



The effect of transcutaneous electrical nerve stimulation (TENS) on decreasing primary dysmenorrhea pain in adolescents

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ABSTRAK

Latar Belakang: Dismenore merupakan kondisi adanya kenaikan hormone prostaglandin (PG) F2-alfa dan siklooksigenase (COX-2) yang berefek munculnya hipertonus serta aktivitas vasokonstriksi pada organ anatomi myometrium, dengan kondisi ini maka akan terjadi proses iskemia dan timbul nyeri pada organ uterus. Kondisi ini akan mempengaruhi kualitas dan produktivitas dan kualitas hidup sebagian besar wanita. Kejadian dismenorhea di Indonesia tercatat sebesar 64,25% dan sejumlah 52% pelajar di Yogyakarta mengalami penurunan aktivitas selama menstruasi.

Tujuan: untuk mengetahui Pengaruh Pemberian TENS Terhadap penurunan Nyeri Dismenore Primer Pada Remaja Putri Universitas Jenderal Achmad Yani Yogyakarta

Metode: Metode yang digunakan dalam penelitian ini adalah Quasi Experiment, pre test-post test control group desain. Jumlah responden 24 untuk intervensi dan kontrol. Teknik sampling yang digunakan yaitu Quota Sampling. Variabel penelitian nyeri dismenore diukur menggunakan Numerical Rating Scale (NRS). Analisis bivariate untuk perbedaan nyeri kedua kelompok yaitu dengan Uji T

Hasil: Terdapat perbedaan $p < 0.05$ yang bermakna pada nyeri kedua kelompok sebelum dan setelah diberikan intervensi Pada kelompok intervensi sebelum diberikan perlakuan rata-rata skor nyeri 6 (1.70) berada di rentang angka 4-10, setelah diberikan perlakuan mengalami penurunan intensitas nyeri dengan rata-rata 3.42 (1,6) berada di rentang 1-6. Pada kelompok kontrol intensitas nyeri sebelum diberikan massage yaitu 4 (1.16) dengan rentang skor 3-6, dan setelah diberikan perlakuan mengalami penurunan intensitas nyeri dengan rata-rata 1.50 (0.52) pada rentang 1-2. TENS efektif untuk menurunkan nyeri dari tingkat berat menjadi ringan. Massage effleurage efektif menurunkan nyeri dari tingkat sedang menjadi ringan. Pemberian TENS lebih efektif dalam menurunkan nyeri sebesar 3.50 %

Kesimpulan: Pemberian intervensi berupa TENS dan massage sama sama mampu menurunkan intensitas nyeri dismenore, berdasarkan skor penurunan nyeri TENS lebih efektif dalam menurunkan nyeri sebesar 3.50%. TENS memiliki efek yang signifikan untuk mengurangi nyeri dismenore dengan penurunan nyeri 3.50%

KATA KUNCI: TENS; nyeri; dismenore

ABSTRACT

Background: Dysmenorrhea is medical condition indicated by an increase of the prostaglandin (PG) F2-alpha hormone and cyclooxygenase (COX-2) causing hypertonic as well as vasoconstriction activity to the myometrium. It leads to ischemia and stimulating pain in the uterine organs. The condition influence quality of life and productivity of majority female patients. Dysmenorrhea incidence in Indonesia is reported by 64.25% and a total of 52% of students in Yogyakarta experienced drop activity during menstruation.

Objectives: This study aimed to evaluate the effect of TENS in reducing primary dysmenorrhea pain among female adolescents in General Ahmad Yani University Yogyakarta

Methods: A quasi experiment study with pretest-posttest control group design was conducted. A total of 24 participants for intervention and control group were recruited. In order to recruit study participants, this research implemented a quota sampling approach. Primary dysmenorrhea pain measured using Numerical Rating Scale (NRS) and bivariate analysis between both groups carried out using T-test.

Results: A significant difference ($p < 0.05$) reported from both groups before and after the intervention. Prior to the treatment, the average pain score for intervention group was 6 (1.70) and ranging from 4-10. After the treatment being delivered, the intervention group experienced lower pain intensity by average 3.42 (1.6) between 1-6 score range. Control group in this study reported average pain score before the intervention by 4 (1.16) with and ranging from 3-6. The treatment decreased control group participants pain level to average 1.50 (0.52) between the range of 1-2. TENS is effective for severe pain management. Effleurage massage suitable for moderate level pain management. TENS intervention effective to lower pain by 3.50%.

