one of the interventions to devastate pain during labor.

Besides relieving pain during the opening in the first stage, the birth ball also reduces the incidence of the prolonged first stage by revving the cervical opening, facilitating uterine contractions, enlarging the diameter of the pelvis, and revving the descent of the fetal head. So, it is recommended that pregnant women use the birth ball in labor (Maryani, 2016).

CONCLUSION

Based on the results and discussions described in the previous section, it can be concluded that birth ball therapy effectively reduces the intensity of pain in mothers who give birth spontaneously. Of the five articles that have been reviewed, the most common birth ball therapy interventions are sitting, standing, kneeling, and squatting. The intervention was performed for approximately 10–20 minutes, three times a week. The Visual Analog Scale (VAS) can use the pain assessment technique.

As for suggestions for other scientific writing related to the same topic, namely the effectiveness of birth ball therapy with other types of non-pharmacological treatment in lessening spontaneous labor pain. So that the advantages and disadvantages of each intervention can be seen and which intervention is more effectively used with a more profound and precise discussion.

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REFERENCES

Aktaz, D., Kolsuz, S., Ertugrul, M., Besirli, E. G., & Gundogan, F. R. (2021). Effect of birth ball exercising for the management of childbirth pain in Turkish Women. *Bezmialem Science*, *9*(1), 46–52. https://doi.org/10.14235/bas.galenos.2020.3898

Cunningham, F. (2012). *Williams obstetrics volume I Issue 23*. Jakarta: EGC.

Farrag, R. E. (2018). Using of birthing ball during the first stage of labor: Its effect on the progress of labor and outcome among nulliparous women. *International Journal of Nursing Didactics*, *8*(09), 01–10. https://doi.org/10.15520/ijnd.v8i09.2289

Gau, M.T. (2011). Effects of birth ball exercise on pain and self-efficacy during childbirth: A randomized controlled trial in Taiwan. *Midwifery*, 27(6), 293-300. doi: 10.1016/j.midw.2011.02.004

Hall, G. (2007). *Textbook of medical physiology*. Jakarta: EGC.

Henderson, C.J. (2006). *Midwifery concept textbook*. Jakarta: EGC.

Irawati, A., Susanti, S., & Haryono, I. (2019). Reducing labor pain with techniques birthing ball. *Journal of Smart Midwives (JBC)*, *2*(3), 129. https://doi.org/10.33860/jbc.v2i3.282

Isye, F., Rahmi, J., & Ayu, M. P. (2017). The effect of giving the birth ball method on the intensity of labor pain in the active phase of the 1st stage at BPM Siti Julaeha. *Mther And Child 5.2*, *5*(November), 102–109. https://doi.org/10.35971/jjhsr.v4i2.12495.

Jothirathne, B. S. C. S., & Rathnasiri, U. D. P. (2021). Effect of birth ball usage on labour outcome and perinatal outcome. *Sri Lanka Journal of Obstetrics and Gynaecology*, *43*(3), 174. https://doi.org/10.4038/sljog.v43i3.7963

Kurniawati, A., Dasuki, D., & Kartini, F. (2017). The Effectiveness of birth ball exercise on reduction of active phase I labor pain in primigravida. *Indonesian Journal of Nursing and Midwifery*, *5*(1), 1. https://doi.org/10.21927/jnki.2017.5(1).1-10

Maryani T, & Estiwidani D (2016). Terapi birth ball perpengaruh terhadap ama kala II dan intensitas nyeri persalinan pada ibu bersalin primigravida di RB Kasih lbu Yogyakarta. *Jurnal Kesehat Ibu dan Anak*. 2016;10(2):22–7.

Moola S., Munn Z., Tufanaru C., Aromataris E., Sears K., Sfetcu R., Currie M., Qureshi R., Mattis P., Lisy K.M.P.F. (2017). Checklist for analytical cross sectional studies. *Joanna Briggs Institute Reviewer's Manual*, 1–7. http://joannabriggs.org/research/critical-appraisal-tools.

Reeder, S.M. (2011). *Maternity nursing: women's, infant, & family health*. Jakarta: EGC.

Shirazi, MG, Kohan, S., Firoozehchian, F., & Ebrahimi, E. (2019). Experience of childbirth with a birth ball: A randomized controlled trial. *International Journal of Women's Health and Reproduction Sciences*, 7(3), 301–305. https://doi.org/10.15296/ijwhr.2019.50

Sintya Dewi, P. I., Aryawan, K. Y., Ariana, P. A., & Eka Nandarini, N. A. P. (2020). The intensity of latent phase I labor pain in intrapartum mothers using birth ball exercise. *Silampari Journal of Nursing*, *3*(2), 456–465. https://doi.org/10.31539/jks.v3i2.1050

Solehati, T. (2018). Non pharmacological therapy of pain in labor: Systematic review. *Muhammadiyah Journal of Nursing*, *3*(1). https://doi.org/10.30651/jkm.v3i1.1568

Sutriningish, DY., & Shaqinatunissa, A. (2019). Effect of birthball on labor pain. *Wellness and Healthy Magazine*, *1*(February), 125–132.

Taavoni, S., Charkamyani, F., Hashemdabaghian, F. & Ekbatani, N. (2018). Effect of pelvic movements using birth ball and listening to nature sounds and honey syrup consumption on labor pain in nulliparous women : A Randomized Clinical Trial. *World Family Medicine Journal/Middle East Journal of Family Medicine*, *16*(4), 97–102. https://doi.org/10.5742/mewfm.2018.93348

Tufanaru, C., Munn, Z., Aromataris, E., Campbell, J., & Hopp, L. (2020). Checklist for randomized controlled trials. *Joanna Briggs Institute*, 1–9. http://joannabriggs.org/research/critical-appraisal-tools.html

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Original Research

Determinant Factors Of Early Marriage On Adolescent Reproductive Health In Madura Island

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ABSTRACT

Background: *Early marriage is a problem at the national level in Indonesia. Madurese society has the second highest rate of early marriage in Madura, thus potentially causing poverty and health problems such as teenage pregnancy, labor pain, and death. This study aimed to determine the factors that influence adolescents' knowledge about early marriage.*

Methods: *The variables in this study are gender, education, and place of residence. The analysis in this study is to predict the outcome of the dependent variable, which is categorically based on one or more independent variables. The respondents to this study were teenagers aged 15–19. The number of respondents in this study was 100 respondents with random sampling. The instrument used is a questionnaire about early marriage. With significance criteria in the range r = 0.2000.543, table r = 0.362, and a confidence value of Cronbach's alpha = 0.823. The data were analyzed with the Chi-Square test.*

Results: *The results of the Chi-Square analysis obtained a p-value of 0.000 <0.05, which means that there is a significant relationship between education and knowledge about early marriage. Analysis of the relationship between the two variables shows an OR value of 0.09, meaning that adolescents with higher education have 0.09 times less knowledge of early marriage than adolescents with low education.*

Conclusion*: Access to information is a problem that affects the knowledge of adolescents about the risks of early marriage, so adolescents with low education have less knowledge about the risks of early marriage.*

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INTRODUCTION

Adolescent sexual activity in Indonesia is increasing, especially in East Java, where 23.9% of underage marriages occur among women in Indonesia (BKKBN, 2008). Data from the 2019 BKKBN shows that East Java has a higher number of women marrying early than at the national level, with women marrying at the age of 16–18 years with a percentage of 38.65%, women marrying at the age of 19–24 years with a percentage of 37.78%, and women who are married at the age of fewer than 16 years

with a percentage of 12.78%. One of the areas in East Java with a relatively high incidence of early marriage is in Rubaru District, Sumenep Regency, with a total of 123 cases in January–September 2019.

Mandala Village is the village with the highest number of early marriage cases in the Rubaru District, with a total of 23 cases. This number can increase because there are still teenagers who do not register their marriages with the KUA or village office (KUA Sumenep District, 2019). Early marriage can pose health risks to adolescents, such as teenage pregnancy, repeated pregnancies in adolescence, and morbidity and mortality due to pregnancy and childbirth in adolescents (Guzzo & Hayford, 2021).

Teenage pregnant women are also at high risk for experiencing pre-eclampsia and eclampsia, as well as giving birth to babies with low weight, premature babies or babies born prematurely, and babies dying at the age of less than 28 days (Permatasari and Suprayitno, 2021). According to research conducted by Scientific et al., (2021), the factors causing early marriage are socioeconomic status, socio-culture, education level, level of knowledge about reproductive health, parents, mass media, and culture or customs, especially in rural communities that have marriage habits (Suprayitno, Purnomo, Sutikno, & Indriyani, 2020). Youth and the belief that women who have experienced their first menstruation have the right to be married, and the belief that if a woman and a man are close or in a relationship, their parents' perception of them immediately takes the decision to immediately marry off their child to avoid adultery and gossip from neighbors (Misunas, Gastón, & Cappa, 2019).

The impact of early marriage on physical, mental, and community health. The health impact of early marriage on women is on their reproductive health because, at an early age, they are not ready to be fertilized, and if they are pregnant, they are usually vulnerable to abortion. If they are going to give birth, this will also have an impact on their health. has a major impact, causing bleeding that, if not treated properly, will result in death. on mothers and babies (Luo et al., 2020).

For the physical impact of early marriage, there will be many complaints because of the many activities that have never been done before and also the absence of readiness to become a mother and father, while the mental impact of early marriage or adolescence is both moral and mental readiness for facing married life still not enough (Isnaini and Sari, 2019). While the impact of the community or population aspect is early marriage, namely high fertility, a high population can result in a lack of development support in the field of community welfare (Nurseha Nurseha, 2019).

Efforts that have been made by the government to overcome the increasing number of early marriages include the passing of a bill on marriage, namely Bill No. 12 Article 73 Paragraph (1) of 2011, which stipulates that both men and women are married if they are at least 19 years old. Another effort that can be made is to provide health education about marriage and its impact in various aspects, including reproductive health, especially for women (Agus Wahyudin, 2016). The purpose of this study is to analyze the most dominant determinant influencing early marriage behavior based on the perspective of reproductive health in Rubaru, Sumenep Regency.

MATERIALS AND METHOD

This type of research is called survey research. The implementation of the study used a survey method because, in this study, data was taken from some of the units of analysis (samples) in the population. Furthermore, the sample was generalized to the

population and used a questionnaire as a means of collecting basic data. The variables in this study are gender, education, and place of residence as independent variables.

While the dependent variable is knowledge about the effects of early marriage on adolescent reproductive health, given a code of 0 if good and 1 if not good, code 0 to agree and code 1 to disagree. The analysis in this study is to predict the outcome of the categorical dependent variable based on one or more independent variables. The population of this study was teenagers aged 15–19 years, as many as 283. The number of respondents in this study was 100, with random sampling.

For the purposes of analysis, the age of adolescents is divided into 2 categories: 15–16 years old (early teens) and 17–19 years old (middle teens). The statistical analysis used the chi-square test. This study received a research letter Number: 025/SP2H/PEN-DI/LPPM/UNIJA/V/2021.

RESULTS

The description of the determinants of knowledge about early marriage in adolescents in Rubaru Village (based on the 2019 SKAP) can be seen in the table below: The results of research on the determinants of adolescent knowledge about early marriage and adolescent reproductive health in Rubaru Village, Sumenep Regency, are shown in Table 2 below:

Variable	Early Marriage Knowledge				OR	95%CI	Pvalue
	Good		Poor				
	n	%	n	%			
Age							
15-16 year	47	36,1%	71	90,5%	16,7	12,5-22,4	0,001
17-19 year	53	63,9%	29	9,5%			
Education							
Low	57		73	91,9%	2,51	2,01-3,12	0,001
High	43		26	8,5%			

Table 2 shows that almost all of the 15–16 year olds (90.5%) lack knowledge about the risks of early marriage, while more than half of those 17–19 years old (63.9%) have good knowledge about the risks of early marriage. From the results of the Chi-Square analysis, the p-value is 0.001 < 0.05, meaning that there is a significant relationship between age and knowledge about the risk of early marriage. Analysis of the relationship between the two variables showed an OR value of 16.7, meaning that those aged 15–16 years had 17 times the opportunity to have less knowledge about early marriage than those aged 17–19 years.

