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Muscle Relaxation Therapy for Dysmenorrhea

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ABSTRACT

Dysmenorrhea refers to painful menstruation which appears in the luteal phase that could affect productivity and quality of life, while dysmenorrhea in adolescents can reduce the concentration of learning. Muscle relaxation therapy is a non-pharmacological treatment that is effective, efficient and simple therapy as an treatment of dysmenorrhea. This study was to determine whether the muscle relaxation therapy reduces for dysmenorrhea in adolescents. This study was true experimental with randomized pretest posttest design. *Dysmenorrhea* screening using ACOG diagnostic criteria, in 207 female students to determine the prevalence of *dysmenorrhea* and *it's* symptoms was recorded in the diary records symptom. Students with *dysmenorrhea were divided into a control group (n=30) and an experimental group (n=30). Students in control group received deep breathing relaxation therapy and those in experimental group received muscle relaxation therapy.* The intensity of pain, blood pressure, respiration and pulse were measured 15 minutes before being given treatment and would be measured again at 15 minutes after giving the treatment during menstrual pain. Instruments used Numerical Rating Scale. Result: Pain intensity before and after intervention in intervention and control group were 5,53 ± 1,167 vs 4,17 ± 1,053, P = 0,000 and 4,47 ± 1,358 vs 3,87 ± 1,96, P = 0,000 . Test paired t-test and Wilcoxon test to see changes in systolic, diastolic and respiratory pressure changes of pulse before and after relaxation. Comparison of the effects of muscle relaxation and deep breathing relaxation with P <0.05 (0.002) with Mann Whitney test.

Keywords: Muscle relaxation, Dysmenorrhea

INTRODUCTION

Dysmenorrhea is characterized as a periodic menstrual cramping pain occuring in the center of lower abdomen and back pain and may be associated with nausea, vomiting, fatigue, anxiety, decreased appetite, headache, unstable emotions, depression and diarrhea that occur prior menstruation or with menstruation (Harel, 2006 and ACOG, 2009). The quality of pain vari and those with severe dysmenorrhea has physical, psychological and social consequences and impairs activities of daily living (Ilyasu, 2012 and Deb, 2008). The prevalence dysmenorrhea ranging from 20% -90% worldwide. In addition, dysmenorrhea is common cause of absenteeism from work and classes, sport or other activities by the female students (Banikarim et al., 2000 and French, 2005).

Primary dysmenorrhea is due to the contraction of the myometrium without ovarian or cervical lesions; it appears either immadiately before or after menstruation and continues for one or three days. Prevalence of primary dysmenorrhea about 41.9% -79.4% in adolescent women which occurred at t 9-13 years old and 57.1% -79.4% occurred at 14-18 years old (Zhou et al., 2010). The prevalence of primary dysmenorrhea in adolescents in Indonesia around 54.89% (Mahmudiono, 2011). Various studies have been conducted to find alternative therapies or alternative therapies that are safer when compared with the use of NSAIDs ie nonpharmacologic therapy. This therapy to reduce pain such as TENS (Transcutaneous Electrical Nerve Stimulation), meditation, visualization, emotional support, warm and cold compress, breathing techniques, hypnosis, skin stimulation techniques (back massage), yoga and acupuncture (Care Management Guidelines, 2005) supplemental therapy, acupressure therapy, and inhaled aromatherapy (Proctor, 2009; Wong et al., 2010; Dehkordi et al., 2014), massage and aromatherapy (Han et al., 2006; Chiu Ou et al., 2012; al., 2011).

Relaxation therapy is one of the simple and effectice self-monitoring therapy in reducing the impact of stress on physical conditions such as pain, or mentality, depression, mood swings, and anxiety. Progressive relaxation therapy is a behavioral therapy that connects between the body and mind for healing themselves in an appropriate manner. This therapy is easy to do and requires appropriate measures (Song, 2013). Relaxation

therapy proved to more effective in lowering good physical symptoms such as of pain, and mental (anxiety). The Benefits of relaxation can degrade anxiety and physical symptoms such as back pain, nausea, loss of appetite and lack of energy in patients breast cancer during chemotherapy (Song, 2013). Dvivedi (2008) reported an existence of a decreasing in pulse, blood pressure systolic and diastolic, temperature peripheral, respiratory and anxiety after being given relaxation progressive in patients who are experiencing premenstrual syndrome.

