

# Effects of yogic intervention on pain scores and quality of life in females with chronic pelvic pain

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## ABSTRACT

**Context:** Chronic pelvic pain (CPP) is a common condition of women of the reproductive age group. It has a negative impact on a woman's personal health and quality of life (QOL). Practicing yoga has shown numerous benefits in various chronic painful conditions.

**Aim:** To study the effects of yogic intervention on pain scores and quality of life in females of reproductive age group with CPP, on conventional therapy.

**Settings and Design:** It is a follow-up, randomized case-control study done in a tertiary care hospital.

**Subjects and Methods:** Sixty female patients of CPP in the age group of 18–45 years were randomly divided into Group I ( $n = 30$ ) and Group II ( $n = 30$ ). Group I received only conventional therapy in the form of NSAIDs and Group II received yoga therapy in the form of asanas, pranayama, and relaxation along with the conventional therapy for 8 weeks. They were assessed twice (pre- and post-treatment) for pain scores through visual analog scale (VAS) score and QOL by the World Health Organization quality of life-BREF (WHOQOL-BREF) questionnaire.

**Statistical Analysis Used:** Repeated measure ANOVA followed by Tukey's test.  $P < 0.05$  was considered significant.

**Results:** After 8 weeks of yogic intervention, Group II patients showed a significant decrease in intensity of pain seen by a decrease in VAS score ( $P < 0.001$ ) and improvement in the quality of life with a significant increase ( $P < 0.001$ ) in physical, psychological, social, and environmental domain scores of WHOQOL-BREF.

**Conclusions:** The practice of yoga causes a reduction in the pain intensity and improves the quality of life in patients with chronic pelvic pain.


**Key words:** Chronic pelvic pain; pain scores; quality of life; World Health Organization quality of life-BREF; yoga.

## INTRODUCTION

Chronic pelvic pain (CPP) is defined as an “intermittent or constant pain in the lower abdomen or pelvis of a woman, of at least 6 months duration, not occurring exclusively with menstruation or intercourse and not associated with pregnancy.<sup>[1]</sup> It is a common condition of the reproductive age of group women, yet its pathophysiology remains poorly understood.<sup>[2]</sup> In South-East Asian countries, the

prevalence of CPP varies from 5.2% in India, 8.89% in Pakistan to 43.2% in Thailand.<sup>[3]</sup> CPP has a negative impact on a woman's personal health and quality of life (QOL).<sup>[4,5]</sup>

Though the exact etiology is unknown but CPP may occur due to the involvement and the complex interactions between of gynecological, gastrointestinal, urinary,

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musculoskeletal, endocrine, and neurologic systems. It may also be influenced by psychological and sociocultural factors.<sup>[6]</sup> Common conditions that cause CPP are endometriosis, chronic pelvic inflammatory disease, adenomyosis, fibroids, adhesions, celiac disease, colitis, inflammatory bowel disease, fibromyalgia, degenerative disk disease, and chronic urinary tract infection.<sup>[7]</sup>

The common presentations of CPP are noncyclic lower abdominal pain seen in about 80% of women, congestive dysmenorrhea in 26%, and pelvic tenderness in 20% of cases.<sup>[8]</sup> Symptoms of depression, anxiety, low QOL, low productivity, decreased energy, sexual dysfunction, and relationship problems are also present in these patients of CPP.<sup>[9,10]</sup>

The treatment of CPP entails two aspects, one is the treatment of chronic pain, and the other is the treatment of the underlying cause. In most cases, an effective treatment can be achieved by using both approaches. The treatment can be medical or surgical but for those women in whom a definitive diagnosis cannot be reached (61% of women with CPP reported that the etiology was unknown), it requires a multidisciplinary approach, i.e., addressing dietary, social, environmental, and psychological factors in addition to standard medical therapy.<sup>[10,11]</sup>

Yoga is an effective, time-tested method for improving overall health and managing psychosomatic and chronic degenerative disorders.<sup>[12]</sup> Practicing yoga regularly has shown improvement in QOL and pain reduction in chronic low back pain.<sup>[13,14]</sup> Prevalence of musculoskeletal pain (neck pain and lower back pain) was found to be lower in dentists with regular yoga practice as compared to dentists practicing other physical activities or with no physical activity.<sup>[15]</sup> Yoga therapy has shown a reduction in severity and duration of pain in women with primary dysmenorrhea.<sup>[16]</sup> Literature survey however has shown a paucity of studies on the beneficial effects of yoga on pain and QOL in females with CPP.

