

Assess Effectiveness of Fennel Seeds Tea on Menstrual Pain among Young Adolescent Girls in Selected Community Area of Maharashtra: Experimental Study

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ABSTRACT

Background: Painful Menstrual Cramps is one of the symptoms of a condition called Dysmenorrhea in which, some teenage girls or young adolescent girls go through severe symptoms, during their periods. The use of herbs to improve women's health, mainly for menstrual disorders and aim is to prepare herbal tea with new combination using plant species such as ashwagandha, chamomile, cinnamon, fennel seeds, etc. Fennel seeds is a kind of volatile oil known as anethole, along with other powerful phytochemicals, which are effective in calming the cramps. **Methodology:** A true experimental study was conducted among 60 young adolescent girls to assess the effectiveness of fennel seeds tea on menstrual pain from selected community areas of Maharashtra. Data were collected by using verbal numerical pain scale. Data were analyzed using SPSS (version 16) analytical package and the chi-square test was performed. The scoring system was used to categorize the level of menstrual pain among young adolescent girls. **Results:** In the present study, in experimental group, on day 1 the pre-test mean and SD was 4.86 ± 0.97 and in the post test the mean and SD was 0.46 ± 0.50 . The paired t test value shown that 25.85, $df=29$ and p value was 0.0001. The calculated value shown that there was a significant difference between the pre-test and post-test menstrual pain score, which shows that fennel seed tea consumption during menstruation is effective on menstrual pain. In control group the pre-test mean and SD was 4.60 ± 1.13 and in the post test the mean and SD was 3.26 ± 1.08 . The paired t test value shown that 13.35, $df=29$ and p value was 0.000. The calculated value shown that there was a significant difference between the pre-test and post-test menstrual pain score. There is no association between the pretest menstrual pain scores with their selected socio-demographic variables of young adolescent girls. **Conclusion:** The study concluded that fennel seeds tea is an effective intervention for reducing menstrual pain among young adolescent girls. A significant reduction in menstrual pain was observed in the experimental group after consuming fennel seeds tea, compared to the control group that received no intervention. This indicates that fennel seeds tea can be a beneficial and natural remedy for managing menstrual discomfort in adolescents.

Keywords: Menstrual pain, fennel tea, young adolescent girls..

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INTRODUCTION

Dysmenorrhea is defined as abdominal cramping or discomfort associated with menstrual flow. It involves uterine pain with menstruation and is commonly called menstrual cramps. Menstruation perceived as a "Natural gift". Menstrual pain (Begins a few hours before or starts with the onset of menstruation). Due to vasopressin and prostaglandin, it is assumed that prostaglandins are strong vasoconstrictive agents which lead to ischemia of the myometrium and this causes uncontrollable spasmodic pain or dysmenorrhea.¹

The menstrual cycle has been denoted to have three classic

phases: An estrogen dominated pre-ovulatory phase, a postovulatory and progesterone dominated secretory phase. A menstrual phase following progesterone withdrawal that accompanies demise of the corpus luteum.²

According to recent systemic reviews and meta-analysis of world Health Organization, the pooled prevalence of primary dysmenorrhea in the world ranges between 60 % and 73%. However, other published report indicates that prevalence ranges from 16.8% to 95%. Prevalence of primary dysmenorrhea in India range from 25 to 90% among women and adolescents. Studies from India reported the prevalence range between 50 to 87.8%.⁴

Some herbs like cinnamon, ginger, black paper seeds can calm menstrual pain or cramps. A species of blooming plant in the carrot family is fennel. With feathery leaves and yellow flowers, it's a hardy perennial herb. Although it is native to the Mediterranean coast, it has spread widely around the world, particularly on dry soils close to the ocean and on riverbanks. The rich array of nutrients and powerful antioxidant, anti-inflammatory and antibacterial properties in fennel seeds are valuable in treating digestive and respiratory ailments, improve vision and also cure menstrual problems. Herbal teas, such as chamomile and peppermint, have been used by menstruating women in numerous cultures for centuries because they are calming to the body. Other teas associated with dysmenorrhea are those made from cramp bark or fennel. Fennel or *Foeniculum vulgare* is an herbal therapy that is proposed to alleviate menstrual pain by lowering the prostaglandin levels in blood.³

Objectives

- To assess the levels of menstrual pain among young adolescent girls.
- To assess the effectiveness of fennel seeds tea on menstrual pain among young adolescent girls.
- To find out the association between the pre-test menstrual pain scores with selected socio demographic variables of young adolescent girls.

