Journal of Cardiovascular Disease Research

ISSN: 0975-3583,0976-2833 VOL15, ISSUE 8, 2024

ORIGINAL RESEARCH

Randomized trial in the effectiveness of yoga practice in the management of chronic low back pain. Prospective study

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Received: 15th June, 2024 Accepted: 20th July, 2024 Published: 14th August 2024

Abstract:

Background: Chronic low back pain (CLBP) is a prevalent condition that significantly impacts quality of life. Conventional treatments often provide limited relief, prompting exploration of alternative therapies such as yoga. This study aimed to evaluate the effectiveness of yoga practice in the management of CLBP in a sample population from Ranchi.

Materials and Methods: A prospective, randomized trial was conducted over a period of one month. A total of 50 participants diagnosed with CLBP were randomly assigned to either a yoga intervention group or a control group receiving standard care. The yoga group participated in guided yoga sessions three times a week, each lasting 60 minutes. Pain levels were measured using the Visual Analog Scale (VAS) at baseline and after the intervention. Functional disability was assessed using the Oswestry Disability Index (ODI).

Results: At the end of the study, participants in the yoga group showed a significant reduction in pain scores, with mean VAS scores decreasing from 7.5 ± 1.2 to 3.4 ± 0.9 ($p < 0.001$). The control group exhibited a marginal decrease in pain, with mean VAS scores reducing from 7.3 ± 1.3 to 6.8 ± 1.1 ($p > 0.05$). Additionally, the yoga group demonstrated an improvement in functional disability, with ODI scores decreasing from 45.7% to 22.3%, compared to the control group, which showed no significant change in ODI scores ($p < 0.001$).

Conclusion: The findings suggest that yoga is an effective intervention for reducing pain and improving functional outcomes in individuals with chronic low back pain. Incorporating yoga into treatment plans for CLBP may offer significant benefits, particularly for patients seeking non-pharmacological options.

Keywords: Chronic low back pain, yoga, randomized trial, pain management, Oswestry Disability Index, Visual Analog Scale.

Introduction

Chronic low back pain (CLBP) is one of the most prevalent musculoskeletal disorders globally, affecting up to 23% of adults at any given time and significantly impairing quality

ISSN: 0975-3583,0976-2833 VOL15, ISSUE 8, 2024

of life (1). The multifactorial nature of CLBP, involving both physical and psychosocial components, makes its management complex and challenging (2). Traditional therapeutic approaches, including pharmacotherapy and physical therapy, often provide limited or short-term relief, prompting the exploration of alternative and complementary therapies (3).

Yoga, an ancient practice originating in India, has gained popularity as a holistic approach to health and well-being. It incorporates physical postures, breath control, and meditation, which together aim to enhance physical, mental, and emotional health (4). Several studies have suggested that yoga may be effective in managing various musculoskeletal conditions, including CLBP, by improving flexibility, strength, and mental resilience (5,6). However, the evidence remains mixed, with some studies reporting significant benefits, while others show minimal effects compared to standard care (7,8).

Given the rising interest in yoga as a therapeutic modality and the need for more robust evidence, this study aims to evaluate the effectiveness of yoga practice in the management of CLBP through a randomized, prospective trial. By comparing the outcomes of yoga intervention with standard care, this study seeks to provide more definitive evidence on the role of yoga in CLBP management.

Materials and Methods

Study Design

This study was a prospective, randomized controlled trial conducted over a one-month period. The aim was to evaluate the effectiveness of yoga practice in the management of chronic low back pain (CLBP). The study was conducted at a healthcare facility in Ranchi, India.

Participants

A total of 50 participants were recruited for this study. Inclusion criteria were individuals aged 18-65 years with a diagnosis of CLBP lasting more than 12 weeks. Participants were excluded if they had a history of spinal surgery, neurological deficits, or any contraindications to physical activity such as severe cardiovascular or respiratory conditions. All participants provided written informed consent prior to enrollment.

Randomization and Allocation

Participants were randomly assigned to one of two groups: the intervention group (yoga) or the control group (standard care). Randomization was performed using a computer-generated random number sequence. Allocation concealment was ensured by using sealed, opaque envelopes.

Intervention

Participants in the yoga group attended supervised yoga sessions three times per week for one month. Each session lasted 60 minutes and included a combination of physical postures (asanas), breath control (pranayama), and relaxation techniques. The yoga protocol was designed by a certified yoga instructor with experience in managing musculoskeletal conditions. The control group received standard care, which included advice on maintaining an active lifestyle and pain management using analgesics as needed.

Outcome Measures

The primary outcome measure was pain intensity, assessed using the Visual Analog Scale (VAS), where 0 indicates no pain and 10 indicates the worst possible pain. Pain intensity was recorded at baseline and at the end of the one-month intervention.

