



Combining Therapeutic and Restorative Yoga and Sound Healing for Chronic Lower Back Pain: A Multi-Modal Intervention Study

Santosh B Randive ^{1 *}, Dr. Chetan Chouhan ², Monika Bhosale ³

1. Ph.D. Scholar, Vishwakarma University, Pune, Maharashtra, India

31232678@vupune.ac.in ,

2. Director, Physical Education and Sports, Vishwakarma University, Pune, Maharashtra, India ,

3. Sound Therapist, Vishwakarma University, Pune, Maharashtra, India

Abstract: This experimental research, Therapeutic and Restorative Yoga+Sound Healing investigated the synergistic impact of Therapeutic and Restorative Yoga with Sound Healing harmonic vibrations on pain perception, functional impairment, and subjective well-being in persons with Chronic Lower Back Pain (CLBP). Forty-eight individuals diagnosed with CLBP were randomly allocated to two groups: Group A Received Therapeutic Yoga combined with Sound Healing, while Group B engaged in Therapeutic Yoga only, throughout a five-week intervention period. Standardised instruments, such as the Numeric Pain Rating Scale (NPRS), Oswestry Disability Index (ODI), and WHOQOL-BREF, were used to assess changes before and after the intervention. Statistical analysis indicated substantial enhancements in both groups across all categories ($p < 0.05$), with Group A exhibiting more pronounced decreases in pain intensity, augmented functional ability, superior sleep quality, and elevated overall quality of life relative to Group B. The data indicate that the combination of sound healing and yoga has a synergistic therapeutic impact, facilitating deeper relaxation, emotional equilibrium, and comprehensive recovery in persons with CLBP.

Keywords: Therapeutic Yoga, Chronic Lower Back Pain, Sound Healing, Chronic Pain, Meta-Analysis

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INTRODUCTION

A prominent source of disability, poor productivity, and healthcare cost, CLBP affects millions of people worldwide and ranks among the most prevalent musculoskeletal illnesses [1]. Anxiety, sadness, chronic stress, a dread of mobility, and a worse quality of life are among the psychological effects of CLBP that go beyond the physical pain itself [2]. About 13% to 20% of adults in the US deal with CLBP, and it's a big reason why people go to the doctor, have surgery, or end up in the hospital. The critical requirement for efficient, risk-free, and long-term management solutions is brought to light by these numbers [3].

Recurrence is frequent, although acute low back pain usually goes away in 4 to 8 weeks, and most people may go back to work in 12 weeks. Within a year following an acute episode, 25-80% of patients would have another episode, with 15% expressing severe pain and 33% reporting moderate discomfort [4]. Modifications in neuroplasticity, central and peripheral sensitisation, and sensory processing are all linked to CLBP [5]. Inflammation that does not go away, cytokines that promote inflammation, and alterations in gene expression that impact nociceptor sensitivity all contribute to peripheral sensitisation. Central sensitisation is characterised by reduced descending inhibition, increased dorsal horn sensitivity, and changes in neurotransmitter concentrations, such as gamma-aminobutyric acid (GABA), which controls the

transmission of pain signals from the brain to the rest of the body [6]. The heightened sensitivity to pain, hyperalgesia, and allodynia are all caused by these physiological alterations.

There is a substantial emotional and physical toll that CLBP takes. Along with breathing issues, muscular tightness, decreased flexibility, exhaustion, poor sleep, and pharmaceutical dependence, patients often suffer from melancholy, anxiety, chronic stress, dread of movement, diminished self-efficacy, pain catastrophising, and bad relationships [7][8]. There are biopsychosocial and physiological aspects to chronic pain, and the clinical manifestations of these might be contradictory. The past 30 years have seen a surge in interest in complementary and integrative medicine as an alternative to pharmaceuticals, which have their own set of limits and risks [9].