MATERIALS AND METHODS:

Study design and duration

A community-based experimental, study started from 1st February, 2025, till the sample collection was completed.

Study area

This study was conducted in community area of Tal. Khed, Dist, Ratnagiri, Maharashtra, India.

Target population

Young adolescent girls having mild to moderate menstrual pain

Sample size

Using sample size calculation particularly when estimating a population proportion, the sample of Young adolescent girls was calculated by the formula for a two-group experimental study, the sample size calculation is typically based on the comparison of means between two groups (e.g., treatment vs. control). To calculate the sample size, we need to consider factors like the significance level (alpha), the power of the test (1 - beta), the expected effect size, and the variability within the groups. The general formula for sample size calculation for comparing two independent means is:

$$n = (\sigma_1 + \sigma_2)^2 / (Z_{1-\alpha/2} + Z_{1-\beta})^2 / (m_1 - m_2)^2$$

By this formula, sample size calculated was 60 selected for the study.

Sampling technique

Simple random sampling

Ethical considerations

Due clearance was obtained from the institutional ethical committee, and permission to conduct the study was taken from Gram panchayat of selected community area of Maharashtra. Informed to the young adolescent girls having mild to moderate menstrual pain. The consent was obtained from the samples who were interested in the study.

Data collection

- Assigning the participants into experimental and control groups
- Collect sociodemographic data and assess the pretest level of menstrual pain from samples of both groups.
 - For the experimental group:
 - Assessed the pretest level of menstrual pain by using verbal numerical pain scale.
 - Administered fennel seeds tea twice a day, with 8 hours gap. Repeated the same for the next two days.
 - Assessed Posttest level of menstrual pain after one hour of administration of every fennel seeds tea. Repeated the same for the next two days.
 - For Control group:
 - Assess the pretest level of menstrual pain by using verbal numerical pain scale.
 - Without any intervention After 1 hour assess pain intensity with 8 hours gap. Repeat the same for the next two days

Data analysis

Data thus generated was compiled and analyzed using SPSS (version 16) software. The analysis of data was done using both descriptive and inferential statistics. Paired T test and Chi-square test was used for testing statistical significance of the association of various variables.

Selection criteria

- Young adolescent girls aged between 17- 19 years living in selected community area, having mild to moderate menstrual pain and who all are willing to participate in the study.
- Young adolescent girls who are not available at the time of data collection and allergic Or they having irregular menstruation and on medication for any other disease condition

RESULTS:**Table no.1** Frequency and percentage distribution of socio-demographic variables in experimental and control group
N= 60

(Experimental Group = 30, and Control group=30)

Demographic data of Experimental group & Control Group

Sr.No	SOCIO-DEMOGRAPHIC VARIABLES		Experimental Group		Control Group	
			F	%	F	%
1	Age	17 year	10	33.33	10	33.33
		18 year	10	33.33	10	33.33
		19 year	10	33.33	10	33.33
	Total	30	100%	30	100%	
2	Age of Menarche	11-12 Years	2	6.67	1	3.33
		13-14 Years	20	66.67	22	73.33
		15-16 Years	8	26.67	7	23.33
	Total	30	100%	30	100%	
3	Length of previous Menstruation Cycle	22-24 days	8	26.67	6	20
		25-27 days	8	26.67	9	30
		28-30days	12	40	14	46.67
		≥31 days	2	6.67	1	3.33
	Total	30	100%	30	100%	
4	Days of previous menstrual cycle flow	1-2 days	3	10	2	6.67
		3-4 days	17	56.67	20	66.67
		5-6 days	10	33.33	8	26.67
	Total	30	100%	30	100%	
5	Duration of last month painful menses	1-2 days	19	63.33	20	66.67
		3-4 days	11	36.67	10	33.33
	Total	30	100%	30	100%	

