Original Article

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Impact of Sanyinjiao Point Complementary Therapy for the Primary Dysmenorrhoea: A Quasi-experimental Study

Physiotherapy Section

LAVANYA NANDAN[1], JAGDISH GOHIL[2]

ABSTRACT

Introduction: Dysmenorrhoea, characterised by chronic menstrual pain often accompanied by symptoms such as fatigue, nausea and reduced functional ability, remains a prevalent issue among young women, particularly nursing students. This condition significantly contributes to absenteeism and diminished academic performance due to its physical and psychological impacts. Previous studies have explored various complementary therapies, with acupressure emerging as a promising non pharmacological intervention.

Aim: To evaluate the effectiveness of acupressure applied at the Sanyinjiao (SP6) point in alleviating symptoms of primary dysmenorrhoea among nursing students.

Materials and Methods: The study employed a quasi-experimental, non equivalent pretest-post-test control group design. It was conducted from May 2022 to August 2022 at the Nightingale Institute of Nursing in Noida and the Sharada School of Nursing Sciences and Research in Greater Noida, Uttar Pradesh, India. Participants were nursing students with primary dysmenorrhoea, selected through purposive sampling. A total of 60 students were divided into two groups: experimental and control (30 each). Dysmenorrhoea severity was assessed using the standardised Working activity, Location, Intensity, Days, Dysmenorrhea (WaLIDD) scale. A pretest pain assessment was performed for both groups. The experimental group received 30 minutes of acupressure at the Sanyinjiao (SP6) point, based on theoretical acupressure principles suggesting energy circuit modulation within 24 minutes. The control group received sham acupressure consisting of light touch at SP6 without applying pressure. The total duration, including pretest and intervention, was approximately 40–60 minutes per participant. Demographic variables such as age, course, type of family, religion, age at menarche, menstrual cycle pattern, pain onset and pain location were recorded. Data analysis was conducted using Statistical Package of Social Sciences (SPSS) version 28.0.

Results: Findings revealed a significant reduction in pain intensity, days of pain and improvement in working ability in the experimental group post-intervention. Pain intensity decreased from 2.17±0.747 to 1.57±0.504), $t(29)=4.289$, $p<0.001$. Days of pain and working ability also showed statistically significant improvements. Analysis of Covariance (ANCOVA) results revealed a significant effect of the intervention on post-test pain scores after controlling for baseline demographic differences, $F(1, 50)=18.356$, $p<0.001$, partial $\eta^2=0.269$.

Conclusion: The results conclude that SP6 acupressure is effective in reducing dysmenorrhoea symptoms, offering a low-cost, accessible alternative for menstrual pain management. These findings advocate for the inclusion of acupressure in menstrual health education and nursing self-care strategies.

Keywords: Acupressure, Discomfort, Menstrual pain management, Nursing students, Sanyinjiao point

INTRODUCTION

Dysmenorrhoea, marked by painful menstrual cramps, affects many young women and disrupts daily life and academics. For nursing students, this impact is intensified by academic and clinical stress. Understanding and managing dysmenorrhoea is essential to support their wellbeing and prepare them for providing effective, empathetic care in their future practice [1]. The condition can lead to absenteeism, poor focus and reduced performance in nursing students, hindering their academic and clinical progress. The demanding nature of nursing education exacerbates these symptoms. Effective management is crucial to protect students' health, ensure academic success and prepare them for their future responsibilities in the healthcare system [2,3].

Primary dysmenorrhoea is typically managed using Non Steroidal Anti-Inflammatory Drugs (NSAIDs), hormonal contraceptives and other pharmacological interventions. However, concerns about side effects and inconsistent effectiveness have led many women to seek safer, non invasive alternatives. Acupressure, a technique grounded in traditional Chinese medicine, has gained increasing attention for its potential to reduce menstrual pain and associated symptoms [4-6]. Unlike acupuncture, acupressure involves applying manual pressure to specific points on the body known as acupoints—to stimulate the body's natural healing processes, regulate the flow of energy (Qi) and relieve pain. The mechanism is believed to involve the modulation of the nervous system, reduction of inflammation and enhancement of endogenous endorphin release. By addressing both physical discomfort and emotional stress, acupressure offers a holistic, low-risk method for managing dysmenorrhoea, which is particularly suitable for students seeking drug-free pain relief [4,7].

For nursing students, being knowledgeable about the management of dysmenorrhoea is essential, as they are likely to encounter this issue not only in their personal lives but also in their clinical practice. In their future roles as healthcare providers, they must be capable of offering appropriate advice and care to women suffering from menstrual-related discomfort. Several strategies are employed to treat dysmenorrhoea, including Complementary and Alternative Medicine (CAM) therapies such as acupressure, in addition to traditional medical treatments [5,8].

The academic and personal wellbeing of nursing students is crucial to their development as effective healthcare providers. Dysmenorrhoea can significantly impair concentration, lead to absenteeism and negatively affect academic performance [9,10]. Effectively managing this condition supports both educational success and clinical competence. Moreover, personal experience with dysmenorrhoea enables nursing students to better empathise

with patients and deliver compassionate, informed care [11-13]. As a non pharmacological and accessible intervention, acupressure may offer meaningful relief from menstrual discomfort while also alleviating the psychological burden faced by students in demanding academic and clinical environments [14].

