The Effect of Provision of Young Coconut Water against Menstrual Pain

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Abstract: Menstrual pain is an imbalance of the hormone progesterone in the blood resulting in abdominal pain caused by uterine muscle spasms. Young coconut water, containing glucose, vitamin, hormone, and mineral, and naturally without preservatives which can reduce muscle tension and help relieve pain due to menstrual cramps. This research is an experimental research with the total of samples as many as 36 young women. Collecting data used the Numeric Rating Scale observation sheet, pain was measured before and after in the intervention group and in the control group. The result showed that there were significant differences in menstrual pain between the intervention group and the control group with a p-value of 0.007. For health care, this research can be applied to clients who got experience about menstrual pain in providing obstetric care.

1 INTRODUCTION

Menstrual pain is described as cramping in the lower abdomen that occurs during menstruation. In the United States, it has been reported about 15% of girls got experience severe menstrual pain and a leading cause of absence from school and disrupt daily activities (Rosyida. D.A.C, Suwandono.A, Ariyanti.I, Suhartono, Mashoedi.D.I, and Fatmasari.D, 2017). The incidence of menstrual pain in young women in Malaysia is 62.3%, in Indonesia, young women who experience menstrual pain reaches 64.25%, consisting of 54.89% of primary menstrual pain and 9.36% secondary menstrual pain. Primary menstrual pain is experienced by 60-75% of young women, with 3/4 of them experiencing mild to moderate pain and 1/4 experiencing severe pain (Ulya.H.F, Suwandono. A, Ariyanti.I, Suwondo.A, Kumorowulan.S, and Pujiastuti.E.S, 2017). The problem of menstrual pain is generally considered to be only a minor health problem in the society, but if not treated immediately it can interfere with daily activities and even interfere with concentration and life-threatening (Bachloo.T, Kumar.R, Goyal.A, Parmal Singh, Yadav.S.S, Bhardwaj.A, and Mitta.A, 2016). The frequency of menstrual pain in young women in school is still high, according to the survey results there are still many students or young women who do not know how to reduce menstrual pain (Wulandari.S, and Afriliana.D.A, 2017).

The results of a preliminary study conducted by researchers in March 2018 at SMA Negeri 2 Perbaungan of 5 female students, the results of these observations showed that around 3 young women who experience menstrual pain during menstruation on the first day and experience disruption in their activities, they cannot concentrate with both when attending class lessons and feeling weak and lazy, to overcome the pain they take pain-reducing drugs, pharmacological drugs have chemical substances and side effects on health if consuming drugs in high frequency can cause interference with the function of organs. Synthetic drugs have side effects that are destructive or addictive. Utilizing natural remedies can avoid the potential bad side effects of using synthetic drugs (Firdaus. S, and Astuti, 2016).

There are so many ways to eliminate or reduce pain, both pharmacologically and non-pharmacologically. Non pharmacological pain management is safer to use because it does not cause side effects. One way to reduce menstrual pain in a non-pharmacological way is by administering young coconut water. Coconut (Cocos nucifera) is a type of palm plant that has quite large fruit (Polemer M. Cuarto1, Ronie F. and Magsino, 2017). Young coconut water contains 95.5% water, protein, fat,

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vitamin C and vitamin B complex. Young coconut water also contains some of minerals namely nitrogen, phosphorus, potassium, sodium, magnesium, chlorine, sulfur and iron (life Bruce, 2017). Young coconut water contains all the natural electrolytes that the body needs such as sodium, potassium or potassium, sodium, chloride, calcium and magnesium. The mineral content of potassium or high potassium in young coconut water can be used to treat menstrual pain (Buwana.A.P, Wijasena.B, and Suroto, 2016). Beside of that young coconut water is also one of the most versatile natural products in the world (life Bruce, 2017). Therefore, researchers are interested in conducting research on providing young coconut water for menstrual pain in female students at SMA Negeri 2 Perbaungan.