We hypothesized that the use of yogic intervention used along with conventional therapy in CPP patients will help in improving visual analog scale (VAS) score and QOL as compared to conventional therapy alone. The primary objective of our study was to measure VAS score and World Health Organization QOL-BREF (WHOQOL-BREF) scores in CPP patients on conventional therapy and in CPP patients on both conventional + yoga therapy.

## SUBJECTS AND METHODS

### Sampling

It was a follow-up, randomized case-control study. Eighty CPP patients were recruited from gynecology outpatient

department. All subjects underwent complete physical and clinical assessment prior to the participation. Subjects with CPP were randomly divided into two groups Group I and Group II. Simple randomization was done using a computer-generated random number table, and allocation was done by sealed envelope technique. However, nine subjects in Group I could not come for follow-up and ten subjects in Group II showed poor compliance to the yoga regimen. Hence, we selected thirty subjects in each group to participate in our study. Prior to the participation, all the subjects were explained the purpose of study in detail and a written informed consent was taken. This research proposal was approved by the Institutional Research Protocol and Ethics Committee.

### Inclusion criteria

Gender: Females  
Age: 18–45 years.

### Exclusion criteria

- Females with obvious gynecological and nongynecological causes of CPP
- Gynecological, abdominal, or pelvic malignancy
- Desire to conceive
- Pregnant females/pregnancy in the past 12 months
- Moderate to severe hypertension
- Severe low backache
- Any other medical disease complicating CPP.

### Assessments

Pain assessment was done using VAS and QOL assessment was done through WHOQOL-BREF questionnaire. Both groups (I and II) underwent assessment for the outcome measures at the beginning as well as after 8 weeks of respective therapy. Figure 1 depicts plan of the study.

### Visual analog score for pain

VAS is the most extensively used pain measurement tool. It is a unidimensional measurement tool that can be applied to measure pain intensity and pain relief.<sup>[17]</sup> The scale comprises a 10 cm straight line with verbal anchors that define boundaries. The score is obtained by measuring the distance in millimeters from left to right. It is quick and relatively easy to use. Results are to be considered as follows: Mild/no pain, 0–30; moderate pain, 31–69; and severe pain, 70–100.<sup>[18]</sup> Studies have shown VAS to be sensitive measure of variation in patient's pain in response to treatment and are reproducible over time for that individual patient.<sup>[19]</sup>