Conclusions: TENS and massage intervention potential to decrease pain intensity of primary dysmenorrhea. This study reported lower pain level associated with TENS by 3.50%. TENS had significant effect for reducing dysmenorrhea pain by 3.50%.

KEYWORDS: dysmenorrhea; painful; TENS

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INTRODUCTION

Primary dysmenorrhea defined as inconvenient experience during menstruation characterized by cramp and concentrated at the upper symphysis or lower abdominal part followed by sweat production, pain, headache, nausea, vomiting, diarrhea and tremors which leads to activity disturbance (1) . Primary dysmenorrhea experienced by women due to increasing prostaglandin (PG) F₂-alpha hormone and cyclooxygenase (COX-2) causing hypertonic and vasoconstriction of the myometrium. The uterine affected by ischemia and pain stimulation. The occurring tense and long contraction episode of the uterus wall causing increased level of the prostaglandin hormone and organ dilation, as a consequence of blood elimination is emergence of painful moment (2) .

Dysmenorrhea among women associated with the quality of life and activity level. The

prevalence of dysmenorrhea around the world ranging from 50% and 90%. Pain level experienced by women account for 38.3% to moderate level of 58% (2) .

Dysmenorrhea incidence in Indonesia reached 64.25%, distributed to primary dysmenorrhea by 54.89% and secondary dysmenorrhea by 9.36%. The number above represent 55% dysmenorrhea experienced by patient within reproductive age, while 52% of students in Yogyakarta reported lower activity level during menstruation period (3) . A study indicated that 29 (65.9%) of 44 respondents experienced moderate dysmenorrhea which signify the severity of this problem.

Many factors identified to influence the incidence of dysmenorrhea. In general, the factors associated with provoked dysmenorrhea symptoms are menarche, length of menstrual period, blood volume, smoking habits, and

family history. High prevalence of dysmenorrhea cases among adolescent stipulated the problem severity and demand for appropriate care (1) .

Pharmacology management is a common treatment for dysmenorrhea by the prescription of analgesics (80%) (4) . Non-pharmacological managements which align with the physiological principle appropriate for dysmenorrhea treatment. These includes acupuncture, electrotherapy in a form of TENS, body distraction, relaxation and deep breathing, imagination, music therapy, massage and warm compress. Non-pharmacological treatment proven for its safety and long term benefit for quality of life due to the nature of the therapy(3).

Transcutaneous Electrical Nerve Stimulation (TENS) categorized as a non-pharmacological analgesia therapy tool for pain management (5) . TENS generate electricity to stimulate nerves system and peripherals motors in delivering sensation through the skin surface. This method effective for treat pain with different severity. In addition, TENS stimulate hypothalamus for endorphins secretion (6). TENS is a tool that is used to reduce the sensation of pain in various fields including dysmenorrhea pain, However, there have not been many reviews of how effective the use of TENS with other non-pharmacological methods is to reduce dysmenorrhea. In this study, it has been shown that the analysis shows that TENS is more effective in reducing dysmenorrhea pain by 3.5% compared to other types of non-pharmacological therapy, namely massage, and is much more effective and efficient.

In primary dysmenorrhea management, TENS serves as a complementary medicine (7). A number of women who had experienced primary dysmenorrhea reported better outcome after TENS administration (5) . TENS works as a pain reliever and alleviate dysmenorrhea symptom. Among patient within the age between 18-25 years old, TENS reported to be effective

for lowering pain level (6) . Based on this background, the purpose of this study was to determine the effect of Transcutaneous Electrical Nerve Stimulation (TENS) on reducing primary dysmenorrhea pain.

MATERIALS AND METHODS

This is a quasi-experimental study with *pretest* and *posttest* control group design. Intervention group programmed for TENS while the control group treated with effleurage massage. The study conducted at General Ahmad Yani University Yogyakarta from February to April. Population in this study includes residing students in the university dormitory. Inclusion criteria for the study are students with regular menstruation cycle, have no current analgesic prescription, experienced dysmenorrhea on the previous menstruation period, able to communicate idea, have no sensitivity to electric therapy, and willing to participate following the study rules.

