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# "An Experimental Study To Assess The Effect Of Topical Heat Application On Dysmenorrhea Among Women Of Age Group Between 18-30 Years In Selected Rural Population At Uttar Pradesh."

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**Abstract**

Menstruation is a typical physiological event in women that shows her procreative potential. Dysmenorrhea is the most prevalent menstrual condition, affecting 50% of women of childbearing age, and 10% of these women feel incapacitating pain for 1-3 days each month. Dysmenorrhea is a prominent factor in the absence from school, restriction of daily living activities, and lack of social engagement in 60–90% of adolescent girls in India. An experimental study using randomized control trial design was done. The sample size for the study was 60 women. The study findings revealed that most of the women in were having moderate dysmenorrhea. It has been seen that the mean post pain level as evident by numeric pain rating scale in experimental group (2.13) was higher than mean pre pain level as evident by numeric pain rating scale (6.03). The obtained t value 20.55 was significant at 0.01 levels. This shows that mean difference between pre-administration and post administration of heat application was true and topical heat application was effective in pain reduction in experimental group.

**Keywords:** Dysmenorrhoea, Dried ginger powder

## Introduction

The female reproductive system is unique in its own structure. A reproductive system is necessary for giving birth to new life throughout pregnancy. The mechanism of copulation in female humans is known as the female reproductive system.[1] During the foetal period of development within their bodies, females must carry foetuses. The female reproductive system becomes increasingly sophisticated as a result of modifications and adaptations made to carry the foetus.[2]

The menstrual cycle is the hormonally controlled process of ovulation and menstruation that a woman's body goes through to get ready for pregnancy. The uterus develops endometrium once a month to prepare for a fertilized egg.[3] Menstrual pain, or dysmenorrhea, is also referred to as painful periods or menstrual cramps. It typically starts right when menstruation does. Symptoms usually disappear within three days. Usually, the lower abdomen or pelvic are the areas of pain. Back ache, diarrhea, and nausea are examples of further symptoms.[4]

The estimated prevalence of dysmenorrhea varies widely, with studies from throughout the world indicating a range between 28% to 71.7%.[5,6] Similar studies conducted in Turkey have estimated the prevalence of dysmenorrhea to be between 58.2% and 89.5%.[7,8,]

Research conducted in India revealed that the prevalence ranged from 50 to 87.8%. According to other research, up to 90% of women who are fertile experience dysmenorrhea, albeit to differing degrees.[9] The prevalence percentage among adolescents in south India was determined to be 66.8% in a study that was done.[10]

Numerous factors are connected to this condition, according to studies on the prevalence of menstruation discomfort. The prevalence and severity of dysmenorrhea are influenced by a number of factors, including young age, low body mass index (BMI), smoking, early menarche, prolonged or aberrant menstrual flow, peri-menstrual somatic complaints, pelvic infections, prior sterilization, somatization, psychological disturbance, genetic influence, and a history of sexual assault.[11]

Heat therapy is often most beneficial when used for a good amount of time. Minor stiffness or tension can often be relieved with only 15 to 20 minutes of heat therapy. Moderate to severe pain can benefit from longer sessions of heat therapy like warm bath, lasting between 30 minutes and two hours.[12]

A great deal of studies have been done separately on the prevalence and practice of topical heat application for managing dysmenorrhea among girls. However its effect on dysmenorrhea in women of rural areas is an area less explored, therefore the present study is aimed at doing so.

The investigator experience with her colleagues with dysmenorrhea had shown that- quality of work both academic seems to be affected; peer and social interaction were also markedly affected during their

menstrual days. This motivated the investigator to research into various methods that can reduce the severity of dysmenorrhea in a natural way so as to permit normal activities even during their menstruation.

**Objectives of the Study**

- To assess the pretest level of dysmenorrhea among women in both groups.
- To determine the effectiveness of topical heat application on dysmenorrhea among women in Experimental Group.
- To find out the association between pre-test level of dysmenorrhea among women with their demographic variables in experimental group.

**Null hypotheses**

- $H_{01}$- There will be no significant difference between the pretest and post-test level of dysmenorrhea as assessed by Numeric pain rating scale among women in experimental group at 0.05 level of significance.
- $H_{02}$-There will be no significant association between pre-test level of dysmenorrhea among women with their demographic variable in experimental and control group at 0.05 level of significance.

