e-ISSN XXXX-XXXX
p-ISSN XXXX-XXXX

Blambangan Journal of Nursing and Health Sciences (BJNHS)
https://blambangan-scholar.com/index.php/BJNHS
Vol. 1 No. 1 (2023): September

Article Research

The Effect of Pineapple Juice on Reducing Menstrual Pain in Adolecents in SMPN 3 Jember

Virgi Vernanda Anisa[1], Jamhariyah[2], Yuni Handayani[1,*]

[1]School of Midwifery, Universitas dr. Soebandi, Jember, Indonesia
[2]School of Midwifery, Poltekkes Kemenkes Malang, Jember, Indonesia
* E-mail: yunih579@gmail.com

Abstract

Background: Menstrual pain is pain in the abdomen that originates from birth cramps and occurs during menstruation. Complaints of menstrual pain are normal complaints experienced, but the incidence of menstrual pain is still high. Factors causing menstrual pain are the age of menarche that is too early, the length of menstruation, smokers, a history of menstrual pain, and obesity. If the cause of menstrual pain is not immediately addressed, it will have an impact on teaching and learning activities. This will affect achievements in the academic and non-academic fields.
Aims: The purpose of this study was to determine the effect of pineapple juice on reducing menstrual pain in adolescent girls at SMPN 3 Jember.
Methods: Types of Pre-Experimental Designs research. The research design is One-Group Pretest-Posttest Design. The sample of 46 respondents was taken by Proportionate stratified Random Sampling. Analysis using Wilcoxon signed rank test.
Results: Analysis test using Wilcoxon signed rank test results with p-value = 0.000 ≤ α = 0.05 which means there is an effect of pineapple juice on reducing menstrual pain in adolescent girls at SMPN 3 Jember.
Conclusion: There is an effect of pineapple juice on reducing menstrual pain in adolescent girls at SMPN 3 Jember. Suggestion: Can make it a basis for education to female students how to deal with menstrual pain using non-pharmacology, namely pineapple juice.

Keywords: adolescents, menstrual pain, pineapple juice

INTRODUCTION

Adolescence is a period of transition or transition from childhood to adulthood, in the age range between 13-20 years. During this time there were many changes, both hormonal, physical, psychological and social (Elsera, Hamrarani and Kusumaningrum, 2022). In adolecentsit is marked by the arrival of the first menstruation or menarche. This period is a sign of the functioning of a woman's reproductive organs. In addition, there are several things that affect the menstrual cycle, which are influenced by the emotional level (Yuni, Rizki, and Kustin, 2022). Not a few women experience complaints of pain during menstruation or more commonly referred to as menstrual pain. Menstrual pain is pain in the stomach that comes from birth cramps and occurs during menstruation. Menstrual pain or dysmenorrhea can be referred to in other words as a symptomatic disorder or discomfort, meaning that it is not a disease but a symptom that arises and can cause discomfort. The prevalence of menstrual pain in Indonesia is still very high, namely 107,673 (64.25%) consisting of 59,671 people (54.89%) experiencing primary menstrual pain and 9,496 (9.36%) experiencing menstrual pain sekunder (Elsera, Hamrani, and Kusumaningrum, 2022).

Whereas, East Java the incidence of dysmenorrhea based on data from the East Java Province Adolecents Reproductive Health Survey in 2021 found around 4,653 adolecentss experiencing menstrual pain (Meinawati and Malatuzzulfa, 2021). Data from the Jember Regency Health Office in 2017 stated that the highest cases of menstrual disorders in adolecentss aged 10-14 years were 1457 cases, Sumbersari District ranked first with 740 cases, Ledokombo District 122 cases, Tanggul District 116 cases, Sumberbaru District 109

cases, Ajung District 63 cases (Huda, 2019). The cause of menstrual pain or dysmenorrhea is due to the proliferative process towards the secretory process, there is an increase in the amount of prostaglandins in the endometrial area in excess of usual and can cause contractions in the myometrium resulting in ischemia which is then followed by a reduction in the amount of progesterone at the end of the luteal process. This causes pain in the uterine muscles during menstruation (Susanti, 2021).