Table 2:**Menstrual pain among young adolescent girls in day 1****Day wise menstrual pain among young adolescent girls N=60**

Group	Day 1				
	Test	Mean	Median	Mode	SD
Experimental	Pre test	4.86	5.00	5.00	0.97
	Post test	3.40	4.00	4.00	1.19
Control	Pre test	4.6	5	5	1.13
	Post test	4.53	5	5	1.13

On day 1, among the experimental group, the mean and SD of pretest menstrual pain was 4.86 ± 0.97 , the median pain score was 7 and mode pain score was 5, where as in the post test, the mean and SD of menstrual pain was 3.40 ± 1.19 , median pain score was 4 and mode pain score was 4. Similarly in control group, the mean and SD of pretest menstrual pain was 4.6 ± 1.13 , the median pain score was 5 and mode pain score was 5, where as in the post test, the mean and SD of menstrual pain was 4.53 ± 1.13 , median pain score was 5 and mode pain score was 5.

Table 3:**Menstrual pain among young adolescent girls in day 3 N=60**

Group	Day 3				
	Test	Mean	Median	Mode	SD
Experimental	Pre test	2.46	2.50	3.00	0.77
	Post test	0.46	0.00	0.0	0.50
Control	Pre test	3.3	3	4	1.11
	Post test	3.26	3	4	1.08

On Day 3, among the experimental group, the mean and SD of pre-test menstrual pain was 2.46 ± 0.77 , the median pain score was 2.5 and mode pain score was 3, whereas in the post-test, the mean and SD of menstrual pain was 0.46 ± 0.50 , median pain score was 0 and mode pain score was 0. Similarly, in control group, the mean and SD of pre-test menstrual pain was 3.3 ± 1.11 , the median pain score was 3 and mode pain score was 4. Whereas in the mean and SD of menstrual pain was 3.26 ± 1.07 , median pain score was 3, and mode pain score was 4.

Table 4:**Effectiveness of fennel seeds tea on menstrual pain****Effectiveness of fennel seeds tea on menstrual pain of experimental group N=30**

Days	Mean	SD	t value	df	P value	Inference
Day 1 Pre test	4.86	0.97	25.85	29	0.000	Significant
Day 3 Post test	0.46	0.50				

The table no 16, shows that on day 1, in experimental group the pre-test mean and SD was 4.86 ± 0.97 and in the post test the mean and SD was 0.46 ± 0.50 . The paired t test value shown that 25.85, $df=29$ and p value was 0.0001. The calculated value shown that there was a significant difference between the pre-test and post-test menstrual pain score, which shows that fennel seed tea consumption during menstruation is effective on menstrual pain.

Table 5: Comparison pretest and post test scores of menstrual pain in control group.N=30

Days	Mean	SD	t value	df	P value	Inference
Day 1 Pre test	4.60	1.13	13.35	29	0.000	Significant
Day 3 Post test	3.26	1.08				

The table no 17, shows that on day 1, in control group the pre-test mean and SD was 4.60 ± 1.13 and in the post test the mean and SD was 3.26 ± 1.08 . The paired t test value shown that 13.35, $df=29$ and p value was 0.000. The calculated value shown that there was a significant difference between the pre-test and post-test menstrual pain score. This may be due to the duration or days of pain and natural body response.