**Materials and Methods**

The research approach used in this study was experimental research approach in which **randomized control trial design** found to be appropriate for the study.

| **Group** | **Pre- test** (Day 1 of menstruation) | **Manipulation** (Day 1 Morning 8A.M soon after Pretest) | **Post test 1**(Day1, After one hour of intervention) | **Manipulation** (Day 1 Afternoon 2 P.M before | **Post test 2** (Day1, After one hour of intervention) | **Manipulation** (Day1,Evening 8 P.M before | **Post test 3** (Day1, After one hour of intervention) |
|---|---|---|---|---|---|---|---|
| **Experimental Group (R)** | O1 | **XH1** | O2 | **XH2** | O3 | **XH3** | O4 |
| **Control Group (R)** | O1 | __ | O2 | __ | O3 | __ | O4 |

**Figure-1 Schematic representation of research design.**

**Key:**

- **XH:** Topical heat application on lower abdomen three times on first day of menstruation among women in experimental group.
- **R:**Randomization

- **O1:**Pre-test assessment of Pain.
- **O2:**Post-test – 1 - Assessment of Pain.
- **O3:**Post-test – 2 - Assessment of Pain.
- **O4:**Post-test – 3 - Assessment of Pain.

Study was conducted on women residing in rural areas of Uttar Pradesh. The sample size for the study 120 women in experimental and control group both.

The sampling technique used in the present study was total enumeration technique to select the subjects and then randomization was done using lottery method to allocate the subjects to experimental and control group. Data was collected from 10th October 2023 to 30th April 2024. Investigator explained about the nature of the study and informed consent was taken. Subjects were assured about the confidentiality of their responses. A structured interview schedule was used to identify the number of women who are suffering from primary dysmenorrhoea. A standardized tool Numeric pain rating scale used for the measurement of pain during menstruation given by Mc Caffery, Beebe et al (1989).It is device by which judgment may be qualified or an opinion concerning pain can be systematized. This scale refers to a scale with a set of opinion which describes varying degree of dimensions of pain being observed as depicted in figure-2.

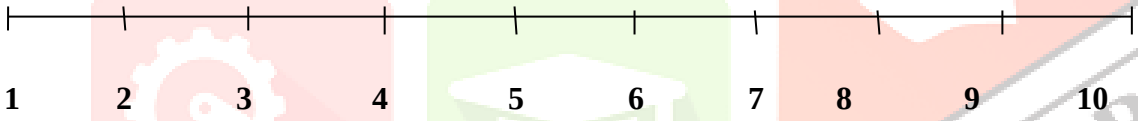


**Figure-2 Numeric pain rating scale.**

**Key:**

1 to 3- Mild pains

4 to 6- Moderate pain

7 to 10- Severe pain

**Results**

**Section A: Description of baseline characteristics of 60 women.**

**Table -1**

**Comparison of Frequency, percentage distribution of women by theirage, nutritional status, religion, onset of menarche, duration of menstrual flow, length of menstrual cycle, marital status, level of education, occupation, dietary pattern, type of family, Family monthly income, family history of 328ysmenorrheal, management of 328ysmenorrheal, impact ofdysmenorrhea, frequency of dysmenorrhea, duration of feeling pain, region of pain, intensity of pain.**

**n=120**

| S.No. | Baseline data | Experimental group (n1=60) | | Control group (n2 = 60) | |
|---|---|---|---|---|---|
| | | F | % | F | % |
| 1 | **Age** | | | | |
| | **18-22** | 2 | 3 | 0 | 0 |
| | **23-26** | 56 | 94 | 57 | 95 |
| | **27-30** | 2 | 3 | 3 | 5 |
| 2 | **Nutritional status** | | | | |
| | **Underweight** | 4 | 7 | 3 | 5 |
| | **Healthy** | 49 | 82 | 49 | 82 |
| | **Obese** | 2 | 3 | 3 | 5 |
| | **Overweight** | 5 | 8 | 5 | 8 |
| 3 | **Religion** | | | | |
| | **Hindu** | 5 | 8 | 25 | 42 |
| | **Muslim** | 37 | 62 | 23 | 38 |
| | **Sikh** | 5 | 8 | 4 | 7 |
| | **Christian** | 13 | 22 | 8 | 13 |
| | **Others** | 0 | 0 | 0 | 0 |
| 4 | **Onset of menarche** | | | | |
| | **12 or<12** | 0 | 0 | 0 | 0 |
| | **13** | 24 | 40 | 24 | 40 |
| | **14** | 36 | 60 | 35 | 58 |
| | **>15** | 0 | 0 | 1 | 2 |
| 5 | **Duration of menstrual flow** | | | | |
| | **<3** | 2 | 3 | 2 | 3 |
| | **4-5** | 52 | 87 | 51 | 85 |
| | **6-7** | 6 | 10 | 7 | 12 |
| | **>8** | 0 | 0 | 0 | 0 |