The novelty of present study lies in targeting nursing students—a group that experiences high academic and clinical stress—offering them a simple, drug-free alternative for menstrual pain relief. The significance of the research is rooted in its potential to enhance student wellbeing and academic performance by integrating a non pharmacological approach into self-care practices.

The present study aimed to evaluate the effectiveness of Sanyinjiao (SP6) point acupressure as a complementary therapy for managing primary dysmenorrhoea among nursing students. This aligns with the study's title and objective as stated in the abstract. The primary objective is to assess the impact of SP6 acupressure on reducing pain intensity and the number of days affected by menstrual pain. The secondary objective is to examine its effect on working ability and the overall symptom experience.

The alternative hypotheses of the study are as follows: The study hypothesises that acupressure at the Sanyinjiao (SP6) point will significantly reduce dysmenorrhoea levels among nursing students, as measured by the WaLIDD scale. It is anticipated that there will be a significant difference between pretest and post-test scores within the experimental group (H1), a significant difference between the post-test scores of the experimental and control groups (H2) and a significant association between post-test dysmenorrhoea levels and selected demographic variables (H3), at the 0.05 level of significance. Conversely, the null hypothesis states that no such significant differences or associations will be observed following the intervention.

MATERIALS AND METHODS

The present study employed a quasi-experimental, non equivalent pretest-post-test control group design to evaluate the impact of acupressure at the Sanyinjiao (SP6) point on primary dysmenorrhoea. The study was conducted at the Nightingale Institute of Nursing, Noida and the Sharada School of Nursing Sciences and Research, Greater Noida, Uttar Pradesh, India, from May 2022 to August 2022. Ethical approval was obtained from the Institutional Ethics Committee (Approval Number: Ref. No. SU/SMS&R/76-A/29). Written informed consent was obtained from all participants prior to their enrollment. The study adhered to the ethical principles outlined in the Declaration of Helsinki.

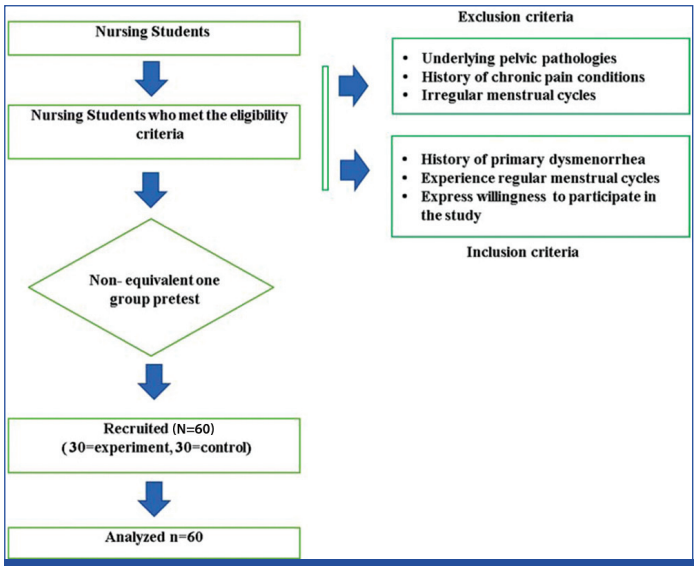
Sample size calculation: The sample size was calculated using G*Power software (version 3.1), based on an effect size of 0.5, an alpha error probability of 0.05 and a power of 0.80, which yielded a minimum required sample of 60 participants. This sample size was supported by prior literature assessing non pharmacological interventions for dysmenorrhoea [15]. To assess the effectiveness of the intervention, the severity of pain and associated systemic symptoms were measured using validated scales before and after the intervention across both groups.

Participants for the study were selected using purposive sampling, a non probability technique involving the selection of individuals based on specific characteristics relevant to the research objectives. A total of 60 nursing students were recruited and assigned equally into two groups, with 30 participants each in the experimental and control groups. This sampling method ensured the inclusion of participants who were most likely to benefit from the intervention for primary dysmenorrhoea. Eligible participants were selected from nursing students enrolled in Bachelor of Science in Nursing and General Nursing and Midwifery programs. All participants provided informed consent prior to their participation in the study [5,16].

Inclusion Criteria: The inclusion criteria required that participants be nursing students currently enrolled in the aforementioned programs, have a history of primary dysmenorrhoea, experience regular menstrual cycles and express willingness to participate in the study. Additionally, only those without known contraindications to acupressure therapy were considered eligible [5,16].

Exclusion Criteria: Exclusion criteria were established to avoid confounding variables and ensure the validity of the results. Participants were excluded if they had been diagnosed with underlying pelvic pathologies such as endometriosis, uterine fibroids, or pelvic inflammatory disease. Students who were currently using other pain management therapies or had a history of chronic pain conditions, including fibromyalgia, irritable bowel syndrome, or chronic fatigue syndrome, were also excluded. Furthermore, individuals who had received acupressure or acupuncture treatment within the past six months to one year, had irregular menstrual cycles, or declined to provide or withdrew consent were not included in the study [5,16].

The flowchart representation of exclusion and inclusion criteria is shown in [Table/Fig-1].



