THE EFFECTIVENESS OF CANANGA AROMATHERAPY WITH WARM COMPRESS IN REDUCING PREMENSTRUAL SYNDROME (PMS) AMONGST TEENAGE GIRLS

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ABSTRACT

Premenstrual Syndrome (PMS) can cause an uncomfortable feeling and pain that eventually can disturb the activities and quality of life of teenage girls. Cananga aromatherapy with a warm compress is one of complementary therapy that considered to be safer than chemical medication and has no side effects. The purpose of this research is to investigate the effectiveness of Cananga aromatherapy with a warm compress in reducing PMS in teenage girls. This research is a quasi-experimental, pretest and posttest with control group design. Consecutive sampling was used to generate 68 respondents from teenage girls who were then divided into two groups - the intervention group that was given Cananga aromatherapy with a warm compress and the control group who did not receive the intervention. The bivariate analysis in the experimental group after the intervention, using the Cochran test, showed that the Cananga aromatherapy with a warm compress is effective in reducing PMS amongst teenage girls (p=0.000 < α=0.05). Another analysis using the Kolmogorov-Smirnov test showed that there is a difference in the level of PMS between the intervention and the control group (p=0.002 < α=0.05). It is therefore recommended that Cananga aromatherapy with a warm compress can be used to reduce PMS amongst teenage girls.

Key words: Premenstrual Syndrome; PMS; Cananga Aromatherapy; Warm Compress; Teenage Girls

ABSTRAK

Premenstrual Syndrome (PMS) dapat menimbulkan rasa tidak nyaman dan nyeri yang akhirnya mengganggu aktivitas dan kualitas hidup pada remaja putri. Aromaterapi kenanga dipadukan dengan kompres hangat merupakan slaah satu terapi komplementer yang dianggap lebih aman dan tanpa efek samping. Penelitian ini bertujuan untuk mengetahui efektivitas aromaterapi kenanga dipadukan dengan kompres hangat terhadap PMS pada remaja putri. Penelitian ini menggunakan desain kuasi eksperimen, *pretest* dan *postest* dengan kelompok kontrol. Teknik *consecutive sampling* digunakan pada 68 responden gadis remaja yang dibagi menjadi dua kelompok yaitu kelompok eksperimen dengan intervensi aromaterapi kenanga dipadukan dengan kompres hangat dan kelompok tanpa intervensi pada kelompok kontrol. Analisis bivariat pada kelompok eksperimen setelah intervensi, menggunakan uji Cochran menunjukkan bahwa aromaterapi kenanga dipadukan dengan kompres hangat terbukti efektif mengurangi PMS remaja putri (=0.000 < α=0.05). Hasil analisis dengan uji Kolmogorov-Smirnov menunjukkan adanya perbedaan antara kelompok intervensi dan kelompok kontrol (p=0.002 < α=0.05). Hasil penelitian ini merekomendasikan bahwa aromaterapi kenanga dipadukan dengan kompres hangat dapat digunakan untuk mengurangi PMS pada gadis remaja.

Kata kunci: Premenstrual Syndrome; PMS; aromaterapi kenanga; kompres hangat; remaja putri

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BACKGROUND

The menstrual period for teenage girls usually begins when sexual maturity occurs (Soetjiningsih, 2004). Premenstrual Syndrome (PMS) appears cyclically within a period of 7-10 days before menstruation starts and disappears after the menstrual blood comes out (Soetjiningsih, 2004). PMS can interfere with teenage girls' lifestyles and activities (Suparman and Ivan, 2011). PMS is felt by some teenage girls as an experience that can cause emotional confusion (Soetjiningsih, 2004). They often wonder whether this is something normal or if treatment is needed, and whether PMS is curable or not (Elvira, 2010). The complaints, both physical and mental, can vary from mild to more severe (Sarwono, 2008). An estimated 85% of reproductive age women (aged between 15-35 years old) experience one or more PMS symptoms (Azra, 2009).