2 RESEARCH METHODS

This research has used a quasi-experimental design (Quasy Experimental) with a non randomized control group pretest posttest design. The research subjects were grouped into 2 groups: 1 intervention group was observed before and after being given young coconut water when menstrual pain was taken 2 times a day 1 cup (250 ml), morning and evening, for 3 consecutive days, and 1 control groupobservations were carried out before and after being given deep breathing relaxation techniques (Khodijah.S, 2017).

This research was conducted at SMA Negeri 2 Perbaungan, Serdang Bedagai Regency, North Sumatera. This research was begun from January - February 2019. The population in this research was all young women in SMA Negeri 2 Perbaungan, as many as 135 people. The sampling technique of this research was purposive sampling with a total sample of 36 people who were divided into 2 groups of 18 people for the intervention group and 18 people for the control group with inclusion criteria: girls who experience primary menstrual pain, aged 16-18 years, have routine menstrual cycle, have a history of menstrual pain, and are willing to be respondents, while exclusion criteria are: young women diagnosed with certain gynecological diseases or secondary dysmenorrhea, and young women undergoing pharmacological treatment with painkillers (analgesics). This research has been examined by a team of research ethics commission in North Sumatera University. The instrument used in this research was the observation sheet Numeric Rating Scale (NRS) 0-10 and the interview method. Analysis of the data used in this research was to determine before and after the intervention group and the control group using the Paired T Test and to find out the differences between the two groups with the Independent T-Test which was calculated using SPSS with a significant level of 95% ($\alpha = 0{,}05$) (Wulan.S, Soejoenoes.A, Wahyuni M,S, Hidayat.T.S, Widyawati.N.M, and Gurusinga.A, 2017).

The following is a Figure of research implementation flow

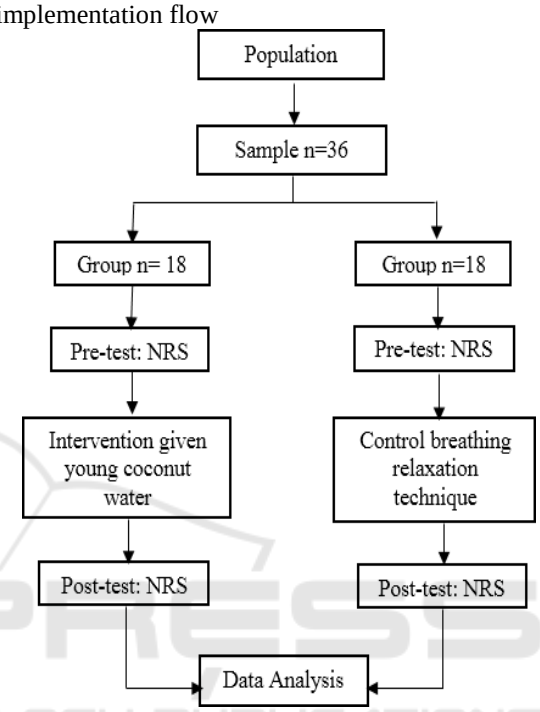

Figure 1: Research Implementation Flow.

The following is a Figure of the instrument used in the study.

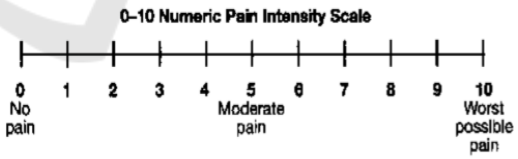

Figure 2: Numeric Rating Scale.

Pain Criteria are: 0 indicates no complaint of menstrual pain or cramps in the lower abdomen, 1 – 3 indicates minor pain: It feels cramps in the lower abdomen but can still be overcome and can do activities and can still concentrate on learning, 4 – 6 indicates medium pain: Feeling cramps in the lower abdomen, pain spreading to the waist, lack of appetite, disturbed activity, hard to concentrating learning, 7 - 9 indicates Severe pain : Severe cramps in the lower abdomen, pain spreading to the waist, thighs or back, no appetite, nausea, weakness, just sleeping in bed, can't move, can't concentrate on

learning, 10 indicates Uncontrol pain : Severe cramping in the lower abdomen, pain spreading to the waist, legs and back, not eating, nausea to vomiting, headache, no energy, unable to get out of bed, sometimes until fainting (Ameade.K.P.E and Mohammed.S.B, 2016).