If the causes of menstrual pain are not addressed immediately, it will have an impact on these adolecents, such as causing disruption in teaching and learning activities, not paying attention to the teacher, and tending to sleep in class during teaching and learning activities. This will affect achievement in the academic and non-academic fields. The more severe the degree of pain experienced, the more disrupted learning activities will be (Wulandari, Hasanah and Woferest, 2018). The purpose of this study was to determine the effect of pineapple juice on reducing menstrual pain in adolescent girls at SMPN 3 Jember.

METHOD

Design

This type of research is Pre-Experimental Designs. The research design used in this research is the One-Group Pretest-Posttest Design.

Sample

The population in this study was grade VIII students who experienced menstrual pain totaling 86 female students at SMPN 3 Jember Regency. Sampling in this study was using Proportionate stratified Random Sampling. The sample in this study was female students who had dysmenorrhea and in accordance with the inclusion of 46 female students. This research process will be carried out from June to July 2023 at SMPN 3 Jember.

Data analysis

The statistical test used in this study is the Wilcoxon signed rank test.

RESULTS

The results of data collection and data analysis that have been carried out by the researcher will be presented in the form of general data and special data. General data consists of age, BMI, Menarche, Menstrual Cycle, and Menstrual Period. The presentation of data is displayed in the form of tables and narrations as follows:

Table 1.
Frequency distribution of respondents' characteristics based on age in adolescent girls at SMPN 3 Jember in 2023

Age of Respondents	Frequency	Percentage (%)
14	36	78,3
15	10	21,7
Total	46	100,0

Based on table 1, it can be seen that the age of 46 respondents is 14 years with a total of 36 respondents (78.3%) and 10 respondents aged 15 years (21.7%).

Table 2.
Frequency Distribution of Respondents' Characteristics Based on BMI in adolescent girls at SMPN 3 Jember in 2023

BMI	Frequency	Percentage (%)
Thin (17- <18,50)	13	28,3
Normal (18,5 – 25,0)	28	60,9
Fat (>25 – 27)	5	10,9
Total	46	100,0

Based on table 2, it can be seen that the BMI of 46 respondents is thin BMI of 13 respondents (28.3%), normal BMI of 28 respondents (60.9%), and fat BMI of 5 respondents (10.9%).

Table 3.

Frequency Distribution of Respondents' Characteristics Based on Menarche Age in adolescent girls at SMPN 3 Jember in 2023

Age of Menarche	Frekuensi	Persentase (%)
<12 years old	34	73,9
12 years old	9	19,6
>12 years old	3	6,5
Total	46	100,0

Based on table 3, it can be seen that the menarche age of the 46 respondents was <12 years old for 34 respondents (73.9%), 9 respondents at menarche age 12 years (19.6%), and >12 years old for 3 respondents (6, 5%).

Table 4.
Frequency Distribution of Respondents' Characteristics Based on Menstrual Cycle in adolescent girls at SMPN 3 Jember in 2023

Menstrual Cycle	Frequency	Percentage (%)
Orderly	29	63,0
Disorganized	17	37,0
Total	46	100,0

Based on table 4, it can be seen that the menstrual cycles of 46 respondents are regular menstrual cycles of 29 respondents (63.0%), while respondents who experience irregular menstrual cycles are with a frequency of 17 respondents (37.0%).

Table 5.
Frequency distribution of respondents' characteristics based on menstrual periods in adolescent girls at SMPN 3 Jember in 2023

Menstrual Period	Frequency	Percentage (%)
Normal 21-35 days	30	65,2
Abnormal <21 atau >35 days	16	34,8
Total	46	100,0

Based on table 5, it can be seen that the menstrual period of 46 respondents is a normal menstrual cycle of 21-35 days, 30 respondents (65.2%), while the abnormal menstrual period <21 or >35 days is 16 respondents (34.8%) .