| | | | | | |
|---|---|---|---|---|---|
| 6 | **Length of menstrual cycle** | | | | |
| | **<21** | 0 | 0 | 0 | 0 |
| | **22-28** | 47 | 78 | 55 | 92 |
| | **29-35** | 9 | 15 | 5 | 8 |
| | **>35** | 4 | 7 | 0 | 0 |
| 7 | **Marital status** | | | | |
| | **Married** | 58 | 97 | 55 | 92 |
| | **Unmarried** | 2 | 3 | 0 | 0 |
| | **Widow** | 0 | 0 | 2 | 3 |
| | **Divorced** | 0 | 0 | 3 | 5 |
| 8 | **Level of education** | | | | |
| | **Non- literate** | 4 | 7 | 4 | 7 |
| | **Primary education** | 35 | 58 | 31 | 52 |
| | **Secondary education** | 12 | 20 | 12 | 20 |
| | **Higher education** | 9 | 15 | 11 | 18 |
| | **Graduation and above** | 0 | 0 | 2 | 3 |
| 9 | **Occupation** | | | | |
| | **Housewife** | 55 | 92 | 56 | 94 |
| | **Job** | 3 | 5 | 2 | 3 |
| | **Bussiness** | 0 | 0 | 0 | 0 |
| | **Student** | 2 | 3 | 2 | 3 |
| 10 | **Dieary pattern** | | | | |
| | **Vegetarian** | 5 | 8 | 18 | 30 |
| | **Eggetarian** | 5 | 8 | 7 | 12 |
| | **Non- vegetarian** | 50 | 84 | 35 | 58 |
| 11 | **Types of family** | | | | |
| | **Nuclear** | 13 | 22 | 16 | 27 |
| | **Joint** | 33 | 55 | 30 | 50 |
| | **Extended** | 14 | 23 | 14 | 23 |
| 12 | **Family's monthly income** | | | | |
| | **Below Rs. 10,000** | 0 | 0 | 0 | 0 |
| | **10,000- 20,000/-** | 5 | 8 | 5 | 8 |
| | **Above Rs. 20,000/-** | 55 | 92 | 55 | 92 |
| 13 | **Family history of dysmenorrhoea** | | | | |
| | **Yes** | 57 | 88 | 46 | 77 |
| | **No** | 7 | 12 | 14 | 23 |
| 14 | **Management of dysmenorrhoea** | | | | |
| | **Pharmacological management** | 36 | 60 | 21 | 35 |
| | **Non-Pharmacological management** | 16 | 27 | 18 | 30 |

| | | | | | |
|---|---|---|---|---|---|
| | **None** | 8 | 13 | 21 | 35 |
| 15 | **Impact of dysmenorrhoea** | | | | |
| | **Limitation in daily living activities** | 52 | 87 | 55 | 92 |
| | **Absenting from class** | 2 | 3 | 2 | 3 |
| | **Remain isolated** | 6 | 10 | 3 | 5 |
| | **Nil** | 0 | 0 | 0 | 0 |
| 16 | **Frequency of dysmenorrhoea** | | | | |
| | **Always** | 52 | 87 | 58 | 97 |
| | **Never** | 0 | 0 | 0 | 0 |
| | **Sometimes** | 8 | 13 | 2 | 3 |
| 17 | **Duration of dysmenorrhoea** | | | | |
| | **One day** | 46 | 77 | 49 | 82 |
| | **Two days** | 12 | 20 | 9 | 15 |
| | **Three days** | 2 | 3 | 2 | 3 |
| | **More than three days** | 0 | 0 | 0 | 0 |
| 18 | **Region of dysmenorrhoea** | | | | |
| | **Upper abdomen** | 0 | 0 | 0 | 0 |
| | **Lower abdomen** | 48 | 80 | 54 | 90 |
| | **Whole abdomen** | 0 | 0 | 0 | 0 |
| | **Back** | 12 | 20 | 6 | 10 |
| | **Others** | 0 | 0 | 0 | 0 |
| 19 | **Intensity of dysmenorrhoea** | | | | |
| | **Mild** | 2 | 3 | 1 | 2 |
| | **Moderate** | 13 | 22 | 20 | 33 |
| | **Severe** | 45 | 75 | 39 | 65 |

According to the above mentioned table out of 60 women who belonged to experimental group, data reveal that 94% belong to the age group 23-26, 2% belong to the age group of 27-30 and 2 % belong to the age group of 18-22 whereas in control group out of 60 women 95% belong to the age group 23-26, 5% belong to the age group of 27-30.

Regarding the nutritional status out of 60 women, 82% were healthy,3% were obese, 8% were overweight, 7% were underweight in experimental group, whereas in control group, 82% were healthy,5% were obese, 8% were overweight, 5% were underweight.

Regarding the religion 8% belong to the Hindu religion, 62% belong to Muslim religion, 8% belong Sikh religion and 3% belong to Christian religion in experimental group. Whereas in control group, 42% belong to the Hindu religion, 38% belong to Muslim religion, 7% belong Sikh religion and 22% belong to Christian religion.