[Table/Fig-1]: Flow diagram representing the study chronology including exclusion and inclusion criteria (N=60).

Study Procedure

Demographic variables for dysmenorrhoea assessment: To evaluate the possible impact of demographic variables on the results, several factors were considered, including age, course of study, type of family, religion, age at menarche, menstrual cycle, onset of pain and location of pain. These variables were crucial for ensuring that participant characteristics were properly accounted for when analyzing the effects of acupressure on dysmenorrhoea [17].

Instrumentation: The WaLIDD pain scale was employed as the primary tool to assess the severity of dysmenorrhoea-related pain among participants (see [Table/Fig-2]). The WaLIDD scale has demonstrated high internal consistency and reliability, with a reported Cronbach's alpha of 0.853, validating its appropriateness for use in clinical and academic research settings. The scale was administered to all participants before and after the acupressure intervention to assess changes in the severity of dysmenorrhoea symptoms. This pre- and post-assessment allowed for a consistent and reliable evaluation of acupressure's effectiveness in alleviating menstrual pain and associated limitations [17,18].

Data collection procedure: Data collection took place from May 2022 to August 2022. A standardised tool, the WaLIDD scale, was used to assess dysmenorrhoea among the students. Pretest pain assessments were conducted in both groups before applying Sanyinjiao (SP6). Acupressure was applied only to the Sanyinjiao (SP6) point in the experimental group. The 30-minute intervention time was based on acupressure theory, which suggests that the time needed to activate the body's energy circuits is approximately

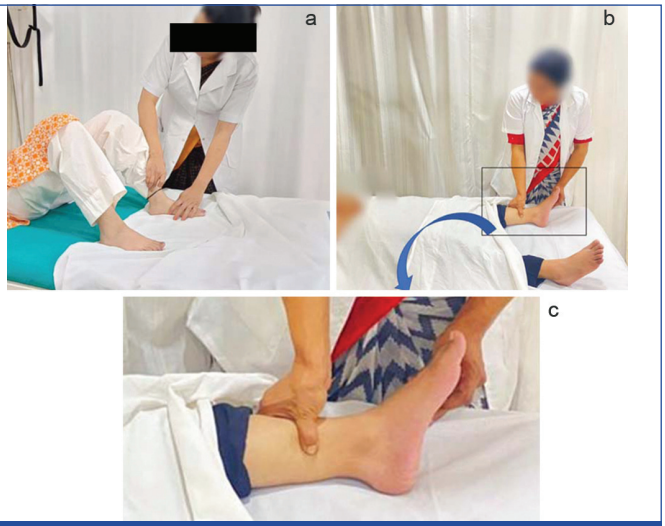
24 minutes. The entire process, including pretest and intervention, took about 40 to 60 minutes per participant. Sham acupressure at SP6 was administered in the control group, following the same steps but without pressure.

Working ability	Location	Intensity (Wong Baker)	Days of pain
0 - None	0 - None	0 - Does not hurt	0 - 0
1 - Almost never	1 - 1 site	1 - Hurts a little bit	1 - 1- 2
2 - Almost always	2 – 2-3 sites	2 - Hurts a little more - hurt even more	2 - 3- 4
3 - Always	3 - 4 sites	3 - Hurts a whole lot - Hurts worst	3 - >5

[Table/Fig-2]: Dysmenorrhoea scoring.
- Score 0: Without dysmenorrhoea
- Score 1-4: Mild dysmenorrhoea
- Score 5-7: Moderate dysmenorrhoea
- Score 8-12: Severe dysmenorrhoea

Intervention: The WaLIDD pain scale was used to measure the pain intensity of dysmenorrhoea among nursing students. In the experimental group, the intervention was applied for 60 seconds, followed by a 60-second rest and this cycle was repeated for 30 minutes among the dysmenorrhoea-affected nursing students. The application of acupressure at the SP6 point (Sanyinjiao), located medially above the ankle—approximately four finger widths above the medial malleolus—was assessed for its effectiveness in relieving dysmenorrhoea. According to acupressure theory, about 24 minutes are needed to initiate energy transformation in the body's energy circuits, so the intervention lasted for 30 minutes to allow for maximum therapeutic benefit.

The intensity of pressure applied was determined by the partial darkening of the nail bed, indicating the appropriate level of pressure. This pressure was adjusted to ensure comfort while remaining effective. Nursing students in the control group received sham acupressure SP6 touch using the same techniques but without pressure. The visual hands-on practice of Sanyinjiao as a complementary therapy for dysmenorrhoea among nursing students is depicted in [Table/Fig-3].



[Table/Fig-3]: Representing the visual hands on practice as Sanyinjiao point complementary therapy providing to dysmenorrhoea among nursing students: 3a) for sham group; 3b) for patient via providing acupressure at the SP6 point (Sanyinjiao); and 3c) is the zoomed image of this SP6 (Sanyinjiao) point to show where exactly it is located.