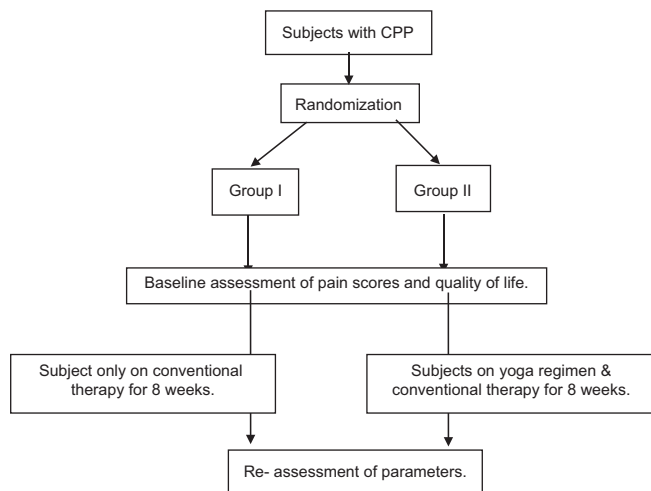


Figure 1: Plan of the study

### World Health Organization quality of life-BREF questionnaire

The WHOQOL-BREF is the short 26-item form of the larger WHOQOL-100 assessment that yields four QOL domains: Physical health, psychological, social QOL, and environmental QOL. In addition, it also includes two questions for “overall quality of life” and “general health” facets. The domain scores are scaled in a positive direction (i.e., higher scores denote higher QOL). Responses are scored via five-point response scales with various anchor statements (e.g., from 1 [Very dissatisfied] or [Very poor] to 5 [Very satisfied] or [Very good]). The WHOQOL-BREF can be scored in three ways; through raw scores and two transformation methods; the first that creates domain scores within the range of 4–20 and the second that creates domain scores within the range of 0–100. The internal consistency of WHOQOL-BREF ranged from 0.66 to 0.84 (Chronbach’s alpha coefficient).<sup>[20]</sup> The WHOQOL-BREFs psychometric properties have been analyzed using cross-sectional data from 11,830 adults from 23 countries and are a valid assessment across cultures and socioeconomic status.<sup>[21]</sup> The Hindi version of the WHOQOL-BREF has been developed which can be used for intervention studies and drug trials. This instrument holds satisfactory psychometric properties and can be used in an Indian setting.<sup>[22]</sup>

### Intervention

Group I received only conventional therapy in the form of analgesics mainly NSAIDs (nonsteroidal anti-inflammatory drugs) as and when required for pain (CPP). Group II subjects underwent regular supervised yogic regimen which included deep breathing, OM chanting, asana, pranayama and relaxation, etc., [Table 1] for 5 times a week for 8 weeks under the expert guidance of highly trained yoga specialists and trainers (having 5–10 years’ experience in teaching yoga

Table 1: The yoga regimen followed by Group II subjects

Deep breathing - 2 minutes
OM chanting - 2 minutes
Loosening of joints - 15 minutes
Forward and backward bending with legs apart - 5 times
Sideward bending (both sides) - 5 times
Spinal twisting (both sides) - 5 times
Hip flexion (both sides) - 5 times
Cycling movement - 10 times
Reverse cycling - 10 times (initially 5 times)
Scissoring movements - 10 times (initially 5 times)
Hip abduction exercises - 10 times (with both legs one by one)
Butterfly movements - 20 times
Followed by relaxation in Shavasana - 5 minutes
Asana
Standing position - 5 minutes
Vrikshasana
Trikonasana/Parshawkonasana
Veebhadasana
Followed by Shavasana - 2 minutes
Supine position - 5 minutes
Uttanapadmasana - 60°
Pawanmuktasana with single leg
Vipareetkarni/sarvangasana (for those who can do)
Followed by Shavasana - 2 minutes
Prone position - 5 minutes
Bhujangasana
Shalbbhasana (with single leg)
Dhanurasana
Followed by Makrasana - 2 minutes
Sitting position - 5 minutes
Baddhakonasana/Upvistikonasana
Suptavajrasana/Ustrasana
Vakrasana/ardhamatsyendrasana
Padmasana
Followed by Dandasana - 1 minutes
Relaxation in Shavasana - 7 minutes
Pranayama - 10 minutes
Nadi shuddhi - 7 times
Bhramari - 5 times

possessing MD/PhD in yoga) running the yoga center in Physiology Department under Central Council for Research in Yoga and Naturopathy. All the subjects practicing yoga were beginners. They were thoroughly supervised by the instructors to carry yoga correctly. Attendance of the subjects was maintained regularly by the instructors. Yoga was performed in a quiet environment in a batch of 10–15 subjects of CPP. The yoga sessions were carried out from 10 to 11 am. They also received conventional therapy in the form of NSAIDs (as and when required) for CPP.

### Statistical analysis

Data were analyzed by IBM SPSS Statistics 20 software (by IBM Corporation, USA). Two factors repeated measure ANOVA followed by Tukey’s test at 5% level of significance. One factor is group (Group I and Group II) another factor is time (pre, post) for comparison of mean pain score and QOL scores before intervention and after intervention between the groups and within the group that is pre- and post-comparison for each group.

## RESULTS

The mean age of the subjects in Group I and Group II was  $30.9 \pm 5.59$  years and  $32.6 \pm 6.97$  years, respectively, and they were age-matched [Table 2].