DISCUSSION

Based on education, the results of the study in Table 2 show that almost all of the 100 respondents who have low education, namely 74 respondents (91.9%), have less knowledge about the risk of early marriage. The results of the Chi-Square analysis obtained a p-value of 0.000 <0.05, meaning that there is a significant relationship between education and knowledge about early marriage. Analysis of the relationship between the two variables shows an OR value of 0.09, meaning that adolescents with higher education have 0.09 times less knowledge of early marriage compared to adolescents with low education.

The results of this study are in line with the results of Bawono's research in 2020, which shows that low education plays a role in the occurrence of early marriages in Madura (Bawono, Suminar, & Hendriani, 2019). Lesmayani's research also supports the results of research on the relationship between knowledge and early marriage in adolescents (Liesmayani, Nurrahmaton, Juliani, Mouliza, & Ramini, 2022). Theoretically, education is a determinant factor that has a relationship with knowledge about early marriage, the higher a person's education, the more able he is to be independent with something that concerns himself, be able to behave in a healthy way, easily accept new things, and adapt to new problems (Dianita Wahyusari, 2017).

Increased education has an impact on wider experience and insight. The age factor plays an important role in determining adolescent behavior and attitudes toward early marriage. Age affects a person's perception and mindset. The older they get, the more their grasping power and mindset develop, so that the knowledge gained gets better (Raudlatun, 2020). Most of the age's knowledge is obtained through the eyes and ears, namely through the process of experience and learning in education, both formal and informal.

Actions based on knowledge will be more lasting than those without knowledge (Oktavia et al., 2018). Early marriage is an underage marriage, in this case, the preparation of a child or teenager has not been fully maximized. As in mental, psychological, and even material preparation. When marriage is carried out at an early age, adolescents do not have sufficient knowledge about marriage and family and do not know how to manage conflict well (Umedjanova, Salikhov, & Salikhov, 2022). So that it will cause fights in the family, which will make the marriage less harmonious, even to the point of divorce (Everett S., 2012).

It is hoped that with high education, they can make decisions not to support early marriage in view of the risk of the impact of early marriage (Permatasari and Suprayitno, 2021). However, in this study, it was found that higher education also has a tendency to support disapproval of early marriage, this may be due to other factors that affect adolescent respondents in Banten, including customs and culture, environment, parenting patterns, socio-economic problems, or a lack of literacy in adolescents (Colquhoun & Nilan, 2020). If the youth's education is low, but their insight and literacy are broad, it can be one of the factors in the decline in agreeable attitudes toward early marriage (Narti, 2020).

Here, we need an important role from various cross-sectoral local government parties to maximize the coverage of electronic media in senior secondary schools to educate literacy skills in finding the right information so that teenagers can make the right decisions for themselves (Kurniasari, Hariastuti, & Pardiono, 2018). The results of other studies explain that early marriage is influenced by various factors, including the low level of adolescent education, which affects the mindset of adolescents in understanding the nature and purpose of marriage. Adolescents with low education affect the incidence of early marriage, the lower the education of adolescents, the lower their education level.

It is increasingly risky to carry out early marriage because of the lack of activities or daily activities of teenagers, so teenagers choose to do early marriage. And vice versa, the higher the education of the youth, the longer it will take to get married, so teenagers avoid marriage at an early age (Nurasiah, 2016). This study discusses the determinants of early marriage in adolescents' reproductive health. The difference with other studies is that, from several influencing factors, the most dominant influence is

sought in influencing early marriage on reproductive health. The research was conducted in Madura, East Java, where the highest number of early marriages was due to culture. in a village where there is still a tradition in a town in Madura.

CONCLUSION

Based on the results of the study, it can be concluded that age and education are significantly related to adolescent knowledge about the risk of early marriage. Due to time constraints, this study only took into account age and education variables that were associated with knowledge about the risk of early marriage. The hope in this research is that there is an effort to increase partnerships with schools for the community standby school program so that the BKKBN program is expected to be more effective and efficient because it is carried out simultaneously.

In addition, facilitating reading corners in strategic places that contain and provide literacy and technology-based population information can be an alternative solution. Another activity that can be done is to revive activities at the Youth Posyandu, which are integrated with the Puskesmas and the local Health Office. The target of reproductive health for adolescents certainly has its charm in creating healthy and intelligent adolescents.

In this case, the partnership of related institutions such as the BKKBN, the Ministry of Communication and Informatics, and the Ministry of Education and Culture is highly expected to provide support in making appropriate technology information media that is more easily accepted, such as making short films with the theme of Maturation of Marriage Age Education to support the implementation of Posyandu activities.

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REFERENCES

Agus Wahyudin, K. muqi'ah. (2016). Pernikahan Dini dan Pengaruhnya terhadap Keluarga di Kabupaten Sumenep Jawa Timur. *Jurnal Hukum Keluarga Islam, 1(1),* 34–49.

Bawono, Y., Suminar, D. R., & Hendriani, W. (2019). Low education and early marriage in Madura: a literature review. *The Journal of Educational Development, 7*(3), 166–172.

BKKBN. (2008). *Gender Dalam Ksehatan Reproduksi*. (Pusat Pelatihan Gender dan Peningkatan Kualitas Perempuan).

Colquhoun, L., & Nilan, P. (2020). Early marriage among Sasak boys in rural North Lombok. *Jurnal Studi Pemuda*, *9*(2), 150–162.

Dian Permatasari, E. S. (2021). Pendampingan Remaja Putri Tentang Kesehatan Reproduksi Dalam Mengurangi Tingkat Stres Pada Saat Keputihan Di Pesantren Almuqri Parenduan. *Jurnal Pengabdian Masyarakat Nusantara (JPMN), 1(1),*

31–35.

Dianita wahyusari. (2017). *Analisis Faktor-Faktor Yang Mempengaruhi Pernikahan Dini Di Kabupaten Sumenep Menggunakan Regresi Logistik Ordinal*.

Everett S. (2012). *Kontrasepsi dan Kesehatan Seksual Reproduksi*. (EGC,Jakarta).

Guzzo, K. B., & Hayford, S. R. (2021). Adolescent reproductive attitudes and knowledge effects on early adult unintended and nonmarital fertility across gender. *Advances in Life Course Research*, *50*, 100430.

Kurniasari, N. D., Hariastuti, I., & Pardiono, P. (2018). Pemahaman Remaja Tentang Kesehatan Reproduksi (Pernikahan Dini dan Perilaku Beresiko) di Sampang Madura. *Jurnal Komunikasi*, *12*(1), 74–85.

Liesmayani, E. E., Nurrahmaton, N., Juliani, S., Mouliza, N., & Ramini, N. (2022). Determinan Kejadian Pernikahan Dini Pada Remaja. *Nursing Care and Health Technology Journal (NCHAT)*, *2*(1), 55–62.

Luo, D., Yan, X., Xu, R., Zhang, J., Shi, X., Ma, J., … Sawyer, S. M. (2020). Chinese trends in adolescent marriage and fertility between 1990 and 2015: a systematic synthesis of national and subnational population data. *The Lancet Global Health*, *8*(7), e954–e964.

Misunas, C., Gastón, C. M., & Cappa, C. (2019). Child marriage among boys in high-prevalence countries: an analysis of sexual and reproductive health outcomes. *BMC International Health and Human Rights*, *19*(1), 1–16.

Narti, S. (2020). Faktor Yang Memengaruhi Kejadian Pernikahan Usia Dini Pada Remaja Putri Di Kecamatan Lembah Melintang. *Jurnal Kesehatan Global*, *3*(2), 55–61.

Nurasiah, A. (2016). Efektivitas Pendidikan Kesehatan Reproduksi Terhadap Pengetahuan Dan Sikap Pasangan Calon Pengantin Di Kantor Urusan Agama Kecamatan Kuningan Kabupaten Kuningan. *Jurnal of School Health*, *1*, 44–53.

Permatasari, D., & Suprayitno, E. (2021). Factors Affecting The Role Of Peer Counselors In Implementing Adolescent Reproductive Health Education In Sumenep District. *International Journal of Nursing and MidwiferyScience(IJNMS)*, *5*(Int. J. Nurs. MidwiferyScience(IJNMS)), 16–23.

Suprayitno, E., Purnomo, J. D. T., Sutikno, S., & Indriyani, R. (2020). Health education in principle of community affected teenagaer's smooking attitude and habitual in the coastal area of madura island indonesia. *International Journal of Psychosocial Rehabilitation*, *24*(10). https://doi.org/10.37200/IJPR/V24I10/PR300173

Umedjanova, M. L., Salikhov, S. M., & Salikhov, T. M. (2022). The Role of National Education in Preparing Young People for Family Life. *European Journal Of Innovation In Nonformal Education*, *2*(2), 271–276.

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Original Research

Formulation and Physical Evaluation of the Combination Syrup of Rosella (*Hibiscus sabdariffa* L.) and Lemongrass (*Cymbopogon citratus*)

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ABSTRACT

Background: *Rosella flowers and lemon grass are combined into one formulation, namely syrup. The benefits of this rosella and lemongrass combination syrup are to maintain the body's immune system, reduce high blood pressure, as a source of body antioxidants. The purpose of this study was to determine the formulation and evaluation test of formulation one and formulation two on rosella (Hibiscus sabdariffa L.) and lemon grass (Cymbopogon citratus) combination syrup preparations.*

Methods: *The type of research used is quantitative with a descriptive design. The syrup was made with two formulations using the boiling method with the composition of rosella, lemon grass, sucrose, and distilled water. The physical test for the syrup included the viscosity test, the pH test, the organoleptic test, and then the hedonic test which included color, smell, taste, and aroma.*

Results: *The results of the viscosity test on the combination of rosella and lemon grass syrup were that in formula one it was 1.39 mPas and in formula two it was 1.27 mPas. The results of the pH test on formula one were 2.47 and on formula two 2.48. The results of the organoleptic syrup test for the combination of rosella and lemongrass in Formula One had a deep brown-red color, a distinctive smell of rosella and lemongrass, and a sweet and sour taste. Formula two has a red-brown color with a distinctive rosella odor and has a sweet-sour taste. The hedonic test which has the most favorable results is the formula for two aromas 67%, taste 74%, color 80%, and texture 77%.*

Conclusion: *The viscosity value of the two formulas is quite low and the pH of the two formulas is also low, which is less than pH 4. The taste, aroma, and texture of Formula 2 are preferred. While the colors of the two formulas produce the same percentage of preference.*

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INTRODUCTION

Indonesia as a tropical country has a wide variety of plants that can be used as a source of food and medicine. Along with the development of science and human lifestyle, it has caused people to think that food not only provides benefits as a source of nutrients but also must be beneficial for health. Since the emergence of the Covid-19

virus, people have realized the importance of maintaining health. Many drinks are in demand by the public because they are believed to be able to maintain health. Some of the trending drinks are made from traditional spices which are believed to be able to maintain the body's immunity and body health.

Rosella (Hibiscus sabdariffa L.) on the petals of fresh rosella flowers are used for coloring and flavoring in the manufacture of wine, syrup, gelatin, and pudding. Dried rosella flower petals are often used to make tea, jelly, and syrup. The syrup is one type of drink that is much liked by the public so it has a very guaranteed market potential. The syrup is a kind of soft drink in the form of a thick sugar solution with various flavors (Eslaminejad and Zakaria, 2011).

Lemongrass is a plant that belongs to the grass family. This plant is known as lemongrass because it has a strong smell like lemon, often found growing naturally in tropical countries. Lemongrass can be used to lower high blood pressure, boost the immune system, maintain the digestive system, and relieve flu symptoms (Sutik and Pangestuti, 2022).

Rosella flowers and lemon grass are combined into one formulation, namely syrup. The syrup is a syrup which is a concentrated preparation made from a mixture of water and sugar with a minimum sugar solution content of 65% (SNI, 2013). Syrup cannot be drunk immediately, unlike ready-made drinks or other fruit juices, because the syrup must first be diluted with water. To add flavor to the syrup, coloring and citric acid can be added.