The most commonly reported physical symptoms of PMS are headaches, abdominal cramps, constipation, diarrhea, back and waist pain, fatigue, swollen and hardened pain and breasts, sleep disturbances, weakness of the joints or muscles, the onset of acne, swelling of the legs, lust, increased food intake and weight gain (Wijayakusuma, 2008). The physiological and behavioral symptoms of PMS include sensitivity, irritability, mood swings, sudden crying, changes in libido, forgetfulness, anxiety, depression, concentration disorders, aggressive behavior (Sarwono, 2009) and fear (Baziad, 2007).

PMS is considered to be one of the most commonly experienced health problems reported by women of childbearing age with a prevalence of 12.6-31% (of women who experience menstruation). 2% of women of reproductive age experience symptoms of moderate to severe PMS (Freeman, 2007). Sarwono (2009) mentions that about 80-90% of women experience physical and psychological changes before menstruation. Symptoms are felt in the form of physical and psychological symptoms that affect daily activities, including a decreased interest in learning

and disrupted social functioning (Sarwono, 2009). PMS can be experienced very severely by some women and it disturbs their daily activities due to the lower abdominal pain, cramps, nausea, vomiting, dizziness, and fainting that they experience (Sarwono, 2009). 5-10% of women experience very severe dysmenorrhea and have to leave their activities for 1-3 days a month (Taufikasari, 2005).

The prevalence of PMS among teenage girls in the world is between 50.2% and 80.2% (Öztürk et al, 2011). According to a survey carried out in the United States, about 40% of women aged 12-50 years old experienced PMS, and 50% of middle-class women visited gynecology clinics (Karyadi, 2007). In line with this study, the American College of Obstetricians and Gynecologists (ACOG) in 2011 in Sri Lanka showed that the number of female adolescents who experienced PMS was around 65.7% (Ali et al, 2015). Research in the Asia Pacific conducted reported that PMS is experienced by 44% of adult women in Australia, 34% of women in Japan, 17% of women in Hong Kong and 13% of women in Pakistan (Ali et al, 2015). Another study found that as many as 98.2% of female students aged 18-27 years in Iran experienced PMS (Elvira, 2010).

WHO (2004) stated that 40% of Indonesian women experienced PMS, 3% experienced mild to moderate symptoms whilst 2-10% experienced severe symptoms. Suparman & Ivan, (2011) stated that 60-75% of women in Indonesia experienced moderate to severe PMS. This prevalence rate can reach up to 85% of the entire female population of reproductive age in Indonesia (Suparman & Ivan, 2011). The results of the research carried out on Surabaya high school students ascertained that the likelihood of the incidence of PMS was 54% and of that number, only between 1.07-1.31% came to the hospital to resolve their complaints (Maulana, 2008). Although most women experienced symptoms before their menstruation, many did not realize that they were experiencing PMS (Bobak, 2015; Soetjiningsih, 2004). Ironically, many teenage girls do not know what PMS

really is and how to overcome it (Elvira, 2010). This phenomenon shows that PMS sufferers in Indonesia may experience quite a lot of symptoms so it is necessary to take measures to prevent and overcome them.

Although some medications can relieve PMS symptoms, women may need to seek more natural or traditional treatments as an alternative method considering that there is no one exact treatment that can eliminate all symptoms (Kloss, et al, 2012). WHO (2004) has stimulated and encouraged the use of complementary therapies and the development of scientific studies to help women to get a better knowledge of the efficacy, safety, and quality of natural or traditional treatments. Inhaling aromatherapy oils can be used to treat PMS (Ou M. C et al, 2012). The research revealed that aromatherapy has a beneficial effect on psychological problems such as depression, stress, and anxiety (Chen et al, 2015; Liu et al, 2013).

Cananga was chosen for this study because it provides antidepressant effects that are usually indicated for healing anxiety, frustration or nervous tension (Wulandari, 2012). Cananga has been clinically proven to contain natural substances that can improve relaxation and comfort in humans (Siahaan & Ranti, 2015). Cananga has a moderate to strong aroma with a fresh, fragrant but soft scent (Goodrich, 2012). In addition to Cananga aromatherapy, the use of warm compresses is expected to improve muscle relaxation and reduce the pain experienced due to spasms or stiffness and provide a sense of localized warmth (Tamsuri, 2006).

The purpose of this study was to determine the effectiveness of Cananga aromatherapy combined with warm compresses in reducing PMS amongst teenage girls.