STATISTICAL ANALYSIS

Data analysis was conducted using SPSS version 28.0. To summarise participant demographics and pain scores, descriptive statistics such as frequency distribution, percentage, mean and Standard Deviation (SD) were employed. The Chi-square test was utilised to identify significant differences between the experimental and control groups across various demographic variables. Pain levels in the experimental and control groups were compared using inferential statistics, including the independent t-test. Additionally, ANCOVA was used to control for demographic variables in relation to post-intervention pain scores, while One-way Analysis of Variance (ANOVA) and t-tests were applied to explore the relationship between pain scores and demographic variables. These statistical methods helped determine the effectiveness of acupressure in alleviating pain and improving overall dysmenorrhoea symptoms among nursing students.

RESULTS

The demographic analysis revealed notable differences between the experimental and control groups, which are important for interpreting the study results. The experimental group primarily consisted of participants aged 19-20 years (50%), whereas the control group had a majority aged 21-22 years (63.3%), potentially affecting pain perception and coping mechanisms. Course enrollment also varied: the experimental group had a balanced representation of BSc nursing (46.7%) and general nursing (43.3%), while 83.3% of the control group were general nursing students, potentially reflecting different stress levels and clinical exposure.

Family structure showed a contrast, with 66.7% of the experimental group coming from nuclear families, while an equal proportion of the control group came from joint families. This may influence stress levels, support systems and health-seeking behavior. A higher proportion of Hindus was observed in the experimental group (76.7%) compared to the control group (33.3%), suggesting possible cultural differences affecting menstrual health (see [Table/Fig-4]).

Regarding age at menarche, 56.7% of control participants experienced menarche at ages 10-11 years, compared to a

Demographic variables		Experimental group (n=30) n (%)	Control group (n=30) n (%)	Chi-square test
Age (in years)	17 - 18	10 (33.3%)	1 (3.3%)	p<0.001
	19 - 20	15 (50.0%)	10 (33.3%)	
	21 - 22	5 (16.7%)	19 (63.3%)	
Course	PBBSc nursing	3 (10.0%)	18 (60.0%)	p<0.018*
	BSc nursing	14 (46.7%)	12 (40.0%)	
	General nursing	13 (43.3%)	25 (83.3%)	
Type of family	Nuclear family	20 (66.7%)	5 (16.7%)	p<0.001
	Joint family	10 (33.3%)	20 (66.7%)	
Religion	Hindu	23 (76.7%)	10 (33.3%)	p=0.98
	Christian	7 (23.3%)	3 (10.0%)	
Age at menarche	10-11 years	4 (13.3%)	17 (56.7%)	p=0.006
	12-13 years	8 (26.7%)	7 (23.3%)	
	14-15 years	10 (33.3%)	3 (10.0%)	
	16-17 years	8 (26.7%)	15 (50.0%)	
Menstrual cycle	Typical 28 days	6 (20.0%)	8 (26.7%)	p=0.068
	21-27 days	22 (73.3%)	6 (20.0%)	
	29- 35 days	2 (6.7%)	1 (3.3%)	
Onset of pain	Before menstruation	4 (13.3%)	8 (26.7%)	p=0.000
	With the onset of menstruation	8 (26.7%)	20 (66.7%)	
	After 6 hours of menstruation	10 (33.3%)	1 (3.3%)	
	After 24 hours of menstruation	8 (26.7%)	1 (3.3%)	
Location of pain	Lower abdomen only	8 (26.7%)	5 (16.7%)	p=0.115
	Lower abdomen and back only	8 (26.7%)	13 (43.3%)	
	Lower abdomen, back and legs	8 (26.7%)	11 (36.7%)	
	Other body parts	6 (20.0%)	1 (3.3%)	

[Table/Fig-4]: Demographic profile of sample characteristic (N=60).

wider age distribution in the experimental group. Variations were also noted in menstrual cycle duration, timing of pain onset and pain location. Although the control group exhibited a statistically significant change in pain intensity, the mean remained unchanged. This may be attributed to individual score variations, natural cycle fluctuations, or a placebo effect, which will be further discussed later.

These demographic and baseline differences may have influenced participants' menstrual experiences and responses to acupressure or standard care, underscoring the importance of contextual interpretation of the results.

The Chi-square analysis revealing statistically significant differences between the experimental and control groups in several demographic variables. Significant group differences were observed in age (χ^2, p=0.000) has been demonstrated in [Table/Fig-4]. course of study (p=0.018), type of family (p=0.000), age at menarche (p=0.006) and onset of pain (p=0.000). These findings indicate potential baseline imbalances between the groups in these characteristics. In contrast, no significant differences were found for religion (p=0.98), menstrual cycle length (p=0.068) and location of pain (p=0.115).

The distribution of pain-related parameters in the pretest for both the experimental and control groups. The majority of participants in the experimental group (43.3%) and control group (36.7%) reported that pain "almost never" affected their working ability. Regarding pain location, most participants in both groups experienced pain in 2-3 sites (60.0% experimental; 50.0% control) has been depicted in [Table/Fig-5]. In terms of intensity, the most frequent response in both groups was "hurts a little more - hurt even more" (43.3% experimental; 50.0% control). In the days of pain domain, the majority in both groups (56.7%) reported pain lasting 3-4 days. For overall pain, severe pain was the most commonly reported level (50.0% experimental; 56.7% control).