Regarding menarche, out of 60 women, in experimental group, 60% were having menarche at the age of 14 years, 40% were having menarche at the age of 13 years, whereas in control group, 58% were having menarche at the age of 14 years, 40% were having menarche at the age of 13 years, and 2 % were having at the age of 15 or more than 15 years.

In experimental group, 3% were having duration of menstrual flow less than or equal to 3 days, 87% were having duration of menstrual flow ranging 4-5 days and 10% were having duration of menstrual flow ranging 6-7 days, whereas in control group, 3% were having duration of menstrual flow less than or equal to 3 days,85 % were having duration of menstrual flow ranging 4-5 days and 12% were having duration of menstrual flow ranging 6-7 days .

In experimental group, 78% were having length of menstrual cycle ranging 22-28 days, 15% were having length of menstrual cycle ranging 29-35 days, 7% were having length of menstrual cycle ranging > 35 days. In control group 92% were having length of menstrual cycle ranging 22-28 days, 8% were having length of menstrual cycle ranging 29-35 days.

In experimental group, 97% women were married, 83% were unmarried whereas in control group 92% were married and 3% were unmarried, 3% were divorced.

In experimental group, 58% women were having primary education, 20% were having secondary education, 15% were having higher education, 7% were non-literate, 3% were having graduation, whereas in control group 52% women were having primary education, 20% were having secondary education, 18% were having higher education, 7% were non-literate, 3% were having higher education.

In experimental group, 92% women were housewife, 5% were doing job, 3% were student whereas in control group, 94% women were housewife, 3% were doing job, 3% were student.

In experimental group, 84% women were non-vegetarian , 8% were vegetarian,8% were eggetarian whereas in control group 58% women were non-vegetarian , 30% were vegetarian, 12% were eggetarian.

Regarding the family type in experimental group, majority of the women, 55% belonged to joint family, 23 % belonged to the extended family, 22% belonged to nuclear family. Whereas in control group majority of the women, 50% belonged to joint family, 23 % belonged to the extended family, 27% belonged to nuclear family.

In experimental group, out of 60 women, 92% of the women had a monthly income above Rs. 20000, 8% had a monthly income between Rs. 10000-Rs 20000, whereas in control group also 92% of the women had a monthly income above Rs. 20000, 8% had a monthly income between Rs. 10000-Rs 20000.

In experimental group, out of 60 women, 88% of the women had family history of dysmenorrhea, whereas in control group 77% of women had family history of dysmenorrhea.

In experimental group, out of 60 women, 60% of the women had taken pharmacological treatment for dysmenorrhea, 27% of the women had taken non-pharmacological treatment for dysmenorrhea, 13% of the women used nothing for dysmenorrhea, whereas in control group 35% of the women had taken pharmacological treatment for dysmenorrhea,30% of the women had taken non-pharmacological treatment for dysmenorrhea,35% of the women used nothing for dysmenorrhea.

In experimental group, out of 60 women, 87% of the women had limitation in daily activities, 3% were absent from class, 10% remain isolated, whereas in control group 97% of the women had limitation in daily activities, 3% were absent from class, 5% remain isolated.

In experimental group, out of 60 women, 87% of the women were always facing dysmenorrhea, 13% were sometimes facing dysmenorrhea, whereas in control group 97% of the women were always facing dysmenorrhea, 3% were sometimes facing dysmenorrhea.

Regarding duration of dysmenorrhea, in experimental group, out of 60 women, 77% of the women had dysmenorrhea on first day , 20 % had dysmenorrhea for first two days, only 3% had dysmenorrhea for first three days, whereas in control group 82% of the women had dysmenorrhea on first day, 15% had dysmenorrhea for first two days, only 3% had dysmenorrhea for first three days. .

Regarding region of dysmenorrhea, in experimental group, out of 60 women, 80% of the women had dysmenorrhea in lower abdomen, 20 %had dysmenorrhea in back also. Whereas in control group 90% of the women had dysmenorrhea in lower abdomen, 10 % had dysmenorrhea in back also.

Regarding intensity of dysmenorrhea, in experimental group, out of 60 women, 75% of the women had severe dysmenorrhea, 22%had moderate dysmenorrhea, 3% had mild dysmenorrhea. Whereas in control group 65% of the women had severe dysmenorrhea, 33%had moderate dysmenorrhea, 2% had mild dysmenorrhea.