METHODS

This study is a quasi-experiment with a pretest-posttest with a control group research design. The population in this study amounted to 130 teenage girls. The total sample of the study was 68 teenage girls. The sampling technique used was a consecutive sampling technique whereby individuals who were eligible were selected in accordance with the selection criteria, i.e. teenage girls aged 12-21 years who experienced moderate to severe PMS, until the desired number of samples was fulfilled (Dharma, 2011). The consecutive sampling method includes the nonprobability sampling technique that is commonly used for research that tests an intervention. The number of respondents was determined using the estimation formula of the sample size of the different hypotheses 2 mean the independent group obtained 68 respondents, 34 in the intervention group and 34 in the control group.

A pre-test was conducted before the intervention of Cananga aromatherapy and warm compresses in order to find out the initial state and ensure the equality between the control and intervention groups. A post-test was done after the intervention of Cananga aromatherapy and warm compresses were given to find out the different levels of PMS experienced by teenage girls before and after the intervention.

The study was conducted on the youth community in Batu X Tanjungpinang Village, Riau Islands Province, Indonesia. The study was conducted throughout six months from February to July 2018. Interventions using Cananga aromatherapy and a warm compress (temperature 40-45°C) were conducted for five days during the teenager's period of PMS. The interventions for each respondent in the intervention group were repeated every time the PMS symptoms occurred with a duration of 25 minutes: 5 minutes for pre-test, 15 minutes for Cananga aromatherapy and warm compresses treatment, and 5 minutes for posttest. This research instrument is a Pre Menstrual Syndrome Assessment questionnaire prepared by researchers and has been tested for validity using Pearson Product Moment correlation technique with a significance level of 0.374-0.8886, and reliability testing with r Alpha value of 0.904. Researchers used an observation sheet as well that was given to the intervention group.

A univariate analysis was carried out to describe each research variable. Respondents' characteristics including age and PMS levels of teenage girls presented in categorical data are presented in the frequency distribution and 95% confidence interval (CI). A bivariate analysis was applied to find out the difference between female adolescent PMS before and after the intervention in each group using the Cochran test. The bivariate analysis was used to determine the differences in PMS before and after the intervention between the intervention group and the control group using a Kolmogorov-Smirnov test.

This study has passed the ethical clearance from Stikes Hang Tuah Tanjungpinang Ethics Committee with a letter-number 02/KEPK/II/Stikes/2018.

RESULTS

Respondents in this study were teenage girls aged 12 to 21 who experienced moderate to severe PMS. They consisted of early adolescents, middle adolescents, and late adolescents.

The results of the univariate analysis for the characteristics of respondents based on age showed that the majority of adolescent girls, as many as 39 respondents (57.4%), were in the middle age group (15-18 years old) and the lowest figure was the early adolescent age group (12-14 years) which numbered 13 respondents (19.1%). These are described in table 1.

Table 1. Respondent Characteristics by Age N= 68

No	Category	Frequency (number of people)	%
1	Early Adolescents Age (12-14 years)	13	19,1
2	Middle Adolescents Age (15-18 years)	39	57,4
3	Late Adolescents Age (19-21 years)	16	23,5
	TOTAL	68	100

Table 2. Respondents' PMS Level and Analysis Of EqualityTest In The Intervention Group and The Control Group Before Intervention N = 68

Variable	Intervention Group		Control Group		Deviation		p
	n	%	n	%	n	%	
PMS Level							
a. Mild	0	0	0	0	-	0	0,
b. Moderate	15	44.10	11	32.40	4	11.70	001
c. Severe	19	55.90	23	67.60	4	11.70	
Total	34	100	34	100			

α = 0.05

Before being given the Cananga aromatherapy and warm compress, PMS levels were measured for each respondent using the observation sheet guidelines and the Pre-Menstrual Syndrome Assessment questionnaire. Respondents who were included were those who only experienced PMS between moderate and severe levels, which was as many as 68 respondents. Then the respondents were divided into two - 34 respondents for the experimental group and 34 respondents for the control group. The results of the univariate analysis of female adolescent PMS levels and equality analysis tests in the intervention group and the control

group before the intervention are described in Table 2.

