Combination of Acupressure on Sp6 Point and Ginger Drinks for Dysmenorrhea among Adolescents

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Abstract: *Background: Dysmenorrhea is often a problem for women, especially for adolescents. Management of dysmenorrhea can be done through pharmacologically and non-pharmacologically treatments. Non-pharmacological treatments include acupressure therapy and ginger drinks. Methods: This was a quasy experimental study with Pretest-Posttest Control Group Design. The sampling technique used was consecutive sampling consisting of 57 respondents assigned into 3 groups, namely acupressure group, analgesic group and combination of acupressure and ginger drinks. Pain scale was measured using the Numeric Rating Scale. Data analysis used Paired t test and One Way Anova test. Results: The results showed that there was an effect of analgesic, acupressure and combination of acupressure and ginger drinks on dysmenorrhea. The result of mean difference test found that combination of acupressure and ginger drinks with analgesic had a higher effectiveness compared to acupressure to reduce dysmenorrhea among female adolescents. Conclusion: Analgesic therapy, acupressure and combination of acupressure and ginger drinks given to respondents were able to significantly reduce dysmenorrhea or menstrual pain. Recommendation: Women who experience dysmenorrhea can try to apply pain management using non-pharmacological treatments such as acupressure therapy, consumption of warm ginger drinks or using analgesic drugs.*

Keywords: Analgesic, Acupressure, Combination, Dysmenorrhea

1. Introduction

Dysmenorrhea is menstrual pain that can interfere with daily activities such as absent from work or school. If this problem is not addressed immediately it will be very detrimental.[1] Dysmenorrhea is caused by excessive amounts of prostaglandin in menstrual blood, which stimulates uterine hyperactivity and seizure of uterine muscles.[2] If the muscles of the uterus contract continuously, they will cause muscle tension. This tension not only occurs on the abdominal muscles, but also on the supporting muscles in the lower back, waist, pelvis and thighs.[3] The incidence of dysmenorrhea in the world is very high with an average of more than 50% of women in each world experience it. Morgan and Hamilton said that 40% -50% of women in the world had dysmenorrhea and 5% -10% were in severe and unbearable category.[4] In Indonesia it is estimated that 55% of women of childbearing age suffered menstrual pain. The incidence of primary dysmenorrhea in Indonesia in 2008 was 54.89%, while the rest was secondary type.[5] At this time the prevalence of significant clinical symptoms is estimated by 12.6% -31% of menarche-aged women. Epidemiological studies showed that about 20% of adolescents experienced primary dysmenorrhea.

Dysmenorrhea can have an impact on the activities or routines of women's especially adolescents. Dysmenorrhea causes adolescents to be absent from school or college so that this condition may cause a decline in the quality of life of women.[6] Efforts to overcome primary dysmenorrhea in adolescents require integrated and comprehensive treatment, because in general it can interfere with daily activities and can affect the work productivity. One way to overcome this problem is by exercising regularly to reduce pain.[7] The management of dysmenorrhea can be performed pharmacologically and non-pharmacologically. Pharmacological treatment can be performed with the use of non-steroidal anti-inflammatory drugs (NSAIDs), while non-pharmacological treatments can be performed with hypnotherapy, warm water compresses, regular exercise, distraction, relaxation and acupressure.[5]Acupressure can overcome dysmenorrhea because there are 3 points in the acupressure, body or general points, special points and pain points. One of the ways to deal with dysmenorrhea is the pain points namely the points in the complaint area. If the point is pressed it always feels pain and its function is only symptomatic, as pain reliever.[8]

Acupressure can reduce dysmenorrhea because acupressure is a method of massage based on acupuncture or it can also be called acupuncture without needles. Red ginger is included in seasonal plants with greenish stems, upright, 40-50 cm, high grooved and forms rhizomes. Red ginger rhizome also contains resin oil which consists of gingerin, starch, resin, organic acids, oxalic acid, malic acid, and gingerol. The red ginger rhizome has anti-inflammatory property.[9] The test results on ginger extract stated that the p-value obtained was 0.000 or p<0.05 which meant that it affected the decrease in dysmenorrhea pain scale. Various studies have been carried out to find supplementary therapies or complementary therapies that are safer compared to pharmacological therapy (non steroids), such as acupuncture, exercise, herbal therapy, behavioral therapy, and aromatherapy. Acupressure on Sp-6 point (Sanyinjiao) is

very important to reduce menstrual cramps, regulate the menstrual cycle, treat pain, and increase energy because it is a point with strong move of qi (energy) and Xue (blood). This point also helps to produce qi. Acupressure at the Sanyinjiao point (SP-6) had a significant effect on reducing the severity of menstrual symptoms.[10] The result of statistical test stated that there was an effect on the decrease in dysmenorrhea with a p value of (<0,002).