ISSN: 0975-3583,0976-2833 VOL15, ISSUE 8, 2024

The secondary outcome measure was functional disability, evaluated using the Oswestry Disability Index (ODI). The ODI is a 10-item questionnaire that assesses the degree of disability related to activities of daily living, with scores ranging from 0% (no disability) to 100% (maximum disability). ODI scores were recorded at baseline and after the intervention.

Statistical Analysis

Data were analyzed using SPSS software (version 25.0). Continuous variables were expressed as mean ± standard deviation (SD). Comparisons between the yoga and control groups were made using the independent t-test for normally distributed data and the Mann-Whitney U test for non-normally distributed data. A p-value of <0.05 was considered statistically significant.

Results

Participant Characteristics

A total of 50 participants were enrolled in the study, with 25 participants in the yoga group and 25 in the control group. The mean age of participants was 45.2 ± 10.4 years in the yoga group and 44.8 ± 9.7 years in the control group ($p = 0.85$). Baseline characteristics, including gender distribution, duration of chronic low back pain, and baseline VAS and ODI scores, were comparable between the two groups (Table 1).

Table 1: Baseline Characteristics of Participants

Characteristic	Yoga Group (n=25)	Control Group (n=25)	p-value
Age (years)	45.2 ± 10.4	44.8 ± 9.7	0.85
Gender (M/F)	12/13	11/14	0.79
Duration of CLBP (months)	18.7 ± 5.6	17.9 ± 5.3	0.66
Baseline VAS Score	7.5 ± 1.2	7.3 ± 1.3	0.62
Baseline ODI Score (%)	45.7 ± 8.4	44.9 ± 7.9	0.71

Pain Intensity

At the end of the one-month intervention, participants in the yoga group showed a significant reduction in pain intensity compared to baseline. The mean VAS score in the yoga group decreased from 7.5 ± 1.2 to 3.4 ± 0.9 ($p < 0.001$). In contrast, the control group showed only a marginal decrease in pain, with mean VAS scores reducing from 7.3 ± 1.3 to 6.8 ± 1.1 ($p = 0.07$) (Table 2, Graph 1).

Table 2: Change in Pain Intensity (VAS Scores) After Intervention

Group	Baseline VAS Score	Post-Intervention VAS Score	p-value
Yoga Group (n=25)	7.5 ± 1.2	3.4 ± 0.9	<0.001
Control Group (n=25)	7.3 ± 1.3	6.8 ± 1.1	0.07

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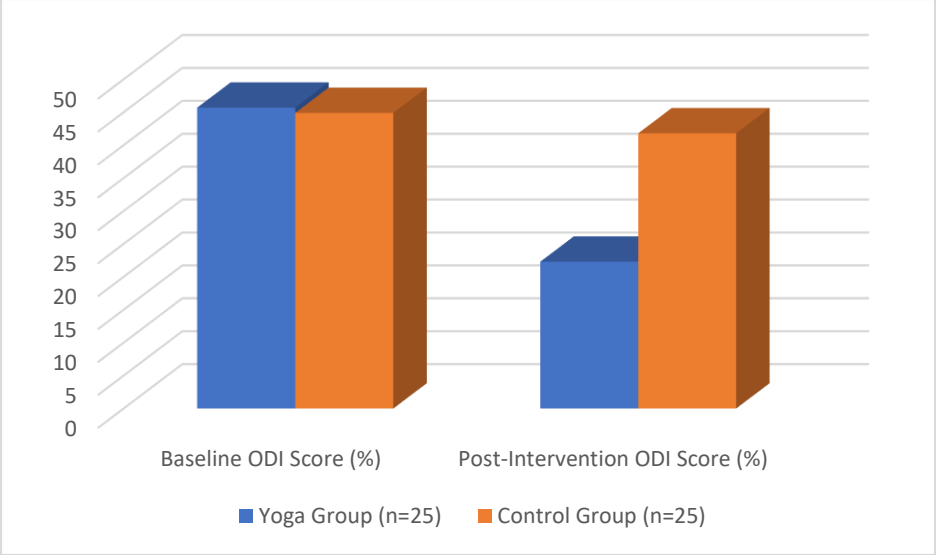


