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**ORIGINAL ARTICLE** **OPEN ACCESS**

# The Effects of Acupressure on Dysmenorrhea Symptom and pain among students at Shree Guru Gobind Singh Tricentenary University, Gurugram: True Experimental Study

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**ABSTRACT**
*In India, Dysmenorrhea is estimated to be present among 40-50% of the women population[1]. Those with severe focus result in work or school absence of up to 15% and in mild forms medication was not required or sometimes over-the-counter analgesics in about 30%of the cases[2]. The majority of adolescents (60%) reported dysmenorrhea, with 14% saying they frequently missed school because of severe menstrual cramps[3]. Those students are not responding to medical management should be considered for further Investigation. A True experimental study with sixty students was selected, out of which 30 experimental groups and 30 control groups through simple random sampling technique (lottery method). Sp6 points on one leg for 10 minutes were given for the experimental group. For the experimental group, the post-test was given 1, 2, and 3 hours after the intervention, while for the control group, it was not given. According to Numerical Pain Rating Scale (NRS), the pain score before Intervention was 3.5 ± 0.5713 and after it was reduced to 2.033±0.3198 ANOVA findings shows the significant difference in the mean pain score ($p < 0.001$). The mean score of MMDQ before and after Intervention for Dysmenorrhea was 141.63 ± 19.49 and 99.7±11.51, respectively. Acupressure helps to reduce dysmenorrhea and enhance the quality of life among students regarding health.*
***Keyword:*** *Dysmenorrhea, work or school absenteeism, severe menstrual cramp, medical management, alternative modalities*

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## INTRODUCTION

In India, dysmenorrhea is estimated to be present among 40-50% of the women population. Those with severe focus result in work or school absence15% and in mild forms medication was not required or sometimes over-the-counter analgesics in about 30%[1-3]**.** A study was conducted in Sweden inference that increase 50% of all menstruating students feels few discomfort incidences are 33.5% among students in India[5]. Students consist of 1/5[th] population of females globally. Students under 19 years consist of one-quarter population of India[6]. In South India 49.5% of dysmenorrhea and in Karnataka 87.87%[7,15,16]. In their study reported that approximately 5-10% of students, the late teenagers are suffering from severe spasmodic pain[8]. The majority of the adolescents (60%) reported dysmenorrhea, with 14% saying that they frequently missed school because of painful menstrual cramps[3-7]. According to studies from India, 70.2 % of women experience dysmenorrhea[9]. Most patients experienced pain for one to two days during their period. Pain persisted for 1-2 days for 23.2% of the dysmenorrhea girls[16]. Exhaustion was the most frequent symptom during the menstrual cycle in both dysmenorrhea and non-dysmenorrhea girls, and back pain came in second[17]. Dysmenorrhea is highly prevalent among nursing students and is one of the leading causes of absenteeism. Their study findings suggested that the need for educating adolescent girls on appropriate and effective management of dysmenorrhea. Statistics findings from different research studies conducted earlier show that absence from school due to primary dysmenorrhea is 34-50%[18-19]. Acupressure treatment is a nursing intervention that can help people become more creative, productive, effective at work, and have higher standards of living[10]. It is referred to as a healing art that restores the body's own inherent healing processes and creative skills by skilfully pressing specific areas with the fingers[11]. Pushing these trigger points reduces muscular tension, stimulates blood flow, and activates the body's natural healing energy. The acupressure point'SP6' used for the menstruation pain. The point was placed in four fingers above the medial, lateral malleolus bone[12-14]**.**The above findings

support the fact that Acupressure is effective in reducing pain in students. It also affects their academic performance. So, the investigator being in the Nursing profession, felt the need to evaluate the effectiveness of Acupressure on reducing pain among students.

## MATERIAL AND METHODS

### Research design

The study was carried out in Shree Guru Gobind Singh Tricentenary University, Gurugram, Haryana, India. It was a true experimental study, which included 60 students from Ayurveda, Pharmacy and Nursing (30 experimental & 30 control group by Simple-random sampling technique using Lottery Method) of the age group 18-21 years.

### Criteria for sample selection:

**Inclusion criteria**:

The study will include students aged above 18and below 21 years who have attained menarche present during the study, students who have painful menstruation for the first three days of the menstrual cycle.