**Section B: Findings related to the level of pre-test pain scores among women between experimental and control group.**

**Table-2**

**Frequency and Percentage Distribution, Mean, Median, Standard Deviation in the experimental group and control group.**

**n1+n2=120**

| Group | Mild | | Moderate | | Severe | | Mean | Standard Deviation | Median |
|---|---|---|---|---|---|---|---|---|---|
| | F | % | F | % | F | % | | | |
| **Frequency/ Percentage in experimental group** | 0 | 0 | 36 | 60 | 24 | 40 | 6.03 | 1.40 | 6 |
| **Frequency/ Percentage in control group** | 0 | 0 | 42 | 70 | 18 | 30 | 5.6 | 1.20 | 6 |

The data presented in table 2, shows that most (60%) of women were having moderate pain, (40%) were having severe pain in experimental group whereas in control group most (70%) of women were having moderate pain, (30%) were having severe pain. The mean score in experimental and control group regarding level of pre-test pain score 6.03, 5.6, the median being 6, and standard deviation obtained was 1.40, 1.20 respectively.

**Section C**: **Findings related to pre and post intervention (Dried ginger powder) evident by pain scores in experimental group.**

**Table-3**

**Mean standard deviation, standard error, mean difference and t value of pain levels of women in the experimental group as evident by the numeric pain rating scale**

**n1=60**

| **Observation** | **Mean** | **Standard Deviation** | **$SE_{MD}$** | **Mean D** | **'t' Value** | **df** | **p value** |
|---|---|---|---|---|---|---|---|
| **Experimental group Pre administration of topical heat application** | 6.03 | 1.40 | 0.14 | 3.90 | 20.55 | 59 | **0.01**** |
| **Post administration of topical heat application** | 2.13 | 0.79 | | | | | |

- **t(59)=2.6,p≤.0.01**Significant at 0.01 level of significance.**

From the data present in table-3, it can be seen that the mean post pain level as evident by numeric pain rating scale in experimental group (2.13) was higher than mean pre pain level as evident by numeric pain rating scale (6.03). The obtained t value 20.55 was highly significant at 0.01 level. This shows that mean difference between pre-administration and post administration of heat application was true and not by chance. Hence the null hypothesis $\mathbf{H_{01}}$ was rejected and research hypothesis $\mathbf{H_1}$ was accepted.

**Section D: Findings related to the association between pre-test level of dysmenorrhea among women with their demographic variables in experimental group.**