Table 2 shows that both the experimental group (55.9%) and the control group (67.6%) experienced severe PMS levels before being given Cananga aromatherapy and a warm compress. The results of further analysis of the equality test showed that female adolescent PMS levels in both groups before the intervention were equivalent (p= 0.001, α = 0.05).

The results of the univariate analysis of female PMS levels in the intervention group and the control group before the intervention are described in Table 3. Table 3 shows that there were

significant differences in PMS levels between the experimental group and the control group. In the experimental group, the majority of teenage girls (as many as 94.2%) experienced a significant change in the level of PMS from severe PMS to mild PMS after being given the intervention of Cananga aromatherapy and warm compresses. Whereas in the control group, because they were not given aromatherapy and warm compress treatment, there was an increase in the number of teenage girls who experienced PMS severely, which was as many as 76.50% of the group.

Tabel 3. The Different Analysis of Respondent PMS Levels Before and After Aromatherapy and Warm Compresses in the Experimental Group and the Control Group, N = 68

Variable	Intervention Group					Control Group				
	Pre Test		Post Test		p	Pre Test		Post Test		p
	n	%	n	%		n	%	n	%	
PMS Level										
a. Mild	0	0	32	94.12	.001*	0	0	0	0	0.436
b. Moderate	19	55.88	2	5.88		24	70.59	8	23.50	
c. Severe	15	44.12	0	0		10	29.41	26	76.50	
Total	34	100	34	100		34	100	34	100	

α = 0.05

The result of further bivariate analysis tests in Table 3 shows the difference in PMS levels in each group before and after the intervention analyzed using the Cochran test.

The result of the analysis showed that there was a significant difference in the proportion of female PMS in the intervention group (p=0.001; α=0.05) and there was no significant difference in the proportion in the control group (p= 0.436; α=0.05) before and after the intervention.

Table 4. Analysis of Differences PMS Levels after Cananga Aromatherapy and Warm Compress between Intervention Groups and Control Groups, N = 68

Variable	Intervention Group		Control Group		p
	n	%	n	%	
PMS Level					
a. Mild	32	94.12	0	0	0.002*
b. Moderate	2	5.88	8	23.50	
c. Severe	0	0	26	76.50	
Total	34	100	34	100	

α = 0.05

The results of the analyzing test of the differences in the level of PMS amongst teenage girls between the experimental group and the control group after Cananga aromatherapy and warm compresses were analyzed using the Kolmogorov-Smirnov test, which is described in Table 4. The results of the analysis showed that there were significant differences in PMS levels amongst adolescents in the experiment and control groups after the intervention (p=0.002; α=0.05). Based on this analysis it can be concluded that there is a significant effect of Cananga aromatherapy intervention and warm compresses on female PMS levels.

DISCUSSION

PMS in teenage girls is an experience that can interfere with their quality of life (Sylvia, 2010). Teenage girls can feel health complaints such as anxiety, depression, unstable moods, fatigue, weight gain, swelling, breast pain, spasms and back pain, which usually starts one week to several days before menstruation and peaks when menstruation occurs, which causes them to experience disruption in their daily functions and activities (Winkjosastro,

(2007); Bardosono, (2006); Sylvia, (2010)). Respondents in this study were teenage girls aged 12 to 21 who experienced moderate to severe PMS. One way to control the characteristics of respondents, which can be a confounding factor, is to make sure both groups start in the same condition. Respondent breakdown based on age showed that the majority of teenage girls were in the middle age group (15-18 years), which was as many as 39 people (57.4%) and the lowest number was in the early teenage age group (12-14 years), which totaled 13 people (19.1%). The results also showed that both the experimental group (55.9%) and the control group (67.6%) experienced severe levels of PMS before being given Cananga aromatherapy and warm compress treatment. The results of the equality test analysis showed that female PMS levels in both groups before the intervention were equivalent (p=0.001, α=0.05). The equality condition of the characteristics of the research subjects between the intervention group and the control group at the beginning of the study was the validity of the results of quasi-experimental research (Dahlan, 2009). Equality of characteristics based on age, gender and PMS level of teenage girls at the beginning of the study confirmed that significant changes in PMS levels for teenage girls in the intervention group were not due to confounding factors but due to the intervention in the form of Cananga aromatherapy and warm compress treatment.