Sample size was calculated based on numeric descriptive formula $n = \left(\frac{z \times s}{d}\right)^2$ while precision $= \frac{s}{\sqrt{n-1}}$ retrieved from the following equation

Reported precision score from previous studies was 9.9 while largest sample size from previous study was 10 participants. The numbers applied to the formula and yielded 3.3 for determining numeric calculation.

$$n = \left(\frac{z \times s}{d}\right)^2$$

$$n = \left(\frac{1.64 \times 9.9}{3.3}\right)^2$$

$$n = \left(\frac{16,236}{3,3}\right)^2$$

$$n = 24$$

The sample calculation requires 24 participants (12 for intervention group and 12 for control group). A quota sampling technique implemented for participant recruitment while dysmenorrhea pain evaluated using

Numerical Rating Scale (NRS). Respondents' characteristics were collected using web-based form available for access through <http://gg.gg/DATA-RESPONDEN-TENS> .Secondary data retrieved to identify the number of students from the General Ahmad Yani University Yogyakarta.

Effleurage massage delivered for the control group for two series in one cycle of 15 minutes period while TENS with 10-50 Hz intensity being administered to the intervention group for two series in 1 menstruation cycle for 15 minutes (2).

Univariate and bivariate statistical analysis performed to analyze the collected data. Univariate analysis aimed to describe the data distribution of participants characteristics, while for participants' characteristic equality was evaluated with Chi Square. T-test bivariate analysis carried out to measure pain difference between two groups. The study has been approved for ethical approval with registration number: S.Kep/027/KEPK/III/2020.

RESULTS AND DISCUSSION

RESULT

Data analysis of this research includes participants characteristics respondent, pain level measurement, decreasing pain level analysis and treatment effectiveness among both groups.

Descriptive statistics analysis conducted to present univariate features of the participants in a form of frequency distribution. Participants characteristics include age of menarche, length of menstruation, menstruation cycle, family history and exercise. The following table describe this study participants' characteristics:

Participants' characteristics as described in Table 1 indicated that menarche age from both groups were dominated from <12 years old with 58.3%. Length of menstruation less than or equal to 6 days of the intervention group was 91.6%, while in the control group was 66.6%. 66.6 % of participants reported irregular menstruation cycle, 75% of the participants have a family

Table 1. Participants characteristics

Characteristics	Intervention		Control		p value
	n(12)	f	n(12)	f	
Menarche					0.685*
< 12	7	58.3%	7	58.3%	
12	5	41.6%	5	41.6%	
Mean (SD)	12.5 (1.44)		12.1 (2.20)		
Menstruation Length					0.761*
6 days	11	91.6%	8	66.6%	
7 days	1	8.3%	4	33.3%	
Mean (SD)	29.2(3.07)		28.6 (0.98)		
Menstruation Cycle					0.591*
Regular (28-35)	8	66.6%	4	33.3%	
Irregular (< 28, >35)	4	33.3%	8	66.6%	
Mean (SD)	6.33(1.55)		6.5 (0.90)		
Family History					0.157**
Positive	9	75%	4	33.3%	
Negative	3	25%	8	66.6%	
Median (Range)	1 (1-2)		2 (1-2)		
Exercise					0.121**
Active	6	50%	2	16.6%	
Inactive	6	50%	10	83.3%	
Median (Range)	1.5 (1-2)		2 (1-2)		

Note: *Paired Samples Test, ** chi square

history of dysmenorrhea and 83.3% perform regular exercise. Statistical analysis yielded significant difference with $p > 0.05$ which indicated a qualification comparative characteristic

Table 2. Dysmenorrhea pain level before and after treatment

Dysmenorrhea Pain	Group		p
	Intervention (n=12)	Control (n=12)	
Pre			0.012
Mean (SD)	6 (1.70)	4 (1.16)	
Range	4-10	3-6	
Post			0.002
Mean (SD)	3.42 (1.67)	1.50 (0.52)	
Range	1-6	1-2	

Note: * Paired Samples Test

The results indicated a significant difference of the participants' dysmenorrhea pain level before and after treatment with $p < 0.05$. Pain intensity was improved in particular for the intervention group. Before the treatment, participants' pain level in average was 6 (1.70) and ranging from 4-10. The treatment decreased pain intensity to 3.42 (1.6) between the range 1-6. In addition, reported pain intensity of the control group prior the massage was 4 (1.16) from level 3-6. After the intervention, the pain intensity improved to 1.50 (0.52) between the range of 1-2. The treatments for both groups effective to lower dysmenorrhea pain intensity.