TABLE 6: Chi square value showing the association between pre-test menstrual pain scores and Socio-demographic variables of experimental group N=60

Sr. No.	Socio demographic variable	Pretest menstrual pain Scores (Day 1) Median= 5		χ^2 calculated value	df	Inference
		<Median (10)	\geq Median (20)			
1	Age in years			1.20	2	NS
	17 years	4	6			
	18 Years	4	6			
	19 Years	2	8			
2	Age of Menarche			1.08	2	NS
	11-12 Years	0	2			
	13-14 Years	7	13			
	15-16 Years	3	5			
3	Length of previous Menstruation Cycle			1.12	3	NS
	22 - 24 days	3	5			
	25 - 27 days	3	5			
	28 - 30 days	4	8			
	≥ 31 days	0	2			
4	Days of previous menstrual cycle flow			1.66	2	NS
	1- 2 days	2	1			
	3- 4 days	5	12			
	5- 6 days	3	7			
5	Duration of last month painful menses			0.07	1	NS
	1-2 days	6	13			
	3-4 days	4	7			

DISCUSSION

The current study objective is to assess effectiveness of fennel seeds tea on menstrual pain among young adolescent girls in selected community area of Maharashtra. In order to achieve the objectives of the study, true experimental research design were adopted. The samples were selected by simple random sampling technique, total 60 young adolescent girls from a chosen community area in

Maharashtra based on inclusion and exclusion criteria.

Findings related to socio-demographic variables:

In experimental group samples according to age in years 10 (33.33%) samples were belongs to 17 years of age, 10 (33.33%) samples were age group of 18 years, 10 (33.33%) samples were the age group of 19 years. In relation to age of menarche maximum samples 20(66.67%) samples were

age of menarche was 13-14 years. In relation to the length of previous menstruation cycle maximum 12 (40%) samples length of previous menstruation cycles were between 28-30 days. In relation to the days of previous menstrual cycle maximum 17 (56.67%) samples had days of previous menstrual cycle flow between 3-4 days. In relation to the duration of last month's painful menses maximum 19 (63.33%) samples having painful menses were between 1-2 days. Similarly in control group in relation with age in years, 10(33.33%) samples were age group of 17 years, 10 (33.33%) samples were age group of 18 years, and 10 (33.33%) samples were age group of 19 years as per the matching criteria. In age of menarche maximum 22 (73.33%) samples were age of menarche was 13-14 years. In case of length of the previous menstruation cycle maximum 14 (46.67%) samples length of the previous menstruation cycle was between 28-30 days. In relation with days of previous menstrual cycle flow maximum 20 (66.67%) samples of days of previous menstrual cycle flow were between 3-4 days. Similarly majorly 20 (66.67%) samples having a duration of last month's painful menses were between 1-2 days.

Findings related to levels of menstrual pain among young adolescent girls

In experimental group in level of menstrual pain on day 1 in pretest maximum samples had 27(90%) moderate menstrual pain and in post-test after the administration of fennel seeds tea maximum had 16 (53.3%) moderate pain. Similarly on second day in pretest maximum 22 (73.3%) moderate pain and whereas in posttest 18(60%) moderate pain. Similarly on day 3 in pretest majority were had 28(93.3%) had mild pain but after intervention in posttest again major were 16(55.3%) had mild pain.

In control group in level of menstrual pain on day 1 in pretest maximum samples had 24(80%) had moderate menstrual pain and in post-test without any intervention again maximum had 24 (80%) moderate pain. Similarly on second day in pretest maximum 18 (60%) moderate pain and whereas in post-test 18(60%) moderate pain. Similarly on day 3 in pretest majority were had 16(53.3%) had mild pain but without intervention in post- test again major were 16(53.3%) had mild pain.

A cross sectional study was conducted to assess the prevalence of primary dysmenorrhea in young girls and the assessment of clinical indicators associated with the condition, among 310 girls about their menarche age, the presence or absence of dysmenorrhea, the length of the condition, premenstrual symptoms (PMS), family history, irregular menses, menstrual history and severity grading using the visual analogue scale (VAS). The prevalence of dysmenorrhea was very high in girls, 84.2% (261) reported having menstrual pain, where as 15.8% (49) reported having none at all. 34.2% of girls reported severe pain, 36.6% reported moderate pain, and 29.2% reported mild pain using the VAS.¹⁰

Findings related to Effectiveness of fennel seeds tea on menstrual pain

In the present study, in experimental group the pre-test mean and SD was 4.86 ± 0.97 and in the post test the mean and SD was 0.46 ± 0.50 . The paired t test value shown that 25.85, $df=29$ and p value was 0.0001. The calculated value shown that there was a significant difference between the pre-test and post-test menstrual pain score, which shows that fennel seed tea consumption during menstruation is effective on menstrual pain among young adolescent girls. Hence H_01 was rejected.