The effect of relaxation therapy can also overcome the symptoms of insomnia in the elderly people (Napitupulu, 2010). The survey results showed that 78% of adolescents in Institute of Health Science "Karya Husada" Semarang, Indonesia experienced dymenorrhea. Students seek treatment of menstrual pain by checking into health service (9%), taking pain medication (32%), taking herbal medicine like herbal medicine by 40%. As many as 47% of students permit from lectures due to menstrual pain, at least 1 time during menstruation. The problem of menstrual pain can decrease the daily activities of students, 53% of students say can not concentrate in learning.

The aim of this study was to determine whether the muscle relaxation therapy reduces for dysmenorrhea in female students.

METHODS

This true experimental study with randomized pretest posttest design was conducted between July-August 2017 on nursing female students of Institute of Health Science "Karya Husada" Semarang, Indonesia. Ethical approval for this study was obtained from Ethics Committee of Institute of Health Science "Karya Husada" and informed consent was obtained from all students before sample collection. We enrolled 207 students from first until fourth grade. Inclusion criteria were primary dysmenorrhea, having regular menstrual cycle (21-35 days), aged 17-21 years, willingness to participate, experiencing mild to moderate scale menstrual pain. If the teenagers are still experiencing pain after muscle relaxation therapy was allowed used analgesic drugs to reduced dysmenorrhea and this students would be excluded.

Data collection:

The first stage, by preparing guidelines relaxation instructions made by the researchers cited from Suseno (2001) made a guide audiotape relaxation. The Initial screening prevalence of dysmenorrhea were 160 female students (77,3%). Students who fulfilled the inclusion and exclusion criteria were asked to fill the daily record of the symptoms given until the next menstruation as many as 95 students. All the female students are taught relaxation before menstruation by psychologist. Monitoring diary charging was done by sending message to the respondents in the afternoon assisted by student in charge of each class to remind each other to fill the diary. The first day of menstruation after being given a diary, they were asked to report to the person in charge of the class or researchers. Researchers examined the diary, if the students had dysmenorrhea, so they were experienced with the criteria, then the relaxation therapy would be given during dysmenorrhea lasts. The second meeting of the relaxation 15 minutes before being given relaxation, both groups were measured systolic blood pressure, diastolic blood pressure, respiratory rate (breathing), and heart rate (pulse). Similar measurements performed on 15 minute after treatment. Female students treatment group were given relaxation schedule during the days of dysmenorrhea. The activities during the study can be seen in Figure 1.

Data Analysis:

The results were analyzed by computer using SPSS 16.0. Univariate analysis was used to describe respondent characteristics for instance: age frequency, age of menarche, duration of menstruation and type of treatment which taken during menstrual pain. Before testing the hypothesis, normality test was tested , if the data were normally distributed then the data analysis would use mean and standard deviation, whereas if the data were not normally distributed, then it would use median minimum and maximum. In bivariate analysis, prior to the hypothesis test, researchers used test data normality using *Kolmogorov-Smirnov* test if the samples were 50 dan instead of this researchers would use *Saphiro Wilk* when the samples were less than 50. The data was normal distribured when the p>0,05. The hypothesis, can be stated as normal distributed when using Paired T-test, yet the data was abnormally distributed, it had to use nonparametric Wilcoxon test. Comparison of muscle relaxation therapy and deep breathing relaxation used Mann Whitney Test, while to see changes in systolic pressure, pulse and respiratory rate in muscle relaxation group groups used Paired t-test and systolic pressure and diastolic pressure in deep breathing relaxation group used Wilcoxon test.

RESULTS

Characteristics of students' average (mean) age were 15,59 and the mean age of menarche was 12,64 yearsold. Mean Body Mass Index (BMI) was 19,56. Aproximately, student had a regular menstrual pattern (81.9%) with the majority of the long period more than 5 days. Majority of female students complained dealt

with dysmenorrhea (77.2%), but most of them did not consume herbs and medicines, but the majority did sports activities (64.6%). Characteristics of the entire population can be seen in Table 1.

Tabel 1 Characteristics of respondents based on age, menarche, duration of menstruation and type of treatments during dysmenorrhea

Characteristics	Population (n=207)			
	Mean ± SD	Range	f	%
Age (tahun)	19,18 ± 1,193	17 - 26		
Menarche (tahun)	12,91 ± 1,418	10 - 17		
duration of menstruation	6,84 ± 1,706	1 - 15		
Type of treatments during dysmenorrhea				
1. Let it be			103	49,8
2. Warm compress			38	18,4
3. Visited health service			9	4,3
4. Medication			32	15,5
5. Herb mediacation			43	20,8
6. Massase			43	20,8

Tabel 2 Characteristics of Muscle Relaxation and Deep Breathing Relaxation Therapy