The results of the univariate analysis showed that the level of PMS in teenage girls in the intervention group and control group had significant differences. In the experimental group, the majority of teenage girls experienced a significant decrease in PMS levels from severe PMS to mild PMS (as much as 94.2%) after being given Cananga aromatherapy and warm compress treatment. In contrast, in the control group, there was an increase in the number of teenage girls who experienced severe PMS, which was as much as 76.50%. This is in line with the results of Rayana's (2013) study, which showed a significant reduction in the scale of dysmenorrhea pain after aromatherapy was given.

Aromatherapy comes from the word aroma which means fragrant and therapy which can be interpreted as a way of treatment or healing (Liu et al, 2013). Therefore it can be interpreted as a method of body care and or healing of diseases using essential oils (Wulandari, 2012). Aromatherapy is a method of nursing therapy that uses volatile plant fluids also known as essential oils and other aromatic compounds from plants that aim to influence a person's mood or health (Halcon & Buckle, 2006; Goodrich, 2012). As it has been known the sense of smell in humans is sharp and highly sensitive (Goodrich, 2012; Gnatta, 2014). The sharpness of the sense of smell can be up to 10,000 times stronger than the sense of taste (Gnatta, 2014). Therefore this inhalation therapy has a strong effect on the sensory organs due to the passing through of the active ingredients of essential oils (Goodrich, 2012).

The significant reduction in PMS levels from severe PMS to mild PMS in the experimental group in this study was supported by the finding that Cananga aromatherapy is very effective at producing a relaxing effect and reducing tension in the body, and is especially beneficial for psychological or emotional therapy (Siahaan & Ranti, 2015). It regulates the flow of adrenal glands in the nervous system, causing feelings of pleasure and calmness, as well as relief from anxiety, anger, and panic (Dean, 2007; Baehr, 2010; Siahaan & Ranti, 2015).

The olfactory nerves from the nose to the brain are workplaces for breathing essential oils (Jaelani, 2009; Ali et al, 2015). A study found that olfactory stimulation produced changes in parameters such as blood pressure and skin temperature and reduced anxiety (Hongratanaworakit and Buchbauer, 2006). When aromatherapy is inhaled, the molecule is absorbed by the nostrils and the olfactory nerve receptor is connected directly to the Central Nervous System and takes its stimulus to the limbic system which is responsible for feelings, memory, impulses, and emotions

(Hongratanaworakit and Buchbauer, 2006). Wahyu (2011) states that the aroma of essential oil substances in the form of fine steam drops or in other forms will wet the mucous membranes of the nose, pharynx, larynx, trachea, bronchi, bronchioles and alveoli. It increasing alpha waves in the brain and this is what makes us relaxed and reduce the intensity of the pain (Jaelani, 2009).

The results of this study are supported by the findings of Lakhan et al (2016) who proved that aromatherapy can be effective in treating pain for various medical conditions. Likewise, studies find that patient satisfaction increases, while patient anxiety and depression decrease (Herrera et al, 2009; Wulandari, 2012). For psychological or emotional therapy, the effect of Cananga aromatherapy can produces relaxation and reduces tension in the body (Wahyu, 2011). Cananga is also effective in overcoming the mood swings experienced due to the menopause and PMS (Wahyu, 2011). It will regulate the flow of adrenal glands in the nervous system, causing feelings of pleasure and calmness as well as relief from anxiety, anger, and panic (Wahyu, 2011). It also helps to lower blood pressure, balances hormones, and relieves stress (Ou M. C et al (2012); Loh Teng Hern Tan et al. (2015). Wulandari (2012) stated that Cananga can be used and safely extracted into a Cananga herb and has no side effects. The use of Cananga aromatherapy has a relaxing effect, which calms and restores fitness levels (Wulandari, 2012).

The results of the analysis of this study also showed that there were significant differences between the intervention group and the control group in terms of the level of PMS experienced after the intervention (p=0.002; α=0.05). Based on this analysis it can be concluded that Cananga aromatherapy and warm compress intervention has a significant effect on female PMS levels. Inhalation therapy is very useful to overcome and alleviate conditions related to women's bodies. In this research, in order to distribute the substances produced by essential oils effectively, aromatherapy was applied through inhalation using an aromatherapy air humidifier. Substances produced in the form of gas, fine steam drops, smoke, and sublimation vapor are inhaled through the nose and swallowed by mouth (Ali et al, 2015).