3 RESULTS AND DISCUSSION

3.1 Characteristic of Respondents based on Age, Duration of Menstruation and Days of Menstrual Pain in the Intervention Group

Characteristics of respondents in the intervention group were obtained that there were 10 people (55.6%) who were 16 years old, 5 people (27.7%) were 17 years old and 4 people (22.2%) were 18 years old, whereas from menstrual period data, 2 people (11.2%), 3 people (16.6%) had a menstrual period of 6 days and 10 people (55.6%) had a period of 7 days and from the data of respondents who experienced menstrual pain days, there were 2people (11.2%) who experience menstrual pain before menstruation), 15 people (83%) experience menstrual pain on the first day and 1 person (5.5%) experience menstrual pain on the second day. 16-18 years old is the age of middle adolescence during which adolescents experience changes in her. One of the changes that occur in adolescent girls is experiencing menstruation, namely the process of expenditure of blood from the vagina due to the decay of the inner uterine wall or endometrium (Fisher.C, Sibbritt,D, Hickman.L and Adams.J, 2018). Characteristic of respondents based on the duration of the most menstruation is 7 days, as many as 10 respondents (55.6%). Respondents with 5-7 days of gestation are more likely to experience menstrual pain faster than those who have menstruation longer than 7 days. It's caused during menstruation, the pain is caused by high levels of prostaglandins, while based on the occurrence of menstrual pain the majority of menstruation on the first day as many as 15 respondents (83.3%), where at the first hait endometrium cells exfoliate releasing prostaglandins. Prostaglandin stimulate uterine muscles and affect blood vessels that cause uterine contractions through myometrial and vasoconstriction contractions. Prostataglandin levels increase especially on the first day to the second day.

3.2 Characteristics of Respondents based on Age, Duration of Menstruation and Days of Menstrual Pain in the Control Group

Characteristic of respondents in the intervention group were obtained below that there were 11 people (61.1%) who were 16 years old, 5 people (27.7%) were 17 years old and 2 people (11.2%) were 18 years old, whereas from menstrual period data, 1 person (5.5%), 3 people (16.6%) had a period of 6 days and 13 people (72.4%) had a period of 7 days and from the data of respondents who experienced menstrual pain, there were 3people (16.6%) who experience menstrual pain before menstruation), 14 people (77.9%) experience menstrual pain on the first day and 1 person (5.5%) experience menstrual pain on the second day.

Adolescence is a period of change from children to adult. Teenagers will experience physical and emotional changes. In women, puberty is characterized by menstruation. Menstruation is an event of blood loss from the uterus or endometrial wall decays periodically because it is not fertilized. Menstruation is natural so it can be ensured that all normal young women will experience menstruation (Preeti Gupta.G, Jini Gupta.J, Govind Singha.G, and Meharda.B, 2018).

From Figure 5 it is also known that the majority of the control group experienced menstruation for 7 days this is also the same as that experienced by the intervention group of the characteristics in this study, it is seen that the female students or young women under study all have a productive age, while based on the majority of menstrual pain daysoccurred on the first day as many as 14 respondents (77.9%) this was also the same as the intervention group, menstrual pain is abdominal pain that comes from uterine cramps and occurs during menstruation. Menstrual pain is one of the most common gynecological problems experienced by women of various age levels (Windartik.E, Yuniarti.V.E, and Akbar.A, 2017).

3.3 Menstrual Pain Scores before and after Administration of Young Coconut Water in the Intervention Group

Based on the Figure 3 It was found that from 18 respondents prior to the intervention the majority of respondents experienced severe pain as many as 10

people (55.6%) and a minority experienced mild pain 1 person (5.5%) while after the intervention the majority of respondents experienced moderate pain as much as 10 people (55.6%) and minorities experience severe pain as many as 3 people (16.6%).

The following is a Figure 3 of the distribution of menstrual pain in the intervention group before and after being given young coconut water taken 2 times a day 1 cup (250 ml) morning and evening for 3 consecutive days.