Level of dysmenorrhoea		Experimental group	Control group
Working ability	None	13.3%	13.3%
	Almost never	43.3%	36.7%
	Almost always	23.3%	26.7%
	Always	20.0%	23.3%
Location	None	0%	0%
	1 site	33.3%	33.3%
	2-3 sites	60.0%	50.0%
	4 sites	6.7%	16.7%
Intensity	Does not hurt	0%	0%
	Hurt a little bit	20.0%	10.0%
	Hurts a little more- hurt even more	43.3%	50.0%
	Hurts a whole lot- hurts worst	36.7%	40.0%
Days of pain	0	0%	0%
	1-2	23.3%	20.0%
	3-4	56.7%	56.7%
	More than 5	20.0%	23.3%
Overall pain	None	0%	0%
	Mild	10.0%	3.3%
	Moderate	40.0%	40.0%
	Severe	50.0%	56.7%

[Table/Fig-5]: Domain -wise pretest level of pain among nursing students (N=60).

The distribution of pain-related parameters post-intervention in the experimental and control groups has been depicted in [Table/Fig-6]. The majority of participants in the experimental group (50.0%) reported that pain "almost never" affected their working ability, whereas the control group predominantly reported "almost always" (26.7%). For pain location, the highest percentage in the experimental group indicated pain in one site (46.7%), while the control group reported pain in one site (60.0%). Regarding pain intensity, most participants in the experimental group (56.7%) reported "hurts a little more – hurts even more," while the control group (50.0%) reported "hurt a little bit." In terms of the duration of pain, 60.0% of the experimental group experienced pain for 3-4 days, while 26.7% of the control group experienced pain for more than five days. Concerning overall pain, the majority of the experimental group (73.3%) reported moderate pain, while 43.3% of the control group reported severe pain.

Level of dysmenorrhoea		Experimental group	Control group
Working ability	None	23.3%	13.3%
	Almost never	50.0%	26.7%
	Almost Always	26.7%	40.0%%
	Always	0%	20.0%
Location	None	0%	33.3%
	1 site	46.7%	60.0%
	2-3 sites	53.3%	6.7%
	4 sites	0%	33.3%
Intensity	Does not hurt	0%	10.0%
	Hurt a little bit	43.3%	50.0%
	Hurts a little more- hurt even more	56.7%	40.0%
	Hurts a whole lot- Hurts worst	0%	10.0%
Days of pain	0	6.7%	26.7%
	1-2	33.3%	53.3%
	3-4	60.0%	20.0%
	More than 5	0%	26.7%
Overall pain	None	0%	0%
	Mild	20.0%	0%
	Moderate	73.3%	56.7%
	Severe	6.7%	43.3%

[Table/Fig-6]: Domain -wise post-test level of pain among nursing students (N=60).

Intervention study of dysmenorrhoea symptoms

The pretest and post-test mean scores and standard deviations for pain-related parameters across the experimental and control groups. In the experimental group, reductions were observed in all domains following the intervention has been depicted in [Table/Fig-7]. Specifically, working ability improved from a pretest mean of 1.50±0.97 to a post-test mean of 1.03±0.72 and pain intensity decreased from 2.1±7 0.75 to 1.57±0.50). Similarly, scores for pain location decreased from 1.73±0.58 to 1.53±0.51 and days of pain reduced from 1.97±0.67 to 1.53±0.63. The overall pain score also declined from 7.37±1.69 to 5.67±1.16. In contrast, the control group showed minimal changes across domains, with most post-test scores remaining comparable to pretest values.

The results of a paired-samples t-test conducted to evaluate the effectiveness of the intervention on various pain-related parameters within the groups. In the experimental group, there was a statistically significant difference in working ability scores (t=2.728, p=0.011) has been depicted in [Table/Fig-8]. However, the control group showed a non significant difference in working ability (t=0.403, p=0.690). For pain location, both groups demonstrated a decrease in pain scores, but these changes were not statistically significant (experimental group: t=1.417, p=0.616; control group: t=0.601, p=0.547).

Regarding pain intensity, the experimental group exhibited a significant reduction in pain score (t=4.289, p<0.001). In contrast, the control group showed no significant change (t=1.107, p=0.271). The number of days of pain significantly decreased in the experimental group (t=3.261, p=0.003), whereas the control group did not exhibit a significant reduction (t=1.61, p=0.118).

Domain	Max score	Experimental group		Control group	
		Pretest	Post-test	Pretest	Post-test
		Mean±SD	Mean±SD	Mean±SD	Mean±SD
Working ability	3	1.50±0.974	1.03±0.718	1.60±1.003	1.67±0.959
Location	3	1.73±0.583	1.53±0.507	1.83±0.699	1.73±0.583
Intensity	3	2.17±0.747	1.57±0.504	2.30±0.651	2.12±0.614
Days of pain	3	1.97±0.669	1.53±0.629	2.03±0.669	1.93±0.691
Overall	12	7.37±1.691	5.67±1.155	7.77±1.716	7.63±1.564

[Table/Fig-7]: Domain -wise and overall mean and SD among nursing students (N=60).