**Table -4**

**n1= 60**

| S.No. | Baseline data | Mild | Moderate | Severe | df | Test used | P-value | Significant |
|---|---|---|---|---|---|---|---|---|
| 1 | **Age** | | | | | | | |
| | **18-22** | 0 | 1 | 1 | 2 | Fisher exact test | 1 | Not Significant |
| | **23-26** | 0 | 33 | 23 | | | | |
| | **27-30** | 0 | 2 | 0 | | | | |
| 2 | **Nutritional status** | | | | | | | |
| | **Underweight** | 0 | 3 | 1 | 3 | Fisher exact test | **0.043*** | Significant |
| | **Healthy** | 0 | 28 | 21 | | | | |
| | **Overweight** | 0 | 2 | 0 | | | | |
| | **Obese** | 0 | 3 | 2 | | | | |
| 3 | **Religion** | | | | | | | |
| | **Hindu** | 0 | 3 | 2 | 4 | Fisher exact test | 1 | Not Significant |
| | **Muslim** | 0 | 20 | 17 | | | | |
| | **Sikh** | 0 | 2 | 2 | | | | |
| | **Christian** | 0 | 10 | 3 | | | | |
| | **Others** | 0 | 0 | 0 | | | | |
| 4 | **Onset of menarche** | | | | | | | |
| | **12 or<12** | 0 | 0 | 0 | 3 | Fisher exact test | 0.865 | Not Significant |
| | **13** | 0 | 16 | 8 | | | | |
| | **14** | 0 | 20 | 16 | | | | |
| | **>15** | 0 | 0 | 0 | | | | |
| 5 | **Duration of menstrual flow** | | | | | | | |
| | **<3** | 0 | 1 | 1 | 3 | Fisher exact test | 0.696 | Not Significant |
| | **4-5** | 0 | 32 | 20 | | | | |
| | **6-7** | 0 | 3 | 3 | | | | |
| | **>8** | 0 | 0 | 0 | | | | |
| 6 | **Length of menstrual cycle** | | | | | | | |
| | **<21** | 0 | 0 | 0 | 3 | Fisher exact test | 0.845 | Not Significant |
| | **22-28** | 0 | 28 | 19 | | | | |
| | **29-35** | 0 | 5 | 4 | | | | |
| | **>35** | 0 | 3 | 1 | | | | |
| 7 | **Marital status** | | | | | | | |
| | **Married** | 0 | 35 | 23 | 3 | Fisher exact test | 1 | Not Significant |
| | **Unmarried** | 0 | 1 | 1 | | | | |
| | **Widow** | 0 | 0 | 0 | | | | |
| | **Divorced** | 0 | 0 | 0 | | | | |
| 8 | **Level of education** | | | | | | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **Non- literate** | 0 | 4 | 0 | 4 | Fisher exact test | 0.624 | Not Significant |
| | **Primary education** | 0 | 18 | 16 | | | | |
| | **Secondary education** | 0 | 7 | 5 | | | | |
| | **Higher education** | 0 | 7 | 2 | | | | |
| | **Graduation and above** | 0 | 0 | 1 | | | | |
| 9 | **Occupation** | | | | | | | |
| | **Housewife** | 0 | 34 | 22 | 3 | Fisher exact test | 0.713 | Not Significant |
| | **Job** | 0 | 1 | 1 | | | | |
| | **Bussiness** | 0 | 0 | 0 | | | | |
| | **Student** | 0 | 1 | 1 | | | | |
| 10 | **Dieary pattern** | | | | | | | |
| | **Vegetarian** | 0 | 4 | 1 | 2 | Fisher exact test | 0.822 | Not Significant |
| | **Eggetarian** | 0 | 4 | 1 | | | | |
| | **Non- vegetarian** | 0 | 33 | 22 | | | | |
| 11 | **Types of family** | | | | | | | |
| | **Nuclear** | 0 | 8 | 5 | 2 | Fisher exact test | 0.542 | Not Significant |
| | **Joint** | 0 | 20 | 13 | | | | |
| | **Extended** | 0 | 8 | 6 | | | | |
| 12 | **Family's monthly income** | | | | | | | |
| | **Below Rs. 10,000** | 0 | 0 | 0 | 2 | Fisher exact test | 0.775 | Not Significant |
| | **10,000- 20,000/-** | 0 | 1 | 4 | | | | |
| | **Above Rs. 20,000/-** | 0 | 35 | 20 | | | | |
| 13 | **Family history of dysmenorrhoea** | | | | | | | |
| | **Yes** | 0 | 32 | 21 | 1 | Fisher exact test | 1 | Not Significant |
| | **No** | 0 | 4 | 3 | | | | |
| 14 | **Management of dysmenorrhoea** | | | | | | | |
| | **Pharmacological management** | 0 | 20 | 16 | 2 | Fisher exact test | 0.521 | Not Significant |
| | **Non-Pharmacological management** | 0 | 10 | 5 | | | | |
| | **None** | 0 | 6 | 4 | | | | |
| 15 | **Impact of dysmenorrhoea** | | | | | | | |
| | **Limitation in daily living activities** | 0 | 33 | 19 | 3 | Fisher exact test | 0.572 | Not Significant |
| | **Absenting from class** | 0 | 0 | 2 | | | | |
| | **Remain isolated** | 0 | 3 | 3 | | | | |
| | **Nil** | 0 | 0 | 0 | | | | |
| 16 | **Frequency of dysmenorrhoea** | | | | | | | |
| | **Always** | 0 | 35 | 23 | 2 | Fisher exact test | 1 | Not Significant |
| | **Never** | 0 | 0 | 0 | | | | |
| | **Sometimes** | 0 | 1 | 1 | | | | |
| 17 | **Duration of dysmenorrhoea** | | | | | | | |
| | **One day** | 0 | 30 | 22 | 3 | Fisher exact | 1 | Not Signific |
| | **Two days** | 0 | 5 | 1 | | | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **Three days** | 0 | 1 | 1 | | test | | ant |
| | **More than three days** | 0 | 0 | 0 | | | | |
| 18 | **Region of dysmenorrhoea** | | | | | | | |
| | **Upper abdomen** | 0 | 0 | 0 | 4 | Fisher exact test | 0.476 | Not Significant |
| | **Lower abdomen** | 0 | 33 | 21 | | | | |
| | **Whole abdomen** | 0 | 0 | 0 | | | | |
| | **Back** | 0 | 3 | 3 | | | | |
| | **Others** | 0 | 0 | 0 | | | | |
| 19 | **Intensity of dysmenorrhoea** | | | | | | | |
| | **Mild** | 0 | 2 | 0 | 2 | Fisher exact test | 0.575 | Not Significant |
| | **Moderate** | 0 | 6 | 7 | | | | |
| | **Severe** | 0 | 28 | 17 | | | | |

***significant p<0.05**

**Section E: Findings related to the association between pre-test level of dysmenorrhea among women with their demographic variables in control group.**