Characteristics	Muscle Relaxation n=30		Deep Breathing Relaxation n=30		*p value*
	%	Mean±SD	%	Mean±SD	
Age (tahun)		19,10 ± 1,125		19,10 ± 1,185	0,741
Menarche (tahun)		12,70 ± 1,208		12,77 ± 1,455	0,921
duration of menstruation		7,13 ± 1,570		6,63 ± 0,999	0,402
Type of treatments during dysmenorrhea					
1. Let it be	9 (30%)		14 (46,7%)		0,184
2. Warm compress	8 (26,7%)		3 (10,0%)		0,095
3. Visited health service	2 (6,7%)		0		0,500
4. Medication	2 (6,7%)		7 (23,3%)		0,073
5. Herb mediacation	3 (10%)		4 (13,3%)		0,246
6. Massase	9 (30%)		6 (20,0%)		0,371

Based on table 2, it was found out that the average age of female students in muscle relaxation group and deep breathing was 19.10 years with mean duration of menstruation was 7.13 days in 6.63 days. The majority of female students let the pain occur that is 30% and 46.7% and only 6.7% and 23.3% who come to visit health services to overcome the pain. Non-pharmacological measures performed by the majority with abdominal massage (30%) and warm compresses (26.7%).

Tabel 3 Pain Intensity and Vital Signs Measurement Before and After Muscle Relaxation therapy (n=30)

Measurement	Before		After		P *value*
	Mean ± SD	Range	*Mean*	Range	
Pain Intensity	5,53 ± 1,167	3 - 7	4,17 ± 1,053	2 - 6	0,000**
Systolic (mmHg)	100,80 ± 9,091	80 -120	102,13 ± 8,709	90 -120	0,514**
Dyastolic (mmHg)	69,77 ± 8,665	60 - 93	66,07 ± 7,192	50 87	0,039*
Respiratory rate	22,10 ± 2,426	18 -27	19,93 ± 2,363	16 -25	0,000**
Pulse	87,27 ± 9,805	70 -114	82,13 ± 7,606	64 - 99	0,000**

* Uji *Wilcoxon test*

** Uji *Paired t-test*

Table 3 shows that there are differences in pain intensity, respiratory rate and pulse with pvalue = 0,000. While the pressure of sistole and diastole there is no significant difference with pvalue> 0.005.

Tabel 4 Pain Intensity and Vital Signs Measurement Before and After Deep Breathing Relaxation Therapy (n=30)

Pengukuran	Before		After		P *value*
	Mean ± SD	Range	*Mean*	Range	
Pain Intensity	4,47 ± 1,358	2 - 7	3,87 ± 1,196	2 - 6	0,000**
Systolic (mmHg)	109,30 ± 9,154	90 - 120	109,67 ± 8,802	90 - 120	0,643*
Dyastolic (mmHg)	72,27 ± 5,085	60 - 80	72,67 5,529	60 - 80	0,733*
Respiratory rate	22,10 ± 2,280	18 27	20,07 ± 2,828	16 - 26	0,000**
Pulse	82,83 ± 8,579	70 - 100	79,77 ± 7,686	61 - 94	0,002**

* Uji *Wilcoxon test*
** Uji *Paired t-test*

Table 4 shows that there are differences in pain intensity, number of respiration and pulse with pvalue = 0,000. While the pressure of sistole and diastole there is no significant difference with pvalue> 0.005.

DISCUSSION

The study was conducted in two stages, inial screening respondents and muscle relaxation interventions. Screening was done on 207 students. Prevalence of dysmenorrhea are 160 (77.3%) female students. Characteristics of female students is 19.18 years old, which is classified as late adolescence. Adolescence is the age of puberty where the growth and development of secondary and secondary sex traits begin. The average age of menarche is 12.91 years. Dysmenorrhea occurs in the premenstrual phase (secretion), which increases the hormone estrogen and prolactin. This prolactin serves to increase uterine contractions, another hormone that affects the prostaglandins that stimulate the hormone oxytocin, which also increases the contraction of the uterus. This uterine contraction can cause pain during menstruation. The average menstrual period is 6.87 days. Zhou (2010) reported that menstrual pain can affect efficiency and productivity, interfere with daily activities. Students complain of being unable to learn effectively in school, but only 6.7% are visiting health services.