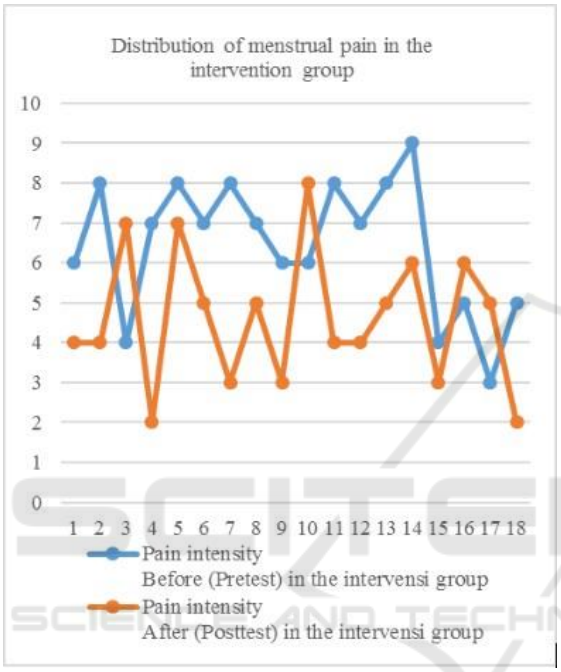

Figure 3: Distribution of menstrual pain in the intervention group.

The results showed that there were no respondents who did not experience pain. These results are obtained by measuring the level of menstrual pain before and after given young coconut water. Factors that influence menstrual pain are psychological, family history, endocrine factors, and hormonal factors. Yesuf (2018) said during menstruation the body will produce the hormone estrogen, progesterone and prostaglandin. The hormone estrogen stimulates contractility of the uterus, while the hormone progesterone inhibits it. (Septianingrum. Y, Hatmanti. M. N, and Andikawati. 2019) Progesterone has the function of maintaining endometrium, but due to the absence of fertilization, the release of the hormone progesterone becomes less and the endometrial wall will decay, endometrium which exfoliates to produce prostaglandins. Increased prostaglandins in the endometrium following the fall in progesterone levels cause an increase in uterine contractions and then pain (Teshager Aklilu Yesuf. A.T, Eshete. A.N, and Sisay.A.E, 2018).

Young coconut water can be administered during the first day of menstruation taken 2 times a Day 1 glass (250cc), morning and evening, for 3 consecutive days can reduce painful menstruation because young coconut water contains electrolytes, minerals, folic acid and vitamins. The blood that comes out can be replaced by folic acid. Folic acid assists in the process of forming red blood cells. Menstrual pain complaints are due to the presence of uterine hypercontraction and the hormonal imbalance of progesterone and prostaglandins. The vitamins and minerals contained in coconut water stimulate the production of progesterone and prostaglandins in stable quantities. Enough hormone levels will stimulate and accelerate the process of endometrial decay and the pain that arises will soon diminish. Pain will be reduced after the blood is quite a lot or smooth.

Water is one of the essential components for the body because the cell function depends on the liquid environment. Water composes 60-70% of the whole body. Drinking therapy of young coconut water aims to replace the lost fluid and lower menstrual pains. The use of therapeutic herbs such as young coconut water is very effective in helping to relieve pain that arises during menstruation. The use of this therapeutic herb is expected menstruation blood expenditure will be smooth and the pain felt will soon decrease (Nuriyanah.E.K and Hanum.F. 2018)

This is in line with research by Fitri Lestari and Sarwinanti (2017) on the Effect of Green Coconut Water Supply on Menstrual Pain Levels in Nursing Science Study Program Students in Stikes'Aisyiyah Yogyakar that of 18 respondents showed the value of Asymp Sign (2-tailed) 0,000 (<0,05). There is an influence of giving green coconut water to the level of menstrual pain (Lestari .F, and Sarwinanti, 2017)

3.4 Menstrual Pain Scores before Breathing Relaxation in the Control Group

Based on Figure 4 it is known that in the control group before breathing relaxation in the majority of respondents experienced severe pain as many as 10 people (55.6%) and in figure 8 known after breathing relaxation the majority of respondents still experienced severe pain that is as many as 11 people (61.1 %) and minority experienced mild pain of 1 person (5.5%). This is because when relaxation of the breath the respondent did not concentrate so that there was no decrease in pain and even increased.