**Exclusion criteria**: -The study will not include the students who have not attained menarche not present during the survey, Students suffering with other Gynae related issues, a student those have pain for other physical ailments and the students those are not available during the period of data collection Those are not willing to participate in the study

### Research hypotheses tested at level of significance was 0.05.

**H1:** There will be a significant difference among the effectiveness of Acupressure on the level of pain in Dysmenorrhea among students within the experimental and control group

**H 2:** Significant difference between the effectiveness of Acupressure on the level of Dysmenorrhea symptoms among students within the experimental and control group.

**H3:** There will be a significant association among the effects of Acupressure on the level of pain in Dysmenorrhea among students with a selected demographic variable in the experimental group.

**H4:**Significant association among the effects of Acupressure on Dysmenorrhea Symptoms among students with a selected demographic variable in the experimental group.

## METHODS OF DATA COLLECTION

Participants were in moderate to severe pain and had regular periods between 21 to 35 days during Jan and Feb 2018. The preliminary study was carried out in four steps, firstly the development of a protocol for Acupressure and a tool to collect data. The means for data collection were – Demographic variables, Numerical pain rating scale, and modified distress questionnaire. 60 Sample was selected by randomized sampling technique with lottery method. Thirty control and 30 experimental groups were enrolled with moderate and severe Dysmenorrhea using numerical rating pain scores after receiving their written informed consent. The Acupressure therapy was implemented by applying thumb pressure over the Sp6 point on one leg for 10 minutes. For the pressure cycle, pressure is applying for six secs and relive for 2 secs without applying any strain. Post-test was conducted soon after & 1, 2, 3 hours post Intervention for Experimental group and Control group samples are assessed during 1, 2, 3-hour interval. After that, to explain the purpose of the study, and were told that data would be kept confidential.

## RESULT

Table 1 showed the distribution of students according to age in a control group, most of the age group 19 (63.33%) belongs to 19 and 21 years ,but the experimental group, 15 (50%), belongs to the age group between 16 and 18 years and19 and 21 years. Age at menarche shows that the majority 17 (56.670%) of 14 and 16 years in the control group. In experimental group 19 (63.33%) 10 and13. Type of family in the control group, majority 25(83.33%) belonged to nuclear family. In the experimental group, 20 (66.67%) belonged to a nuclear family. Duration of menstruation in a control group, majority 17 (56.67%) had 3-5. Family history of dysmenorrhea in the control group majority 16 (53.33%) %) had a family history regarding dysmenorrhea. In the experimental group, 21 (60%) had absence of family history.

**Table 1:** According to demographic factors, the frequency and percent distribution of students in the experimental and control groups. **n=60**

| Demographic Variables | Control group n=30 | | Experimental group n=30 | |
|---|---|---|---|---|
| | f | % | f | % |
| **Age** | | | | |
| 16-18 years | 11 | 36.67 | 15 | 50 |
| 19-21year | 19 | 63.33 | 15 | 50 |
| **Age at menarche** | | | | |
| 10-13 years | 13 | 43.33 | 19 | 63.33 |
| 14-16 years | 17 | 56.67 | 11 | 36.67 |
| **Type of family** | | | | |
| Nuclear | 25 | 83.33 | 20 | 66.67 |
| Joint | 5 | 16.67 | 10 | 33.33 |
| **Duration of menstruation** | | | | |
| < 3 days | 9 | 30 | 10 | 33.33 |
| 3-5 days | 17 | 56.67 | 17 | 56.67 |
| > 6 days | 4 | 13.33 | 3 | 10 |
| **Family history of Dysmenorrhea** | | | | |
| No | 14 | 46.67 | 21 | 70 |
| Yes | 16 | 53.33 | 9 | 30 |