Syrup preparations must have quality standards, so after the formulation is made, physical tests need to be carried out. A physical test is a test in which product quality is measured objectively based on physical things that appear on a product. The physical test aims to determine whether the syrup preparations made are suitable for consumption or meet the standards (Husen, et al., 2015). Apart from the physical test, a hedonic test was also carried out. The hedonic test or hedonism test is a syrup test that is carried out using several random respondents. The extract syrup preparation was given to the respondent to try after that the questionnaire was filled in by the respondent. To determine the hedonic test or preference test on rosella and lemongrass combination syrup. The level of preference of respondents can be seen based on the aroma, texture, and taste parameters. The scale used is a numerical scale, namely 1 to rate strongly disagree, 2 to disagree, 3 to agree, and 4 to strongly agree (Sayuti and Agus, 2015).

There have been many studies on rosella syrup preparations, but research on the combination formulation of rosella syrup and lemongrass has not been available. Therefore, the authors are interested in researching the formulation and physical evaluation of a combination of rosella syrup (Hibiscus sabdariffa L.) and lemongrass (Cymbopogon citratus). Physical tests on syrup preparations consist of organoleptic tests, pH tests, and viscosity tests. In addition to physical evaluation of syrup preparations, hedonic tests can also be carried out. The hedonic test comes from the response of respondents who carry out tests consisting of color, taste, and smell tests (Fitriana, et al., 2022). This syrup preparation is useful for maintaining the body's immune system, lowering high blood pressure, and as a source of body antioxidants (Ministry of Health RI, 2011).

MATERIALS AND METHOD

This type of research is quantitative research. Quantitative research is a research method used to examine certain populations or samples. Data collection uses research

instruments, and data analysis that have a quantitative or statistical nature (Sugiyono, 2015). The design in this study uses a descriptive design. Descriptive research is research that provides a detailed description of a symptom based on existing data, presents data, analyzes, and interprets it (Narbuko and Achmadi, 2003). Data was collected using observation and questionnaires.

The main ingredients for making this syrup are dry simplicia of rosella flowers and wet simplicia of lemon grass stalks. Additional ingredients used for syrup formulation are sucrose and distilled water.

The tools used for the syrup formula are stoves, stainless steel pans, knives, stainless filters, basins, stirrers, scales, bottles, funnels, and temperature thermometers. The tool used to test the viscosity is the VT-03F rion viscometer. The tool used for organoleptic testing is to use the five senses. The tool used to test the pH is a pH meter. The tool used for hedonic testing is to use the five senses.

Extraction by boiling

150 grams of rosella flower simplicia in Formula One was extracted using the boiling method. Method of boiling method by heating distilled water in a stainless pan at 97◦C until it boils. Then put the simplicia into a stainless pot containing 500 ml of distilled water. The extract obtained was then filtered using a stainless filter. After that, save the decoction of the rosella flower simplicia in a bottle and close it tightly when it's cold.

Table 1. Rosella and Lemongrass Extract Syrup Formula

Component	Unit	Formula 1	Formula 2
Rosella extract	gram	150	100
Lemongrass extract	tree trunk	10	5
Aquadest	mL	12000	12000
Sucrose	gram	850	850

The formula for two rosella flower simplicia as much as 100 grams was extracted using the boiling method. The method of boiling with distilled water is heated in a stainless pan at 97◦C until it boils. Then put the simplicia into a stainless pot containing 500 ml of distilled water. The extract obtained was then filtered using a stainless filter. After that, save the decoction of the rosella flower simplicia in a bottle and close it tightly when it's cold. Formula one takes as many as 10 stalks of lemongrass and is then extracted by heating distilled water in a stainless pan at 97◦C until it boils. After boiling, add the lemongrass extract into 500 ml of distilled water. The extract obtained was then filtered using filter paper. Then store it in a bottle. The formula for two lemongrass was as many as 5 sticks and was then extracted by heating distilled water in a stainless pan at 97◦C until it boiled. After boiling, add the lemongrass extract into 500 ml of distilled water. The extract obtained is then filtered using filter paper, then stored in a bottle (Dirjen POM, 2011)

1. Syrup making
   Formula one Heat 200 ml of distilled water in a saucepan until it boils, then add 850 grams of sucrose, and stir until homogeneous. After that, put 625 ml of rosella flower extract and lemongrass stem extract in a stainless steel pot while stirring until homogeneous, then filter and put it in a glass bottle. Formula two Heat 200 ml of distilled water in a saucepan until it boils, then add 850 grams of sucrose, and stir until homogeneous. After that, add 625 ml of rosella flower extract and lemongrass stem extract into a stainless pot while stirring until homogeneous, then filter and put into a glass bottle.
2. Physical Evaluation
   a. Viscosity or viscosity test
      Performed using a viscometer VT-03F rion. The combination of rosella and lemon grass syrup formula in formula one and formula two to be tested was put into a 250 ml beaker glass. Run the viscometer and record the viscometer reading results displayed on the display in the form of speed viscosity, viscosity data, and percent viscosity
   b. pH test
      The pH meter is immersed in a combination of rosella and lemon grass syrup. Performed on formula one and formula two as much as 50 ml then let stand a few minutes and after seeing the results.
   c. Organoleptic test
      The test was carried out using observations of the shape, color, taste, and smell of 50 ml of formula one and formula two syrup combination of rosella and lemongrass.
3. Hedonic test
   Research using 30 respondents at random. Respondents will be given examples of rosella and lemongrass combination syrup formulations to try then questionnaires filled out by respondents to see the level of respondents' preference for syrup formula preparations based on parameters of shape, color, taste, and smell. by using a numerical scale, namely 1 to rate strongly disagree, 2 to assess disagree, 3 to agree, and 4 to strongly agree (Sayuti and Agus, 2015).
4. Data analysis
   The data analysis used in this study was univariate. Univariate analysis is an analysis performed for one variable or per variable. which aims to describe the results of the distribution and presentation of each variable (Notoatmojo, 2010).

RESULTS

Rosella and Lemongrass Extract Results

Dried rosella flowers in formula one as much as 150 grams when boiling produces 270 ml of rosella flower extract. In formula two, 100 grams of dried rosella flowers when boiled produce 270 ml of extract. The rosella flower extract obtained in formula one was dark brownish red in color and viscous, then for formula two the rosella extract obtained was brownish red in color and liquid. This extract will be used as the main ingredient for making syrup.

Wet lemongrass stems in formula one as many as 10 stems when boiling produces 350 ml of extract. In formula two, 5 stalks of wet lemon grass when boiled produce 350 ml of extract. The lemongrass stem extract obtained in formula one is green and liquid, then in formula two it is green and liquid. The extract obtained will be used as the main

ingredient in making syrup.

Physical Test of Syrup from Rosella and Lemongrass Ingredients
The syrup property test was carried out on two formulas which included a viscosity test, an organoleptic test, and a pH test.

1. Viscosity (Viscosity)
   The results of testing the viscosity of the rosella and lemon grass combination syrup in formula one was 1.39 mPas and in formula two was 1.27 mPas
2. Organoleptic
   Organoleptic tests included observing the shape, color, smell, and taste of the combined rosella and lemon grass extract syrup using the five senses. The results of the organoleptic test are as follows:

Table 2. Organoleptic test results

Organoleptic test	Formula I	Formula II
Form	Thick	Liquid thick
Color	Dark brown red	Red-brown
Smell	Typical of rosella and lemongrass	Typical of rosella and lemongrass
Flavor	Sweet and sour	Sweet acidity

3. pH test
   Based on the results of the degree of acidity (pH) test in formula one 2.47 and in formula two 2.48

Hedonic Test
The hedonic test was carried out by describing the panelists' preference for syrup which included (parameters of taste, aroma, color, and texture) using 30 respondents. The results of the hedonic test can be seen in Table 3.

Table 3. Formula I and II hedonic test results

Hedonic Test	Formula I		Formula II	
	Very like	Like	Very like	Like
Flavor	50%	50%	74%	26%
Smell	60%	40%	67%	33%
Color	80%	20%	80%	20%
Form	60%	40%	77%	33%

DISCUSSION

This rosella and lemon grass combination syrup uses two formulas. Formula One uses 150 grams of rosella flower extract, 10 stalks of lemon grass extract with additional ingredients of 1200 ml of distilled water, and 850 grams of sucrose. Then for formula two use 100 grams of rosella flower extract, 5 stalks of lemongrass extract, with additional ingredients of 1200 ml of distilled water and 850 sucrose.

Using this formula is based on a modification from Palimbong (2020). The way to make this syrup is different from making Palimbong 2020 because the way the syrup is made is the ingredients are macerated for 48 hours before making the syrup. Then when making boiling syrup, it was done with variations of 60 minutes, 90 minutes, and 120

minutes. The formula used in this journal is different from that made.

According to Palimbong (2020), the ingredients used are 250 grams of ginger, 100 grams of secang wood, 1 cinnamon stick, 5 lemongrass sticks, and 7 cloves. Meanwhile, the syrup formula made is different because the method of making rosella and lemongrass combination syrup uses the method of boiling for 15 minutes. With the ingredient formula, formula one uses 150 grams of rosella flowers and 10 stalks of lemongrass, then in formula two, 100 grams of rosella flowers and 5 stalks of lemongrass.

How to make a combination of rosella and lemon grass syrup using the boiling method. This syrup uses the non-intrusive method of boiling so that people can also make this syrup. In making this syrup using additional ingredients 1200 ml of distilled water and 850 grams of sucrose. Using sucrose 850 because the syrup must contain 55-65% sugar (SNI, 2013), this syrup already contains 65% sugar in it.

Making this syrup uses a temperature of 97^{o}C, this temperature is based on the Palimbong. So that the temperature is maintained, Place the thermometer in the syrup during the manufacturing process, and always pay attention to the size of the fire so that the temperature is maintained properly. Boil using a stainlesssteel pan. Use a stainlesssteel pan because the metal material used does not react with the material being boiled (Suharmiati, 2005). Of all the main ingredients and additional ingredients, the result is a combination of rosella and lemongrass syrup, which is 1250 ml.

Physical Test in the form of Viscosity test on formula one syrup has a value of 1.39 mPas and on formula two has a value of 1.27 mPas. The results of the viscosity of this syrup are different because it is influenced by the ingredients used, namely rosella. Formula one with 150 grams of rosella produces a thick extract then formula two with 100 grams of rosella produces a liquid extract. Based on these results, SNI has not determined the normal value of syrup viscosity.

According to the journal from Palimbong (2020), the results of the viscosity test carried out were that Formula 1 had a value of 163.33, Formula 2 had 170, and Formula Three had 26.67. The results of the average value of the Secang syrup above are affected by the boiling time. The results of the syrup viscosity can be affected by the addition of CMC ingredients to the syrup which aims to thicken.

However, in making this syrup CMC is not used, only sugar is used as a thickener in the syrup. The minimum sugar solution level in syrup is 65% (SNI, 2013). In addition to being used as a sweetener, sugar is also used as a source of solids so that it can increase the viscosity of the syrup (Hasni, et al. 2017). In this study, the sugar contained in the syrup complied with SNI, namely 65%.

The pH of the syrup resulted in formula one of 2.47 and formula two had a pH of 2.48. In the rosella and lemongrass combination syrup, the pH obtained is not by the SNI, because the syrup has a pH value that ranges from 4-7 (Ministry of Health RI, 1995). This syrup has a low pH because of the high acid content (low pH) accompanied by high total dissolved solids, this can be said to be a food preservative (Prichard, et al 1985).

In addition, low pH also occurs because rosella contains a very large anthocyanin pigment, especially in determining color, at low pH anthocyanin acid has a red color (Sugiyono, et al 1992). If anthocyanins are high, the antioxidants contained will increase (Lestario et al, 2002). High antioxidants are very beneficial for human immunity.

The hedonic test was carried out on 30 trained respondents. The purpose of

selecting these trained respondents was because the respondents had previously known about the hedonic test and had done it before. The results of the hedonic test showed differences in response between each parameter of the rosella and lemon grass combination syrup.

Taste is one of the factors in determining the quality of food or drink. The food or drink served must have a taste that can react to affect the senses so that it can cause an appetite to eat or drink (Tarwendah, 2007). The results for formula one syrup were 50% and 50%, then for formula two the flavors were 74% and 26%. Based on the table above, the flavor that the panelists liked the most was formula two, with the amount of ingredients 100 grams of rosella and 5 stalks of lemongrass by boiling method and using a temperature of 97°C.