Table 3. Descriptive analysis pain reduction from both groups

Dysmenorrhea Pain	Intervention		Control	
	n(12)	%	n(12)	%
Pre				
Mild	0	0	3	25
Moderate	9	75	9	75
Severe	3	25	0	0
Post				
Mild	6	50	12	100
Moderate	6	50	0	0
Severe	0	0	0	0

Pain reduction analysis in association with TENS and *effleurage massage* presented on

Table 3. It is inferred that 9 (75%) participants from the TENS group reported moderate pain level and 3 (25%) of them reported severe pain experience. TENS improved participants' pain severity into mild and moderate level by 6 (50%) respectively, and no reported severe pain experience. The results confirmed that TENS effective for the management of dysmenorrhea pain. Similar findings identified from the control group. The effleurage massage effective to decrease pain level from mild and moderate to mild level. These findings indicated that both modalities were effective for dysmenorrhea pain management.

Table 4. Treatment effectiveness comparison for menstrual pain

Dysmenorrhea Pain	Intervention	Control
Pre-post		
Mean (SD)	2.58 (1.08)	3.00 (1.47)
Range	1.89-3.27	2.06-3.93
Comparison painful	0.000*	0.000*
% Decrease painful	3.50%**	1.50%**

Description: * Paired Samples Test, ** Mann Whitney

Comparative analysis effectiveness treatment on both group in drop pain is served in table 4. The results of the analysis in table 4 show comparison dysmenorrhea pain after given treatment in the form of TENS in the given group treatment in the form of *effleurage massage* that is in the control group data obtained that gift treatment dysmenorrhea pain on both group before and after given treatment show that there is significant difference $p < 0.05$. However, based on testing related % decrease pain, the data obtained that in the group Intervention in the form of giving TENS more effective in lower painful of 3.50.

DISCUSSION

Menstruation is a part of the reproductive organs' maturation process. However, various symptoms that occurs emerge to be a disorder (8). First menstruation episode commonly

referred as menarche is a physiological process characterized by an increase in the FSH and LH hormones which serve the function to stimulate ovarian target cells.

FSH and LH hormones in association with receptors increase secretion rate, cell growth as well as cell proliferation (9) . Menarche in each woman different depend on individual hormone levels. The ideal age for menarche is between the age of 12 to 14 years old. First menstruation that occurs under the age 12 years old classified as an early menarche (10) .

The study results as presented on Table 1 indicated that the participants' menarche was less than 12 years old. Menarche that occurs at the age below 12 affect individual physical and psychological readiness. Physical unpreparedness could cause problem for adolescent, especially pain during the menstrual period due to lack of reproductive organ maturity (11) . Menstrual pain experienced because of excessive contraction in uterus which associated with endocrine factors of the body. Endometrium contraction amid secretion phase will produce prostaglandin F₂ to stimulate smooth muscles movement. Another outcome of the excessive prostaglandin F₂ production including diarrhea, nausea and vomiting in conjunction with the hormone released in the blood circulation (12) .

Results indicated that that average respondent experienced menarche at the age below 12 years. The findings were in accordance with a theory that immature development and readiness of reproductive organs lead to primary dysmenorrhea. Menstrual pain emerges as a consequence of cyclooxygenase (COX-2) process which directed by increasing prostaglandin F₂ levels in the body. The process causing hypertonus and vasoconstriction of the myometrial tissue to mark the onset of pain or ischemia (2) .

Menstrual duration is one influencing factor associated with dysmenorrhea pain. Research showed that the average length of menstruation

is 6 days. This study discovered that participants were performing physical exercise and confirmed family history associated with menstrual pain. In this regard, menstrual length failed to withstand as the main factor of dysmenorrhea. Menstrual duration influenced by women physiological and psychological factors. Physical activity, hormonal factors as well as body enzyme levels reported to affect menstrual duration (13) .

Psychological aspect considered to influence the menstrual duration. Emotional status of the adolescent in general characterized by unstable state in approaching menstruation. Physiologically, menstruation correlated with reproductive organ function specifically uterine muscle contraction. Longer menstrual period associated with prolonged uterine contractions which produce more prostaglandin and inhibit blood flows. Vascular and genetic factors found to have association with the dysmenorrhea (14) .

Menstruation cycle is an observed process in dysmenorrhea pain. Menstruation cycle regulated by endometrium, hypothalamus, pituitary and ovaries glands (15) . This study discovered that among intervention group participants experienced regular menstruation cycle, while in the effleurage massage dominated by irregular cycle. Pain in primary dysmenorrhea occurs during ovulatory menstruation cycle. The pain episode emerges after ovulation process completed, mature follicle cells transform into corpus luteum and gradually degenerate due to absence of the fertilization and implantation. In parallel, estrogen and progesterone hormone levels decreasing. Both hormones' activities impact endometrial lining. Decreasing ovarian hormone stimulate the production of prostaglandin which stimulate vasoconstriction in the endometrial lining and causes uterine contractions (16) . Interpretation of the process suggest that regular menstrual cycle participants' common to experience dysmenorrhea pain since the episode occurs during ovulatory phase.