2. Literature Survey

Adolescence is a time when individuals develop from the first time they show their secondary sexual signs until they reach sexual maturity, individuals experience psychological development and patterns of identification from childhood to adulthood and a transition from full socio-economic dependence to relative circumstances more independent.[11] Dysmenorrhea is defined as menstrual pain.[12] Menstrual pain usually with cramps and is concentrated in the lower abdomen. Complaints of menstrual pain can vary from mild to severe.[13] So it can be concluded that dysmenorrhea is a period accompanied by pain (cramps) in the abdominal area and is a gynecological problem that is common in women.

Red ginger which has the scientific name Zingiber Officinale var rubrum is one of the plants in the form of clumps plants that have pseudo stems. Red ginger is an herbal plant that has a red rhizome and has the smallest rhizome size with red skin and fiber that is coarser than other ginger. Red ginger has a red rhizome and is smaller than a small white ginger with a diameter of 42 to 43 mm, height 52 to 104 mm and a length of 123 to 126 mm.[14] Acupressure is a method of Chinese medicine by pressing or massaging and stimulating acupuncture points. Acupressure is the development of acupuncture.[15] Acupressure is an ancient healing art that requires using objects (generally hands or arms) to stimulate certain key points in the body with the aim of reducing pain or discomfort. Pain and discomfort are considered signs of an imbalance of energy left in this state will become sick and sick.[16]

3. Methods

This was a quasy experimental study with Pretest-Posttest Control Group Design. The sampling technique used was consecutive sampling consisting of 57 respondents assigned into 3 groups: 19 in the control group (analgesic), 19 in the acupressure group, and 19 in the combination group. The variables studied here were the level of pain among female adolescents who had dysmenorrhea before and after treatment. Interventions were given in the form of analgesic drugs, acupressure and combination for adolescents with dysmenorrhea and observation of pain was performed in the second day. The measuring instrument used here was Numeric Rating Scale (NRS). Data analysis was conducted with univariate analysis to analyze the study variables descriptively; bivariate analysis to test each variable between the control group and the intervention groups, the data were normally distributed so that the data analysis usef paired sample t test. To test the difference in dysmenorrhea level in each group, one way anova test was performed.

4. Results and Discussion

4.1 Univariate Analysis of Respondents' Characteristics

Table 1: Characteristics of Respondents

S. No	Characteristic	Group			p value
		Combination	Analgesic	Acupressure	
1	Age (Year)	16.11±0.87	16.00±0.74	16.05±0.78	0.320
2	Menstrual Period (Day)	6.11±1.15	6.21±1.31	6.00±1.49	0.371
3	Class a. X b. XI c. XII	8 (42.1%) 6 (31.6%) 5 (26.3%)	6 (31.6%) 8 (42.1%) 5 (26.3%)	7 (36.8%) 7 (36.8%) 5 (26.3%)	0.966
4	Drug History Ya, used drug No, didn't use drug	2 (10.56%) 17 (89.5%)	1 (5.3%) 18 (94.7%)	3 (15.8%) 16 (84.2%)	0.572

Based on Table 1 it is known that the mean of age in each group based on Anova difference test statistically had the same or homogeneous values because it was obtained p value of 0.320 or <0.05 with the mean in the combination group of 16.11 (n=19), in the analgesic group of 16.00 (n=19) and in the acupressure groupof 16.05 (n=19) from the age of 15-17 years. The mean of menstrual duration using the ANOVA test in the three groups showed the same or homogeneous values (p=0.371) with the mean in the combination group of 6.11 (n=19), in the analgesic group of 6.21 (n=19) and in the acupressure group of 6.00 (n=19). Most of the respondents in the three groups were students of class X as many as 21 respondents (n=57), class XI as many as 21 respondents (n=57) and class XII as many as 15 respondents (n=57). Most of the respondents did not consume drugs during menstruation, namely in the combination group of 17 respondents (89.5%), in the analgesic group of 18 respondents of 94.7% and in the acupressure group 16 respondents of 84.2%.