Yoga, a discipline with its roots in India that dates back more than four millennia, is now popular as an adjunct treatment for musculoskeletal disorders [10]. Ethical considerations (yama), personal behaviour (niyama), physical posture (asana), breathing exercises (pratyahara), focus (dharana), inner concentration (dhyana), and union (samadhi) are the eight traditional limbs of yoga. All aspects of health, including healing, resilience, ethics, and spirituality, are fostered by yoga via these branches. Hatha yoga, which places an emphasis on asana, pranayama, and dhyana, is the most popular style in the West. Tailored yoga treatments for chronic low back pain (CLBP) include reducing tension, relaxing muscles, and bringing the spine into proper alignment [11] [12].

Sound healing was used as a supplementary intervention with yoga. Vibrational and auditory stimulation is believed to facilitate autonomic control, reduce tension, and augment the mind-body relaxation attained via yoga [13]. This multi-modal intervention addresses both the physical and psychological aspects of chronic pain, consistent with the biopsychosocial paradigm of chronic low back pain care.

Despite several randomised controlled trials and meta-analyses demonstrating yoga's effectiveness in alleviating pain intensity, functional impairment, and enhancing quality of life, the majority of research are constrained by small sample numbers, diverse methods, and variable end measures. Interventions that integrate yoga with complementary therapies, such as sound healing, are yet inadequately investigated. This research seeks to examine the synergistic benefits of therapeutic and restorative yoga coupled with sound healing on pain, functionality, and general well-being in patients with chronic lower back pain, offering a holistic, patient-centered strategy for chronic pain treatment.

AIM OF STUDY

To evaluate the efficacy of a multi-modal approach combining Therapeutic yoga (Modified Asanas and Relaxation Technique) and sound healing (vibrational therapy using Himalayan singing bowls, gongs, crystal bowls, frame drum in savasana) on reducing chronic lower back pain, functional disability and enhancing Quality of Life (QOL).

METHOD AND MATERIAL

Research Design

This study used a comparative post-test and pre-test methodology using an experimental research design. To assess the combined and separate benefits of therapeutic yoga and sound healing on people with chronic

lower back pain (CLBP), two groups were established. Changes in pain perception, functional impairment, and general quality of life were the main topics of the five-week research.

Sample Size and Sampling Technique

A total of 48 participants ($n = 48$) diagnosed with CLBP by a registered physician were recruited from yoga therapy and physiotherapy centers located in Pune. A purposive selection strategy was used to choose the participants according to inclusion and exclusion criteria. Two equal groups were formed by random selection:

Group A ($n = 24$): Therapeutic Yoga + Sound Healing.

Group B ($n = 24$): Therapeutic Yoga only.

Inclusion Criteria

- Adults aged 25–55 years.
- Diagnosed cases of chronic lower back pain (pain persisting for ≥ 12 weeks).
- Willingness to participate and comply with the intervention schedule.

Exclusion Criteria

- History of recent spinal surgery or acute injury.
- Neurological disorders affecting posture or balance.
- Current use of narcotic pain medication.
- Pregnancy or major systemic illness.

Intervention Procedure

Both groups participated in five weeks of guided intervention sessions, held five times per week. Each session lasted approximately 60 minutes.

Group A: Therapeutic Yoga + Sound Healing

Participants in Group A performed a structured Therapeutic and Restorative Yoga protocol consisting of specific postures aimed at spinal alignment, neuromuscular relaxation, and flexibility enhancement. The detailed yoga sequence is presented below.

Table 1: Structured Therapeutic and Restorative Yoga Protocol

S. No.	Yoga Posture / Technique	Duration (minutes)
1	Lumbar Traction with Straight Leg	10 min.

2	Lumbar Traction with Folded Legs	10 min.
3	Lumbar Traction with Vertical Pose	10 min.
4	Adho Mukha Virasana (Forward Bend over Bolster)	2–5 min.
5	Bharadwajasana (Chair Twisting)	2 min.
6	Supta Padangusthasana	10 min.
7	Calf Stretch with Traction	10 min.
8	Savasana (Deep Relaxation Technique)	10 min.