The following is a Figure 4 of the distribution of menstrual pain in the control group before and after breathing relaxation techniques were given.

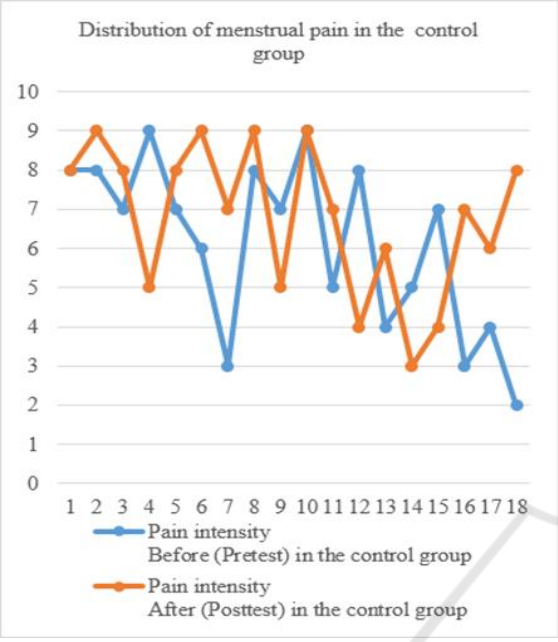

Figure 4: Distribution of menstrual pain in the control group.

Every young woman has different menstrual experiences and menstrual pain. Most of young women got menstruation without complaints, but not a few of those who get menstruation accompanied by complaints in the form of menstrual pain that causes discomfort and impact on disruption of activities such as: teenagers are not concentrated in accepting lessons, decreased learning achievement and often absent (Ardela.M, Yuliwar.R, and Dewi.N, 2017).

Based on Figure 5 the average data of menstrual pain before giving young coconut water is 6.45 and after the intervention has decreased pain with an average value of 4.61. Whereas in the control group there was no decrease in pain before and after breathing relaxation with an average value of 6,78. The results of this study are in line with what was done by Latifah (2016) about the effect of green young coconut water in decreasing dysmenorrhoea pain in class XI students at SMK Ma'arif 5 Gombong. There is a difference between the treatment group and the control group. Paired t-test results of the treatment group were obtained (p), where the value of $\rho = 0{,}000$ (<0.05) and the results of the control group $p = 4.215$ (> 0.05) (Latifah, U, 2016).

The following is a Figure 5 of average menstrual pain in the intervention group before and after young coconut water is given and average pain in the control group before and after breathing relaxation techniques are given.

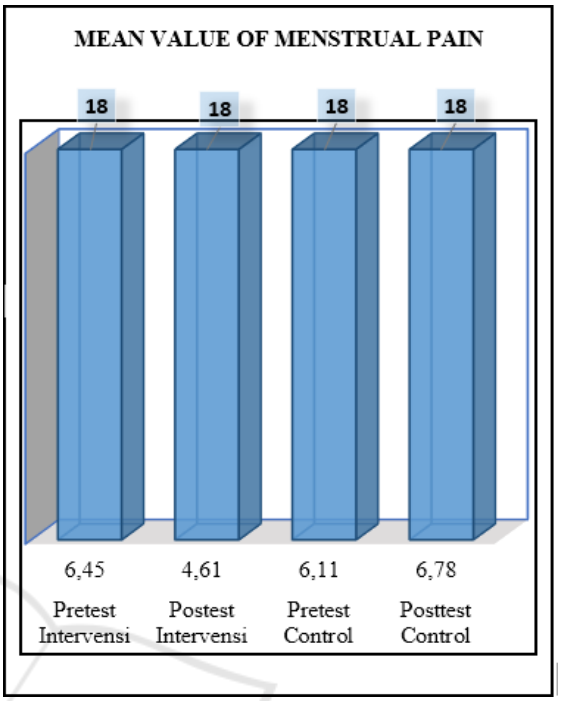

Figure 5: Mean of menstrual pain before and after in the intervention group and the control group.