In these results, formula two is preferred because it has a sweet and sour taste, this can be compared with the journal "Vitamin C Content, Physical Quality, pH and Organoleptic Quality of Rosella Syrup (Hibiscus sabdariffa, L) Based on Extraction Method". The sour taste contained in rosella syrup extracted by heating will disappear, this is because the organic acids contained in rosella are lost as a result of the heating process and some of the acids are still present in the ingredients because the ingredients are not destroyed which results in the addition of sour taste sugar contained in the syrup is lost (Mukaromah, et al 2010).

Aroma is an odor caused by chemical stimuli that can be smelled by the olfactory nerves located in the nasal cavity which can function to increase appetite (Negara et al., 2016). The results of the aroma in the syrup in formula one liked the aroma of 60% and 40% and formula two liked the aroma of 67% and 33%. Based on the results above, the panelists preferred the aroma of formula 2 syrup.

In the second formula, the measurement of rosella ingredients is 100 grams and 5 stalks of lemon grass using the boiling method and using a temperature of 97°C. Formula Two prefers the scent because it has the right ratio and produces a fragrant aroma that the panelists like. This is because rosella flowers do not have the distinctive aroma of other flowers such as jasmine, roses which have a pleasant aroma and are liked by the panelists (Mukaromah et al, 2010).

Color is a sensory that can be seen directly by the panelists, the determination of the color of food or drink depends on the color it has. Attractive and natural colors can enhance taste (Negara et al., 2016). The results of the hedonic test on syrup have a color in formula one which is 80% and likes 20% and formula two has a color that likes 80% and likes 20%. The results of testing the two panelists' syrup formulas both liked it because the results showed the same value. The results of the study can be compared with the journal "The Influence of Rosella Raw Material Preparation and Cooking Time on the Antioxidant Activity of Rosella Flower Syrup (Hibiscus sabdariffa L.)".

The use of dried rosella flowers produces a syrup with a pale red color. This is because, in rosella flowers that received the drying treatment, there was degradation or damage to compounds such as gossypetin, anthocyanin, and hibiscin glucosides and a decrease in antioxidant activity due to the drying process. This decrease in antioxidant activity will certainly cause a decrease in anthocyanin content (Hartiati, 2009).

Texture is the result of the response of the senses of taste and touch to physical stimulation when contact occurs between the oral cavity and food or drink. Texture consists of the thickness or viscosity used for liquids (Tarwendah, 2017). Based on the tests conducted on the combination syrup of rosella and lemon grass, the results showed a very like texture of 60% and a liking of 40%, and formula two liked a texture of 77%

and a liking of 23%. In the hedonic test results, the favorite rite texture is formula two. In the second formula, the dose of rosella flowers is 100 gr,ams, and 5 stalks of lemon grass using the boiling method ing a temperature of 97^{o}C. Due to the use of ingredients and sugar in good proportions, the panelists liked the texture.

CONCLUSION

Based on the results of the study with physical tests and hedonic tests on the combination of rosella and lemongrass syrup that had been carried out, it was concluded that the physical test results of the viscosity test on the combination of rosella and lemongrass syrup were in formula one which was 1.39 mPas and in formula two was 1.27 mPas. The results of the pH test on formula one were 2.47 and on formula two 2.48. This syrup has a low pH because rosella contains a very large anthocyanin pigment, especially in determining color, at low pH anthocyanin acid has a red color (Sugiyono, et al 1992). The organoleptic test results for the combination of rosella and lemongrass syrup in formula one had a deep brown-red color, a distinctive rosella and lemongrass odor, and a sweet and sour taste. Formula two has a red-brown color with a distinctive rosella odor and has a sweet-sour taste.

The hedonic test results on the aroma of syrup in formula Oneriked 60% and liked 40%, formula Formula Twoliked 67% and liked 33%, the taste of formula One really liked 50% and liked 50%, formula two liked it 74% and likes 26%. The color in formula one likes 80% and likes 20%, formula two has a color that likes 80% and likes 20%. Formula one likes texture 60% and likes 40%, formula two likes texture 77% and likes 23%

REFERENCES

Azwar, Saifuddin. (2007). ikap Manusia. Teori dan Pengkurannya. Edisi ke-2. Yogyakarta: Pustaka Pelajar.

Badan Standarisasi Nasional Indonesia. (2013). SNI Sirup 3544:2013.

Bastanta, D., Karo-karo, T., & Rusmarllin, H. (2017). Pengaruh perbandingan sirsak dengan sari bit dan konsentrasi gula terhadap sirup sabit. Jurnal. Rekayasa Poangan dan Pertanian

BPOM RI. (2010). Serial Data Ilmiah Terkini Tumbuhan Obat : Rosella (Hibiscuss sabdariffa L,). Direktorat Obat Asli Indonesia. Badan Pengawas Obat Dan Makanan Republik Indonesia. Hal 2.

BPOM RI. (2010). Acuan Sediaan Herbal. Direktorat Obat Asli Indonesia. Jakarta: Badan Pengawas Obat dan Makanan Republik Indonesia Vol. 5 : 30-31.

Charter JS. (1997). Dispensing for Pharmaceutical Student. Edisi ke-12. Medical: London (10), 186-187.

DepKes RI. (1995). Farmakope Indonesia Edisi IV. Jakarta: Departemen Kesehatan RI.

Dirjen POM. (2000). Parameter Standar Umum Ekstrak Tumbuhan Obat. DepKes RI, Jakarta.

Eslaminejad T, and Zakaria M. (2011). Morphological characteristics and pathogenicity of fungi associated with Roselle (Hisbiscus sabdariffa L.) diseases in Penang, Malaysia: Microbial Pathogenesis, 51(5): 325-337

Fitriana, M., Halwany, W., Kartika, Y., Anwar, K., Siswadi, Rizki, M.I., Rahmanto, B., Andriani, S. (2022). Formulasi dan uji stabilitas sirup ekstrak etanol daun tanaman penghasil gaharu (Aquilaria microcarpa Baill.). Jurnal Riset Industri Hasil Hutan Vol.14, No.1, 33 – 42.

Handayani, S. (2011). Pembuatan Sirup Markisa dan Terong Belanda (Martebe) Sebagai Sumber Vitamin C Bagi Tubuh. [Skripsi]. Fakultas Teknik Universitas Negri Yogyakarta. Yogyakarta.

Hadiwijaya, H. (2013). Pengaruh perbedaan penambahan gula terhadap karakteristik sirup buah naga merah (Hylocereus polyrhizus). Jurnal. Fakultas Teknologi Pertanian: Universitas Andalas.

Hartiati, A., Sri, M., & Made, D. P. (2009). Pengaruh preparasi bahan baku rosella dan waktu pemasakan terhadap aktivitas antioksidan sirup bunga rosella (Hisbiscus sabdariffa L.). Jurnal Argotekno, 15(1), 20-24.

Hasni, D., Rohaya, S., & Supriana, N. (2017). Kajian pengolahan sorbet campuran terong belanda dan buah bit sebagai produk pangan fungsional. Jurnal Sagu, 16(1), 21- 27.

Husen, R.W.M., Yamlean, P.V.Y, Citraningtyas, G. (2015). Formulasi Dan Evaluasi Sirup Ekstrak Daun Sidaguri (Sida rhombifolia L.). Pharmacon Jurnal Ilmiah Farmasi – Unsrat, Vol. 4 No. 3, 2302-2493.

Kesehatan Surakarta. KemenKes RI. (2011). Vademekum Tanaman Obat Untuk Saintifikasi Jamu Jilid II. Jakarta: Kementrian Kesehatan RI.

Lamlertthon, S., Luangharumitchai, S., & Tiyaboonchai, W. (2007). Aktivitas Antimikroba Minyak Esensial Terhadap Lima Strain Propionibacterium acnes. Jurnal. Ilmu Farmasi Universitas Mahidol, 34 (1-4), 60-64

Lestario, L. N., Herawati, D., & Andini, S. (2016). Pengaruh Konsentrasi Alginat dan CaCl2 terhadap Kadar Antosianin, Aktivitas Antioksidan, dan Karakteristik Sensoris Buah Duwet (Syzygium cumini Linn) Restrukturisasi. Agritech, 36(3), 261-269.

Maryani, Herti, dan Kristiana, Lusi. (2008). Khasiat dan Manfaat Rosella rev. Jakarta: PT. Agro Media Pustaka.

Ministry of Health. (2011). Vademekum Tanaman Obat Untuk Saintifikasi Jamu Jilid II. Jakarta.

Muhlisah, Fauziah. (1999). Tanaman Obat Keluarga. Jakarta: Penebar Swadaya.

Mukaromah Ummu, Sri Hetti Susetyorini, Siti Aminah., 2010, Kadar Vitamin C, Mutu Fisik, pH dan Mutu Organoleptik Sirup Rosella (Hibiscus sabdariffa, L) Berdasarkan Cara Ekstraksi. Jurnal Pangan Dan Gizi : Universitas Muhammadiyah Semarang Vol. 01.

Murrukmihadi, M,. Wahyono, S,Marchhaban, Martono, S., 2011, Optimasi Formulasi Sirup Fraksi Tidak Larut Etil Asetat Yang mengandung Alkaloid dari Bunga Kembang Sepatu (Hibiscus rosa-sinensis L.), Majalah Obat Tradisional, Fakultas Farmasi Universitas Gadjah Mada Yogyakarta, 16(2): 101-108.

Narbuko, C., & Achmadi, A. (2003). Metode Penelitian Kualitatif (ed2). Bandung: PT. Remaja Rosda Karya.

Negara, J. K., Sio, A. K., Rifkhan, R., Arifin, M., Oktaviana, A. Y., Wihansah, R. R. S., & Yusuf, M. (2016). Aspek mikrobiologis, serta Sensori (Rasa, Warna, Tekstur, Aroma) Pada Dua Bentuk Penyajian Keju yang Berbeda. Jurnal Ilmu Produksi dan Teknologi Hasil Peternakan, 4(2), 286-290.

Notoadmojo. (2010), Ilmu Perilaku Kesehatan. Jakarta : Rineka Cipta.

Palimbong Sarlina, Gera Mangalik, Alifia Lilla Mikasari, (2020). Pengaruh Lama Perebusan Terhadap Daya Hambat Radikal Bebas, Viskositas dan Sensori Sirup Secang (Caesalpinia Sappan L.). [Jurnal] Fakultas Kedokteran dan Ilmu Kesehatan : Universitas Kristen Satya Wacana.

Prichard, P. J., Yeomans, N. D., Mihaly, G. W., Jones, D. B., Buckle, P. J., Smallwood, R. A., & Louis, W. J. (1985). Omeprazole: a study of its inhibition of gastric pH and oral pharmacokinetics after morning or evening dosage. Gastroenterology, 88(1), 64-69.

Sayuti, N. A, & Agus, W., (2015). Stabilitas Fisik dan Mutu Hedonik Sirup dari Bahan Temulawak (Curcuma xanthorrhiza Roxb.). Surakarta: Politeknik Kesehatan Kementrian.

Sayuti, N. A., & Winarso, A. (2014). Stabilitas fisik dan mutu hedonik sirup dari bahan temulawak (Curcuma xanthorrhiza roxb). [Jurnal] Ilmu Farmasi dan Farmasi Klinik, 11(1), 47-53.

Simanjuntak, M, R. (2008). Ekstraksi dan Fraksinasi Komponen Ekstrak Daun Tumbuhan Senduduk (Melastoma Malabathricum L.) serta Pengujian Efek Sediaan Krim Terhadap Penyembuhan Luka Bakar. Medan: Farmasi. Universitas Sumatera Utara.

Sugiyono, M. T., & Ayustaningwarno, F. (1992). Ilmu pengetahuan bahan pangan.

Depdikbud Jendral Pendidikan PAU Pangan Dan Gizi. Bogor: IPB.

Sugiyono. (2015). Metode Penelitian Pendidikan :Pendekatan Kuantitatif, Kualitatif, dan R&D. Alfabeta.

Suharmiati, H. L. (2005). Cara Meracik Obat Tradisional. Penerbit Agromedia. Jakarta.