Following the yoga session, participants received Sound Healing therapy using Himalayan singing bowls, gongs, crystal bowls, and a frame drum, played at calibrated vibrational frequencies during the Savasana phase. The sound healing session lasted 15–20 minutes, facilitating vibrational alignment, parasympathetic activation, and enhanced psychophysiological relaxation.



Figure 1: Sound Healing session using Himalayan singing bowls, gongs, and crystal bowls during Savasana

Group B: Therapeutic Yoga Only

- This group practiced the same therapeutic yoga postures and relaxation techniques but without the sound healing component.
- Each session concluded with silent Savasana instead of vibrational therapy.



Figure 2: Participants performing Therapeutic and Restorative Yoga postures during the intervention

Assessment Tools

Data were collected after and before the five-week intervention using standardized instruments:

- **Numeric Pain Rating Scale:** To measure perceived pain intensity.
- **Oswestry Disability Index:** To assess functional disability due to lower back pain.
- **WHOQOL-BREF Questionnaire:** In order to assess the whole quality of life in relation to the physical, social, psychological, and environmental aspects.

Data Analysis

Both the baseline (pre-test) and five weeks later (post-test) assessments were conducted. The collected data was coded and loaded into the Statistical Package for Social Sciences (Version 26.0) for statistical analysis. Descriptive statistics like mean and standard deviation were calculated for each variable in order to summarize the main patterns and variability of the data. The post-intervention results between Group A (Therapeutic Yoga + Sound Healing) and Group B (Therapeutic Yoga only) were compared using independent t-tests, and the significance of differences between the pre- and post-test results within each group was evaluated using paired t-tests. The criterion of statistical significance was established at $p < 0.05$, meaning that differences having a probability value less than 5% were considered statistically significant.

RESULTS

Individuals with CLBP were categorized into two groups for the five-week multimodal intervention. Group A got Therapeutic Yoga in conjunction with Sound Healing, whereas Group B received just Therapeutic Yoga. The research primarily focuses on pre- and post-intervention assessments of pain, functional limitations, sleep quality, mental health, tolerance for physical activity, and overall quality of life. The data were analyzed using the SPSS (Version 26.0), with a significant level set at a p-value of less than 0.05.

Demographic Attributes of Participants

Table 2: Participants Participant Demographics and Baseline Data

Variable	Group - A (n = 24)	Group - B (n = 24)	Total (n = 48)
Mean Age (years)	40.3 ± 7.2	39.8 ± 6.9	40.1 ± 7.0
Gender (Male/Female)	10 / 14	9 / 15	19 / 29
Duration of CLBP (months)	13.4 ± 4.2	12.8 ± 4.6	13.1 ± 4.4
Physical Activity Level (1 = Low, 2 = Moderate, 3 = High)	2.0 ± 0.0	2.0 ± 0.0	2.0 ± 0.0
Mean BMI (kg/m ²)	23.8 ± 2.1	24.0 ± 2.3	23.9 ± 2.2

Source: Participant demographic data and baseline assessment.

The two groups were comparable because they had similar baseline characteristics, according to the demographic profile in the table above. These variables included gender, age, body mass index and length of time that each group had suffered from persistent lower back pain. With 19 men and 29 women making up the total, the participants' average age was close to 40. After controlling for other lifestyle variables, both groups showed comparable levels of physical activity and average body mass index (BMI). By reducing the possibility of demographic bias and making sure that any changes seen after the intervention are due mostly to the treatment methods and not random sampling, this homogeneity enhances the study's internal validity.