### Visual analog scale score

At the onset of study, there was no significant difference of VAS scores between Group I ( $65.60 \pm 5.89$ ) and Group II ( $66.90 \pm 8.40$ ) subjects. After 8 weeks of intervention, Group II subjects showed a significant reduction ( $P < 0.001$ ) in VAS scores ( $34.07 \pm 10.12$ ) as compared to Group I ( $67.03 \pm 6.557$ ) subjects indicating better pain reduction in Group II subjects. There was no significant difference between the pre- and post-treatment VAS scores in Group I subjects. A significant reduction was seen in posttreatment VAS scores ( $P < 0.001$ ) as compared to pretreatment VAS scores in Group II subjects [Table 3]. Figure 2 depicts a comparison of VAS score before and after 8 weeks of intervention in Group I and Group II.

### Quality of life

There was a significant difference between the pretreatment and posttreatment values of WHOQOL-BREF transformed scores ( $P < 0.001$ ) in various (physical, psychological, social, and environmental) domains in Group II subjects. WHOQOL-BREF scores increased significantly in Group II after yogic intervention as compared to the Group I subjects [Tables 4-7]. Figures 3-6 depicts the comparison of the WHOQOL-BREF transformed scores in the physical, psychological, social, and environmental domain, respectively, before and after 8 weeks of intervention in Group I and Group II subjects.

## DISCUSSION

### Yoga and pain score

In the present study, 8 weeks of yogic intervention resulted in statistically significant decrease in the VAS scores, in CPP patients. However, no significant changes in VAS scores were seen in CPP patients receiving only conventional therapy (Group I). The difference in VAS scores between CPP patients on conventional therapy (Group I) and CPP patients on conventional + yoga therapy (Group II) postintervention were also significant. Decrease in VAS score is suggestive of decrease in pain intensity after 8 weeks of yoga therapy. Pain relief in gynecological conditions after yoga therapy has been reported in many studies. On extensive literature survey, we could not come across any of the study highlighting the role of yogic intervention on CPP patients. Hence, we do not have a similar study to compare our results. However, yoga nidra therapy of 6 months significantly reduced the pain symptoms in women with dysmenorrhea.<sup>[23]</sup> Moreover,

**Table 2:** Comparison of age of the subjects in Group I and Group II

	Mean±SD (n=30)		P value unpaired t test
	Group I (control)	Group II (experimental)	
Age (years)	30.9±5.59	32.6±6.97	0.206

**Table 3:** Comparison of VAS scores before (pre) and after 8 weeks of intervention (post) in Group I and Group II

VAS score	Mean±SD		P value (F-test)	Tukey's significance
	Pre	Post		
Group I	65.60±5.89	67.03±6.557	<0.001	Non-significant
Group II	66.90±8.40	34.07±10.12		
P value (F-test)	<0.001			
Tukey's Significance	Non-significant	Significant		

**Table 4:** Comparison of the WHOQOL-Bref transformed scores in the Physical domain before (PRE) and after 8 weeks of intervention (POST) in Group I and Group II

WHOQOL-Bref physical domain score	Mean±SD		P value (F-test)	Tukey's significance
	Pre	Post		
Group I	39.41±8.36	39.98±7.22	<0.001	Non-significant
Group II	41.41±7.93	69.64±9.03		
P value (F-test)	<0.001			
Significance	Non-significant	Significant		

**Table 5:** Comparison of the WHOQOL-Bref transformed scores in the psychological domain before (pre) and after 8 weeks of intervention (post) in Group I and Group II

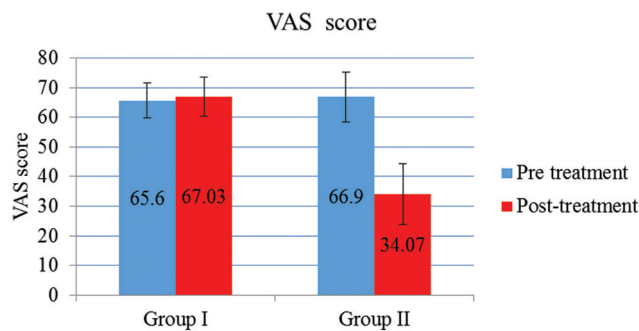
WHOQOL-Bref psychological domain score	Mean±SD		P value (F-test)	Tukey's significance
	Pre	Post		
Group I	43.47±9.00	43.19±9.25	<0.001	Non-significant
Group II	47.64±12.17	71.94±10.03		
P value (F-test)	<0.001			
Significance	Non-significant	Significant		