Table 6.
Frequency Distribution of Menstrual Pain Level Before Pineapple Juice is Given to adolescent girls at SMPN 3 Jember in 2023

Menstrual Pain Level	Frequency	Percentage (%)
Mild pain (1-3)	33	71,7
Moderate pain (4-6)	12	26,1
Severe Pain (7-10)	1	2,2
Total	46	100,0

Based on table 6, it can be seen that the level of menstrual pain before pineapple juice experienced by 46 respondents was mild pain of 33 respondents (71.7%), moderate pain of 12 respondents (26.1%), and severe pain of 1 respondent (2.2%).

Table 7.
Frequency Distribution of Menstrual Pain Level After Pineapple Juice Given to adolescent girls at SMPN 3 Jember in 2023

Menstrual Pain Level	Frequency	Percentage (%)
No Pain (0)	13	28,3
Mild pain (1-3)	25	54,3
Moderate pain (4-6)	8	17,4
Total	46	100,0

Based on table 7, it can be seen that the level of menstrual pain experienced by 46 respondents was no pain with 13 respondents (28.3%), mild pain with 25 respondents (54.3%), and moderate pain with 8 respondents (17.4%).

Table 8.
Differences in Menstrual Pain Levels Before and After Pineapple Juice Is Given to adolescent girls at SMPN 3 Jember in 2023

		Before Pineapple Juice is Given			Total
		Mild pain (1-3)	Moderate pain (4-6)	Severe Pain (7-10)	
Level After Pineapple Juice Given	No Pain (0)	13	0	0	13
	Mild pain (1-3)	20	5	0	25
	Moderate pain (4-6)	0	7	1	8
Total		33	12	1	46

Based on table 8, it can be seen that the results before pineapple juice were given mild pain by 33 respondents and then after being given pineapple juice decreased to painless by 13 respondents, but there were 20 respondents who remained at the level of mild pain. At the level of menstrual pain before pineapple juice was given at a moderate level there were 12 respondents and those who experienced a decrease to mild pain amounted to 5 respondents. However, 20 respondents remained at a mild pain level. At the level of severe pain before being given pineapple juice decreased by 1 respondent to moderate pain.

Table 9.
Normality Test Results of Menstrual Pain Level Data Before and After Pineapple Juice Was Given to adolescent girls at SMPN 3 Jember in 2023

Menstrual Pain Level	Shapiro-Wilk		
	Statistic	Df	Sig
Before	0.601	46	0.000
After	0.797	46	0.000

Based on the results of the normality test data in table 9, the results of the significance of SPSS output the level of menstrual pain before pineapple juice was 0.000< α (0.05) and the level of menstrual pain after pineapple juice was 0.000 < α (0.05), it was stated that the data was not normally distributed, with the results of the data it did not meet the requirements in parametric systematics so as to test the effect of menstrual pain levels before and after giving pineapple juice to young women at SMPN 3 Jember then used the Wilcoxon Test.

Table 10.
Wilcoxon Test Results of Menstrual Pain Level Before and After Pineapple Juice Given to adolescent girls at SMPN 3 Jember in 2023

		N	Mean Rank	Sum of Rank	Asymp. Sig. (2-tailed)
Before-After	**Negative**	19[a]	10.00	190.00	0.000
	Positive Rank	0[b]	0.00	0.00	
	Ties	27[c]			
	Total	46			

Based on table 10, Wilcoxon test results were obtained with p-value = 0.000 ≤ α = 0.05, then Ha was accepted by Ho was rejected, which means that there is an effect of giving pineapple juice on reducing menstrual pain in adolescent girls at SMPN 3 Jember.