**Table -5**

**n2= 60**

| S.No. | Baseline data | Mild | Moderate | Severe | df | Test used | P-value | Significant |
|---|---|---|---|---|---|---|---|---|
| 1 | **Age** | | | | | | | |
| | **18-22** | 0 | 0 | 0 | 2 | Fisher exact test | 1 | Not Significant |
| | **23-26** | 0 | 40 | 17 | | | | |
| | **27-30** | 0 | 2 | 1 | | | | |
| 2 | **Nutritional status** | | | | | | | |
| | **Underweight** | 0 | 2 | 1 | 3 | Fisher exact test | **0.048*** | Significant |
| | **Healthy** | 0 | 34 | 15 | | | | |
| | **Overweight** | 0 | 2 | 1 | | | | |
| | **Obese** | 0 | 4 | 1 | | | | |
| 3 | **Religion** | | | | | | | |
| | **Hindu** | 0 | 17 | 8 | 4 | Fisher exact test | 0.72 | Not Significant |
| | **Muslim** | 0 | 16 | 7 | | | | |
| | **Sikh** | 0 | 3 | 1 | | | | |
| | **Christian** | 0 | 6 | 2 | | | | |
| | **Others** | 0 | 0 | 0 | | | | |
| 4 | **Onset of menarche** | | | | | | | |
| | **12 or<12** | 0 | 0 | 0 | 3 | Fisher exact test | 0.36 | Not Significant |
| | **13** | 0 | 18 | 6 | | | | |
| | **14** | 0 | 24 | 11 | | | | |
| | **>15** | 0 | 0 | 1 | | | | |
| 5 | **Duration of menstrual flow** | | | | | | | |
| | **<3** | 0 | 1 | 1 | | Fisher | | Significant |
| | **4-5** | 0 | 36 | 15 | | exact | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **6-7** | 0 | 5 | 2 | 3 | test | **0.029 *** | |
| | **>8** | 0 | 0 | 0 | | | | |
| 6 | **Length of menstrual cycle** | | | | | | | |
| | **<21** | 0 | 0 | 0 | 3 | Fisher exact test | 1 | Not Significant |
| | **22-28** | 0 | 40 | 15 | | | | |
| | **29-35** | 0 | 2 | 3 | | | | |
| | **>35** | 0 | 0 | 0 | | | | |
| 7 | **Marital status** | | | | | | | |
| | **Married** | 0 | 38 | 17 | 3 | Fisher exact test | 1 | Not Significant |
| | **Unmarried** | 0 | 0 | 0 | | | | |
| | **Widow** | 0 | 3 | 0 | | | | |
| | **Divorced** | 0 | 1 | 1 | | | | |
| 8 | **Level of education** | | | | | | | |
| | **Non- literate** | 0 | 4 | 0 | 4 | Fisher exact test | 1 | Not Significant |
| | **Primary education** | 0 | 21 | 10 | | | | |
| | **Secondary education** | 0 | 8 | 4 | | | | |
| | **Higher education** | 0 | 8 | 3 | | | | |
| | **Graduation and above** | 0 | 1 | 1 | | | | |
| 9 | **Occupation** | | | | | | | |
| | **Housewife** | 0 | 41 | 15 | 3 | Fisher exact test | 0.623 | Not Significant |
| | **Job** | 0 | 0 | 2 | | | | |
| | **Bussiness** | 0 | 0 | 0 | | | | |
| | **Student** | 0 | 1 | 1 | | | | |
| 10 | **Dieary pattern** | | | | | | | |
| | **Vegetarian** | 0 | 15 | 3 | 2 | Fisher exact test | 0.812 | Not Significant |
| | **Eggetarian** | 0 | 5 | 2 | | | | |
| | **Non- vegetarian** | 0 | 22 | 13 | | | | |
| 11 | **Types of family** | | | | | | | |
| | **Nuclear** | 0 | 12 | 4 | 2 | Fisher exact test | 0.614 | Not Significant |
| | **Joint** | 0 | 19 | 11 | | | | |
| | **Extended** | 0 | 11 | 3 | | | | |
| 12 | **Family's monthly income** | | | | | | | |
| | **Below Rs. 10,000** | 0 | 0 | 0 | 2 | Fisher exact test | 0.724 | Not Significant |
| | **10,000- 20,000/-** | 0 | 3 | 2 | | | | |
| | **Above Rs. 20,000/-** | 0 | 39 | 16 | | | | |
| 13 | **Family history of dysmenorrhoea** | | | | | | | |
| | **Yes** | 0 | 32 | 14 | 1 | Fisher exact test | 1 | Not Significant |
| | **No** | 0 | 10 | 4 | | | | |
| 14 | **Management of dysmenorrhoea** | | | | | | | |
| | **Pharmacological management** | 0 | 14 | 7 | 2 | Fisher exact | 0.661 | Not Significant |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **Non-Pharmacological management** | 0 | 15 | 3 | | test | | ant |
| | **None** | 0 | 13 | 8 | | | | |
| 15 | **Impact of dysmenorrhoea** | | | | | | | |
| | **Limitation in daily living activities** | 0 | 38 | 17 | 3 | Fisher exact test | 0.845 | Not Significant |
| | **Absenting from class** | 0 | 1 | 1 | | | | |
| | **Remain isolated** | 0 | 3 | 0 | | | | |
| | **Nil** | 0 | 0 | 0 | | | | |
| 16 | **Frequency of dysmenorrhoea** | | | | | | | |
| | **Always** | 0 | 42 | 16 | 2 | Fisher exact test | 1 | Not Significant |
| | **Never** | 0 | 0 | 0 | | | | |
| | **Sometimes** | 0 | 0 | 2 | | | | |
| 17 | **Duration of dysmenorrhoea** | | | | | | | |
| | **One day** | 0 | 34 | 15 | 3 | Fisher exact test | 0.672 | Not Significant |
| | **Two days** | 0 | 8 | 1 | | | | |
| | **Three days** | 0 | 0 | 2 | | | | |
| | **More than three days** | 0 | 0 | 0 | | | | |
| 18 | **Region of dysmenorrhoea** | | | | | | | |
| | **Upper abdomen** | 0 | 0 | 0 | 4 | Fisher exact test | 0.645 | Not Significant |
| | **Lower abdomen** | 0 | 36 | 18 | | | | |
| | **Whole abdomen** | 0 | 0 | 0 | | | | |
| | **Back** | 0 | 6 | 0 | | | | |
| | **Others** | 0 | 0 | 0 | | | | |
| 19 | **Intensity of dysmenorrhoea** | | | | | | | |
| | **Mild** | 0 | 1 | 0 | 2 | Fisher exact test | 0.812 | Not Significant |
| | **Moderate** | 0 | 13 | 7 | | | | |
| | **Severe** | 0 | 28 | 11 | | | | |