The decrease in the value of pain varies between one individual with another and the relatively small change in value can be caused by a variety of factors. For one thing, because pain is subjective, no two individuals experience the same pain and no two events of the same pain produce an identical response or feeling to the individual. Pain is a source of frustration, both for patients and health workers. Other factors that can cause pain values vary and show relatively small changes, including the meaning of pain, pain perception, pain tolerance, and reaction to pain (Wulan.S, Soejoenoes.A, Wahyuni M,S, Hidayat.T.S, Widyawati.N.M, and Gurusinga.A, 2017).

Provision of young coconut water is one of the non-pharmacological independent measures. During menstruation the body will produce the hormones estrogen, progesterone and prostaglandins. The hormone estrogen stimulates contractility of the uterus, while the hormone progesterone inhibits it. Progesterone has the function of maintaining endometrium, but due to the absence of fertilization, the release of the hormone progesterone becomes less and the endometrial wall will decay, endometrium which exfoliates to produce prostaglandins. Increased prostaglandins in the endometrium following the fall

in progesterone levels cause an increase in uterine contractions and then pain. Vitamin and mineral contained in young coconut water which can stimulate the production of progesterone in a stable amount. Adequate levels of progesterone will expedite the endometrial decay process and the pain that arises will immediately pass (Aulia, 2017).

3.5 Differences in Mean Menstrual Pain before and after in the Intervention Group and the Control Group

The difference in respondent's pain value in the intervention group was 1.83 and the control group was 0.67 with a p value of 0.007> 0.05. This is in line with Siti Khodijah's research (2017) on the Effect of Green Coconut Water Supply on the Reduction of Dysmenorrhea Pain in Study Program D IV Students of Educator Midwives at 'Aisyiyah University in Yogyakarta where the results of statistical tests show that there is an influence of green coconut water on the reduction of pain in dysmenorrhea with a p = 0.001.

Research conducted by Amirita (2017) about the effect of giving young coconut water to the reduction of teenage menstrual pain in SMA Negeri 1 Lubuk Pakam. The lowest menstrual pain scale before being given young coconut water is 3 (mild pain) and the highest is 7 (severe pain) with a standard deviation of 0.927. The lowest menstrual pain scale after being given young coconut water is 0 (no pain) and the highest is 5 (moderate pain) with a standard deviation of 1.009. Different test results using Wilcoxon test showed that the p value 0,000 (p <0.05) could be interpreted as a mean difference in the scale of teenage menstrual pain before and after being given young coconut water. Young coconut varieties used are early types of eburnea coconut. Early maturing coconuts are small in size and the color of the rind is green that the coconut has been identified as suitable for soft or fresh drinks (young coconut) especially the early maturing coconut of eburnea variety (fast bearing fruit and many fruit production). Early maturing coconut fruit generally at the age of 3-4 years after planting with a variety of fruit production. The respondents who were given the intervention found a decrease in menstrual pain after being given young coconut water. This is because during menstruation the body releases fluids and blood. Young coconut water contains a number of electrolyte liquids that can prevent dehydration. Folic acid contained in it is also useful to replace the blood that comes out.

Water is an important component for the body because cell function depends on the liquid environment. Water makes up 60-70% of the whole body. Therapy to drink young coconut water aims to replace lost fluids and reduce menstrual pain. The use of herbal therapies such as young coconut water is very effective in helping to relieve pain that arises during menstruation. The use of herbal therapy is expected to smooth menstrual blood discharges and the perceived pain will soon decrease. Folic acid is one of the components needed in the production of red blood cells. There is enough of blood production will accelerate blood circulation. A smooth circulation of blood will be enough for cells to need oxygen and nutrients. With this condition, the body will be more resistant to painful sensations caused during menstruation (Ismantoa. V and Beharb. N.A., 2018). Complaints of pain during menstruation can be caused by uterine hypercontractility caused by prostaglandins. Vitamins and minerals contained in young coconut water which can stimulate the production of progesterone in a stable amount. Adequate levels of progesterone will expedite the endometrial decay process and the pain that arises will immediately pass (Putri, S.A., Yunus, M. and Fanani, E, 2018).

