



Effectiveness of Aromatherapy on Menstrual Distress among Adolescent Girls

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Authors' contributions

This work was carried out in collaboration between both authors. Author PT designed the study, wrote the protocol, managed the analyses and wrote the first draft of the manuscript. Author KB managed the literature searches and performed the statistical analysis of the study. Both authors read and approved the final manuscript.

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ABSTRACT

Aim: To determine the effectiveness of Aromatherapy on menstrual distress among young adolescent girls with primary dysmenorrhea.

Study Design: Quantitative approach with Pre-experimental research design.

Place and Duration of Study: Saveetha College of Nursing, Saveetha Institute of Medical and Technical Sciences, Chennai, from December 2019 to February 2020.

Methodology: Sixty adolescent girls were selected for the study by using a convenience sampling technique. The participants who participated in the study were adolescent girls with 17 - 19 years of age, have regular menstrual cycle, having primary dysmenorrhea, and willing to participate in the study. Demographic variables and clinical variables were collected by using structured questionnaire. Followed by pre-test assessment on primary dysmenorrhea symptom was assessed on 5th day of menstruation by primary dysmenorrhea symptoms questionnaire. Aromatherapy was administered by inhalation method in alternate days from 7th day of menstrual cycle for two consecutive menstrual cycles. Post test was conducted at the end of intervention on the first day of menstrual cycle using the same tool. The data were tabulated and analyzed by descriptive and inferential statistics using SPSS statistical package.

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Results: The result of the study shows that in the pre-test, 54(90%) had moderate menstrual distress and 6(10%) had severe menstrual distress. Whereas in the post test, almost all 60(100%) had mild menstrual distress. pre-test and post-test mean score of menstrual distress was 62.83 ± 2.93 and 33.03 ± 2.48 . Which was compared by paired 't' test revealed that the post-test mean value is lower than the pre-test mean value and found statistically significant at the level of $p < 0.001$

Conclusion: The finding of the present study concludes that aromatherapy using lavender oil is significantly effective in reducing the menstrual distress without side effects among adolescent girls with primary dysmenorrhea and also reduces the risk pharmacological intervention.

Keywords: Aromatherapy; adolescent girls; lavender oil; menstrual distress; primary dysmenorrhea.

1. INTRODUCTION

Dysmenorrhea is one of the most common gynaecologic complain among adolescent girls [1]. Dysmenorrhea is a painful menstruation, caused by uterine contraction by a hormone called prostaglandin during menstrual cycle. Pain results due to part of the uterus muscle loses its supply of oxygen when the uterus contracts too strongly which can press against nearby blood vessels causes cutting off the supply of oxygen. There are two types of dysmenorrhea: Primary and secondary. Primary dysmenorrhea is common menstrual cramps that are recurrent and not due to underlying pathology. Pain usually begins 1 or 2 days before, or when menstrual bleeding starts, it can range from mild to severe last 12 to 72 hours, and can be accompanied by nausea-and-vomiting, fatigue, and even diarrhoea. Agarwal AK et al. reported that the prevalence of dysmenorrhea in adolescent girls was found to be 79.67% and out of which 37.96% suffered regularly from dysmenorrhea severity [2]. According to the study in Ethiopia, prevalence of dysmenorrhea was 71.8% [3], in Kuwait, the one-year prevalence of dysmenorrhea was found to be 85.6% [4], in India, studies from India reported the prevalence range between 50 to 87.8% [5-7] though the exact incidence and prevalence of dysmenorrhea are not clearly established in India. The study report stated that dysmenorrhea is a common problem in India and the prevalence of dysmenorrhea was 87.87% [8]. Dysmenorrhea directly and indirectly impacts on the physical and psychological wellbeing adolescent girls which may influence the academic performance.

Both the Several pharmacological and non-pharmacological interventions are adopted in managing the primary dysmenorrhea. The pharmacological interventions are including mild analgesic to Non-steroidal anti-inflammatory drug. Current evidence shows that non-steroid

anti-inflammatory drugs (NSAIDs) are beneficial for reducing pain in primary dysmenorrhea [9]. However, there are adverse effects associated with using NSAIDs including gastrointestinal discomfort, hemorrhage, and cardiovascular risks are common. Simple analgesics (aspirin, paracetamol) are likely beneficial for alleviating pain in the short term but may also have potential adverse events (AEs) including skin reactions [10]. Combined oral contraceptives may also provide effective management for dysmenorrhea, but they also exhibit AEs including irregular uterine bleeding and the induction of endometriosis [11].