***significant p<0.05**

## Discussion

The present study reveals that most of the women irrespective of their age, body weight and religion suffer with dysmenorrhea. This directly and indirectly influence their activities of daily living during dysmenorrhea. Administration of topical heat application during dysmenorrhea was beneficial to resume their activities comfortably. The findings shows that the administration of heat application for 30 min thrice on first day of menstruation showed marked reduction in dysmenorrhea.

The findings of present study was consistent with the study conducted by **Akin MD et al**[13]to compare the efficacy of topically applied heat for menstrual pain with oral ibuprofen and placebo treatment. Study concluded that continuous low-level topical heat therapy was as effective as ibuprofen for the treatment of dysmenorrhea.

The findings of present study was consistent with the study conducted by **Chaudhuryet al**[14]to assess the impact of exercise and hot water bottle use on primary dysmenorrhea and result revealed that both exercises and hot water bottle led to significant relief in the severity of pain and menstrual distress in the respective groups.

Menstruation though a normal physiological process is many a times associated with premenstrual and menstrual disturbances. These disturbances may sometimes be very severe leading to loss of working days. The pain of dysmenorrhea is very difficult to measure partly because it is usually accompanied by other unpleasant sensations which affect the judgment of pain. Dysmenorrhea should therefore be regarded as multidimensional scoring system. In the present study severity of dysmenorrhea was measured by numerical rating pain scale.

A lot of randomized controlled trials have been conducted to assess the effectiveness of various other home remedies on primary dysmenorrhea as these does not involve any cost and are readily available. These remedies also do not involve any side effects as is associated with over the counter medicines.

There are many non-pharmacological method of intervention which are readily available, involves no cost and does not have any side effects which includes hot water bottle, dietary modification, and dry ginger powder, exercise and so on. So the present study reveals that most of the women irrespective of their age, body weight and religion suffer with dysmenorrhea. This directly and indirectly influence their activities of daily living during dysmenorrhea. Administration of dried ginger powder during dysmenorrhea was beneficial to resume their activities comfortably.

Non pharmacological methods of management of primary dysmenorrhea should be included in the curriculum at school as well as college level to prevent loss of work days. Home remedies should be considered as the first line treatment for dysmenorrhea in the home as well as in community setting. There is a need to disseminate information on primary dysmenorrhea through mass media to general public at large, that effective treatment based on home based remedies is available. Routine screening of girls with primary dysmenorrhea should be done at school as well as college level so that girls with secondary dysmenorrhea could be referred to higher gynecologist. Although there are many studies proving the effectiveness of ginger and heat on primary dysmenorrhea, proper dosage of ginger and duration of treatment of treatment has not been generalized.

So further studies regarding the effects of ginger on other symptoms associated with dysmenorrhea and efficacy and safety of various dosage and treatment durations of ginger are warranted.

## Conclusion

- Both the groups were found homogenous with respect to age, nutritional status, religion, onset of menarche, duration of menstrual flow, length of menstrual cycle, marital status, level of education, occupation, dietary pattern, type of family, Family monthly income, family history of dysmenorrhea, management of dysmenorrhea, impact of, frequency of dysmenorrhea, duration of feeling pain, region of pain, intensity of pain of women.
- There was a significant reduction in the pain scores after topical heat application on lower abdomen.
- The maximum pain score was found before the interventions in both groups during the pre-test and it reduced during the post-test in experimental group.

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**Conflict of interest**

There are no conflict of interest.

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