Non-pharmacological therapy methods that can reduce menstrual pain include relaxation therapy (Mahdavi et al., 2013). Relaxation is a state in which a person is free from stress and anxiety or the return of equilibrium after an interruption. One of relaxation therapy is progressive relaxation which is a muscle relaxation technique that does not require imagination or suggestion. This technique focuses on muscle activity by identifying the tense muscles and then lowering the tension with relaxation. This relaxation can decrease muscle tension, anxiety, depression, irritability. The results of this study found that menstruation pain is trained in muscle relaxation therapy and breath in decreased intensity of pain, Pvalue <0.005. The effect of progressive relaxation is also seen from changes in systolic, diastolic, pulse and respiratory measurements before and after relaxation. Changes in blood pressure, heart rate, and respiration have a significant relationship between before and after progressive relaxation therapy, with a p value <0.001 using the Wilcoxon test test. The results of the study Dvivevi et al (2008) suggest that relaxation therapy may reduce the abnormal sympathetic nerve basal activity, as indicated by changes in blood pressure, pulse, breathing and temperature after relaxation therapy.

Improved sympathetic nervous work can increase the body's metabolic work as a preparation for energy consumption in the move. Improvement of sympathetic nervous work can be seen from the speed of work of the heart, blood pressure, respiratory rate, pulse and muscle tension. Progressive relaxation is to focus on a muscle activity, by identifying the tense muscles and then decreasing the tension with relaxation (Dvivevi et al., 2008). The results of Sukamto (2009), showed that relaxation can reduce the anxiety of adolescents in facing exams. Relaxation can also reduce stress, anxiety and depression in patients with hemodialysis (p <0.000) in Iran (Mahdavi et al., 2013). The results of this study are also supported by research by Morse et al (1991) and Goodale et al (1990) who reported that relaxation can reduce both physical and emotional symptoms. Relaxation techniques aim to achieve a relaxed state physiologically, cognitively and behaviorally. The physiological relaxed state is characterized by decreased levels of epineprine and non-epineprine in the blood, decreased heart rate, decreased airway frequency, decreased muscle tension, decreased metabolism, vasodilation and increased extremity temperature.

Blood pressure is the product of peripheral vascular resistance and cardiac output. Increased cardiac output or vascular resistance can lead to an increase in blood pressure. The various factors that affect cardiac output and peripheral resistance will affect blood pressure. These factors include age, stress, race, gender, medication and obesity (Roger, 2007). Students who were all intervened in the category of adolescents, Javanese race, female sex. Looking at the above discussion can be concluded that muscle relaxation and deep breathing therapy effectively reduce the intensity of pain. Mann Whitney analysis showed that muscle relaxation

therapy was more effective than deep breathing relaxation to reduce pain (pvalue = 0.002) with mean relaxation of deep breathing muscle and breath of 36.87 and 24.13.

CONCLUSION

The Prevalence of dysmenorrhea in adolescents in Institute of Health Science "Karya Husada" Semarang, Indonesia was 77,3%. Characteristics of respondents with premenstrual syndrome of age aspect was such as the average (mean) of 19,18 years, the mean age of menarche of 12,91 years. 76.2%, yet the majority of the students consume herbs and medicines (20,8% and 15,5%) and only 4,3% student seek the health services. There were some changes in symptoms before and after doing progressive relaxation therapy with p value measurement of systolic pressure p = 0.000, mean rank p value = 0.002. Muscle relaxation therapy was effective in reducing pain intensity than in deep breathing relaxation and there are significant changes in pulse and breathing measurements. The suggestions for students muscle relaxation therapy could be listened to reduce dysmenorrhea and other researchers can develop this research using different design or compare with other forms of therapy decreased the symptoms of dysmenorrhea.

REFERENCES

ACOG (The American College of Obstetricians and Gynecologists). (2009). Menstrual Cramps and Dysmenorrhea. *Fact Sheet Tool Kit Teen Care, Second Edition.*

Banikarim, C., Chacko,M.R., Kelder, S.H. (2000). Prevalence and Impact of Nyeri haid on Hispanic Female Adolescents. *Arch Pediatr Adolesc Med*.,154:1226-1229.

Care Management Guidelines. (2005). *Pain Management International association for the study of Pain (IASP)*. Palliative Care. Departemen of Health and Human Service.

Chiu, M., Hsu, T.F., Lai, A.C., Lin, Y.T., Lin, C.C. (2012). Pain Relief assessment by aromatic essential oil Massage On Outpatients with Primary Dysmenorrhea: A randomized, double blind clinical trial. *Journal of Obstetrics and Gynaecology* Research. Japan.Dawood, M.Y. (2006). *Primary Dysmenorrhea Advances In Pathogenesis and Management. Journal Obstetric and Gynecologists*. Vol. 108, No 2, August. Published by Lippincott williams & Wilkins. ISSN 0029-7844/06.

Deb, S, raine Fenning N. (2008). Dysmenorrhea. *Obstet Gynecol Reprod Med*. 18:294-299.