4 CONCLUSIONS

Based on the result of statistical tests and the above discussion of 18 respondents in the intervention group and 18 respondents in the control group it is known that there are differences in the average value in the intervention group 1.83 and in the control group 0.67 with a p value of 0.007 so that it can be concluded that there is an effect of water delivery young coconut against menstrual pain.

It is recommended for young women or girls who experience menstrual pain are expected to be able to consume young coconut water 2x a day with a dose of 1 glass (250 ml) for 3 days to cope with menstrual pain and for health services this research can be applied to clients who experience menstrual pain.

REFERENCES

Ameade, K, P, E., and Mohammed, S, B., 2016. Menstrual pain assessment: comparing verbal rating scale (VRS) with numerical rating scales (NRS) as pain measurement tools. *International Journal of Women's Health and Wellness 2016, 2: 017 Volume 2 | Issue 2.*

Amirita., 2017. Pengaruh pemberian air kelapa muda terhadap pengurangan nyeri haid remaja di SMA Negeri 1 Lubuk Pakam. *Skripsi Mahasiswa Institut Kesehatan Medistra Lubuk Pakam. https://elearning.medistra.ac.id/*

Ardela, M., Yuliwar, R., and Dewi, N., 2017. The effectivity of deep breathing and roses aromatherapy relaxation to pain alteration of adolescents with primary dy smenorrhea in Lowokwaru Malang. *International Journal Nursing News Volume 2, Nomor 1, 2017*.

Aulia., 2017. *Kupas tuntas tentang menstruasi. milestone*, Jakarta. Yadika Kopandakan Ii. Jurnal E-Biomedik, 2(1), 2–6.

Bachloo, T., Kumar, R., Goyal, A., Parmal Singh, Yadav, S., Bhardwaj, A., and Mitta, A,. 2016. A study on perception and practice of menstruation among school going adolescent girls in district Ambala Haryana, India. *International Journal of Community Medicine and Public Health Bachloo T et al. Int JCommunity Med Public Health. 2016 Apr;3(4):931-937*.

Buwana, P., Wijasena, B., and Suroto., 2016. Pengaruh pemberian air kelapa muda (cocos nucifera) terhadap kelelahan kerja pada nelayan di Tambak Mulyo Semarang. *Jurnal Kesehatan Masyarakat (e-Journal) Volume 4, Nomor 1, Januari 2016 (ISSN: 2356-3346).*

Fisher, C., Sibbritt, D., Hickman, L., and Adams, J., 2018. A critical review of complementary and alternative medicine use by women with cyclic perimenstrual pain and discomfort: a focus upon prevalence, patterns and applications of use and users' motivations,information seeking and self-perceived efficacy. *Critical review of CAM use by women with CPPD Nordic Federation of Societies of Obstetrics and Gynecology, Acta Obstetricia et Gynecologica Scandinavica 95 (2016) 861–871*.

Firdaus, S., and Astuti., 2016. Pengaruh pemberian aromaterapi terhadap nyeri haid (dismenore) pada mahasiswa s1 keperawatan angkatan IX Stikes Muhammadiyah Banjarmasin. *Website Online Jurnal Citra Keperawatan: http://ejurnal-citrakeperawatan.com.*

Ismantoa, V., and Beharb, A., 2018. Influence the awarding of a dried dinger against a decrease in pain dysmenorrhea in young women at SMK Bhakti Mulia Pare-Kediri. *The 2nd Joint International Conferences | http://proceeding.tenjic.org/jic2 ISBN: 978-602-5842-03-0*

Khodijah, S., 2017. Pengaruh pemberian air kelapa hijau terhadap penurunan nyeri dismenore pada mahasiswa prodi d iv bidan pendidik di Universitas 'Aisyiyah Yogyakarta. naskah publikasi universitas 'aisyiyah yogyakarta. *http:///digilib.unisayogya.ac.id*.