DISCUSSION

Level of menstrual pain before pineapple juice was given to adolescent girls at SMPN 3 Jember

Based on the results of the study found that the level of menstrual pain before pineapple juice experienced from 46 respondents was obtained that the level of menstrual pain in adolescent girls was mostly at the level of mild pain (71.7%), while the rest experienced moderate pain (26.1%), and those who experienced severe pain (2.2%). Young women at SMPN 3 Jember who experience menstrual pain are related to age factors where as many as (78.3%) respondents aged 14 years. According to Susanti et al (2018), early adolescents in a daughter who has just experienced menstruation will experience menstrual

pain (dysmenorrhea) because the cervix has not dilated, so that in early adolescence the incidence of menstrual pain is found. Other factors such as stress due to too much schoolwork cause sensational suppression of the hip nerves and lower back muscles, causing menstrual pain (dysmenorrhea). While respondents aged 15 years obtained fewer results with a total of 10 respondents, this is in line with Kostania's research (2019), that increasing age is the cause of pain disappearing due to the deterioration of uterine nerves due to aging.

The results of the study based on BMI from 46 respondents were Kurus BMI of 13 respondents (28.3%), normal BMI of 28 respondents (60.9%), and fat BMI of 5 respondents (10.9%). This is evidenced in research articles that say that menstrual pain is more susceptible in adolescents with underweight BMI because Individuals with a Body Mass Index (BMI) less than normal show low intake of calories, weight, and body fat that interfere with the pulsatile secretion of pituitary gonadotropins to produce reproductive hormones, causing an increase in the incidence of menstrual pain. BMI more than normal shows an increase in excessive prostaglandin levels, thus triggering myometrial spasm due to prostaglandins contained in blood similar to natural fats that can be found in uterine muscles (Andriyani, 2016).

Menstrual pain is caused by increased prostaglandin production, one of the other causes is menstrual age less than 12 years or menarche age is too early because the reproductive organs are not fully developed. Factors that affect menstrual pain are caused by lack of pharmacological and non-pharmacological treatment in adolescent girls, causing the level of menstrual pain to be controlled and caused by a rudimentary reproductive system that has not been able to function properly so that menstruation will cause menstrual pain.

Based on the results of the menstrual cycle of 46 respondents, 29 respondents (63.0%) had regular menstrual cycles, while 17 respondents (37.0%) experienced irregular menstrual cycles. Meanwhile, 30 respondents (65.2%) had a normal menstrual cycle of 21-35 days, while 16 respondents (34.8%) had abnormal menstrual periods <21 or >35 days. This is in line with research by Mau R, (2020) that lengthening the menstrual cycle when menstruation is more than 35 days has not been an obstacle to the incidence of menstrual pain by 50% compared to the length of the normal menstrual cycle. However, longer menstruation will result in longer uterine muscle contractions due to the increasing secretion of prostaglandins, resulting in menstrual pain. Risk factors for menstrual pain can cause uterine work to increase and contractions longer as well.

Psychological and physiological factors can affect the length of menstruation, psychologically affect the emotional level of young women who are labile during menstruation while physiologically excessive uterine muscle contractions will increase hormone sensitivity so that the endometrium in the secretion phase produces prostaglandin hormones. Such prostaglandins are formed due to the presence of unsaturated fatty acids and are synthesized throughout the cells in the body. Increased prostaglandin production results in menstrual pain which is affected by the length of menstruation and also frequent uterine contractions. Long periods during menstruation are usually experienced by adolescents with setress, where the setress experienced by adolescent girls results in menstrual disorders such as irregular menstrual periods.

Menstrual pain or dysmenorrhea is a gynecological complaint due to an imbalance of the hormone progesterone in the blood, resulting in pain that most often occurs in women. Women who experience menstrual pain produce 10 times more

prostaglandins than women who do not have menstrual pain. This protaglandin causes uterine contractions. Menstrual pain or dysmenorrhea is a condition of pain in the lower abdominal region with a very high prevalence and is the main cause of absenteeism of adolescent girls in school (Agustina and Salmiyati, 2016).