Sutik & Pangestuti, R. (2022). Rebusan Air Serai Efektif Menurunkan Tekanan Darah Pada Penderita Hipertensi Di Posyandu Lansia Desa Turus. Jurnal Penelitian Keperawatan Vol 8. (2), 203-211.

Tarwedah, I. P. (2017). Jurnal review : studi kompetensi atribut sensoris dan kesadaran merk produk pangan comperative study of sensory attributes and brand awareness in food product: a review. Jurnal Pangan dan Agroindustri, 5(2), 66-77.

Voight. (1995). Buku Pembelajaran Teknologi Farmasi. Diterjemahkan oleh Dr. ref. nat. Soendani., apt. Jogjakarta: Universitas Gajah Mada.

Winarno. (2010). Enzim Pangan. Jakarta: Gramedia Pustaka Utama.

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Original Research

Ginger Stew Vs Warm Compress Toward Dysmenorrhea Intensity In Adolescent; Experimental Study

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ABSTRACT

Background: *Adolescence can be defined as a developmental phase characterized by the transition from childhood to adulthood, usually during this period marked by changes in physiology, psychology, mental, emotional, and social. The transition signs in females indicate that they are experiencing menstruation. Menstruation can cause dysmenorrhea in some individuals, leading to disruptions in their daily activities. Ginger stew compress, or warm compress, is a non-pharmacological therapy that can help alleviate dysmenorrhea.*

Methods: *This was quantitative research using a quasi-experiment design with a two-group pretest-posttest approach. The participants were selected using a simple random sampling technique, resulting in a sample of 44 respondents divided into two groups. The instrument in this study was an observation sheet containing the identity of the respondent, and the scale to determine the level of pain intensity experienced was the Numeric Rating Scale (NRS).*

Results: *This research indicates that there was a significant difference in dysmenorrhea intensity when using a ginger stew compress compared to a warm compress. The statistical analysis used was an independent sample t-test performed in the study with a* p*-value that was lower than 0.05 (Asymp.Sig 2-tailed = 0.015), indicating a significant difference between the two types of compresses, giving a ginger stew compress and a warm compress toward the intensity of dysmenorrhea.*

Conclusion: *The ginger stew compress is more effective than the warm water compress to reduce the intensity of dysmenorrhea in adolescent girls in grade 7 at 2 JHS Gantiwarno. It is hoped that the results of this research can be utilized as an additional reference regarding research on treating menstrual pain with boiled ginger water compresses and warm compresses.*

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INTRODUCTION

Menstruation is the periodical bleeding of the uterus due to the shedding of the endometrium layer. Uterus muscle contractions interfere with the bloodstream into the

uterus and cause pain during menstruation, known as dysmenorrhea (Pangastuti et al., 2018). Uncomfortable menstruation was caused by dysmenorrhea, which is typically felt in the lower abdomen (Sarwono, 2011). There are two approaches to pain management: pharmacological and non-pharmacological. Non-pharmacological treatments, such as warm compresses, hypnotherapy, physical exercise, and herbal therapy (such as ginger), can be used to alleviate dysmenorrhea (Smeltzer & Bare, 2013; Lia, 2018).

Anurogo (2011), as cited in Betty & Ayamah (2021), reported that various plant-based ingredients, including ginger (Zingibers Officinale Rosc), can be relied upon to alleviate pain. Ginger contains oleoresin, such as gingerol, which has antioxidant properties that are even more potent than vitamin E. Gingerol also acts as an anticoagulant, which can help prevent blood clots and facilitate the flow of menstrual blood.

Furthermore, the decrease in prostaglandin production can be effected by ginger, which is one of the main culprits behind dysmenorrhea. Oleoresin in ginger works by inhibiting the *cyclooxygenase* (COX) reaction, thereby reducing inflammation and relieving uterine contractions. In addition to ginger, a warm compress is another non-pharmacological therapy that can alleviate dysmenorrhea.

Oktaviana & Imron (2017) have explained that a warm compress is a non-pharmacological treatment that effectively reduces dysmenorrhea. Applying a warm compress with a cloth or towel causes conduction of heat from the compress to the stomach, leading to blood vessel dilation and a reduction in muscle tension. A warm compress is considered to be the most effective method for reducing pain.

According to a preliminary study by researchers at 2 JHS Gantiwarno, 80% of 10 girls interviewed in grade 7 reported experiencing dysmenorrhea. Surprisingly, none of them knew the benefits of using ginger stew and warm compresses to alleviate their dysmenorrhea. Respondents deal with dysmenorrhea by sleeping or resting, drinking herbs, and taking medicine. The aim of this study was to investigate whether there is a difference in the intensity of dysmenorrhea for grade 7 students at 2 JHS Gantiwarno when using a ginger stew compress or a warm compress.

MATERIALS AND METHOD

A quantitative research method was used in this study with a quasi-experimental design and a two-group pretest-posttest approach. In particular, this study involved an experimental group and a control group (comparison), but prior observations (pretests) had been carried out, which allowed researchers to examine the changes that occurred after applying the experiment (program) (Sugiyono, 2017). This study consisted of grade 7 adolescent girls who experienced dysmenorrhea at 2 JHS Gantiwarno Klaten, totaling 50 individuals as a population. Simple random sampling was used to select a sample of 44 girls who were divided into two groups: the ginger stew compress group and the warm compress group.

This research focused on two variables, namely ginger stew compress and warm compress. The primary data was collected through direct observation of respondents and observation sheets of grade 7 adolescent girls at SMP Negeri 2 Gantiwarno. To collect data, the *Numeric Rating Scale* (NRS) pain scale was utilized. The data analysis involved descriptive univariate analysis, which calculated the frequency distribution, and bivariate analysis, which utilized the *sample-independent T-test* statistical test.

RESULTS

Analyzes Univariat

The purpose of the univariate analysis was to provide the percentage frequency distribution of the variables under study, such as the characteristics of the respondents, such as their age, age at menarche, and duration of menstruation.

Table 1. Characteristics Respondents in Group 1 (Ginger Stew Compress) and Group 2 (Ginger Compress)

Rusteristics	Group 1		Group 2	
	N	%	N	%
Age (Years)				
12	3	13,6%	4	18,2%
13	16	72.7%	12	54,5%
14	3	13,6%	6	27,3%
Sum	22	100%	22	100%
Menarche Age (Years)				
11	7	31,8%	7	31,8%
12	15	68,2%	15	68,2%
Sum	22	100%	22	100%
Length of Menstruation (Days)				
5	2	9,1%	1	4,5%
6	4	18,2%	6	27,3%
7	14	63,6%	14	63,6%
8	2	9,1%	1	4,5%
Sum	22	100%	22	100%

According to Table 1, most of the respondents in both groups were 13 years old, with Group 1 having as many as 16 respondents (72.7%) and Group 2 having as many as 12 respondents (54.5%). In terms of the age at menarche, the majority of respondents in both groups experienced it at the age of 12, with 12 respondents (68.2%) in group 1 and 15 respondents (68.2%) in group 2. Regarding the duration of menstruation, the majority of respondents in both groups experienced it for 7 days, with 14 respondents (63.6%) in group 1 and 14 respondents (63.6%) in group 2. Finally, in terms of BMI, the majority of respondents in both groups were in the normal category, with 11 respondents (50.0%) in each group.

Table 2. Pretest and Posttest menstrual Pain Intensity Levels in the Ginger Boil Water Compress Group

Intensity Level of menstrual Pain	*Pretest*		*Posttest*	
	Sum	Present (%)	Sum	Present (%)
0	0	0	2	9,1%
1	1	4,5%	5	22,7%
2	2	9,1%	8	36,4%
3	4	18,2%	4	18,2%

Intensity Level of menstrual Pain	*Pretest*		*Posttest*	
	Sum	**Present (%)**	**Sum**	**Present (%)**
4	4	18,2%	3	13,6%
5	6	27,3%	0	0
6	5	22,7%	0	0
7	0	0	0	0
8	0	0	0	0
9	0	0	0	0
10	0	0	0	0
Sum	22	100%	22	100%

Table 2 shows that the most reported dysmenorrhea intensity before using Ginger Stew Compress was a pain scale of 5 by 6 respondents (27.3%). The lowest pain scale reported was 1, reported by only 1 respondent (4.1%), while the highest scale was 6, reported by 5 respondents (22.7%). After using the ginger stew compress, the most dysmenorrhea intensity was reported on a pain scale of 2 by 8 respondents (36.4%). The lowest pain scale reported was 0, indicating no pain, reported by 2 respondents (9.1%), while the highest pain scale reported was a pain scale of 4 by 3 respondents (13.6%).

Table 3. Pretest and posttest Menstrual Pain Intensity Levels in the Warm Compress Group

Intensity Level of Menstrual Pain	*Pretest*		*Posttest*	
	Sum	**Present (%)**	**Sum**	**Present (%)**
0	0	0	0	0
1	0	0	7	31,8%
2	1	4,5%	6	27,3%
3	4	18,2%	7	31,8%
4	6	27,3%	2	9,1%
5	7	31,8%	0	0
6	4	18,2%	0	0
7	0	0	0	0
8	0	0	0	0
9	0	0	0	0
10	0	0	0	0
Sum	22	100%	22	100%

Table 3 shows that the most reported intensity of dysmenorrhea before using a warm compress was on a scale of 4 by 7 respondents (31.8%). The scale of pain with the fewest respondents was scale 1 with 1 respondent (4.5%), while the biggest pain scale

was 6 reported by 4 respondents (18.2%). After using a warm compress, the most reported intensity of dysmenorrhea was on a scale of 1 and 3 each by 7 respondents (31.8%). The lowest pain scale reported was 1, reported by 7 respondents (31.8%), while the biggest pain scale was 4 reported by 2 respondents (9.1%).

Table 4. Reducing the Intensity of Menstrual Pain in the Ginger and Warm Compress Water Compress Group

Decline	Ginger Stew Compress		Warm Compress	
	N	%	N	%
0	0	0	1	4,5%
1	6	27,3%	9	40,9%
2	8	36,4%	8	36,4%
3	5	22,7%	4	18,2%
4	3	13,6%	0	0
Total	**22**	**100%**	**22**	**100%**

Table 4 indicates that the most significant dysmenorrhea intensity declined with the use of a compress with ginger stew, which resulted in a decrease to pain scale 2 reported by 8 respondents (36.4%). On the other hand, the degenerative intensity of dysmenorrhea after using a warm compress was only on pain scale 1, as reported by 9 respondents (40.9%).

Table 5. Overview of Menstrual Pain in the Ginger Stew Compress and warm Compress Group

Group		Mean	Standard Deviation
Ginger Stew Compress	Pretest	4,22	1,47
	Posttest	2,04	1,17
Warm Compress	Pretest	4,40	1,14
	Posttest	2,86	1,08

Table 5 shows that the average intensity of dysmenorrhea in Group 1 was 4.22 and was down to 2.04, indicating a significant reduction in dysmenorrhea intensity. In comparison, the dysmenorrhea intensity in group 2 was 4.40 and down to 2.86, indicating a significant but less prominent reduction in the dysmenorrhea intensity compared to the ginger stew compress group.

Bivariate Analysis

Table 6. Normality Test of Pretest and Posttest pain scale data in the Ginger Stew Compress group at SMP N 2 Gantiwarno

Prepost	Shapiro Wilk	Sum
	Df	.sig
Pretest	22	,053
Posttest	22	,085

According to the Shapiro-Wilk normality test results shown in Table 4.6, it can be observed that the pain scale data before the application of ginger stew compress during dysmenorrhea had a significant value of 0.53. Meanwhile, the significant value after the application of the ginger stew compress was 0.85. Since both values are over 0.05, it can be concluded that the data is distributed normally.

Table 7. Normality Test of Pretest and Posttest pain scale data in the Warm Compress group at SMP N 2 Gantiwarno

Prepost	**Shapiro Wilk**	**Jumlah**
	Df	.sig
Pretest	22	,062
Posttest	22	,060

According to Table 4.7, the results of the Shapiro-Wilk normality test showed a sig value of 0.62 for the pain scale before a warm compress was given during dysmenorrhea and a significant value of 0.60 for the pain scale after ginger was given a stew compress. From both variables, it can be summarized that the .sig value is > 0.05, indicating that the data was normally distributed.