There are many complementary and alternative approaches are aimed to reduce the distress symptoms associated with primary dysmenorrhea as well adverse effects related to pharmacological management. The use of complementary and alternative method is wide spread with a progressively increasing utilization over the years in many countries [12]. Those therapies include massage, hot water application, TENS (Transcutaneous Electrical Nerve Stimulation), acupuncture, acupressure, yoga and meditation, and aromatherapy in recent years [13]. Aromatherapy or essential oil therapy uses aromatic essential oil which is extract from natural plant to improve the health of the body, mind, and spirit [14]. Traditionally, aromatherapy has been used for reducing the symptoms of dysmenorrhea, releasing uterine cramps, and decreasing the pain and anxiety after childbirth [15]. Lavender essential oil extracts from the plant *Lavandula angustifolia* is one of the most popular and versatile essential oils used in aromatherapy. An aromatherapy administration includes massage, topical applications, and inhalation but is normally used through inhalation or as a topical application [16]. Lavender oil is a natural muscle relaxant which helps aid in releasing the tension associated with cramping. It stimulates the receptors in the olfactory bulb and

transfer the message to limbic system and cause releasing endorphin, enkephalin, and serotonin, which results in the sense of relaxation, pain relieve and stress reduction [17]. Hence the investigators had made the observation with the hypothesis of reducing in the level of menstrual distress after the administration aromatherapy containing lavender essential oil through inhalation.

2. METHODS AND MATERIALS

A quantitative approach with pre-experimental research design was adopted to conduct the study among adolescent girls with dysmenorrhea. It was conducted at Saveetha College of Nursing after obtaining formal permission the Principal. Prior to select the sample, primary dysmenorrhea symptom assessment questionnaire was used to screen and select the sample. Sixty adolescent girls were selected for the study by using a convenience sampling technique. The participants who included in the study were adolescent girls with 17 - 19 years of age, have regular menstrual cycle, having primary dysmenorrhoea, and willing to participate in the study. Adolescent girls with known case of Polycystic Ovarian Disease, taking analgesics, allergic to lavender oil, severe cold, nasal block, and on other alternative method of treatment for dysmenorrhea were excluded from the study. Demographic variables and clinical variables were collected by using structured questionnaire. Pre-test assessment on primary dysmenorrhoea symptom was assessed on 5th day of menstruation by primary dysmenorrhoea symptoms questionnaire. It consists of 27 questions includes effect of dysmenorrhoea on daily activities, academic performance and physiological symptoms consists of (exhaust, lethargic, tired, painful cramps in lower abdomen, back ache, radiating pain to thighs and lower back, nausea, vomiting, changes in bowel and bladder pattern, fainting, painful breast, abdominal bloating, joint pain, urinary frequency, dizziness), and psychological symptoms which consists of menstrual migraines, depression, irritability/easily agitated, rapid mood changes, poor concentration, anxiety, insomnia, hypersomnia, over eating/food craving, tension/nervousness and assess the severity of menstrual pain by using numerical pain rating scale. Based on the response it has been scored as no symptoms (1), mild symptoms (2), moderate symptoms (3), and severe symptoms (4). The score prescribed for each question was

4, and the total score was 88 which has been interpreted as no dysmenorrhoea (1-22), mild dysmenorrhoea (23-44), moderate dysmenorrhoea (45-66) and severe dysmenorrhoea (67-88). Aromatherapy was administered by inhalation method in alternate days from 7th day of menstrual cycle for two consecutive menstrual cycles. It was administered by sprinkled few drops of lavender essential oil onto a clean and sterile tissue and instructed the participants to inhale its aroma. Participants were taught about the usage of lavender oil and were not disturbed during the study hours. Post test was conducted at the end of intervention on the first day of menstrual using the same tool. Confidentiality was maintained throughout the study. The data were tabulated and analysed by descriptive and inferential statistics using SPSS statistical package. A probability of 0.05 or less was taken as statistically significant.

3. RESULTS

The Table 1 shows that most of the adolescent girls 31(51.7%) were aged 19 years, 30(50%) were B.Sc (N) 2nd and 3rd year students, 37(62%) had no family history of dysmenorrhoea, 40(67%) were attained menarche at the age of 14-15 years. Regarding duration of menstrual cycle 31(52%) had 29-35 days cycle. Majority 55(92%) had 3 - 4 days duration of menstruation, 56(93%) had the characteristics of menstrual flow of blood only without any clots.