The scent of essential oils can also affect a person's psychological condition through stimuli received by olfactory nerve endings contained in the nasal mucous membranes or areas of nerve response in other organs through which the essential oil vapor drops (Wahyu, 2011). Cananga essential oil is a relaxation method derived from Indonesian plants which are widely used as aromatherapy ingredients besides fragrant lemongrass and patchouli (Siahaan & Ranti, 2015). The main substances found in Cananga which cause an increase in calmness in the body are linalool and geraniol from the monoterpenoid alcohol group which also produces analgesic effects, relaxation, balance, stimulation, vasodilation and decreased blood pressure (Bowels, 2003; Price 2007).

Traditionally Cananga is used to treat stomach ailments, asthma, gout, and rheumatism (Wulandari, 2012). Cananga essential oil is used in aromatherapy and is believed to be effective in treating depression, high blood pressure, and anxiety (Ali et al, 2015). Other studies showed that Indonesian essential oil mixtures when compared to lavender, have the same or even more of a beneficial relaxing effect on blood pressure parameters or MAP (Siahaan & Ranti, 2015). Cananga essence significantly reduced blood pressure and anxiety levels. Self-esteem increased and the mean PMS scale score decreased significantly after aromatherapy was applied (Gnatta, et al, 2014). This study shows that aromatherapy through effective inhalation can be used as an alternative therapy to overcome PMS. It is considered that aromatherapy can be used for women's health problems such as postpartum depression, symptomatic menopause, dysmenorrhea and also PMS (Gnatta et al, 2014). It is recommended that teenage girls who suffer from PMS problems should be informed about aromatherapy (Uzuncakmak and Alkaya, 2018).

One way to reduce the pain experienced by young women with PMS is, in addition to getting adequate rest, is to do regular exercise, and have a massage in the lumbar region, with warm compresses on the abdominal area (Yadi, 2008). The combination of interventions other than aromatherapy, namely the provision of warm compresses in this study is also supported by Prasetyo (2010) who stated that if impulses such as warm compresses carried by large fibers dominate the gate, the sensation of pain is not delivered to the brain by substantial gelatinosa, hence the body does not feel the sensation of pain or discomfort.

The results of this study are also in line with Natalia's findings (2013) who found that the average respondent's dysmenorrhea before the warm compressed action was 5.27, while the average dysmenorrhea of the respondent after a warm compress was applied was 2.54. The average difference in dysmenorrhea before and after warm compresses is 2.730. There was a decrease in the average rate of dysmenorrhea of respondents before and after warm compresses were applied and there was an effect of warm compresses on adolescent dysmenorrhea in SMA PGRI Bengkulu City. Mahfiyyah (2011) also proved that there was an effect of warm compresses on reducing dysmenorrhea pain, which is part of PMS complaints in teenage girls. Applying a warm compress is the method of giving a warm feeling to the client by using a liquid or device that causes warmth on the part of the body that needs it. The warm effects of compresses can cause vasodilation in blood vessels which will increase blood flow to the tissues (Natalia, 2013). In this way, the distribution of acid and food to the cells is enlarged and the removal of the repaired substances can reduce the primary menstrual pain caused by a lack of blood supply to the endometrium (Selfina, 2006).

This study has several limitations. First, the research was limited by a small sample size. The use a larger sample size and not only in teenage age group but also for all ages of women may improve future studies. Secondly, the research method used i.e. quasi-experimental design with a control group with no interventions was too poor to make a sufficient comparison. Further studies can be made more effective by using a comparative design and using a variety of aromatherapy methods rather than only Cananga.

CONCLUSION

This study showed that Cananga aromatherapy combined with warm compresses effectively reduces the symptoms of PMS in teenage girls. Therefore, researchers recommend that Cananga aromatherapy, which is derived from an Indonesian native plant, combined with warm compresses should be used as a complementary therapy to reduce symptoms of PMS in teenage girls.

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