Family history confirmed to influence dysmenorrhea. Research findings reported that participants' have family history of dysmenorrhea. This result showed that genetic factors have role in dysmenorrhea pain. Female adolescent with family history of dysmenorrhea are at risk 3 times higher to experience dysmenorrhea (17) . Genetic factor greatly affect physical as well as hormonal homeostasis including estrogen, progesterone, testosterone and other steroid hormones that associated with neurotransmitter function (18) (19) .

Psychological factors identified to have an association with dysmenorrhea pain. Relationship between family with adolescent demanded to minimize dysmenorrhea pain. Appropriate amount of information, supplemented by counseling about menstrual disorders and stress management in adolescents essential to lower the complications risk. Stress and mood disorders in women during menstrual period correlated with neuroendocrine system. The hormonal activity, indicated by rapid increase in estrogen at puberty modified neurotransmitter system sensitivity. Constant fluctuation of estrogen and progesterone levels during reproductive age signify the changes of neurotransmitter system (19) . Menstrual disorder among adolescent affect individual productivity and causing stress which may alter the menstrual pattern (8) . Management of the risks require support from family and school academia in a form of counseling and appropriate care (20) .

Exercise activity significant to balance the physical and psychological aspect. This study discovered that participants were engaged in physical activity. The activity enhances body metabolic system, in particular promoting blood and oxygen circulation towards the uterus. Lack of physical activity affect blood and oxygen circulation blood in the uterine organs which result in the endorphins production. Endorphins beneficial to maintain psychological health by alleviating stress in reducing dysmenorrhea (21)

. Mild physical activity with relaxation potential to ease muscular tension and increase endorphins secretion (12) .

Dysmenorrhea pain is a menstrual disorder that affect overall adolescent health and reduce productivity. Primary dysmenorrhea emerge due to uterine muscle (myometrium) contraction and prostaglandins release (22) . Non-pharmacological pain management aimed to enhance patient quality of life as well as minimize drug consumption (3) . This research confirmed significant difference before and after treatment. Pain intensity substantially decreased in the intervention group from 6 (1.70) in between range 4-10, to 3.42 (1.6) between the range 1-6. Similar to the control group the pain intensity enhanced from 4 (1.16) with range between 3-6 to 1.50 (0.52) in the range of 1-2. Treatment for both groups effective to lower the dysmenorrhea pain.

TENS manage the dysmenorrhea pain by stimulating large nerve fiber through small fiber in alleviating pain. Non-pharmacological therapy in a form of TENS activate nerves with various inner diameter size to transmit information from the receptor to central nerves system. Electric stimulation with amplitude of 10-50 Hz for 15 minutes stimulate skin with massage-like-movement to promote relaxation.

The relaxation process affect hypothalamus to stimulate pituitary gland in releasing endorphins (6) . Dysmenorrhea pain occurs due to excessive uterine contraction which caused by endocrine factors. Endometrium produces prostaglandin F₂ and causes contraction of smooth muscle during the secretion phase. Worse case of the excessive prostaglandin F₂ circulation in blood vessel include diarrhea, nausea and vomiting (12) .

Pain stimulation received by skin nociceptors either high or low frequency associated with tissue expansion and lesion. Occurring lesion led to necrotic that activates

K⁺ and intracellular proteins. High level of extracellular K⁺ trigger nociceptor depolarization causing inflammation due to protein exfoliation that infiltrates microorganisms. The process excrete leukotrienes, prostaglandin E₂, and histamine (hyperalgesia) or allodynia) (23) .

TENS capable to inhibit pain transmitter by diffusing electricity through the electrodes. TENS electrode placement for dysmenorrhea located at the bottom area of the dorsal. The electrode applied between 1-2 cm distance from Thoracal 10 (T10) to Lumbar 1 (L1). The TENS activated during dysmenorrhea pain with lowest intensity start from gradually increased for 15 minutes. The treatment effective to reduce dysmenorrhea pain by selective process while the electric activity of the skin surface focused on large diameter sensory nerves (A β) and deactivate small diameter nociceptive fibers (A δ and C). Physiologically, the process rapidly activates the segmental pain-relieving substance by hypothalamus to the skin. It works on the central and peripheral nerve system. (24)

Management of dysmenorrhea pain with non-invasive analgesic technique associated with lower levels of stress and anxiety. Relaxing sensation during TENS intervention arises because of a vibration process from the electro-mediated portable pulse generator electricity (25) .