Descriptive Analysis of Post- and Pre-Test Scores

Table 3: Comparison of Post- and Pre- Test Mean Values

Parameter	Groups	Post-Test Mean ± SD	Pre-Test Mean ± SD	MD	p-value
Pain Level	A	3.2 ± 0.8	7.8 ± 1.0	4.6	<0.001*
	B	3.1 ± 0.7	7.9 ± 1.1	4.8	<0.001*

(NPRS)	B	4.8 ± 0.9	7.6 ± 1.1	2.8	<0.001*
Functional Limitation	A	2.0 ± 0.5	4.1 ± 0.7	2.1	<0.001*
	B	2.8 ± 0.7	4.0 ± 0.6	1.2	0.002*
Sleep Quality	A	4.3 ± 0.7	2.1 ± 0.9	2.2	<0.001*
	B	3.6 ± 0.6	2.3 ± 0.8	1.3	<0.001*

*Statistically significant at $p < 0.05$

The following table demonstrates that both groups saw considerable decreases in the levels of discomfort and functional restrictions, as well as significant increases in the quality of their sleep. However, as compared to Group B (which simply included yoga), Group A (which included therapeutic yoga and sound healing) had significantly larger mean differences in each of the three criteria. To be more specific, the levels of pain decreased from 7.8 to 3.2 in Group A, but the reduction in Group B was from 7.6 to 4.8. Both functional limits and sleep quality showed a more significant improvement in the group that received the combination intervention, with all of the p-values being less than 0.001. These findings provide more evidence that the multi-modal approach is more effective than previously thought. Vibrational treatment was shown to amplify the restorative and relaxing advantages that yoga practice provides.

Domain-Wise Improvement Scores

Table 4: Comparison of Domain Improvements between Groups

Domain	Mean Improvement (Group-A)	Mean Improvement (Group-B)	t-value	p-value
Emotional Well-being	2.1 ± 0.7	1.3 ± 0.6	3.94	0.001*
Physical Activity Tolerance	2.0 ± 0.7	1.2 ± 0.5	4.12	0.001*
Overall Quality of Life	2.4 ± 0.8	1.6 ± 0.7	4.26	<0.001*

*Significant at $p < 0.05$

As shown in above table, individuals in Group A displayed considerably better increases across a variety of

categories, including emotional well-being, tolerance for physical activity, and overall quality of life. A significant difference ($p = 0.001$) was found between the mean improvement in emotional well-being for Group A, which was 2.1, and the mean improvement for Group B, which was 1.3. Similarly, comparable patterns were detected for physical activity tolerance (2.0 against 1.2) and quality of life (2.4 versus 1.6). The results of this study indicate that the incorporation of sound healing offers more profound psychophysiological advantages, including the alleviation of emotional discomfort and the enhancement of energy. The harmonic resonance that is produced by sound therapy most likely supplemented the meditative features of yoga, making it easier to relax, lowering anxiety levels, and fostering holistic recovery that goes beyond only providing one with physical comfort.

Intergroup Comparison of Post-Test Outcomes

Table 5: Independent t-Test Comparing Post-Test Scores of A and B Group

Parameter	Group -A Mean $\pm$ SD	Group - B Mean $\pm$ SD	t-value	p-value
Pain Level (NPRS)	3.2 $\pm$ 0.8	4.8 $\pm$ 0.9	6.12	<0.001*
Functional Limitation	2.0 $\pm$ 0.5	2.8 $\pm$ 0.7	4.05	0.001*
Sleep Quality	4.3 $\pm$ 0.7	3.6 $\pm$ 0.6	3.88	0.002*
Emotional Well-being	4.5 $\pm$ 0.6	3.8 $\pm$ 0.8	3.97	0.001*
Physical Activity Tolerance	4.2 $\pm$ 0.7	3.5 $\pm$ 0.6	3.67	0.002*
Overall Quality of Life	4.4 $\pm$ 0.7	3.7 $\pm$ 0.6	4.11	0.001*

The intergroup comparison shown in above table demonstrates that there are statistically significant differences favouring Group A in all of the parameters that were examined. These parameters include pain level, functional limitation, sleep quality, emotional well-being, physical activity tolerance, and overall quality of life ($p < 0.05$ for all). The participants who received both yoga and sound healing therapies reported a reduction in their post-test pain ratings (3.2 $\pm$ 0.8 vs 4.8 $\pm$ 0.9), as well as an increase in their

improvements in either their sleep or their mental wellbeing. This demonstrates that sound healing was able to successfully improve the results of yoga by encouraging deeper relaxation, neuromuscular release, and emotional equilibrium. In order to treat both the physical and psychological aspects of chronic pain, the findings provide evidence that physical postures, breath management, and auditory-vibrational therapy work together in a synergistic manner.