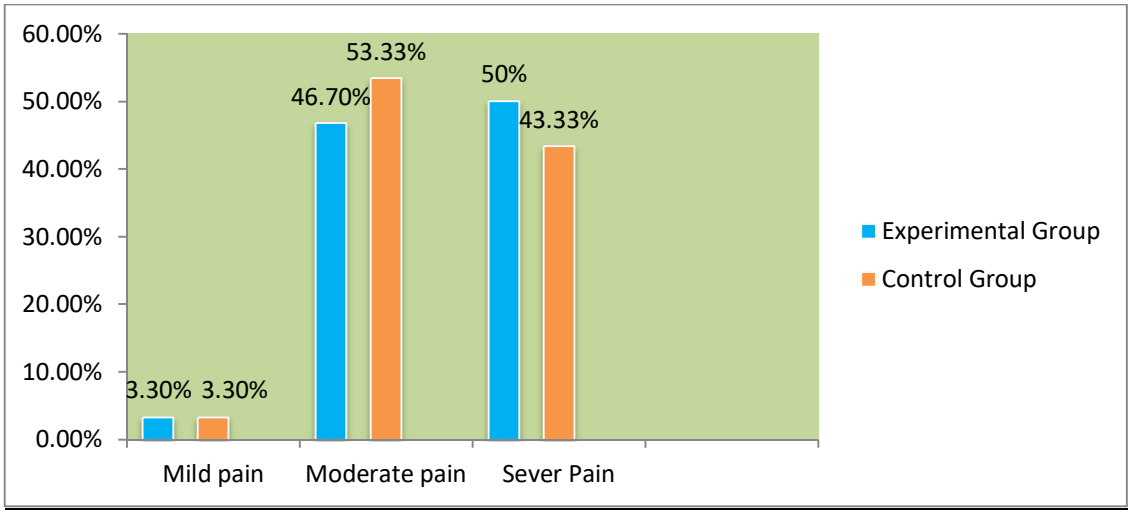


**Fig.1Before Intervention, frequency and (percent) distribution of students in the experimental and control groups according to their level of pain**

**Fig 1** represents, Students pre-Intervention in Interventional group 1(3.33) had mild pain, 14(46.7%) moderate pain, 15(50%) and extreme pain, and others are not having any pain. In control group 1(3.33%) had mildpain,16(53.33%) was moderate pain, 13(43.33%) are extreme pain, and others are not having any pain.

**Table 2: Pre-intervention frequency and percent distribution of students in experimental and control groups according to the severity of dysmenorrhea symptoms**n=60

| Dysmenorrhea symptoms | Experimental group (n=30) | | Control group (n=30) | |
|---|---|---|---|---|
| | f | % | F | % |
| Mild | - | - | 2 | 6.67 |
| Moderate | 11 | 36.6 | 16 | 53.33 |
| Strong | 17 | 56.7 | 10 | 33.33 |
| Severe | 2 | 6.7 | 2 | 6.67 |

Table 2 represents, Students in the Experimental group before the Intervention, no had mild symptoms, 11(36.6%) had moderate symptoms, and 17(56.7%) had intense symptoms. 2(6.7) had extreme symptoms**.** In control group 2(6.67%) had mild symptoms16 (53.33%) had moderate symptoms, and 10(33.33) had intense symptoms 2(6.67%) had severe symptom

**Table 3. Frequency and percentage distribution of students according to severity Dysmenorrhea at different time1,2,3, hour intervals numerical pain rating scale among students in the experimental and control group.** n=30

| Severity Dysmenorrhea per numerical pain rating scale | Before Intervention | Immediately | 1 hour (%) | 2 hour (%) | 3 hour (%) | Before Intervention | Immediately | 1 hour (%) | 2 hour (%) | 3 hour (%) |
|---|---|---|---|---|---|---|---|---|---|---|
| No pain (0) | 0 | 1(3.33) | 4 (13.3) | 8 (26.6) | 19(63.3) | 0 | 0 | 0 | 0 | 0 |
| Mild pain (1-3) | 1(3.33) | 27(90) | 24(80) | 21 (70) | 10(33.3) | 1(3.3) | 2(6.7) | 2 (6.7) | 3 (10) | 4 (13.3) |
| Moderate pain (4-6) | 14(46.7) | 2(6.7) | 2(6.7) | 1(3.33) | 1(3.3) | 16 (53.3) | 15(50) | 16 (53.3) | 17 (56.7) | 17 (56.7) |
| Severe pain (7-10) | 15(50) | 0 | 0 | 0 | 0 | 13 (43.3) | 13(43.3) | 12 (40) | 10 (33.3) | 9(30) |