Table 2 depicts that the 31(52%) had severe pain on the first day of menstrual cycle, 22(37%) had onset of dysmenorrhoea within a year and after 1 year of menarche, 55(92%) had taken adequate rest, 53(88%) were skipped the meals during dysmenorrhea, had not consulted doctor and not been prescribed medications for dysmenorrhoea, 60(100%) had not taken any medicines for dysmenorrhea without doctor's prescription and not performed any exercise, 32(53%) used to take bed rest to get relieved from abdominal pain, and 31(52%) used to manage the situation by self during class hours.

The above Fig. 1 shows that in the pre-test, 54(90%) had moderate menstrual distress and 6(10%) had severe menstrual distress. Whereas in the post test, almost all 60(100%) had mild menstrual distress among adolescent girls with dysmenorrhoea.

The Table 3 portrays that the pre-test and post-test mean score of menstrual distress was

62.83±2.93 and 33.03± 2.48. The effectiveness of aroma therapy using lavender oil on menstrual distress was analyzed by paired 't' test which revealed that the post-test mean value is lower than the pre-test mean value and found

statistically significant at the level of $p < 0.001$ infers that the intervention was found effective in reducing menstrual distress among adolescent girls with dysmenorrhoea.

Table 1. Frequency and percentage distribution of demographic variables of adolescent girls

Demographic variables	Frequency (n)	Percentage (%)
Age		
17 years	-	-
18 years	29	48
19 years	31	52
Education		
B.Sc.(N) 2 nd Year	30	50
B.Sc.(N) 3 rd Year	30	50
Family history of dysmenorrhoea		
Yes	23	38
No	37	62
Age at menarche		
12 – 13 years	20	33
14 – 15 years	40	67
Duration of menstrual cycle		
15 – 20 days cycle	-	-
21 – 28 days cycle	29	48
29 – 35 days cycle	31	52
Number of days of Menstruation		
<3 days	-	-
3 – 4 days	55	92
5 – 6 days	5	8
Characteristics of Menstrual Flow		
Only blood	56	93
Blood with clots	4	7

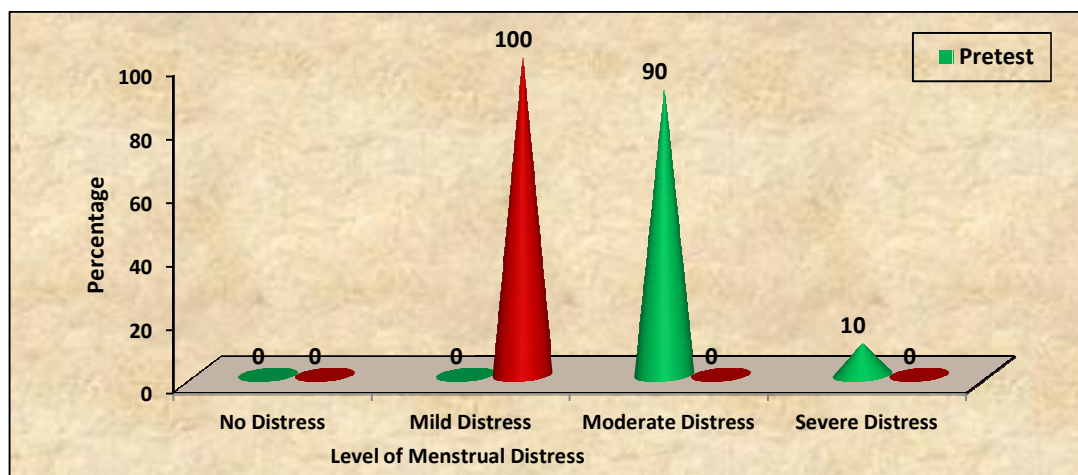


Fig. 1. Percentage distribution of level of menstrual distress among adolescent girls with dysmenorrhoea

Table 2. Frequency and percentage distribution of variables related to primary dysmenorrhea among adolescent girls

Variables	Frequency (n)	Percentage (%)
Nature of pain		
Mild pain	-	-
Moderate pain	17	28
Severe pain	31	52
Cramping pain	12	20
Onset of dysmenorrhea		
1 st menarche onwards	-	-
Within an year after menarche	22	37
After 1 year	22	37
After 2 or more years	16	26
Onset of menstruation with severe pain		
One day before onset of menstruation	-	-
On the first day	33	55
On the second day	27	45
Do you take adequate rest?		
Yes	55	92
No	5	8
Do you skip meals?		
Yes	53	88
No	7	12
Have you consulted doctor for dysmenorrhoea?		
Yes	7	12
No	53	88
Have you been prescribed medications		
Yes	7	12
No	53	88
Have you take medicines without prescription?		
Yes	-	-
No	60	100
Measures take to get relieve from abdominal pain		
Hot or cold application	5	8
Massage	17	28
Bed rest	32	54
No measures	6	10
Do you perform any exercise?		
Yes	-	-
No	60	100
Action Taken For Dysmenorrhoea During Class Hours		
Inform class teacher and seek help	-	-
Inform friends and get help	25	41
Manage the situation by self	31	52
Ask permission and going to hostel	4	7
Any Other measures	-	-

Chi-square test reveals that duration of menstrual cycle had shown statistically significant association with pre-test level of menstrual distress among adolescent girls with primary dysmenorrhea at $p < 0.05$ level as shown in Table 4.