Dehkordi, Z.R., Baharanchi, F.S.H., Bekhradi, R. (2013). Effect of lavender inhalation on the symptoms of primary Dysmenorrhea and the amount of menstrual bleeding: A randomized clinical trial. *Journal Complementary Therapies Medicines.*

Dvivedi, J., Dvivedi, S., Mahajan, K.K., Mittal, S., Singhal, A. (2008). Effect of 61-points relaxation technique on stress parameters in premenstrual syndrome. *Indian J Physiol Pharmacol* 2008: 52(1).

French, L. (2005). Dysmenorrhea. American Academy for Family Phisicians, 71(2), 285-291.

Goodale, I.L., Domar, A.D., Benson, H. (1990). Alleviation of premenstrual syndrome symptoms with the relaxation response. *Obstetric & gynecology.* Vol 75 No. 4 April 1990.

Han, S.H., Hur, M.H., Buckle, J., Choi, J., Lee, M.S. (2006). Effect of Aromatherapy on Symptoms of Dysmenorrhea in College Students: A Randomized Placebo Controlled Clinical Trial. *Journal of Alternativeand Complementary Medicine.*

Harel, Z. (2006). Mini-Review Dysmenorrhea in Adolescents and Young Adults: Etiology and Management. *Journal Pediatric Adolescent Gynecology*.

Ilyasu Z. *et al* (2012). Menstrual pattern and gynecologic morbidity among University students in Kano, Nigeria. *J Pediatr Adolesc Gynecol.* 25:4C1-406.

Kim, Y.J., Lee, S.M.,Yang, Y.S., Hur, M.H. (2011). Self-aromatherapy massage of the abdomen for the reduction of menstrual pain and anxiety during menstruation in nurses: A placebo-controlled clinical trial. *European Journal of Integrative Medicine.*

Lakshmi, A.P.M., Saraswathi I., Saravanan A., Ramamchandran C. (2011). Prevalence of Premenstrual Syndrome and Dysmenorrhoea among Female Medical Students and its Association with College Absenteeism. *International Journal of Biological and Medical Research.*

Mahdavi, A., Heidari, M.A., Gorji, A.M.H., Yazdani, J., Ardebil, M.D. (2013). Implementing Benson's relaxation training in hemodialysis patients: changes in perceived stress, anxiety, and depression. *North American journal of medical sciences*. September 2013. Volume 5. Issue 9.

Mahmudiono, T. (2011). Fiber, PUFA and Calcium Intake is Associated With The Degree of Primary Nyeri haid In Adolescent Girl Surabaya, Indonesia. *Journal of Obstretics and Gynecology*.

Napitupulu, N.F. (2010). Pengaruh teknik relaksasi progresif terhadap insomnia pada lanjut usia di Dusun Blunyah Gede Kelurahan Sinduadi Kec. Mlati Kabupaten Sleman Yogyakarta. Pilliteri. A. (2010). *Maternal and Child Health Nursing*. 6th edition. Wolter Kluwer. New York.

Proctor, M.,Murphy, PA.(2009). Herbal and Dietary Therapies for Primary and Secondary Dysmenorrhea. Cochrane Database Syst Rev ., (3): CD002124.

Roger, P., Smith ., Andrew, M., Kaunitz. (2007). Patient information: Painful menstrual periods (Dysmenorrhea) (Beyond the Basics) Diakses tanggal 19 Maret 2014.

Song, Q.H., Xu, R.M., Zhang, Q.H., Ma, M., Zhao, X.P. (2013). Relaxation training during chemotherapy for breast cancer improves mental health and lessens adverse events. *Int J Clin Exp Med.* 6(10):979-984.

Stuart, G.W. (2006). *Buku Saku Keperawatan Jiwa*. Edisi 5. EGC: Jakarta.

Suyamto. (2009). *Pengaruh Relaksasi Otot Dalam Menurunkan Skor Kecemasan T-TMAS Mahasiswa Menjelang Ujian Akhir Program (UAP) di Akademi Perawat Notokusumo Yogyakarta*. Tesis Program Pasca Sarjana Universitas Gadjah Mada. Yogyakarta.

Wong, L.P., Khoo, E.M. (2011). "Menstrual-Related Attitude and Symptoms Among Multi-racial Asian Adolescent Females". *International Journal Behavioral Medicine.* 18:246-253. DOI 10.1007/s12529-010-9091-z.

Zhou, H.G., Yang, Z.W. (2010). Prevalence of Dysmenorrhoea in Female Students in a Chinese University: A Prospective Study. *Health Journal*.