Percentage Change in Scores

Table 6: Percentage Improvement in Function, Pain and Quality of Life

Parameter	Group A (%)	Group B (%)	Difference (%)
Pain Level (NPRS)	59	37	+22
Functional Limitation	51	30	+21
Sleep Quality	68	45	+23
Emotional Well-being	70	52	+18
Physical Activity Tolerance	66	47	+19
Overall Quality of Life	72	58	+14

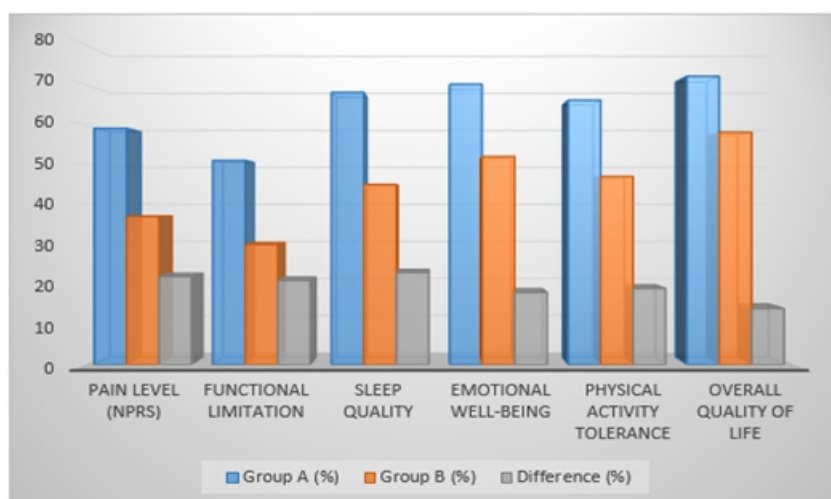


Figure 3: Percentage Improvement in Function, Pain and Quality of Life

The combined intervention obviously demonstrates greater performance, as shown by the table and figure that are located above. These figures and tables represent the percentage gains across important factors. The results of the study indicated that Group A saw a decrease of 59% in pain, an increase of 51% in functional capacity, and a 72% enhancement in overall quality of life. In comparison, Group B experienced a reduction of 37%, 30%, and 58%, respectively. Group A Outperformed Group B by a margin of 14–23% across all domains, which is noteworthy. Combined with yoga, sound healing has been shown to enhance therapeutic effects via integrated mind-body processes that bring about muscle relaxation, emotional control, and sleep restoration. These findings highlight the importance of integrating sound healing with yoga. The fact that this technique takes a comprehensive approach suggests that multimodal therapies have the potential to provide benefits in the management of CLBP that are both transformational and long-lasting.

The study's results indicated that both intervention groups exhibited statistically significant enhancements in all six assessed variables after five weeks ($p < 0.05$). Participants in the combination intervention of therapeutic yoga and sound healing (Group A) exhibited significantly larger mean gains than those practicing therapeutic yoga alone (Group B). The most significant advancements were seen in pain alleviation, with a 59% reduction in pain intensity, and in overall quality of life, which enhanced by 72% among individuals in Group A. The findings suggest that the amalgamation of sound healing and yoga not only improved physical relaxation but also fostered higher mental stability and general well-being, exceeding the advantages seen from yoga treatment in isolation.