Dysmenorrhea is a state of cramping pain that is felt in the abdominal area and occurs aches in the hips to extremity as a result of the production of prostaglandins, this begins to occur 24 hours before bleeding occurs and can last for 24-36 hours. Other factors causing menstrual pain are the age of menarche that is too early or late, the length of menstruation, smokers, history of menstrual pain, and obesity (Kristianingsih, 2016). Symptoms of menstrual pain are malaise, fatigue, nausea, vomiting, diarrhea, low back pain, headache, sometimes it can be accompanied by vertigo, feelings of anxiety, anxiety to fall unconscious (Priyanti and Mustikasari, 2014).

Dysmenorrhea is included in a symptom that is often encountered and becomes a reason that women often find to consult and treat a doctor, because dysmenorrhea has a subjective nature where the intensity is difficult to assess. Although the frequency of dysmenorrhoea is included in a fairly high category and has long been recognized, until now the pathogenesis has not been known. So this makes almost all women experience an unpleasant feeling in the lower abdomen before and during menstruation which is also aggravated by followed feelings of nausea. The term dysmenorrhoea is only used if women during menstruation experience a very great effect, which makes it to rest and leave their daily activities for some time (Handayani et al, 2022).

Based on the results of the study above, it was found that there is still a high incidence of menstrual pain. Many young women experience pain, the pain threshold levels are different. Understanding the concept of pain also affects a person's pain level. Everyone perceives pain differently because pain is subjective. When researchers took data, respondents also showed the level of menstrual pain felt also varied, which can be seen how respondents express feelings during menstrual pain. In menstrual pain every teenager is influenced by several factors such as age, BMI, age of menarche, menstrual cycle and menstrual period. In addition, the symptoms felt by respondents vary so that they can cause differences in the level of menstrual pain. For this reason, efforts are needed to prevent menstrual pain through nonpharmacological approaches such as resting, drinking water, drinking red ginger water, relaxing deep breath, and giving pineapple juice.

Level of menstrual pain after being given pineapple juice to adolescent girls at SMPN 3 Jember

Based on the results of the study, it was found that the level of menstrual pain experienced by 46 respondents that the level of menstrual pain of adolescent girls after being given pineapple juice was mostly at the level of mild pain (54.3%), while the rest experienced no pain (28.3%), and those who experienced moderate pain (17.4%). In this case, respondents still experienced mild pain but no severe pain. Thus to prevent the occurrence of menstrual pain through a nonpharmacological approach, which can be by giving pineapple juice.

Similar research Setianingsih (2018), from the results of research after being given intervention respondents experienced a decrease in menstrual pain levels by an average of 2.2 (mild pain). The data that has been described proves that in this study pineapple juice with warm water can reduce the intensity of menstrual pain. Another study Papalia (2014), states that many ways

are done to reduce a person's menstrual pain level including pharmacological and non-pharmacological ways that can relieve menstrual pain. One of the non-pharmacological treatments is the provision of pineapple juice to overcome menstrual pain. Pineapple is a shrub fruit plant and has the scientific name Ananas Comosus. The effect of decreasing prostaglandins is carried out by the content of bromelain in pineapple fruit. Bromelain causes a decrease in bradykinin levels and decreases prekallikrein levels in serum. A decrease in precalclicrine means a decrease in arachidonate release and inhibition of PGE2 prostaglandin production (Yulia, Gustina, and Rohanah, 2022).

One of the benefits contained in pineapple is produced in the enzyme bromelain which is 95% cysteine protease mixture, which is useful as a protein hydrolyzer and resistant to heat. Pineapple fruit (Ananas comosus) contains calcium oxalate, pectic substances, and bromelain enzyme (Nuraini, 2014). Bromelin is a protease enzyme that can be extracted and extracted from the fruit and skin of pineapple (Ananas comosus) which can hydrolyze protease proteins or peptides. Both young and old pineapples contain bromelin, and are also found in all parts of the pineapple fruit such as the flesh, fruit, pineapple skin and weevil. Bromelin is believed to provide anti-inflammatory, anti-pain, and anti-cancer effects. Bromelin has the ability to reduce inflammatory conditions (Puspaningtyas, 2013).