4.2 The mean values of pain scale in the combination group, analgesic group and acupressure group before and after treatment

Table 2: Pain scale in the combination group, analgesic group and acupressure group before treatment (pre test)

No	Group	Mean ± SD	Median	Min	Max
1	Analgesic Group Before After	6.84±1.16 1.79±1.54	7.00 2.00	5 0	9 5
2	Acupressure Group Before After	6.84±0.95 2.47±2.17	7.00 2.00	5 0	9 7
3	Combination Group Before After	6.89±1.04 1.84±1.38	7.00 2.00	5 0	9 5

Based on table 2 it can be known that the means of pain scale in the three groups before treatment were included in the moderate and severe categories. After therapy, the means of pain scale decreased and all were in the mild category.

4.3 Bivariate Data Analysis

A. The Difference in the Mean of Pain Scale Before and After Treatment in the Analgesic Group, Acupressure Group and Combination Group

Table 3: The Difference in the Mean of Pain Scale Between the Analgesic Group, Acupressure Group and Combination Group

No	Group	Before Treatment (pre test)	After Treatment (post test)	*p value*
1	Analgesic Group	6.84	1.79	0.000
2	Acupressure Group	6.84	2.47	0.000
3	Combination Group	6.89	1.84	0.000

Table 3. showed that there were significant differences in the mean of scale of pain before and after treatment in the three groups, namely the analgesic group, acupressure group and combination group wit p value of 0.000 ($p < 0.05$).

B. Multivariate Data Analysis

Table 4: The Difference in the Mean Difference of Pain Scale Between the Analgesic Group, Acupressure Group and Combination Group

Group	Before Treatment (pre test)	After Treatment (post test)	Δ	p value
Analgesic Group	6.84	1.79	5.05	0.534
Acupressure Group	6.84	2.47	4.37	
Combination Group	6.89	1.84	5.05	

Based on Table 4 the difference in the mean difference of pain scale in the three groups showed that the combination group and analgesic group had an equal value of 5.0 while the difference in the mean difference of pain scale before and after therapy in the acupressure group was 4.37.

4.4 Dysmenorrhea pain scale before and after the administration of analgesic drugs

Based on the results of the paired t test it is known that there were significant differences with a p value of 0.000 (<0.05) which meant that analgesic administration could reduce dysmenorrhea. The mean of pain scale before giving analgesic therapy was 6.84. Menstruation is the periodic removal of blood and body cells from the uterine wall and discharged from the vagina. It can also be interpreted as natural cycle that occurs regularly to prepare a woman's body every month. The average menstrual period of women is 3-8 days with an average cycle of 28 days per month. The maximum period of menstruation is 15 days. As long as the blood discharged has not excessed the limit, then the blood discharged is menstrual blood. Usually menstruation begins at the age of 9-12 years. There are some women who experience menstruation later (13-15 years). The condition of adolescents who have experienced menstruation is emotionally unstable. Some can also have symptoms such as aches in the thighs, pain in the breast area, fatigue, irritability, loss of balance, carelessness and sleep disturbances, even some women also experience pain during menstruation called dysmenorrhea.[17]

Dysmenorrhea is a medical condition that occurs during menstruation that can interfere with daily activities and requires treatment. Dysmenorrhea is characterized by pain in the abdominal or hip area, menstrual pain is characterized with cramp and it is centred on the lower abdomen area. Cramping pain felt before or during menstruation can also be pain in the buttocks area, pain in the abdomen, nausea, vomiting, diarrhea, dizziness or even unconscious condition.[18] Relieving pain caused by dysmenorrhea can be done using analgesic drugs such as aspirin, mefenamic acid, paracetamol, cofein, and feminax. Drugs in the market include novalgin, ponstan which are often used to reduce complaints. There are also some women who use traditional medicine such as betel leaf water, papaya leaves, turmeric rhizome and others.[19] Analgesics are drugs used to relieve pain. Analgesic drugs reduce prostaglandins through a chain mechanism of arachidonic acid thereby it can reduce the amount of pain stimulation.[20]