In control group the pre-test mean and SD was 4.60 ± 1.13 and in the post test the mean and SD was 3.26 ± 1.08 . The paired t test value shown that 13.35, $df=29$ and p value was 0.000. The calculated value shown that there was a significant difference between the pre-test and post-test menstrual pain score. This may be due to the duration or days of pain and natural body response.

The findings of the present study are supported with a clinical trial study to assess the effectiveness of fennel on primary dysmenorrhea symptoms and menstrual duration, 80 female students were selected randomly. The intervention group was given one soft capsule Fennel (30 mg) every 4 hours, 3 days before menstruation till the 5th day and continued for 3 months. The control group received no medication. After three months, the mean levels of weakness and nausea intensity dropped to 1.93 and 2.88, respectively, while they were 2.37 and 6.65 in the control group, indicating a significant difference. Shorten the menstrual cycle; after two and three months of usage, a noticeable difference was observed. There was a noticeable difference in the quality and well-being after one and three months when compared to before using. Considering the safety of herbal remedies, this medication can be used to reduce the length of the menstrual cycle and dysmenorrheal symptoms.¹⁷

Findings related to association between the pre-test menstrual pain scores and socio-demographic variables of young adolescent girls

In the present study in there was no significant association between the pre -test menstrual pain score among young adolescent girls with their selected socio-demographic variables such as age in years, age of menarche, length of previous menstrual cycle, days of previous menstrual cycle flow, duration of last month painful menses hence H_02 was accepted.

The current study showed that intervention of fennel seeds tea for continue three days of menstruation ,the adolescent girls who had experienced mild to moderate menstrual pain, this is evidenced by significant improvement in experimental group compared to control group. Also this improvement had positive effect on level of menstrual pain. This recovery might be due to the mechanism of action of fennel through the inhibition of uterine contractions induced by prostaglandin E2 and oxytocin (Kauphal, 2018).

This result was congruent with Omidvar, et al., (2012) demonstrated that the use of fennel for two months showed more effective results than placebo in pain relief, In

addition, Ghodsi and Asltohiri, (2014) reported that fennel intake reduced pain, menstrual bleeding, nausea and weakness after three month periods.

The present work showed that after three days follow-up with fennel seeds tea, it was found that there were reduce pain level after three days of menstruation. This is evidenced by significant improvement in menstrual pain level, in experimental group the pre-test mean and SD was 4.86 ± 0.97 and in the post test the mean and SD was 0.46 ± 0.50 . The paired t test value shown that 25.85, $df=29$ and p value was 0.0001. The calculated value shown that there was a significant difference between the pre-test and post-test menstrual pain score, which shows that fennel seed tea consumption during menstruation is effective on menstrual pain among young adolescent girls

CONCLUSION

On the basis of the findings of the study the following interference were drawn. The aim of the study was to assess effectiveness of fennel seeds tea on menstrual pain among young adolescent girls in selected community area of Maharashtra. In experimental group there was significant difference found after the consumption of fennel seeds tea on menstrual pain among young adolescent girls as comparing with control group without any intervention, that shows consumption of fennel seeds tea is an effective intervention for reducing menstrual pain

Recommendations

1. The study can be conducted on the large sample size to generalize the findings.
2. The comparative study can be conducted fennel seeds with other non-pharmacological pain reduction methods.
3. It would be of immense value to conduct a study in different settings like, schools and colleges, girl's hostels.
4. Health professionals can conduct campaign to improve public awareness.

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Conflicts of interest

There are no conflicts of interest.

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