Domain	Experimental group		Paired t-test	Control group		Paired t-test
	Pretest	Post-test		Pretest	Post-test	
	Mean±SD	Mean±SD		Mean±SD	Mean±SD	
Working ability	1.50±0.974	1.03±0.718	t=2.728 p= 0.011*	1.60±1.003	1.67±0.959	t=.403 p=0.690
Location	1.73±0.583	1.53±0.507	t=1.417 p= 0.616	1.83±0.699	1.73±0.583	t=0.601 p=0.547
Intensity	2.17±0.747	1.57±0.504	t=4.289 p<0.001	2.30±0.651	2.12±0.614	t=1.107 p=0.271
Days of pain	1.97±0.669	1.53±0.629	t=3.261 p=0.003	2.03±0.669	1.93±0.691	t=1.61 p=0.118
Overall	7.37±1.691	5.67±1.155	t=6.683 p<0.001	7.77±1.716	7.63±1.564	t=.643 p=0.526

[Table/Fig-8]: Domain -wise and overall paired t-test among nursing students (N=60).

Finally, the overall pain-related scores significantly decreased in the experimental group (t=6.68, p<0.001). However, the change in the control group was not statistically significant (t=0.643, p=0.526).

The results of the Analysis of Covariance (ANCOVA) has been depicted in [Table/Fig-9]. Due to observed baseline differences in demographic variables between the experimental and control groups, ANCOVA was employed to statistically adjust for these covariates and isolate the effect of the intervention on post-test pain scores. Accordingly, variables such as age, course of study, type of family, religion, age at menarche, menstrual cycle length, onset of pain and location of pain were controlled in the model.

The overall model was statistically significant, F(9,50)=3.391, p=0.003 and accounted for 37.9% of the variance in the dependent variable (R^2=0.379, Adjusted R^2=0.267). The group variable (experimental vs. control) had a highly significant effect on the outcome, F(1, 50)=18.356, p<0.001, with a large effect size (partial η^2=0.269), suggesting that the intervention significantly improved post-test outcomes, even after adjusting for demographic differences.

None of the demographic variables included in the ANCOVA such as age, course of study, type of family, religion, age at menarche, menstrual cycle length, onset of pain and location of pain yielded statistically significant effects, indicating no influence on the post-test scores of pain.

Pain-related parameters with demographic variables: A One-way ANOVA and t-test were conducted to explore the relationship between various demographic variables and pain-related parameters among nursing students with primary dysmenorrhoea. The findings show that there were no statistically significant differences in pain levels based on the demographic factors considered in this study. When comparing age groups, the mean scores ranged from 6.818 to 7.792, with the highest mean pain score observed in the 21-22 age group. However, the difference was not statistically significant (F=1.346, p=0.268).

Similarly, no significant difference was found based on the course of study (F=0.865, p=0.426), although students from the BSc Nursing course reported slightly higher pain levels. No meaningful differences in pain scores were associated with type of family (t=0.618, p=0.435) or religion (t=0.004, p=0.951). Like-wise, age

Variables	Type III sum of squares	df	Mean square	F	Sig.	Partial η^2
Corrected model	77.699a	9	8.633	3.391	0.003	0.379
Intercept	13.039	1	13.039	5.122	0.028	0.093
Age	0.889	1	0.889	0.349	0.557	0.007
Course	0.041	1	0.041	0.016	0.900	0
Type of family	4.794	1	4.794	1.883	0.176	0.036
Religion	1.169	1	1.169	0.459	0.501	0.009
Age at menarche	3.070	1	3.070	1.206	0.277	0.024
Menstrual cycle	8.123	1	8.123	3.191	0.080	0.060
Onset of pain	0.005	1	0.005	0.002	0.966	0
Location of pain	6.605	1	6.605	2.594	0.114	0.049
Group	46.728	1	46.728	18.356	0.000	0.269
Error	127.284	50	2.546			
Total	2885.000	60				
Corrected total	204.983	59				

[Table/Fig-9]: ANCOVA test for the post-test pain score controlled for demographic variables (N=60).
a. R Squared = 0.379 (Adjusted R Squared = 0.267)

at menarche, menstrual cycle length, onset of pain and location of pain showed no statistically significant relationship with the severity of pain, as all p-values exceeded 0.05.

These findings suggest that demographic variables such as age, course of study, type of family, religion and menstrual characteristics do not significantly influence the intensity of menstrual pain among nursing students. The uniformity of pain experiences across diverse backgrounds highlights the importance of implementing universal pain relief strategies, such as education and non pharmacological interventions, rather than focusing solely on demographic-based approaches. The One-way ANOVA and t-tests representing differences in pain-related parameters with demographic variables are shown in [Table/Fig-10].