Most women who experience dysmenorrhea often use drugs that function as analgesics such as mefenamic acid, ibuprofen, aspirin, paracetamol, diclofenac, and others. In general, the side effects of analgesic drugs are disorders of the gastrointestinal tract, such as nausea, vomiting, dyspepsia, diarrhea, and other symptoms of gastric mucosa irritation, as well as skin erythema and headache. A study conducted by Kresnadi and Mulyo found that the administration of analgesics with the type of cox-2 analgesic and mefenamic acid was able to reduce pain with a p value of 0.001.[21] A study conducted by Dewi and Nugroho found that the analgesic combination of paracetamol and tramadol was able to reduce pain with a p value of 0.016.[105] A study conducted by Permata found that analgesic use could reduce pain.[22]

4.5 Dysmenorrhea pain scale before and after the administration of acupressure therapy

Based on the results of the paired t test it is known that there was a significant difference with a p value of 0,000 ($<0,05$) which meant that on acupressure SP-6 point could reduce the level of dysmenorrhea. The mean of pain scale before the acupressure therapy was 6.84 in which 7 respondents (36.8%) were included in moderate pain category and 12 respondents (63.2%) in severe pain category. The mean of pain scale after the acupressure therapy was was 2.47 in which 4 respondents (21.1%) were included in the painless category, 9 respondents (47.4%), in mild pain category, 5 respondents (26.3%) in moderate pain and 1 respondent (5.3%) in severe pain category.Excessive production of prostaglandin in endometrial during the luteal phase of the menstrual cycle is thought to be one of the causes of dysmenorrhea in some adolescents. Prostaglandins (especially E2 and F2α) diffuse into endometrial tissue and cause abnormal uterine muscle contraction, causing uterine ischemia and hypoxia.[23] Dysmenorrhea treatment can be done with pharmacologic therapy using prostaglandin inhibitor drugs.[24] It can also be treated with nonpharmacologic therapy, one of which is acupressure therapy which is performed during the luteal phase.

A study conducted by Ikhtiarinawati and Nur Aini found that acupressure therapy was able to significantly reduce pain

with a p value of 0.000.[25] A study conducted by Julianti, Hasanah and Erwin found that acupressure therapy was able to significantly reduce pain with a p value of 0.014.[26] A study conducted by Mukhoirotin, dan Fatmawati found that the effect of acupressure on the sanyinjiao point and slow stroke back massage which could reduce the intensity of menstrual pain (dysmenorrhoea) with a p value of 0.000.[27]

4.6 Dysmenorrhea pain scale before and after the administration of combination of acupressure Therapy on SP-6 Point and Ginger Drinks

Based on the results of paired t test, it was found that there was a significant differenceswith p value of 0.000 (<0.05), which meant that the combination of acupressure on SP-6 point and ginger drinks was as effective as acupressure or analgesics to manage dysmenorrhea among adolescents. The mean of pain scale before the combination of acupressure therapy on SP-6 and ginger drinks was 6.89 in which 6 respondents (31.6%) were included in the moderate pain category and 13 respondents (68.4%) were included in the severe pain category. The mean of pain scale after the combination of acupressure therapy on SP-6 and ginger drinks was decreased to 1.84 in which 3 respondents (15.8%) were included in painless category, 14 respondents (73.7%) were included in mild pain category and 2 respondents (10.5%) were included in moderate pain category.

After treatment through a combination of acupressure therapy and ginger drinks there was a decrease in dysmenorrhea scale. This decrease in pain was due to interventions given such as analgesic therapy, acupressure therapy on SP6 point and combination of acupressure therapy on SP6 point and ginger drinks, thus affecting the perceived intensity of pain. The process of reducing pain with acupressure intervention can also be explained using holistic theory. Acupressure in the acupuncture point will give a local effect of reducing pain in the area around the point suppressed. Acupressure energy in the acupuncture points will flow through the meridian flow towards the target organ. Stimulation and sedation of target organ will give effect to biochemical, physiological, and perception changes. Biochemical changes can be in the form of increased levels of endorphins, physiological changes can be in the form of blood flow and oxygen activity, while perceptual changes in perception/feeling can be in the form of reduction in pain levels.[28]

The theory of analgesia acupuncture is able to explain the mechanism of acupressure in reducing the level of acute and chronic pain. Acupressure can reduce pain in the labor process while speeding up the process. Acupressure also reduces menstrual pain, back pain, headache, knee pain, arthritis pain, neck pain and breast cancer pain.The effect of acupressure point suppression is related to its impact on endorphin production in the body. Endorphin controls the activity of the endocrine glands where the molecules are stored. In addition, endorphins can affect pain sensing areas in the brain in a manner similar to opiate drugs such as morphine. Endorphin release is controlled by the nervous system, nerves are sensitive to pain and stimulation from the outside, and once triggered by using acupressure technique, they will instruct the edocrine system to release a number of endorphins according to the body's needs.[29] Acupressure therapy is empirically proven to help increase the endorphin hormone which can naturally help reducing pain.