The amount needed in one drink is 3.75 g / KgBB fresh and ripe pineapple, 10 grams of sugar, 200 ml of water then blended until smooth. The pineapple used is a ripe pineapple because based on research (Dzulqaidah, 2021) the content of bromelin enzyme in mature pineapple is more. The degree of maturity is very influential on the proteolytic activity of crude bromelin enzyme from pineapple fruit. However, the content of bromelin enzyme in pineapple fruit does not affect the activity of bromelin enzyme. In addition, the activity of bromelin enzyme is influenced by pH in pineapples. In ripe pineapples show a pH of 3-8, thus affecting bromelin enzyme levels (Manzoor, 2016). At acidic pH optimum conditions bromelin enzyme works actively. Based on the results of the activity test, it shows that bromelin activity will decrease if stored for a long time. Storage can be done 1-2 days in cold temperature conditions (4 (C) (Poba, Ijirana and Sakung, 2019).

Based on the research above, to reduce menstrual pain in adolescent girls as an action, namely by giving pineapple juice. In this study it can be seen that pain caused by menstrual pain becomes reduced after giving pineapple juice. When given pineapple juice after 60 minutes, bromelin enzyme works to reduce prekallikrein levels in serum. A decrease in precalclicrine means a decrease in arachidonate release and inhibition of PGE2 prostaglandin production so that most respondents experience a decrease in menstrual pain levels. Through the provision of pineapple juice, it makes it easier for adolescent girls to deal with menstrual pain, seen when the post-test questionnaire shows a decrease in menstrual pain after being given the intervention (post).

The effect of pineapple juice on reducing menstrual pain in adolescent girls at SMPN 3 Jember

Based on the results of the study, the results of the cross-table results before pineapple juice were given which experienced mild pain by 33 respondents and then after being given pineapple juice decreased to no pain by 13 respondents, but there were 20 respondents who remained at the level of mild pain. At the level of menstrual pain before pineapple juice was given at a moderate level there were 12 respondents and those who experienced a decrease to mild pain amounted to 5 respondents. However, 20 respondents remained at a

mild pain level. At the level of severe pain before being given pineapple juice decreased by 1 respondent to moderate pain. And the results of the Wilcoxon Test with a value of p-value = 0.000 ≤ α = 0.05 then Ha accepted Ho was rejected, which means there is an effect of giving pineapple juice on reducing menstrual pain in adolescent girls at SMPN 3 Jember. Pineapple juice has significant value in reducing menstrual pain in adolescent girls. Thus, it is expected that adolescent girls consume pineapple juice regularly to effectively reduce menstrual pain. Therefore, there is a significant difference before and after pineapple juice is given at SMPN 3 Jember.

Pineapple juice contains bromelain which can reduce prostaglandins. Bromelain causes a decrease in bradykinin levels and decreases prekallikrein levels in serum. A decrease in precalclicrine means a decrease in arachidonate release and reproductive inhibition of PGE2 prostaglandins (Yulia, Gustina, and Rohanah, 2022). The way the bromelin enzyme works is an antioxidant that can inhibit the formation of arachidonic acid by inhibiting protein kinase C, which has an impact on the activity of phospholipase A2 enzyme. So that when protein kinase C is inhibited and the activity of phospholipase enzyme A2 does not work, it will inhibit the formation of arakindonic acid and can reduce prostaglandin production (Nurmasar and Khuluq, 2017).

This study is in line with previous research by Agus and Widyawati (2018) showing that in the treatment group given pineapple juice which decreased by 15 adolescent girls (94%) and who did not experience a decrease in menstrual pain by 1 adolescent girl (6%) and obtained the results of giving pineapple juice with a significant value of p-value (0.001<0.05). The impact caused by menstrual pain in the form of activity disorders such as high rates of absenteeism from school and work, limitations in social life, academic performance, and sports activities (Sandiati, 2015) in the study showed that there was a decrease in menstrual pain before and after giving pineapple juice. Menstrual pain management is divided into two categories, namely pharmacology and non-pharmacology. Pharmacological pain management of menstrual pain can be treated with analgesic therapy which is the most commonly used method for pain relief (Potter and Perry, 2016).