**Table 6:** Comparison of the WHOQOL-Bref transformed scores in the Psychological domain before (pre) and after 8 weeks of intervention (post) in Group I and Group II

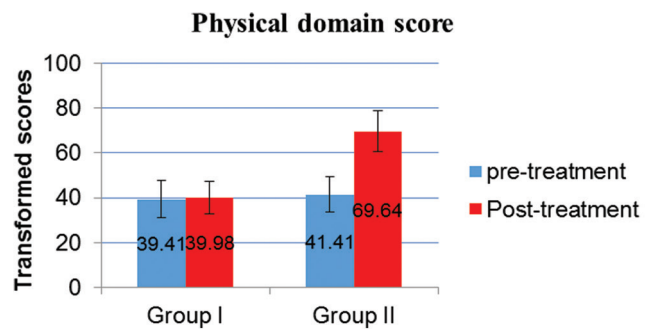
WHOQOL-Bref Social domain score	Mean±SD		P value (F-test)	Tukey's significance
	Pre	Post		
Group I	46.39±11.09	48.33±11.45	<0.001	Non-significant
Group II	57.77±16.66	75.00±10.94		
P value (F-test)	<0.001			
Significance	Significant	Significant		

**Table 7:** Comparison of the WHOQOL-Bref transformed scores in the Environmental domain before (pre) and after 8 weeks of intervention (post) in Group I and Group II

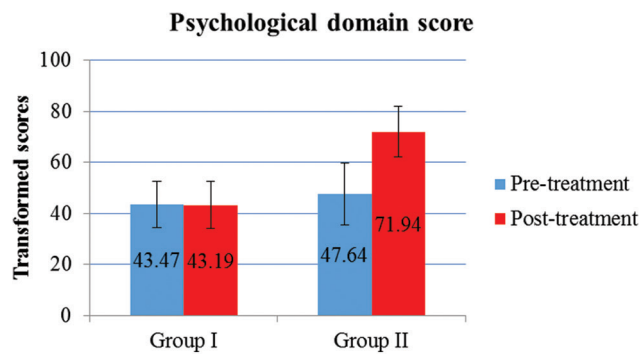
WHOQOL-Bref environmental domain score	Mean±SD		P value (F-test)	Tukey's Significance
	Pre	Post		
Group I	64.06±6.50	65.00±5.76	<0.001	Non-significant
Group II	62.60±8.97	65.00±7.80		
P value (F-test)	0.686			
Significance	Non-significant	Non-significant		



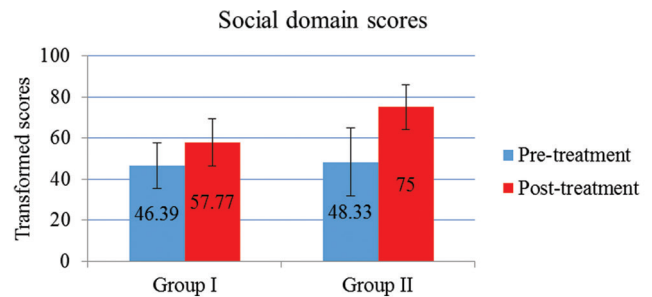
**Figure 2:** Comparison of VAS score before and after 8 weeks of intervention in Group I and Group II



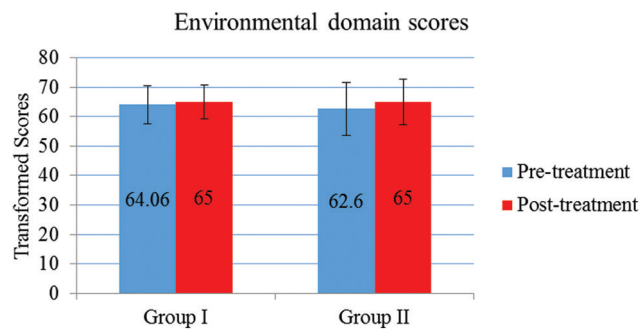
**Figure 3:** Comparison of the WHOQOL-Bref transformed scores in the physical domain before and after 8 weeks of intervention in Group I and Group II