In the control group, dysmenorrhea pain treated with effleurage. This study identified the pain level was similarly decreased. Effleurage massage considered as an alternative for non-pharmacological pain management. Female adolescent experienced menstrual pain characterized by abdominal stiffness and lower-abdominal contractions. The symptoms develop due to increasing prostaglandin (PG) F₂-alpha cyclooxygenase (COX-2) which physiologically causing hypertonus and vasoconstriction of the myometrium (2) . Massage with calm rhythmic, gently pressurized towards distal or lower

abdominal muscles intended to promote blood circulation, offer relaxing experience and warm abdominal muscles (18) .

Administering effleurage massage as a pain therapy of the lower abdominal area stimulate skin fiber tactile to inhibit pain sensation. The massage stimulate A- α fibers of the skin surface and terminate pain receptors of the hypothalamus which allow cortex cerebri receive no pain transmission (18) . Effleurage massage distract individual attention to enhance the endorphin production for muscle relaxation. The massage decelerate fibrous pain stimulus to the brain so that during the therapy process physiologically the pain sensation is not being transmitted to the cortex cerebri (26) .

Another associated factor of the menstrual pain is the onset of menstruation, menstrual length, menstrual cycle, family history and physical activity. The factors were described in the participants' characteristics table. This research discovered participants' onset of menstruation dominated age below 12 years old. Menstruation before the age of 12 correlated with physical and psychological readiness of the individual. Unprepared adolescent are at risk of menstrual pain due to immature reproductive organs (11) . The results indicated that majority of the participants' menstrual length lasts for 6 days. Menstrual length influenced by woman physiological or psychological factors. In addition, physical activity and hormonal factors found to be correlated with menstrual length (13).

Based on psychological state, prolonged menstruation among adolescents generally associated with emotional level, while physiologically menstruation related with reproductive organ functionalities specifically uterine muscles contraction (14) . Menstruation cycle also confirmed to have an effect to dysmenorrhea pain. Dysmenorrhea pain reported to be experienced during ovulatory phase menstrual cycle. After ovulation process

completed, mature follicle cells transform into corpus luteum and gradually degenerate due to absence of the fertilization and implantation. In parallel, estrogen and progesterone hormone levels decreasing. Both hormones' activities impact endometrial lining. Decreasing ovarian hormone stimulate the production of prostaglandin which stimulate vasoconstriction in the endometrial lining and causes uterine contractions. Family history similarly related to the dysmenorrhea pain. The genetic properties influence psychological characteristics as well as the hormonal balance of estrogen, progesterone, testosterone and other steroid hormones that affect neurotransmitter function (19) . Physical activity in several studies confirmed for the benefit by enhancing body metabolism and promote blood as well as oxygen circulation to the uterus (21) .

Effectiveness of TENS for dysmenorrhea pain management highly visible. Implementing TENS as a therapy for dysmenorrhea considered as a portable, non-invasive and affordable method with minimal and low risk of contraindications (27) . Similar study reported that TENS more effective to lower pain level by 3.50% compared with effleurage massage.

The advantages of TENS for dysmenorrhea management improved when regularly programmed Among primary dysmenorrhea patients TENS effective to reduce pain, decrease analgesic use and enhance patients' quality of life (27). TENS proven to equally as effective to acupuncture (28) . Implementing this modality to lower pain level can be performed in day-to-day basis through the relaxing sensation of the body. The relaxation in conjunction with pituitary gland stimulation to release endorphins (6) . TENS electrical activity to the skin surface triggered mechanical deformation of the epithelium tissue which consist of thousands cells in relieving stress (29)

CONCLUSION AND RECOMMENDATION

Differences in dysmenorrhea pain before and after treatment identified in this study. The average pain level of intervention group was 6 (1.70) between 4-10 prior to the intervention. TENS lower the pain to 3.42 (1.6) in the range of 1-6. Among control group participants, pain intensity before the massage was 4 (1.16) ranging from 3-6, and after the treatment was 1.50 (0.52) between 1-2. TENS is effective to alleviate severe pain into mild. Effleurage massage effective to decrease pain level from moderate to mild. Administering TENS effective to lower pain by 3.50.

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