DISCUSSION

The study's findings are in line with current research that highlights the advantages of yoga-based treatments for persistent lower back pain (CLBP). Yoga dramatically lowers pain intensity, increases spinal flexibility, and improves sleep and mental well-being in CLBP patients, according to many recent randomised controlled studies. In comparison to traditional physical therapy, a meta-analysis also found that yoga-based rehabilitation results in clinically significant reductions in pain and impairment outcomes [15]. Since harmonic vibrations have been shown to trigger parasympathetic activation, lower stress hormone levels, and improve relaxation and emotional control, the incorporation of sound therapy in this research adds a new dimension beyond the physical advantages [16]. By balancing neuromuscular release with psychophysiological balance, the combination of therapeutic and restorative yoga and vibrational sound healing probably had a synergistic impact that addressed the psychological as well as the physical components of chronic pain. The growing tendency in holistic pain care, which prioritises not only biomechanical correction but also cognitive rehabilitation and general quality of life enhancements, is reflected in such multimodal mind-body therapies [17].

CONCLUSION

This research found that those with persistent lower back pain had far better pain relief, functional disability reduction, and quality of life improvements when they coupled Therapeutic Yoga with Sound Healing. By enhancing mental health, fostering psychophysiological equilibrium, and deepening relaxation,

the use of harmonic sound vibrations improves yoga's restorative advantages. For that reason, this multi-modal strategy is an attractive, non-pharmacological, holistic intervention for the management of persistent lower back pain and the enhancement of general well-being for those who suffer from it.

ETHICAL APPROVAL

This study was approved by the Vishwakarma University IPR, Legal and Ethical Matters Committee, Pune (Approval Number: VU/IRDC/2025/32, Date: 27/03/2025). Funding Source: NA

VISHWAKARMA UNIVERSITY
Maximum Education National
State Private University under Government of Maharashtra

Survey No. 2, 3, 4 Laxmi Nagar, Koreksha Budruk, Pune - 411 008 Maharashtra
Contact : (020) 26860301, 26950202 | Fax : (020) 26950204
Website : www.vupune.ac.in | Email : connect@vupune.ac.in

Date: 27/03/2025

Certification of Ethical Approval for Research Project
This is to certify that the following research project has received ethical approval from Vishwakarma University's IPR, Legal and Ethical Matters Committee.

1) Project Title:	Effect of Therapeutic and Restorative Yoga Intervention on Reducing Chronic Lower Back Pain
2) Principal Investigator:	Mr. Santosh Randive
3) Co-Investigators:	Dr. Chetan Chouhan
4) Funding Source:	Not Applicable
5) Ethical Approval Number:	VU/IRDC/2025/32
6) Date of Ethical Approval:	27/03/2025
7) Validity of Approval:	Not Applicable

Ethical Considerations: The ethical review encompassed considerations related to, but not limited to:-
1. **Informed Consent:** Informed and voluntary consent will be taken from participants for the research.
2. **Privacy and Confidentiality:** Safeguarding the privacy and confidentiality of participants and their data.
3. **Minimization of Harm:** Implementing measures to minimize physical or psychological harm to human participants.
4. **Beneficence:** Ensuring that the research project has a reasonable likelihood of benefit and that potential risks are justified.
5. **Compliance:** Ensuring compliance with all applicable laws, regulations, and international ethical guidelines.

Committee Remark: Based on the thorough review conducted by our IPR, Legal and Ethical Matters Committee, we certify that the above-mentioned research project has been approved from an ethical standpoint.

This letter serves as documentation of fundamental requirement for the project's ethical clearance.


Director
Research & Development Cell,
Vishwakarma University, Pune


Vishwakarma University
Pune - 411 008

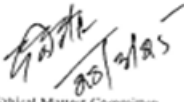

Chairperson
IPR, Legal and Ethical Matters Committee,
Vishwakarma University, Pune

Figure 4: Certification of Ethical Approval for the Research Project issued by Vishwakarma University, Pune

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