Demographic variables		Mean±SD	SE	ANOVA and t-test
Age (in years)	17 - 18	6.818±1.991	0.600	F=1.346 Df= 2,57 p =0.268 (NS)
	19 - 20	7.680±1.701	0.340	
	21 - 22	7.792±1.532	0.313	
Course	PBBSc nursing	6.333±2.082	1.202	F=0.865 Df= 2,57 p =0.426 (NS)
	BSc nursing	7.688±1.635	0.289	
	General nursing	7.560±1.758	0.352	
Type of family	Nuclear family	7.467±1.687	0.251	t=0.618 Df= 58 p =0.435 (NS)
	Joint family	7.867±1.767	0.456	
Religion	Hindu	7.558±1.750	0.267	t=0.004 Df= 58 p =0.951 (NS)
	Christian	7.588±1.622	0.394	
Age at menarche	10-11 years	7.429±1.272	0.481	F=0.380 Df= 3,56 p =0.768 (NS)
	12-13 years	7.840±1.795	0.359	
	14-15 years	7.294±1.829	0.444	
	16-17 years	7.455±1.635	0.493	
Menstrual cycle	Typical 28 days	7.286±2.077	0.453	F=1.049 Df= 2,57 p =.378 (NS)
	21-27 days	7.567±1.406	0.257	
	29- 35 days	8.000±1.604	0.567	
Onset of pain	Before menstruation	7.917±2.065	0.596	F=0.449 Df= 3,56 p =0.719 (NS)
	With the onset of menstruation	7.607±1.663	0.314	
	After 6 hours of menstruation	7.091±1.758	0.530	
	After 24 hours of menstruation	7.556±1.333	0.444	
Location of pain	Lower abdomen only	6.769±1.739	0.482	F=1.915 Df= 3,56 p =0.138 (NS)
	Lower abdomen and back only	7.571±1.886	0.412	
	Lower abdomen, back and legs	7.737±1.522	0.349	
	Other body parts	8.571±0.976	0.369	

[Table/Fig-10]: One-way ANOVA and t-test to describe difference in pain-related parameters with demographic variables (N=60).

DISCUSSION

The present study assessed the effectiveness of acupressure at the SP6 (Sanyinjiao) point in managing primary dysmenorrhoea among nursing students. The analysis revealed a statistically significant reduction in pain intensity, days of pain and improvement in working ability in the experimental group post-intervention compared to the control group. Pain intensity decreased from a mean of 2.17±0.747 to 1.57±0.504, t(29)=4.289, p<0.001. Days of pain and working ability also showed statistically significant improvements.

The ANCOVA results revealed a significant effect of the intervention on post-test pain scores after controlling for baseline demographic differences, F(1, 50)=18.356, p<0.001, partial η^2=0.269. Specifically, the mean pain intensity score decreased from pre- to post-intervention in the experimental group 1.57±0.504, while the control group showed a higher mean score 2.12±0.614, with a p-value <0.001, indicating a highly significant difference. Similarly, working ability improved significantly (t=2.728, p=0.011) and the number of pain-affected days was significantly reduced (t=3.261, p=0.003) in the experimental group. The overall pain experience also showed a marked reduction (t=6.683, p<0.001).

These findings confirm the efficacy of SP6 acupressure in reducing dysmenorrhoea symptoms and improving daily functioning. The intervention led not only to lower pain severity but also to enhanced capacity for academic and clinical engagement. Notably, the pre- and post-test analysis within the experimental group showed improvements in pain scores (t=6.683, p<0.001), the number of pain days (t=3.261, p=0.003) and working ability (t=2.728, p=0.011), reinforcing the reliability of the observed outcomes.

Furthermore, alternative hypotheses H1 and H2 have been accepted, as there were significant differences between pretest and post-test scores within the experimental group and between the post-test scores of the experimental and control groups. However, alternative hypothesis H3 has been rejected, as there was no statistically significant difference in pain levels based on demographic variables.

The present study examined the effectiveness of acupressure at the Sanyinjiao (SP6) point in managing primary dysmenorrhoea among nursing students. The results demonstrated that acupressure provided measurable relief from menstrual pain, improved working ability and reduced the number of days affected by dysmenorrhoea. These findings align with earlier literature, which emphasises the efficacy of SP6 stimulation in reducing both the physical intensity and systemic symptoms associated with menstrual discomfort [11,15].

The use of the WaLIDD scale, a validated multidimensional pain assessment tool, allowed for a comprehensive evaluation of dysmenorrhoea's impact on daily functioning. Participants receiving the acupressure intervention exhibited significant reductions in overall pain scores and activity limitations, highlighting the role of SP6 stimulation in restoring day-to-day function during menstruation.

Importantly, the non significant variations across demographic subgroups such as age, course and menstrual characteristics suggest that the intervention's efficacy is consistent across diverse student profiles, reinforcing its broad applicability [19,20].

Prior studies, including those by Charandabi SMA et al., (2011) and Wu LL et al., (2012), have emphasised the therapeutic relevance of acupressure at SP6 in managing various gynecological symptoms [20,21]. The present study corroborates such findings by demonstrating statistically significant changes across multiple pain-related parameters in the intervention group. Furthermore, the inclusion of a well-defined control group and consistent pre- and post-assessment methods strengthens the reliability of the observed outcomes [20,21].

Kashefi F et al., (2010) suggest that acupressure at the Sanyinjiao point significantly reduces the severity of primary dysmenorrhoea, particularly over repeated cycles. Although both groups experienced some relief initially, the study group receiving targeted acupressure showed a more pronounced and sustained reduction in pain intensity at all measured intervals, especially during the second cycle [15]. These results highlight the cumulative therapeutic effect of acupressure and its potential as a non invasive, low-cost intervention for managing menstrual pain. Incorporating acupressure into self-care routines may offer a valuable alternative or adjunct to pharmacological treatments for individuals suffering from primary dysmenorrhoea [16].