Table 8. Different Tests Before and After Ginger Stew Compress and Warm Compress with Paired Sample T-Test

		N	**Mean**	**SD**	**Df**	**T**	**sig (2-tailed**
Ginger Stew Compress	Pre	22	4,22	1.47	2	10	,000
	Post	22	2,00	1.17	1	16	
Warm Compress	Pre	22	4,40	1.14	2	7.9	,000
	Post	22	2,86	1.08	1	5	

Based on table 4.8, both groups have a sig value less than 0.05, it means there is a difference in the pain intensity before and after the interventions were given.

Table 9. The Differences og Ginger stew compress and Warm Compress on the Intensity of Menstrual Pain

Variable	**N**	**Mean**	**SD**	**T**	**df**	**Sig (2-tailed)**
Ginger Stew Compress	22	2,22	1.02	2.53	42	,015
Warm Compress	22	1,54	,738			

According to Table 4.12, results from the *Independent T-Test Sample* obtained a sig (2-tailed) value of 0.015, which means under 0.05. Therefore, the H_0 was denied and the H_a was accepted, indicating that there is a difference in the effectiveness of both compresses toward the intensity of dysmenorrhea in grade 7 at 2 JHS Gantiwarno.

DISCUSSION

Respondent Characteristics

a. Age

According to the research analysis, the average age of respondents who reported experiencing dysmenorrhea was 13 years old. Out of the ginger stew compress group, 16 teenagers (72.7%) reported experiencing dysmenorrhea at age 13, while in the warm compress group, 12 respondents (54.5%) reported experiencing dysmenorrhea at the same age. The findings of this research align with the study by Sianipar et al., (2009) in Eka (2014), which indicated a significant correlation between age and dysmenorrhea. The participants in this research were in the early adolescent age range of 12–16 years old (Ministry of Health, 2006). Dysmenorrhea tends to increase among women under the age of 25, and the pain usually subsides by the age of 30-35 years (Reeder and Koniak, 2011).

The age of a woman is a significant factor that affects the phenomenon of dysmenorrhea, which is typically experienced a few days before and during menstruation due to an increase in the secretion of prostaglandin hormone. As a woman gets older and menstruates more frequently, the secretion of prostaglandin hormones decreases (Novia & Puspitasari, 2011). Adolescent girls tend to experience dysmenorrhea more frequently, which decreases with age due to the decline in reproductive hormones. The age factor has been identified as an important variable that affects pain response (Wahid et al., 2007).

b. Menache Age

According to the analysis of the research, the frequency distribution of the age at which menstruation first occurred (menarche) among grade 7 students at 2 JHS Gantiwarno showed that most of the respondents in both groups, in terms of 68.2%, had their first menstruation at the age of 12. The findings of this study align with the study by Pundati et al., (2017) which reported the distribution of menarche age among eighth-semester students at UNSOED. The study found that out of 85 respondents, 49 individuals (57.6%) experienced menarche at an age greater than 12 years old, while 36 individuals (42.4%) experienced menarche under 12 years old.

The early onset of menarche can lead to difficulties and challenges for adolescents, as they may experience dysmenorrhea due to the inadequate development of their reproductive organs and a cervical deficiency. When the reproductive organs have matured, it involves the hypothalamic-pituitary-ovarian axis, which secretes LH and FSH hormones regulated by Gonadotropin Releasing Hormone (GnRH). These hormones can influence the production of gonadotropins containing estrogen and progesterone, which in turn can affect the growth of the endometrium. Therefore, early menarche can disrupt the normal reproductive processes and lead to dysmenorrhea (Bare & Smeltzer, 2002; Wulandari & Ungsianik, 2013; Aditiar A., 2018).

This study had an average age of menarche between 12 and 13 years old, which is considered within the normal range. This suggests that their reproductive organs have developed optimally, and there is no constriction or stenosis of the cervix. However, despite having normal reproductive development, they still experienced dysmenorrhea.

c. Duration of Menstruation

Results based on research analysis show that most respondents in both groups experienced menstruation for 7 days, with 14 respondents (63.6%) in each group. This

indicates that the average length of menstruation for both groups was 7 days. This study aligns with the research carried out by Sophia (2013) among students at SMK N 10 Medan, which indicates that there is a significant correlation between the duration of menstruation and the phenomenon of dysmenorrhea. As menstrual duration progresses, the uterus contracts more frequently, leading to the experience of pain. According to Bopak, (2004) a longer duration of menstruation leads to more frequent uterine contractions, which in turn results in increased secretion of prostaglandins. High levels of prostaglandins can lead to dysmenorrhea, and continuous uterine contractions can result in reduced blood supply to the uterus, causing dysmenorrhea.

The duration can be influenced by various factors, including psychological and physiological factors. Psychological factors may include emotional instability commonly experienced by adolescent girls, while physiological factors may be related to the levels of prostaglandin hormone production, which may vary among women (Sirait & Jemadi 2014; Ammar 2016).

d. Body Mass Index (BMI)

According to the researcher's analysis of the frequency distribution of Body Mass Index (BMI) among seventh-grade female students at 2 JHS Gantiwarno, it was found that 11 students (50.0%) in both groups had an average BMI in the normal category. This study aligns with the research carried out by Kurniati et al., (2019) among 54 students from the class of 2015 at the Faculty of Medicine, Baiturrahmah University. The study found that out of 54 respondents with a normal body mass index, 32 people (59.3%) experienced it the most frequently, and 28 people (51.9%) experienced mild dysmenorrhea. The research also showed that there is a correlation between BMI and dysmenorrhea among female students in the Faculty of Medicine year 2015 at Baiturrahmah University ($p = 0.009$, correlation coefficient value = 0.353).

The study has shown that both underweight and overweight women are at increased risk of experiencing dysmenorrhea. Abundant intake of nutrients may lead to decreased hypothalamic function, which can impact the levels of *Follicle Stimulating Hormone* (FSH) and *Luteinizing Hormone* (LH). These hormones play a crucial role in the menstrual process. Dysmenorrhea can be caused by increased levels of prostaglandins and vasopressin. However, numerous factors can also influence the levels of these hormones, such as stress levels, genetics, menstrual cycle history, lifestyle, and various other factors (Widjanarko, 2006).

Pretest and Posttest of Dysmenorrhea Intensity

Pretest and Posttest Dysmenorrhea Intensity in the Ginger Stew Compress Group

The study conducted on seventh-grade female students at 2 JHS Gantiwarno demonstrated that the application of a ginger stew compress resulted in a reduction of the average level of dysmenorrhea. A ginger stew compress should be applied for a duration of 15–20 minutes. Prolonged compress application times can impede the bloodstream and potentially cause harm to the skin, nerves, and body tissues. Pain relief can typically be felt between 10-15 minutes after the intervention because the painful area initially experiences stiffness and requires a few minutes to adapt to the therapy. Over time, the intensity of the pain decreases, and the respondent experiences a greater sense of comfort (Susanti, 2014).

Paired sample T-test results in Table 4.8 show that there was a difference in dysmenorrhea intensity before and after the ginger stew compress was given. The

results of this study align with the research by Fatmawati et al., (2018), which concluded that ginger-boiled compress can significantly alleviate dysmenorrhea in female students residing at the Sulaiman-Bilqis dormitory of the Darul Ulum Jombang Islamic Boarding School. Proper management of dysmenorrhea is crucial to prevent it from hindering daily activities and impacting performance. The use of herbal plants is one viable method for managing dysmenorrhea.

Ginger (*Zingiber Officinale Amarum*) is a type of herbal plant that can be utilized as a natural remedy to alleviate dysmenorrhea. The rhizome of ginger contains compounds that exhibit analgesic, antipyretic, and anti-inflammatory properties, making it effective in reducing the intensity of menstrual cramps (Agoes, 2010). An alternative treatment for dysmenorrhea is ginger due to its high content of oleoresins, which are bioactive compounds that include gingerol and shogaol that have anti-inflammatory properties.

This helps to block the production of prostaglandins and reduce the intensity of pain during menstruation. Additionally, ginger rhizomes are a good source of essential nutrients such as Ca, Mg, Fe, *β*-carotene, and *ascorbic acid*. Fe can be beneficial in preventing anemia during menstruation, as women tend to lose significant amounts of iron during their menstrual cycle. Additionally, the Ca and *Ascorbic acid* present in ginger can help soothe nerves and alleviate dysmenorrhea (Tandi, 2015).

The ability of ginger to reduce the intensity of dysmenorrhea is attributed to its inhibitory effect on thromboxane and its impact on prostaglandin activity. Dysmenorrhea is caused by myometrial contractions triggered by high levels of prostaglandins in women, particularly those who experience severe dysmenorrhea (Nurlaili & Putri, 2017). Ginger can be as effective as commonly used analgesic drugs like mefenamic acid and ibuprofen in relieving dysmenorrhea (Anurogo, 2011; Shirvani & Tabari, 2014).

The application of a ginger stew compress can effectively reduce dysmenorrhea by providing impulses that help suppress pain signals, resulting in a decrease in pain intensity. These impulses are generated by the warming sensation caused by the ginger stew on the affected area of the abdomen. When the skin is exposed to heat, it stimulates the nerves sensitive to temperature. This stimulation sends signals from the affected area to the hypothalamus, which initiates a response to normal body temperature and awareness of local temperature. This is how the local response to heat occurs (Wilis, 2011).

Studies have shown that topical application of ginger can affect systemic absorption. Research using ginger compresses on human skin has demonstrated the absorption of ginger extract through epithelial tissue. In addition, ginger contains compounds such as oleoresins, which can dissolve in addition ginger contains compounds such as oleoresins which can dissolve in water and produce an effective and long-lasting warm compress, so the occurrence of vasodilation of blood vessels, thereby preventing uterine ischemia or hypoxia that can help to increase blood circulation (Ozgoli et al, 2009; Rahayu, 2016).

According to research conducted on grade 7 adolescent girls at 2 JHS Gantiwarno, it was found that warm compresses were effective in reducing dysmenorrhea. The warm compress was applied for 15-20 minutes, and the results showed a significant decrease in the average dysmenorrhea experienced by the participants. The analysis of data using the paired sample T-test in Table 4.9 revealed a significant disparity in the magnitude of dysmenorrhea before and after the application of a warm compress. This finding aligns

with the study by Rahmadhayanti et al., (2017) which reported that warm compress application reduced the level of pain from moderate to mild, and the effect was significant after the application of the warm compress.

A warm compress can be applied for pain relief and to relax tense muscles. The application of a warm compress works by utilizing the principle of conduction. This is achieved by placing a towel or cloth with the desired temperature on the stomach, which will transfer heat to the area and create a warm feeling. This process leads to the expansion of blood vessels in the affected region, thereby facilitating enhanced blood circulation to the area. The warmth also promotes psychological relaxation and a sense of comfort, which can help reduce the sensation of pain (Anugraheni & Wahyuningsih, 2013).

Giving a warm compress to the targeted area can trigger the hypothalamus via the spinal cord. Heat-sensitive receptors in the hypothalamus can then activate the effector system, which sends signals to induce sweating and peripheral vasodilation. The vasomotor center in the medulla oblongata of the brain stem regulates the size of blood vessels, which is influenced by the anterior part of the hypothalamus, resulting in vasodilation. Vasodilation causes an increase in blood circulation and can also relieve ischemia in myometrial cells, which in turn reduces myometrial smooth muscle contractions and promotes muscle relaxation.

As a result, the pain caused by spasms or stiffness is reduced. The application of a warm compress on the skin can also stimulate the production of endorphins, which are natural painkillers that can block the transmission of pain signals (Tamsuri, 2007). Heat therapy helps to reduce inflammatory products such as *bradykinin, histamine*, and *prostaglandins*, which can alleviate pain. Furthermore, applying heat therapy can activate nerve fibers that are capable of closing the synapse gate, thereby blocking pain signals from reaching the spinal medulla and brain (Sylvia & Lorraine 2012).

Differences between Ginger Stew Compress and Warm Compress Against Dysmenorrhea Intensity

The results from the independent sample t-test revealed that the average pain level for the ginger stew compress was 2.22, while for the warm compress, it was 1.54. The inter-subject effect analysis yielded a significant value of 0.015, which is under 0.05. This indicates a significant difference in the pain relief intensity between the ginger stew compress and the warm compress.