Latifah, U., 2016. Pengaruh air kelapa hijau dalam penurunan nyeri dismenorea pada siswi kelas XI di SMK Ma'arif 5 Gombong. *Jurnal Akper Stikes PKU Muhamadiyah Surakarta. http://journal akpergshwng.ac.id.*

Lestari, F., and Sarwinanti., 2017. The effect of green coconut water on menstrual pain level on nursing students of Stikes'aisyiyah Yogyakarta.

life Bruce., 2017. *Coconut water for healt and healing. library of congress cataloging-in-publication data* . Published in the USA. www.piccadilly books.com.

Nuriyanah, E, K., and Hanum, F., 2018. Effectiveness of light exercise and the use of tamarin turmeric to decrease dysminorea of muhammadiyah university students. *International Journal Of Nursing and Midwifery Science (IJNMS), Volume 2, Issue 2, August 2018.*

Polemer, M., Cuarto., Ronie, F., and Magsino., 2017. Development of young coconut (cocosnucifera) wine. *Asia Pacific International Journal of Multidisciplinary Research, Vol. 5, No. 2, May 2017.*

Preeti, G., Jini, J., Govind, G., and Meharda, B., 2018. Knowledge and practices pertaining to menstruation among the school going adolescent girls of UHTC/RHTC area of Government Medical College, Kota, Rajasthan. *International Journal of Community Medicine and Public Health Gupta P et al. Int J Community Med Public Health. 2018 Feb;5(2):652-656.*

Putri, S, A., Yunus, M., and Fanani, E., 2018. Hubungan antara nyeri haid (dismenore) terhadap aktivitas belajar pada siswi kelas XI SMA Negeri 52 Jakarta. Preventia: *The Indonesian Journal of Public Health, volume 2 (2).*

Rosyida, D, A, C., Suwandono, A., Ariyanti, I., Suhartono., Mashoedi, D, I., and Fatmasari, D., 2017. Comparison of effects of abdominal stretching exercise and cold compress therapy on menstrual pain intensity in teenage girls. *Belitung Nursing International Journal, Volume 3, Issue 3, May-June 2017.*

Septianingrum, Y., Hatmanti, M, N., and Andikawati., 2019. The Effect of murottal qur'an on menstrual pain in nursing student of universitas nahdlatul ulama surabaya. *Jurnal Nurse and Health. 2019 January-June; 8 (1): 8-15.*

Teshager, A., Yesuf, A, T., Eshete, A, N., and Sisay, A, E., 2018. Dysmenorrhea among university health science students, northern ethiopia: impact and associated factors. *International Journal of Reproductive Medicine Volume 2018, Article ID 9730328.*

Ulya, H, F., Suwandono, A., Ariyanti, I., Kumorowulan, S., and Pujiastuti, E, S., 2017. Comparison of effects of massage therapy alone and in combination with green coconut water therapy on β-endorphin level in teenage girls with dysmenorrhea. *Belitung Nursing International Journal, Volume 3, Issue 4, July-August 2017.*

Windartik, E., Yuniarti, V, E., and Akbar, A., 2017. Effectiveness of relaxation handheld fingertechnique and benson relaxation to the changes level of post operative pain section caesarea in Rsi Sakinah Mojokerto. *International Journal of Scientific Research and Management (IJSRM) Volume 5 Issue 09 Pages 7107-7111. 2017.*

Wulandari, S., and Afriliana, D, A., 2017. The Effect of consumption dark chocolate against primary dismenore pain for girls teenager at Kediri 5 high school. *Indian International Journal of Medical Research and*

Pharmaceutical Sciences. February 2017; 4(2) ISSN: ISSN: 2349-5340.

Wulan, S., Soejoenoes, A., Wahyuni, M, S., Hidayat, T, S., Widyawati, N, M., and Gurusinga, A., 2017. The effect of effleurage and abdominal lifting massage in the labor pain. *Medicine Science International Medical Journal doi:10.5455/medscience.2017*.