Al-Matouq S et al., (2019) reported a high prevalence of dysmenorrhoea (85.6%) among Kuwaiti high school girls, indicating a substantial impact on students' daily functioning and academic performance. The significant associations with the age of menarche, menstrual regularity, flow and coffee consumption suggest modifiable risk factors that merit attention. With over half of the affected students

missing school or exams, the findings emphasise the need for targeted interventions. Implementing school-based health services, including nurse-led education and management, could help reduce the burden and improve students' wellbeing [17].

Ansaripour et al., (2016) reported that acupressure at the Guan Yuan (RN-4) and Qiujo (RN-2) points, along with self-care behavior education, significantly reduced the severity of primary dysmenorrhoea in female students as measured by the visual analog scale ($p<0.05$). Although all three groups, including the ibuprofen-treated control group, showed significant within-group improvements, no statistically significant differences were observed between groups ($p>0.05$). These findings suggest that non pharmacological approaches like acupressure and self-care education can be effective, accessible and low-cost alternatives to medication [22].

Gharloghi S et al., reported that acupressure at the SP6 and SP8 points significantly reduced the severity of dysmenorrhoea pain for up to two hours post-intervention ($p<0.001$). Additionally, most systemic symptoms associated with dysmenorrhoea were alleviated, with the exception of nausea and vomiting. Notably, fatigue was significantly more reduced with acupressure at the SP6 point compared to SP8 ($p=0.004$). These findings support the effectiveness of targeted acupressure as a short-term, non pharmacological option for managing menstrual pain and symptoms [11].

Chung YC et al., (2012) conducted a meta-analysis demonstrating that acupoint stimulation is an effective intervention for managing primary dysmenorrhoea. Compared to non acupoint-related stimulation or medication, acupoint stimulation significantly improved outcomes such as pain intensity and cure rate. Both invasive and non invasive methods were effective, with non invasive techniques showing slightly better results. With over 3,000 participants included, the evidence supports acupoint stimulation as a promising, low-risk alternative treatment for dysmenorrhoea, despite minor adverse events such as hemorrhage and hematoma [23].

The findings of present study highlight the significant potential of acupressure at the SP6 (Sanyinjiao) point as an effective, non pharmacological intervention for managing primary dysmenorrhoea among nursing students. Given the high prevalence of menstrual pain in this population and its adverse impact on academic performance, attendance and clinical responsibilities, incorporating acupressure into routine self-care practices offers a practical and accessible solution. Its non invasive, drug-free nature makes it especially appealing for young women who prefer to avoid pharmacological therapies due to side effects or contraindications.

Additionally, acupressure supports psychological wellbeing by promoting emotional balance, reducing stress and improving sleep quality—key factors for students navigating rigorous academic and clinical environments.

From a clinical education perspective, integrating acupressure training into nursing curricula could empower students with holistic skills applicable both personally and professionally. Encouraging awareness and practice of evidence-based complementary therapies aligns with the growing global emphasis on integrative healthcare.

For future research, randomised controlled trials with larger, more diverse populations are recommended to validate the present findings. Studies could also explore the optimal frequency and duration of acupressure, compare different acupressure points (e.g., SP6 vs. SP8) and assess the combined effects of acupressure with other modalities, such as aromatherapy or yoga. Longitudinal studies investigating sustained use across multiple menstrual cycles would provide insight into its long-term efficacy and safety. Overall, these directions will strengthen the evidence base, facilitating broader acceptance of acupressure in menstrual health management across academic and clinical settings.

Limitation(s)

The generalisability of the results was limited as the study was conducted in a single area. There is a need for larger studies in the future to improve the generalizability of the results. The observational nature of the study did not include randomization, which restricted the results and introduced potential bias.

CONCLUSION(S)

In conclusion, the present study highlights the effectiveness of acupressure, specifically at the SP6 point, as a significant complementary therapy in reducing the severity of primary dysmenorrhoea among nursing students. The intervention led to measurable improvements in pain intensity, duration and overall functionality, demonstrating the potential of non pharmacological approaches in menstrual health management.

The significance of present study lies in its ability to empower young women with a safe, cost-effective and easily applicable method to manage menstrual pain without relying solely on medication. Furthermore, the study underscores the urgent need for structured educational programs that promote awareness of self-care behaviors and non invasive techniques like acupressure. Integrating menstrual health education into school curricula will ensure early and consistent exposure to effective pain management strategies. Promoting the application of SP6 acupressure, particularly in the early days of menstruation, can lead to better health outcomes and improved academic participation.

For future prospects, similar studies should be conducted across different regions and educational institutions with larger sample sizes to enhance the reliability and generalisability of the findings. Comparative studies exploring various acupressure points can also help identify the most effective intervention methods. Ultimately, this research paves the way for holistic, accessible care for adolescent girls and young women.

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PARTICULARS OF CONTRIBUTORS:
1. PhD Scholar, Faculty of Nursing, Department of Obstetrics and Gynaecology, Parul Institute of Nursing, Parul University, Waghodia, Vadodara, Gujarat, India.
2. Dean and PhD Supervisor, Department of Medical Sciences, Dean, Parul Institute of Medical Sciences and Research, Parul University, Waghodia, Vadodara, Gujarat, India.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:
Lavanya Nandan,
Parul Institute of Nursing, Parul University, Vadodara-391760, Gujarat, India.
E-mail: lavanyanandan61@gmail.com

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