**Figure 4:** Comparison of the WHOQOL-Bref transformed scores in the psychological domain before and after 8 weeks of intervention in Group I and Group II



**Figure 5:** Comparison of the WHOQOL-Bref transformed scores in the Social domain before and after 8 weeks of intervention in Group I and Group II



**Figure 6:** Comparison of the WHOQOL-Bref transformed scores in the Environmental domain before and after 8 weeks of intervention in Group I and Group II

practicing yoga poses (asana) significantly reduced severity and duration of dysmenorrhea.<sup>[16]</sup> Other studies showing the effect of yoga on other painful conditions are also available. Yoga therapy for 5 times, 4 weeks a week, significantly improved VAS score in patients with myofascial pain syndrome.<sup>[24]</sup> Practicing yoga asana for 4 weeks led to significant reduction of VAS scores in chronic low back pain patients.<sup>[25]</sup> Moreover, yoga training reduced the intensity and frequency of headaches in patients suffering from migraine.<sup>[26]</sup> After 12 weeks of yoga intervention, which included various asana, women with chronic low back pain showed a significant reduction in

VAS scores of pain, significant increase in back flexibility, and significant increase in brain-derived neurotrophic factor (BDNF). This increase in BDNF could be attributed to pain reduction in patients with chronic pain.<sup>[27]</sup> Yoga therapy enhances the tone of muscles and helps in releasing of muscle tension. Relaxation exercises performed during yoga leads to reduction of stress-related muscle tension and also modify neurobiological pain perception which could be a mechanism for pain reduction.<sup>[28]</sup> Increase in BDNF and improvements in the pelvic muscle tone after yoga therapy might be responsible for pain relief in CPP patients.

### Yoga and quality of life in chronic pelvic pain patients

There was a significant improvement in QOL after 8 weeks of yoga therapy. Improvement was seen in all domains, i.e., physical, psychological, social, and environmental domain. However, no significant change in QOL scores was seen in CPP patients receiving only conventional therapy (Group I). The difference in QOL scores between CPP patients on conventional + yoga intervention (Group II) posttreatment was also significant in physical, psychological, and social domain. Studies have shown that practicing yoga causes a significant improvement of QOL not only in painful conditions but also in various other medical illnesses. It was seen that yogic intervention (comprising of asana, pranayama, meditation, and lectures on yoga philosophy)

in patients with chronic low back pain led to improvement in the QOL in all the four domains of WHOQOL-BREF.<sup>[13]</sup> Yoga training was helpful in improving QOL in all domains of women with perimenopausal symptoms.<sup>[29,30]</sup> Reduction in the pain intensity and frequency might have led to the improvement of QOL in physical domain and increase in brain GABA levels may be a cause for psychological and social QOL improvement.<sup>[31]</sup>

Hence, improvement in pelvic and abdominal muscle tone and increase in the levels of BDNF along with brain GABA levels (as shown by previous studies) by yoga therapy may perhaps be attributed for the significant reduction in VAS score and improvement in QOL in CPP patients on yoga therapy.

## CONCLUSION

From this study, it can be concluded that after 8 weeks of yoga therapy, Group II CPP subjects had lesser intensity of pain as shown by significantly reduced VAS scores and improved QOL with a significant increase in physical, psychological, and social domain scores of WHOQOL-BREF. Hence, yoga regimen used in our study can be used as add-on treatment for the pain relief and for improving QOL in patients of CPP. Better pain management with yoga can help reduce dependence on NSAIDs and its associated side effects.

## Limitations of our study

This study was conducted in limited time period and the assessment of the parameters was done twice before and after study. If the study had been of a longer duration, multiple assessments would have been possible at regular intervals and then the trends of changes and long-term effects on yoga on CPP patients could have been determined. Further, we could not assess the levels of biochemical markers, i.e., brain-derived neurotrophic factor (BDNF) and GABA because of resource crunch. Levels of these markers would have helped us to validate our findings more scientifically. Further work needs to be done in this field with a larger sample size and a longer follow-up to increase the efficacy and therapeutic value of the study.

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## Conflicts of interest

There are no conflicts of interest.

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