Table 3 depicts mild pain 1 before intervention in the experimental group (3.33). Severe pain is represented by 15 and moderate pain by 14 (46.7). (50). No one was feeling discomfort. Following the intervention. In the experimental group, 1 (3.33) experienced no pain following the intervention, 27 (90) experienced mild pain, 2 (6.7) experienced moderate pain, and none experienced severe pain. One hour after the intervention, only two (6.7%) people had moderate pain, 24 (80%) had mild pain, and four (13.33%) had no discomfort. 2 hours later, none of the 8(26.67) patients had severe pain, only 1(3.33) had moderate pain, and 21(70) had mild pain. 3 hours later, 19 (63.33) people reported no discomfort, 10 (33.33) reported mild pain, and 1 (3.33), moderate pain without any severe symptoms.

**Table 4: Variables associated with dysmenorrhea n=30**

| Variables | Frequency |
|---|---|
| During the most recent menstrual flow | 13(43.33) |
| During the one week before the most recent menstrual flow | 5(16.7) |
| During the remainder of the most recent menstrual Cycle | 12(40) |

Thetable shows that your most current flow 13(43.33) During the one week before your most recent menstrual flow 5(16.7).

**Table 5. Severity of Dysmenorrhea before and after interventions perModified Menstrual Distress Questionnaire among studentsn=30**

| Modified Menstrual Distress questionnaire | Before intervention(n%) | After intervention (n%) |
|---|---|---|
| | | |
| Mild Dysmenorrhea(1-70) | **0(0)** | **4(13.33)** |
| Moderate Dysmenorrhea(71-140) | **11(36.6)** | **24(80)** |
| Strong Dysmenorrhea(141-210) | **17(56.7)** | **2(6.7)** |
| Severe Dysmenorrhea(211-282) | **2(6.7)** | **0(0)** |

Table 5 depicts the severity of dysmenorrhea before and after interventions per Modified Menstrual Distress Questionnaire among subjects. The table shows the Modified Menstrual Distress Questionnaire score. Before giving Intervention, 0% had mild, 36.6% had moderate, 56.7% had strong, and 6.7%had severe Dysmenorrheal post Intervention, ie. Acupressure at SP 6 point most of the study subjects, i.e.,13.33% had mild, 80% had moderate, 2% had strong, and none of the participants had severe dysmenorrhea

**Table 6. A repeated-measures ANOVA with a mean pain score of the subjects among all consecutive observations as per the Numerical Pain Rating Scalen=60**

| Pain score | Pain score | Pain score | | | |
|---|---|---|---|---|---|
| | | Mean difference | Standard error | df | P value |
| Before Intervention | Immediately After: | 1.4667 | 5.7333 | 29 | .00001* |
| | AT 1 hour | 1.7333 | 3.9333 | | .00001* |
| | AT 2hour | 1.9333 | 5.9333 | | .00001* |
| | At 3 hour | 2.3333 | 12.333 | | .00001* |
| Immediately after | AT 1 hour | 0.2663 | 5.9333 | 29 | .017462* |
| | AT 2hour | 0.4666 | 8.7333 | | .0000237* |
| | At 3 hour | 0.8666 | 5.7333 | | .00001* |
| At 1 hour | AT 2hour | 0.2 | 6.4 | 29 | .15465NS |
| | At 3 hour | 0.6 | 10.6 | | .000011NS |
| At 2 hour | At 3 hour | 0.4 | 6.6 | 29 | .004048* |

***= significant at p<0.05 NS = Not significant**

The table depicts the mean pain score of study subjects' Numerical Pain Rating Scale during subsequent observations. The mean pain score difference between before and immediately after Intervention was 1.4667 with a significant p-value of <0.001. Further comparison of pain score immediately after Intervention with subsequent observation, i.e., immediately after, at 1 hour, at 2 hours, and at 3hour shows the mean difference of 1.7333, 1.9333, and 2.3333, respectively, with a significant p-value. Similarly, a comparison of pain scores immediately after Intervention with the pain score at 1 hour, 2 hours, and 3 hours showed a substantial reduction in dysmenorrhea severity. Also, a significant difference was observed between the pain score at 1hour with the pain score at 2 hours and 3hour. So, the comparison of all observations among themselves shows a significant reduction of pain after each observation