4. DISCUSSION

Adolescence is a transition period from childhood to adulthood and one of the major physiological changes that take place in adolescent girls is the onset of menarche. Dysmenorrhea is a common

Table 3. Comparison of pre-test and post -test menstrual distress scores among adolescent girls

Menstrual distress	Mean	S.D	Paired 't' test Value
Pre-test	62.83	2.93	t = 58.660
Post-test	33.03	2.48	df=59
			p = 0.001
			S***

***p<0.001, S – Significant, df=degree of freedom

Table 4. Association of pre-test level of menstrual distress with the selected demographic variables of adolescent girls with dysmenorrhoea

Demographic variables	No Distress (1 – 22)		Mild distress (23 – 44)		Moderate distress (45 – 66)		Severe distress (67 – 88)		Chi-Square Test
	No.	%	No.	%	No.	%	No.	%	
Duration of menstrual cycle									
15 – 20 days cycle	-	-	-	-	-	-	-	-	$\chi^2=1.897$
21 – 28 days cycle	-	-	-	-	25	41.7	4	6.7	d.f=6
29 – 35 days cycle	-	-	-	-	29	48.3	2	3.3	p = 0.05
									S*

*p<0.05, S – Significant; df- degree of freedom

menstrual problem experiencing by most adolescent girls [18]. The current study was intensively assessed the menstrual distress as well analysed the effectiveness of aroma therapy using lavender oil on menstrual distress. It found that 50% had severe pain on the first day of menstrual cycle. It was consistent with previous study by Teshager Aklilu Yesuf who concluded that dysmenorrhea is common among university health science students with the prevalence of 71.8% [3]. The current study also shows that statistically significant association with that duration of menstrual cycle with the pre-test level of menstrual distress among adolescent girls with primary dysmenorrhea. The present study also observed that there is significant reduction in the level of menstrual distress after the administration of aromatherapy using lavender oil inhalation. The severity of menstrual distress of moderate and severe distress became mild distress and none of them have severe distress after the intervention. This finding is closely in line with another study by Tyseer et al., who reported in their randomized blind clinical trial study that aromatherapy is effective in alleviating menstrual pain, its duration and excessive menstrual bleeding after lavender oil abdominal massage [19]. Similarly, the previous studies conducted by Ari Adiputri et al., Bakhtshirin F et al., Apay SE, Han SH et al. who proved that the lavender oil therapy using effleurage and massage technique effectively cause significantly decreases dysmenorrhea [20-23]. But in current study lavender oil was administered by inhalation

method. Farid Zayeri et al. who concluded that lavender inhalation can decrease primary dysmenorrhea without evidence of adverse event [24]. In current study also no adverse effect was experienced by the participants. Similar study was conducted by Ziba Raisi et al. who also reported that lavender inhalation was effective in alleviating dysmenorrhea symptoms [25]. In this study conducted by Rahayu Savitri who proved that lavender aromatherapy was effective among Young women to solve dysmenorrhea [26]. It shows that administration aromatherapy using lavender oil either through inhalation or abdominal massage is effective in reducing the menstrual distress from the adolescent girls to adult women. Hence the present study findings accepted the stated hypothesis. However further study may be conducted by comparing the effectiveness of relieving menstrual distress between inhalation and topical administration of lavender oil.

5. CONCLUSION

The finding of the present study concludes that aromatherapy using lavender oil is significantly effective in reducing the menstrual distress without side effects among adolescent girls with primary dysmenorrhea, thereby decrease the physical symptoms such as nausea,, vomiting, back ache, improve the concentration, sleeping pattern. Moreover, this therapy is inexpensive, easy to administer, safer method, does not cost the time, reduce the risk pharmacological

intervention and can be affordable by all the participants. This therapy may be recommended in both clinical and community setting.

CONSENT

The participants were explained about the purpose of the study and obtained the written informed consent from the participants.

ETHICAL APPROVAL

This study was ethically cleared and approved by the Institutional Scientific Review Board (ISRB) with reference of 453/2019/ISRB/SCON dt 13.11.2019.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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