Moreover, the average pain level for the ginger stew compress was lower than that for the warm compress, indicating that the ginger stew compress was more effective in reducing dysmenorrhea. These study results were consistent with the findings of research by Karomika et al., (2019) that revealed a difference in the reduction of dysmenorrhea scale between adolescents who were treated with a ginger stew compress and those treated with a warm compress. Herbal ingredients can be used to treat pain, and herbal concoction therapy involves using traditional medicines derived from plant materials. Several plant materials, such as turmeric, cinnamon, cloves, and ginger, are believed to have pain-relieving properties (Anurogo, 2011). Ginger was the herbal plant used in this study.

Ginger is a viable option due to its high content of oleoresins, which are bioactive components composed of gingerol and shogaol that act as anti-inflammatory agents. This mechanism can block the production of prostaglandins, thus reducing the severity of dysmenorrhea. Additionally, ginger rhizomes are rich in essential nutrients like Ca,

Mg, Fe, β-carotene, and ascorbic acid. Fe can be beneficial in preventing anemia during menstruation, as women tend to lose significant amounts of iron during their menstrual cycle. Additionally, the calcium and ascorbic acid present in ginger can help to soothe nerves and alleviate dysmenorrhea (Tandi, 2015).

A warm compress is a non-pharmacological method of pain management that can be used to alleviate dysmenorrhea. The application of heat causes vasodilation, which in turn increases blood flow to the affected area. This increased blood flow can help remove pain-causing substances like bradykinin, histamine, and prostaglandins (Sylvia & Lorraine 2012).

According to the researchers' assumptions, both the ginger stew compress and the warm compress were effective in reducing dysmenorrhea intensity among the respondents in the study. However, the more effective therapy was the ginger stew compress. This is because ginger contains chemical compounds that can retain heat longer than plain water. The pain scale decrease among the respondents who were given ginger stew compresses was greater compared to those who were given warm compresses.

Respondents who received warm compresses reported that the heat was only temporary, while those who received ginger stew compresses reported that the heat was lasting and effective in relieving pain. Thus, the ginger stew compress was more effective in effectively absorbing the heat into the affected area of the body that was experiencing pain.

CONCLUSIONS AND SUGGESTIONS

The study showed that the average pain level for dysmenorrhea before using a compress of boiled ginger water was 4.22, with a standard deviation of 1.47. After using the ginger stew compress, the average pain level was 2.04 with a standard deviation of 1.17. This research showed that the average pain level for dysmenorrhea before using a warm compress was 4.40, with a standard deviation of 1.14. After using a warm compress, the average pain level was 2.86, with a standard deviation of 1.08.

According to the Paired Sample t-test results, the study found that warm compress had a significant effect on reducing the intensity of dysmenorrhea, as indicated by the Sig value (2-tailed) of 0.000, which is less than the predetermined level of significance (0.05). The study indicates that the application of ginger stew compress had a significant impact on dysmenorrhea intensity, which was demonstrated by the paired sample t-test results. The Sig value (2-tailed) was 0.000, indicating that the effect was statistically significant at a significance level of less than 0.05.

The study's results showed that both ginger stew compresses and warm compresses reduced dysmenorrhea. However, ginger stew compress was found to be more effective, as indicated by the results of the *independent sample t-test*, which showed a significance value of Sig (2-tailed) = 0.015, indicating that Sig (2-tailed) < 0.05. It can be concluded that there is a significant difference in the effects of ginger stew compress and warm compress on dysmenorrhea intensity.

Educational institutions such as schools or universities can utilize this research as a reference for managing dysmenorrhea among their students. They can provide information about the benefits of using ginger stew compresses and warm compresses for pain relief. As both ginger stew compress and warm compress have been shown to effectively reduce dysmenorrhea in the study, it is recommended that young women consider using either of them as an alternative method to alleviate dysmenorrhea.

Health workers can use the results of this study as a reference to provide non-pharmacological treatment options for dysmenorrhea, particularly in adolescents. The use of ginger stew compresses and warm compresses can serve as complementary therapies to pharmacological treatments and can potentially reduce the reliance on pain medications.

REFERENCES

Aditiara, Bianca Elvira. (2018). *Hubungan Antara Usia Menarche dengan Dysmenorrhea Primer*. Program Studi S1 Fisiolterapi Fakultas Ilmu Kesehatan Universitas Muhammadiyah Surakarta

Aguspairi. (2011). *Efektifitas-Metode-Tepid-Sponge-Pd Px Tipoid 2011.Pdf* (p. vol.11 N.3).

Ammar, U. R. (2016). *Faktor Risiko Dismenore Primer pada Wanita Usia Subur.* Jurnal Berkala Epidemiologi, 4(1), 37–49. https://doi.org/10.20473/jbe.v4i1.37-49

Anurogo, D. & Wulandari, A. (2011). *Cara Jitu Mengatasi Nyeri Haid.* Yogyakarta: CV Andi

Betty, B., & Ayamah, A. (2021). *Pengaruh Pemberian Air Rebusan Jahe Merah Terhadap Penurunan Dismenorea Pada Mahasiswi Semester 8 Stikes Widya Dharma Husada Tangerang*. Edu Dharma Journal: Jurnal Penelitian Dan Pengabdian Masyarakat, 5(2), 61. https://doi.org/10.52031/edj.v5i2.177

Bingan, E. C. S. (2021). *Efektivitas Air Rebusan Jahe Merah terhadap Intensitas Nyeri Haid.* Jurnal Kesehatan Manarang, *7*(1), 60. https://doi.org/10.33490/jkm.v7i1.159

Bobak. (2005). *Buku Ajar Keperawatan Maternitas Edisi IV.* Jakarta: EGC

Dahlan, A. (2017). *Pengaruh Terapi Kompres Hangat Terhadap Nyeri Haid (Dismenorea) Pada Siswi Smk Perbankan Simpang Haru Padang.* Jurnal Endurance, 2(1), 37. https://doi.org/10.22216/jen.v2i1.278

Departemen Kesehatan RI. (2009). *Kategori Umur*. http://Kategori-umur-menurut-Depkes.html

Fadella, C., & Jamaludin, D. N. (2019). *Menstruasi: Pengetahuan Dan Pengalaman Siswa Sd Negeri Prawoto 01*. Journal Of Biology Education, 2(2), 186. https://doi.org/10.21043/jbe.v2i2.6375

Fatmawati, D. A., Muniroh, S., & Ramadhani, M. (2018). *Upaya Penanganan Nyeri Haid (Dysmenorhea) Dengan Kompres Hangat Rebusan Jahe*. Jurnal EDUNursing, 2(2), 7. https://journal.unipdu.ac.id

Fitria, A. (2007). *Panduan Lengkap Kesehatan Wanita*. Jogja : Gala Ilmu Semesta.

Handayani, E.Y., Rahayu, L.S. (2014). *Faktor-Faktor Yang Berhubungan Dengan Nyeri menstruasi (Disminore) Pada Remaja Putri Dibeberapa SMA di Kab Rokan Hulu.* Jurnal Maternity and Neonatal Vol 1 No 4.

Herawati, R. (2017). *Faktor-Faktor yang Mempengaruhi Kejadian Nyeri Haid (Dismenorea) pada Siswi Madrasah Aliyah Negeri Pasir Pengaraian.* Materniry and Neonatal Jurnal Kebidanan, 2(3), 161–172.

Hidayat, A. A. (2014). *Metode Penelitian Kebidanan dan Teknik Analisis Data.* Jakarta: Salemba Medika.

Irianto (2015). *Kesehatan Reproduksi (Reproductive Health) dalam Praktikum.* Bandung: Alfabeta.

Khayat, S., Kheirkhah, M., Behboodi Moghadam, Z., Fanaei, H., Kasaeian, A., & Javadimehr, M. (2014). *Effect of Treatment with Ginger on the Severity of Premenstrual Syndrome Symptoms.* ISRN Obstetrics and Gynecology, 2014, 1–5. https://doi.org/10.1155/2014/792708

Karomika, A., Yuniastuti, A., Sri, R. R., Rahayu, R., & Utara, J. K. (2019). The Comparison in The Effectiveness of Warm and Ginger Compresses to The Menstruation Pain Toward The Students of Smk 2 Al-Hikmah 1 Sirampog. *Public Health Perspectives Journal*, *4*(3), 179–187. http://journal.unnes.ac.id/sju/index.php/phpj

Koswara, S. (2009). *Jahe Rimpang Dengan Sejuta Khasiat* Oleh : Sutrisno Koswara. Ebook Pangan.

Kozier B., Erb G., Berman A., & Snyder S.J. (2009). *Fundamentals of Nursing Concepts, Process and Pratice 7th Ed*. Jakarta: EGC.

Kumalasari, I. (2014). *Kesehatan Reproduksi untuk Mahasiswa Kebidanan dan Keperawatan*. Jakarta: Salemba Medika.

Kurniati, B., Amelia, R., & Oktora, M. Z. (2019). *Hubungan Indeks Massa Tubuh dengan Kejadian Dismenore pada Mahasiswi Angkatan 2015 Fakultas Kedokteran Universitas Baiturrahmah Padang.* Health & Medical Journal, 1(2), 07–11. https://doi.org/10.33854/heme.v1i2.234

Larasati, T. A., A., & Alatas, F. (2016). *Dismenore Primer dan Faktor Risiko Dismenore Primer pada Remaja*. Majority, 5(3), 79–84.

Lestari, N. M. S. D. (2013). *Pengaruh dismenorea pada remaja*. Seminar Nasional FMIPA UNDIKSHA III, 323–329. ejournal.undiksha.ac.id/index.php/semnasmipa/article/download

Lia, N. (2018). *Pengaruh kompres hangat terhadap intensitas nyeri menstruasi (dysmenorrhea) pada siswi kelas x di smk ypib majalengka kabupaten*

majalengka. Jurnal Kampus Stikes YPIB Majalengka, VII(14), 27–37. https://stikesypib.ac.id/e-journal/index.php/JK/article/view/59

Lowdermilk, D.L., Perry, S.E., & Cahion, K. (2013). *Keperawatan Maternitas (8th ed.).* Edinburgh: Elsevier

Machfoedz, I (2009). *Metodologi Penelitian.* Yogyakarta : Fitramaya

Manuaba, I. (2001). *Ilmu Kebidanan Penyakit Kandungan dan KB untuk Pendidikan Bidan.* Jakarta : EGC

Manuaba, I. (2014). *Ilmu Kebidanan Penyakit Kandungan dan KB untuk Pendidikan Bidan.* Jakarta : EGC

Marmi. (2013). *Gizi Dalam Kezehatan Reproduksi*. Yogyakarta : Pustaka Belajar

Mutiara, H., & Pratiwi, L. A. (2017). *Pengauh Jahe Terhadap Nyeri saat Menstruasi.* Fakultas Kedokteran Universitas Lampung Volume 6 Nomor 1 Februari 2017. 54-56.

Notoadmodjo, S. (2014). *Metodelogi Penelitian Kesehatan*. Jakarta: Rineka Cipta.

Novia, I., & Puspitasari, N. (2011). *Faktor Risiko yang Mempengaruhi kejadian Disminore Primer.* FKM Universitas Airlangga, 96103

Nurafifah, D., Mauliyah, I., & Impartina, A. (2020). *Warm compresses to decrease dysmenorrhea among adolescents.* Journal of Health Technology Assessment in Midwifery, 3(2), 110–114. https://doi.org/10.31101/jhtam.1428

Nurlaili Ramli & Putri Santy (2017). *Efektifitas Pemberian Ramuan Jahe dan The Rosella Terhadap Perubahan Intensitas Nyeri Haid.* Jurnal Kesehatan.

Nursalam. (2014). *Metodologi Penelitian Ilmu Keperawatan: Pendekatan Praktis.* Jakarta: Salemba Medika.

Nurwana, N., Sabilu, Y., & Fachlevy, A. (2017). *Analisis Faktor Yang Berhubungan Dengan Kejadian Disminorea Pada Remaja Putri Di Sma Negeri 8 Kendari Tahun 2016.* Jurnal Ilmiah Mahasiswa Kesehatan Masyarakat Unsyiah, 2(6), 185630.