According to Dwienda (2014), doing physical activity can stimulate the release of endorphins. Endorphins are produced in the brain and spinal cord which functions as a natural sedative that can be produced by the brain so that it can cause comfort and produce short-term non-specific analgesics to reduce dysmenorrhea so that adolescents with very light physical activity are more at risk of experiencing menstrual pain compared to adolescents with light physical activity. Non-pharmacological pain management includes warm compresses, drinking plenty of water, resting, exercising regularly, eating nutritious foods, doing activities to reduce pain such as yoga, and using herbal ingredients that are efficacious in reducing pain due to menstrual disorders including pineapple juice (Irianti, 2017).

Based on the research above that giving pineapple juice is effective enough to help reduce menstrual pain levels. From the results of the study, it shows that there is a decrease in the value obtained. This is because if someone drinks pineapple juice where in pineapple there is a bromelin enzyme, bromelin enzyme itself benefits as an analgesic and anti-inflammatory, bromelin enzyme contained in pineapple will slow uterine contractions so that there is no production of excessive prostaglandins that can cause pain during menstruation.

CONCLUSION

The results showed that there was an effect of pineapple juice on reducing menstrual pain in adolescent girls at SMPN 3 Jember

Abbreviations

SMPN: Sekolah Menengah Pertama Negeri (Public Junior High School)

REFERENCES

Agustina, T.W and Salmiyati, S. 2016. The Effect of Jasmine Aromatherapy Effleurage Massage on the Level of Dysmenorrhea in Fourth Semester Nursing Students at Aisyiyah University Yogyakarta.Adriani, M., & Wirjatmadi, B. (2016). Peranan Gizi Dalam Siklus Kehidupan. Jakarta: Kencana

Elsera, C., Hamrarani, and Kusumaningrum. 2022 'Young Women's Menstrual Pain and Anxiety', Journal of Nursing, 14, pp. 1107–1116.

Handayani, Putri, and Nurita. 2022. Effect of Deep Breathing Technique on Dysmenorrhea Pain Reduction. Scientific Journal of Midwifery, Vol 5 No 1

Christianingsih, Ani. 2016. Risk factors for primary dysmenorrhea in junior high school students (SMP X), Natar District, South Lampung Regency. Aisyah Journal: Journal of Health Sciences

Meinawati, L. and Malatuzzulfa, N.I. 2021 'Warm Compresses on Young Women with Dysmenorrhea in the Hamalatul Qur'an Putri Pare Islamic Boarding School Environment - Kediri', Hamalatul Qur'an : Journal of Qur'anic Science, 2(1), pp. 30–35.

Oktavianto, E., Kurniati, F. D., Badi'ah, A., &; Bengu, M. A. (2018). Pain and Anxiety Associated with Quality of Life of Dysmenorrhea Adolescents. Health Sciences and Pharmacy Journal, 2(1), 22. https://doi.org/10.32504/hspj.v2i1.24

Setianingsih, Y.A. and Widyawati, N. 2018 'The Effect of Pineapple Juice and Honey on Reducing Menstrual Pain (Dysmenorrhea) in Young Women at SMP Tri Tunggal II Surabaya', iIfokes : health information, 8(2), pp. 34–38.

Susanti, NY 2021. 'Acupressure Therapy for Menstrual Pain Reduction', Scientific Journal of Obstetrics, 8(2), pp. 145–150.

Susanti, Utami, and Lasri. 2018. The relationship between menstrual pain (dysmenorrhea) and learning activities in adolescent girls MTs Muhammadiyah 2 Malang. Scientific Journal of Nursing, Vol 3 No 1, 2018

Yulia, Mella., Gustina, I., and Rohanah. Effectiveness of Carrot and Pineapple Juice to Reduce Primary Dysmenorrhea in Junior High School Girls. Journal of Education and Development, Vol.10 No 2 May 2022 Edition