**Table7. Comparison of mean scores before and after Intervention as per Numerical Pain Rating Scale &Modified Menstrual Distress Questionnaire.**

| Pain score | | | | | |
|---|---|---|---|---|---|
| | Before Intervention Mean ± SD) | After intervention (Mean ± SD) | df | t-value | p* value |
| Numerical Pain Rating Scale | 3.5 ± 0.5713 | 2.033±0.3198 | 29 | 12.54 | p<0.00001 |
| Modified Menstrual Distress Questionnaire | 141.63 ± 19.49 | 99.7±11.51 | 29 | 11.7039 | p<0.00001 |

The comparison of the mean pain scores before and after the intervention is shown in the table. Numerical Pain Rating Scale (NRS) data show that the pain score before intervention was 3.5 0.5713 and decreased to 2.033 0.3281 after. A significant difference in the mean pain score was seen by paired t-test (p 0.001). The mean MMDQ score before and after the Dysmenorrhea Intervention was 141.63 19.49 and 99.7 11.51, respectively. According to a paired t-test, there is a significant difference between the mean scores before and after the intervention (p 0.001).

**Table 8. Students in the experimental group's pre-test pain levels were associated with various demographic factors.** n=60

| Factors | Level of Pain | | | df | $X^2$ | Table value |
|---|---|---|---|---|---|---|
| | Mild | Moderate | Severe | | | |
| Age in years | | | | | | |
| 18-19 years | 1 | 2 | 5 | 2 | 2.24 | $0.32^{NS}$ |

| | | | | | | |
|---|---|---|---|---|---|---|
| 20-21 years | 1 | 12 | 9 | | | |
| **Age at menarche** | | | | | | |
| 10-13 years | 1 | 2 | 7 | 2 | 2.8 | 0.23 NS |
| 14-16 years | 1 | 10 | 8 | | | |
| **Type of family** | | | | | | |
| Nuclear | 2 | 15 | 6 | 2 | 2.04 | 0.35 NS |
| Joint | 2 | 3 | 2 | | | |
| **Duration of menstruation** | | | | | | |
| <3 days | 2 | 2 | 1 | | | |
| 3-6 days | 1 | 12 | 2 | 4 | 9.67 | 0.04* |
| >6 days | 4 | 2 | 4 | | | |
| **Family history of dysmenorrhoea** | | | | | | |
| No | 2 | 2 | 2 | 2 | 0.63 | 0.72 NS |
| Yes | 5 | 7 | 12 | | | |

*=Significant at p<0.005level NS= Not significant



The experimental group is shown in the table, with a chi-square value of 2.2403 for the level of pain for age group and a tabulation value of 5.99 at the df 2 level. The table value at the degree of freedom was 5.99 and the chi-square value for the age of menarche was 2.7. The chi-square value for the family form is 2.0497, and the table value at the df 2 is 5.99. The chi value for the duration of menstruation was 9.6786 at a df 4 of 9.49. The chi-square value for the family history of dysmenorrhea was 0.6349 at a df 2 of 5.99.Pre-test pain levels among students in the experimental group did not significantly associated with some socio-demographic factors, such as age, age at menarche, family type, and family history of dysmenorrhea, at the p.05 level, with the exception of the length of the menstrual cycle.