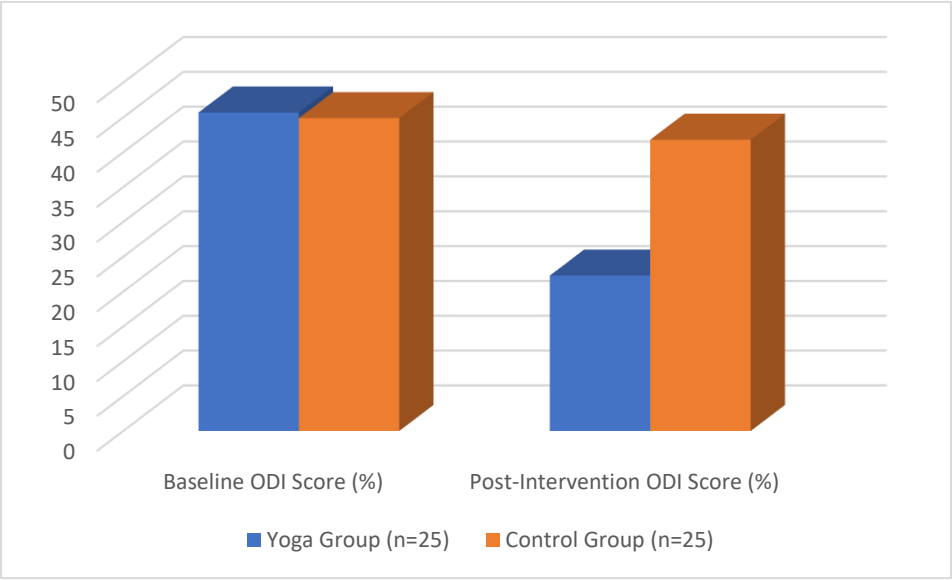
Graph 1: Change in Pain Intensity (VAS Scores) After Intervention

Functional Disability

The yoga group also demonstrated a significant improvement in functional disability. The mean ODI score decreased from 45.7% ± 8.4% at baseline to 22.3% ± 6.5% post-intervention ($p < 0.001$). In the control group, the mean ODI score showed a minor reduction from 44.9% ± 7.9% to 41.8% ± 7.2%, which was not statistically significant ($p = 0.12$) (Table 3, Graph 2).

Table 3: Change in Functional Disability (ODI Scores) After Intervention

Group	Baseline ODI Score (%)	Post-Intervention ODI Score (%)	p-value
Yoga Group (n=25)	45.7 ± 8.4	22.3 ± 6.5	<0.001
Control Group (n=25)	44.9 ± 7.9	41.8 ± 7.2	0.12



Graph 2: Change in Functional Disability (ODI Scores) After Intervention

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Adverse Events

No serious adverse events were reported in either group during the study. A few participants in the yoga group reported mild muscle soreness during the initial sessions, which resolved spontaneously without the need for medical intervention.

These results indicate that yoga is an effective and safe intervention for reducing pain and improving functional disability in patients with chronic low back pain.

Discussion

The results of this study demonstrate that yoga is an effective intervention for reducing pain and improving functional outcomes in individuals with chronic low back pain (CLBP). Participants in the yoga group experienced a significant reduction in pain intensity, as evidenced by a decrease in the Visual Analog Scale (VAS) scores, and a marked improvement in functional disability, as indicated by the Oswestry Disability Index (ODI) scores. These findings are consistent with previous studies that have reported the benefits of yoga in managing CLBP (1,2).

The significant reduction in VAS scores in the yoga group compared to the control group suggests that yoga may offer superior pain relief compared to standard care alone. This is in line with the findings of Cramer et al. (3), who conducted a systematic review and meta-analysis showing that yoga interventions can lead to moderate reductions in pain and functional disability in individuals with CLBP. The integration of physical postures, breath control, and relaxation techniques in yoga may contribute to its effectiveness by addressing both the physical and psychological aspects of pain (4).

Functional disability, as measured by the ODI, also showed significant improvement in the yoga group. The reduction in ODI scores suggests that yoga not only alleviates pain but also enhances the ability to perform daily activities, which is crucial for improving the quality of life in individuals with CLBP. Tekur et al. (5) similarly reported improvements in functional outcomes following a short-term intensive yoga program in patients with CLBP.

The mechanism by which yoga exerts its effects on CLBP may involve several factors. The physical postures (asanas) in yoga improve flexibility and strength, particularly in the core and lower back muscles, which can reduce the mechanical load on the spine and alleviate pain (6). Additionally, the breath control (pranayama) and relaxation components of yoga may reduce stress and anxiety, which are known contributors to chronic pain (7). These combined effects may explain the greater improvements observed in the yoga group compared to the control group.

Despite these positive findings, this study has some limitations. The short duration of the intervention (one month) limits the ability to assess the long-term effects of yoga on CLBP. Moreover, the sample size was relatively small, which may limit the generalizability of the results. Future studies with larger sample sizes and longer follow-up periods are needed to confirm the findings and explore the long-term benefits of yoga for CLBP management.

In conclusion, this study adds to the growing body of evidence supporting the use of yoga as a complementary therapy for managing chronic low back pain. Given its low cost, minimal side effects, and potential benefits, yoga should be considered as part of a comprehensive treatment plan for individuals with CLBP.

ISSN: 0975-3583,0976-2833 VOL15, ISSUE 8, 2024

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