Some plant ingredients believed to reduce complaints during menstruation are ginger (zingiber officinale) where the rhizome functions as analgesic, antipyretic and anti-inflammatory. Ginger is a good option because of the high content of oleroresin in ginger. Oleoresin consists of bioactive components which functions as an anti-inflammatory which can block prostaglandins so that they can inhibit cyclooxygenase enzymes and lipoxygenase enzymes (inflammatory mediators) which in turn have an impact on reducing the intensity of menstrual pain. This will cause a decrease in prostaglandins and leukotrienes which are mediators of inflammation. Thus, ginger is recommended for women with dysmenorrhea.[30],[31] The ability of ginger as a natural antioxidant is inseparable from its high total phenolic levels. Gingerol and shogaol have been identified as components of phenolic antioxidants. In the secretion phase of the menstrual cycle, when the released ovum is not fertilized, the tissue undergoes desquamation which results in the release of vasoconstrictor prostaglandin as an inflammatory mediator. As the estrogen and progesterone levels shrink rapidly, the spiral arteries have spasm so that the blood supply to the functional endometrium stops and necrosis occurs in the functional layer separated from the basal layer. Bioactive compounds in ginger, namely gingerol and shogaol can function as antioxidants because of their ability to stabilize free radicals by giving hydrogen atoms quickly to free radicals. One mechanism to reduce inflammation is to stabilize or neutralize free radicals. The inflammatory process releases macrophages as the body responds to inflammation. The macrophages released will produce ROS (Reactive oxygen species) which will increase the cell and tissue damage and increase pain. The antioxidant property of phenolic compounds of gingerol and shogaol can neutralize ROS, thereby it can prevent the cell and tissue damage and reduce pain.[32] A study conducted by Rahayu and Nujula found that ginger extract was able to reduce dysmenorrhea.[33] A study conducted by Bachtiar found that ginger extract was able to reduce osteotritis pain with a p value of 0.000.[34]

4.7 The difference in the dysmenorrhea pain scale difference between analgesic groups, acupressure groups and combination groups

The difference in pain scale difference can be seen in each group, namely inthe analgesic group, acupressure group and combination group. Based on the delta value, it was found that the difference in pain scale before and after therapy in the combination group and analgesic group was the same of 5.05 while the difference in pain scale before and after therapy in the acupressure group was 4.37. This meant that analgesic therapy and the combination of acupressure on SP6 point and ginger drinks had the same effectiveness in reducing dysmenorrhea. The results also means that the use of analgesic therapy which has long-term side effects can be replaced with the combination of acupressure on SP6 point and ginger drinks to reduce dysmenorrhea.

5. Future Scope

There were so many respondents who had to be given acupressure treatment on SP-6 point and ginger drinks, so that this study required many members in the study team/study assistants who have ever attended acupressure training and certified

6. Conclusion

Paired t test test results on the means of pain scale before and after treatment in the analgesic group, acupressure group and combination group showed a significant difference with a p value of 0.000 (p < 0.05). The scale of pain reduction in the three groups showed that the combination group and the analgesic group had an equal value of 5.0 while the difference in the mean difference of pain scale before and after therapy in the acupressure group was 4.37. This meant that combination of SP-6 acupressure therapy and ginger drinks with analgesics had a higher effectiveness in lowering dysmenorrhea level compared to acupressure therapy alone.

7. Other Recommendation

Women who experience dysmenorrhea can try to apply pain management using non-pharmacological treatments such as acupressure therapy, consumption of warm ginger drinks or using analgesic drugs to reduce dysmenorrhea. Healthcare providers are expected to master acupuncture technique as an alternative complementary therapy that is are very useful in managing various kinds of symptoms due to diseases so that it can be used as an alternative therapy or additional therapy along with pharmacological therapy

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