**DISCUSSION**

In the current study, there are three categories of pain intensity for students with dysmenorrhea prior to administering acupressure in the experimental and control groups: mild, severe, and extreme pain. One (3.33) participants of the experimental group reported mild pain, 14 (46.7%) reported moderate pain, 15 (50%) reported severe pain, and none reported no discomfort. One (3.33%) in the control group experienced mild pain, 16 (53.33%) had moderate pain, 13 (43.33%) had severe pain, and the rest had no discomfort. A study by Elakkiya C [7] explained according to the Pre and Post Assessment of Pain Level among students in the non-interventional group, 15 (or 50%) had moderate pain and 15 (or 50%) had severe pain at the time of the pre-assessment. In the test following the intervention, 1 (3%) had mild pain, 14 (47%) had moderate pain, and 15 (50%) had severe pain. Pre-test scores for students in the experimental group showed that 15 (50 percent) had moderate pain and 15 (50 percent) had severe pain. In the experimental group's post-assessment, 16 (53%) experienced mild pain and 14 (47%) had significant discomfort. In the Study by Padmavati P [13] While the majority of those in the non-interventional group (70%) had severe pain and 30% had moderate pain, most (93%) of those in the interventional group (%) had mild discomfort and 7% had moderate pain. Before applying Acupressure in the experimental and control group, 11(36.6%) had moderate symptoms, and 17 (56.7%) had intense symptoms. 2(6.7%) had severe symptoms of dysmenorrhea among students; in control group 2(6.67%) had mild 58 symptoms16 (53.33%) had moderate symptoms, and 10 (33.33%) had intense symptoms 2(6.67%) had severe symptoms. A study by Omidvar S et al [11] Females with mild pain miss school an average of 1.5 days per month, compared to 2.1, 1.2, and 2.5 days for those with moderate and severe dysmenorrhea, respectively.The Study by Alsaleem MA [2] was reported severe pain by (35.2%) respondents.

In this study, the mean pain score of the Numerical Pain Rating Scale before Intervention, immediately after, at 1 hour, at 2 hours, and at 3 hours was 1.46,1.73,1.93 &2.33. Immediately after 1,2,3 hours was 0.26,0.46 & 0.86. The mean scores before and after Intervention as per Numerical Pain Rating Scale was 3.5 ± 0.5713 & 2.033±0.3198 respectively & the mean scores before and after Intervention as per Modified Menstrual Distress Questionnaire was 141.63 ± 19.49 & 99.7± 11.51 respectively. So, Acupressure is an effective way to reduce dysmenorrhea. Our results are supported by the study of Sharma E and Kaur R [17] mean pain score of Numerical Pain Rating Scale before Intervention, immediately after, at 1 hour, at 2 hours and 3 hour was 6.05, 4.05, 3.35, 2.68 and 2.24 respectively. The mean score of the Modified Menstrual Distress Questionnaire was 24.65 before applying Acupressure, and after it was reduced to 9.98. So, Acupressure is an effective way to reduce dysmenorrhea. A study by Mirbaqher- Ajorpaz*et al* [10] examined the dysmenorrhea among the two groups immediately after (3.50±1.42 v/s 5.06±1.4, p=0.004) and also 3 hours post treatment (1.60±1.98 v/s 4.80±1.37,

QQ13Wp=0.000). The conclusion was Acupressure was effective in reducing the symptoms of dysmenorrhea.

In the present study demographic variables- age, age at menarche, form of family, time period of menstruation did not exhibit significant association with dysmenorrhoea. Family history of dysmenorrhea was found to be associated with dysmenorrhea at p<.05 level. In a study by George N S, Priyadarshini S, Shetty S(2013)[8], demonstrates a favourable relationship between family history and dysmenorrhea. The majority of adolescent girls—146, or 62.7%—attained menarche between the ages of 12 and 13 years. (Z=16.673, p-value=0.001) The study found a connection between family history and dysmenorrhea. Age in years, the beginning of menarche, the length of the menstrual cycle, dietary habits, and a family history of dysmenorrhea are not related in any way.In a study by Karanth S and Liya SR (2018)[9] there are not having any association in between age, religion, form of family, monthly income, food habits, age at menarche, BMI, food pattern, and mother "s education status with pain perception of the sample in the control and experimental group.

## CONCLUSION

The mean pain score was after the intervention, which was determined by the Numerical Pain Rating Scale (NRS), indicating a significant difference in the mean pain score (p 0.001). The MMDQ mean score before and after the Dysmenorrhea Intervention was 141.63 19.49 and 99.7 11.51, respectively. The mean score pre and post intervention differed significantly, according to the ANOVA Test (p 0.001). Acupressure might be a useful

strategy for treating a wide range of problems in different populations, but comprehensive studies are required. Implementing acupressure therapy as an intervention could lead to better results.

## CONFLICT OF INTEREST

The authors declare that there are no conflicts of interest. The research received no specific grant from any funding agency in the public, community, or non-for profit sectors

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