Oktaviana, A., & Imron, R. (2017). *Menurunkan Nyeri Dengan Kompres Hangat.* Jurnal Keperawatan, VIII(2), 137–141. https://ejurnal.poltekkes-tjk.ac.id/index.php/JKEP/article/view/155

Pangastuti, D., Ilmu Kesehatan, F. S., & Universitas Pesantren Tinggi Darul Ulum Jombang, K. (2018). *Pada Remaja Putri*. Jurnal Edursing, 2(2), 13. http://journal.unipdu.ac.id

Potter, P. A., & Perry, A. G. (2005). *Buku Ajar Fundamental Keperawatan : Konsep, Proses, dan Praktik*. In Jakarta: EGC.

Prawirohardjo, S, Wiknjosastro. (2011). *Ilmu Kandungan*. Jakarta: Yayasan Bina Pustaka Sarwono Prawirohardjo.

Prayuni, E. D., Imandiri, A., & Adianti, M. (2019). T*herapy for Irregular Menstruation With Acupuncture and Herbal Pegagan (Centella Asiatica (L.)).* Journal Of Vocational Health Studies, 2(2), 86. https://doi.org/10.20473/jvhs.v2.i2.2018.86-91

Primadianti, R. (2002). *Aromaterapi Perawatan Alami untuk Sehat dan Cantik.* Jakarta: Gramedia.

Proverawati. (2014). *Menarch Menstruasi Pertama Peuh Makna*. Yogyakarta: Nuha Medika

Aguspairi. (2011). *Efektifitas-Metode-Tepid-Sponge-Pd Px Tipoid 2011.Pdf* (p. vol.11 N.3).

Betty, B., & Ayamah, A. (2021). Pengaruh Pemberian Air Rebusan Jahe Merah Terhadap Penurunan Dismenorea Pada Mahasiswi Semester 8 Stikes Widya Dharma Husada Tangerang. *Edu Dharma Journal: Jurnal Penelitian Dan Pengabdian Masyarakat*, *5*(2), 61. https://doi.org/10.52031/edj.v5i2.177

Fatmawati, D. A., Muniroh, S., & Ramadhani, M. (2018). Upaya Penanganan Nyeri Haid (Dysmenorhea) Dengan Kompres Hangat Rebusan Jahe. *Jurnal EDUNursing*, *2*(2), 7. https://journal.unipdu.ac.id

Karomika, A., Yuniastuti, A., Sri, R. R., Rahayu, R., & Utara, J. K. (2019). The Comparison in The Effectiveness of Warm and Ginger Compresses to The Menstruation Pain Toward The Students of Smk 2 Al-Hikmah 1 Sirampog. *Public Health Perspectives Journal*, *4*(3), 179–187. http://journal.unnes.ac.id/sju/index.php/phpj

Kurniati, B., Amelia, R., & Oktora, M. Z. (2019). Hubungan Indeks Massa Tubuh dengan Kejadian Dismenore pada Mahasiswi Angkatan 2015 Fakultas Kedokteran Universitas Baiturrahmah Padang. *Health & Medical Journal*, *1*(2), 07–11. https://doi.org/10.33854/heme.v1i2.234

Lia, N. (2018). Pengaruh kompres hangat terhadap intensitas nyeri menstruasi (dysmenorrhea) pada siswi kelas x di smk ypib majalengka kabupaten majalengka. *Jurnal Kampus Stikes YPIB Majalengka*, *VII*(14), 27–37. https://stikesypib.ac.id/e-journal/index.php/JK/article/view/59

Pangastuti, D., Ilmu Kesehatan, F. S., & Universitas Pesantren Tinggi Darul Ulum Jombang, K. (2018). Pada Remaja Putri. *JURNAL EDUNursing*, *2*(2), 13. http://journal.unipdu.ac.id

Rahmadhayanti, E., Afriyani, R., & Wulandari, A. (2017). Pengaruh Kompres Hangat terhadap Penurunan Derajat Nyeri Haid pada Remaja Putri di SMA Karya Ibu Palembang. *Jurnal Kesehatan*, *8*(3), 369. https://doi.org/10.26630/jk.v8i3.621

Rahayu, (2016). *Efektivitas Kompres Jahe Merah dan Kompres Hangat Terhadap Penurunan Nyeri Sendi Di Posyandu Lansia.*. Universitas Muhammadiyah Malang

Rahmadhayanti, E., Afriyani, R., & Wulandari, A. (2017). *Pengaruh Kompres Hangat terhadap Penurunan Derajat Nyeri Haid pada Remaja Putri di SMA Karya Ibu Palembang.* Jurnal Kesehatan, 8(3), 369. https://doi.org/10.26630/jk.v8i3.621

Ramaiah. (2011). *Gangguan Menstruasi*. Yogyakarta: Digiosa Media.

Ratnawati, A. (2018). *Asuhan Keperawatan Maternitas.* Yogyakarta: Pustaka Barupress

Reeder, S. J., Martin, L. L., Koniak G. (2011). *Keperawatan Maternitas Kesehatan Wanita, Bayi & Keluarga.Edisi 18 Vol 1*. Jakarta: EGC

Reeder, S. J., & Martin, L. L. (2011). *Keperawatan Maternitas Kesehatan Wanita, Bayi & Keluarga*. Jakarta: EGC

Rumiati, F., & Sapulette, L. M. (2016). *Artikel Penelitian Pengaruh Berbagai Fase Siklus Menstruasi terhadap Memori Jangka Pendek pada Mahasiswi Fakultas Kedokteran Ukrida Angkatan 2016*. Jurnal Kedokteran, 0–4.

Sarwono (2011). *Ilmu Kebidanan.* Jakarta: Yayasan Bina Pustaka.

Setyawan, A. (2002). *Keragaman Varietas Jahe (Zingiber officinale Rosc.) berdasarkan Kandungan Kimia Minyak Atsiri*. BioSMART: Journal of Biological Science, 4(2), 48–54. http://biosmart.mipa.uns.ac.id/index.php/biosmart/article/view/104

Sirait.D.S., Hiswani dan Jemadi. (2014). *Faktor-Faktor Yang Berhubungan Dengan Kejadian Disminore Pada Siswi SMA Negeri 2 Medan Tahun 2014.* Jurnal.usu.ac.id.

Shirvani, M. A., N. Motahari-Tabani. (2015). *The effect of mefenamic acid and ginger on pain relief in primary dymenorrhea a randomized clinical trial*.Archives og Gynecologi and Obstetrics.291 (6): 12771281

Sylvia A Price., & Lorratine M. Wilson (2012). *Patofisiologi Konsep Klinis Proses-Proses Penyakit 6th ed.* Jakarta: EGC

Smeltzer, S., & Bare, B. (2013). *Buku Ajar Keperawatan medikal Bedah Brunner & Suddarth Edisi 8*. Jakarta: EGC. https://doi.org/10.103/1524-9220.4.1.3

Soetjiningsih (2004). *Buku Ajar Tumbuh Kembang Remaja dan Permasalahannya.* Jakarta: Sagung Seto.

Sujarweni, W. (2015). *Statistik untuk Kesehatan*. Yogyakarta: Gava Media.

Sugiyono. (2017). *Metode Penelitian Kuantitatif, Kualitatif dan R&D*. Bandung: PT Alfabeta.

Sugiyono. (2018). *Metode Penelitian Kuantitatif*. Bandung: PT Alfabeta.

Tamsuri, A. (2007). *Konsep dan Pelaksanaan Nyeri.* In EGC, Jakarta: EGC.

Tamsuri, A. (2009). *Konsep dan Pelaksanaan Nyeri.* Jakarta: EGC.

Tandi, H.(2015). *Kitab Tanaman Berkhasiat Obat 226 Tumbuhan Obat Untuk Penyembuhan Penyakit dan Kebugaran Tubuh.* Yogyakarta: Octopus Publishing House..

Triyanto, E. (2010). *Pengalaman Masa Pubertas Remaja Studi Fenomenologi di Purwokerto*. Jurnal Ners, 5(2), 147–153.

Utari, M. D. (2017). P*engaruh Pemberian Ramuan Jahe Terhadap Nyeri Haid Mahasiswi Stikes Pmc Tahun 2015*. Jurnal Ipteks Terapan, 11(3), 257. https://doi.org/10.22216/jit.2017.v11i3.681

Widiya, M., Jayati, R. D., & Fitriani, H. (2019). *Karakteristik Morfologi dan Anatomi Jahe (Zingiber Officinale) Berdasarkan Perbedaan Ketinggian Tempat. BIOEDUSAINS:* Jurnal Pendidikan Biologi Dan Sains, 2(2), 60–69. https://doi.org/10.31539/bioedusains.v2i2.854

Widjanarko, Bambang. (2006). *Dismenore Tinjauan Terapi pada Dismenore Primer*. Majalah Kedokteran Damianus. 5(1)

Wilis A. (2015). *Pengaruh Pemberian Air Rebusan jahe Terhadap Intensitas Nyeri Haid pada Mahasiswa Semester 7 Stikes Aisyiyah Yogyakarta*.

Wulandari, S., & Ungsianik, T. (2013). *Status Gizi, Aktivitas Fisik dan Usia Menarche Remaja Putri.* Jurnal Keperawatan Indonesia, 16(1), 5559

Betty, B., & Ayamah, A. (2021). Pengaruh Pemberian Air Rebusan Jahe Merah Terhadap Penurunan Dismenorea Pada Mahasiswi Semester 8 Stikes Widya Dharma Husada Tangerang. *Edu Dharma Journal: Jurnal Penelitian Dan Pengabdian Masyarakat*, *5*(2), 61. https://doi.org/10.52031/edj.v5i2.177

Fatmawati, D. A., Muniroh, S., & Ramadhani, M. (2018). Upaya Penanganan Nyeri Haid (Dysmenorhea) Dengan Kompres Hangat Rebusan Jahe. *Jurnal EDUNursing*, *2*(2), 7. https://journal.unipdu.ac.id

Karomika, A., Yuniastuti, A., Sri, R. R., Rahayu, R., & Utara, J. K. (2019). The Comparison in The Effectiveness of Warm and Ginger Compresses to The

Menstruation Pain Toward The Students of Smk 2 Al-Hikmah 1 Sirampog. *Public Health Perspectives Journal*, *4*(3), 179–187. http://journal.unnes.ac.id/sju/index.php/phpj

Kurniati, B., Amelia, R., & Oktora, M. Z. (2019). Hubungan Indeks Massa Tubuh dengan Kejadian Dismenore pada Mahasiswi Angkatan 2015 Fakultas Kedokteran Universitas Baiturrahmah Padang. *Health & Medical Journal*, *1*(2), 07–11. https://doi.org/10.33854/heme.v1i2.234

Lia, N. (2018). Pengaruh kompres hangat terhadap intensitas nyeri menstruasi (dysmenorrhea) pada siswi kelas x di smk ypib majalengka kabupaten majalengka. *Jurnal Kampus Stikes YPIB Majalengka*, *VII*(14), 27–37. https://stikesypib.ac.id/e-journal/index.php/JK/article/view/59

Pangastuti, D., Ilmu Kesehatan, F. S., & Universitas Pesantren Tinggi Darul Ulum Jombang, K. (2018). Pada Remaja Putri. *JURNAL EDUNursing*, *2*(2), 13. http://journal.unipdu.ac.id

Rahmadhayanti, E., Afriyani, R., & Wulandari, A. (2017). Pengaruh Kompres Hangat terhadap Penurunan Derajat Nyeri Haid pada Remaja Putri di SMA Karya Ibu Palembang. *Jurnal Kesehatan*, *8*(3), 369. https://doi.org/10.26630/jk.v8i3.621

Yudianta., Novita K., Ratih W. (2015). *Assessment Nyeri*. Yogyakarta: Fakultas Kedokteran Universitas Gadjah Mada Rahmadhayanti, E., Afriyani, R., & Wulandari, A. (2017). Pengaruh Kompres Hangat terhadap Penurunan Derajat Nyeri Haid pada Remaja Putri di SMA Karya Ibu Palembang. *Jurnal Kesehatan*, *8*(3), 369. https://doi.org/10.26630/jk.v8i3.621