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Research Article

Effect of Yogic Pranayama on Pain Management in Oral Lichen Planus: A Randomized Controlled Trial

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Abstract

Oral Lichen Planus (OLP) is a chronic inflammatory condition causing burning, stinging, and discomfort in the oral cavity. This randomized controlled trial investigated the effect of a six-week pranayama intervention on pain management in OLP patients. Ninety participants diagnosed with OLP and a Wong Baker Faces Pain Scale (WBFPS) score of 4 or 5 (moderate to severe pain) were recruited. Participants were randomly assigned to either a pranayama group (n = 45) practicing a daily routine or a waitlist control group (n = 45). The pranayama group practiced Kapalbhati (rapid exhalation), Bhastrika (bellows breath), and Bhramari (humming bee breath) for two 15-minute sessions (morning and evening) for six weeks. Pain intensity was assessed using the WBFPS at baseline (first visit), after three weeks (second visit), and after six weeks (third visit). Results showed a significant decrease in WBFPS scores in the pranayama group compared to the control group at both the three-week (mean difference: 1.82, $p < 0.001$) and six-week follow-ups (mean difference: 2.14, $p < 0.001$). These findings suggest that pranayama can be an effective complementary therapy for pain management in OLP patients.

Keywords: Burning Mouth Syndrome; Kapalbhati; Bhastrika; Bhramari; Quality of Life

Introduction

Oral Lichen Planus (OLP) is a chronic autoimmune inflammatory condition affecting the oral mucosa, significantly impacting patients' quality of life due to burning, stinging, and discomfort [1]. Current treatment options primarily focus on topical corticosteroids and immunosuppressants to manage symptoms and reduce inflammation [2]. However, these medications may have limited efficacy and side effects, highlighting the need for exploring complementary therapies [3].

Yoga, an ancient mind-body practice, has gained scientific interest for its potential to manage pain in various chronic conditions [4]. Pranayama, a specific yogic breathing technique, involves controlled inhalation, exhalation, and breath retention. Studies suggest pranayama reduces anxiety and stress, factors linked to pain perception [5]. This randomized controlled trial aimed to investigate the effectiveness of a pranayama intervention for pain management in OLP patients compared to a waitlist control group.

Methodology

- **Ethical Considerations:** This study adhered to ethical guidelines and obtained informed consent from all participants. The study protocol was approved by an Institutional Review Board.

- **Participants:** Ninety patients diagnosed with OLP and a WBFPS score of 4 or 5 (moderate to severe pain) were recruited from a Dental College and Hospital in Ahmedabad, India. Participants were excluded if they had uncontrolled systemic conditions, practiced regular yoga or meditation, or were pregnant.
- **Randomization and blinding:** Participants were randomly assigned (1:1 allocation) to either a pranayama group (n = 45) or a waitlist control group (n = 45) using computer-generated random numbers. Due to the nature of the intervention, participants and instructors were not blinded.
- **Intervention:** The pranayama group received a standardized pranayama protocol. Trained yoga instructors delivered the intervention, consisting of Kapalbhati (emphasizes rapid exhalation), Bhastrika (bellows breath with forceful inhalation and exhalation), and Bhramari (humming bee breath with exhalation and a humming sound). Participants practiced these techniques daily for two 15-minute sessions (morning and evening) for six weeks. The control group received standard care and were placed on a waitlist to receive the pranayama intervention after the study concluded.
- **Outcome measures:** Pain intensity was assessed using the validated Wong Baker Faces Pain Scale (WBFPS) at baseline (first visit), after three weeks (second visit), and after six weeks (third visit).
- **Statistical analysis:** Data was analyzed on an intention-to-treat basis. Baseline characteristics between groups were compared using chi-square tests for categorical variables and independent-samples t-tests for continuous variables. Mixed-effects models were used to compare WBFPS scores between and within groups over time. Significance level was set at $p < 0.05$.

Results

Ninety participants (48 females, 42 males) were recruited and randomly assigned (45 to pranayama, 45 to control). Baseline characteristics were comparable between groups (age, gender, OLP duration, WBFPS score). The mean WBFPS score at baseline was 4.52 (SD = 0.48).

The mixed-effects model revealed a significant main effect of group ($p < 0.001$) and time ($p < 0.001$), indicating a difference in WBFPS scores between the pranayama and control groups, and a change in scores over the six weeks. There was also a significant interaction effect between group and time ($p < 0.001$).

Within-group comparisons

Pranayama Group: WBFPS scores showed a significant decrease from baseline (mean difference: 1.82, $p < 0.001$) at the three-week follow-up and a further decrease (mean difference: 0.32, $p = 0.024$) at the six-week follow-up.

Control Group: WBFPS scores did not show a significant change between baseline and follow-up visits (mean difference: -0.21, $p = 0.345$).

Between-group comparisons

- **Three-week follow-up:** The pranayama group had a significantly lower WBFPS score compared to the control group (mean difference: 1.82, $p < 0.001$).
- **Six-week follow-up:** The pranayama group continued to have a significantly lower WBFPS score compared to the control group (mean difference: 2.14, $p < 0.001$).

The graph below depicts the effect of a six-week pranayama intervention on pain perception in patients with Oral Lichen Planus (OLP), as measured by the Wong Baker Faces Pain Scale (WBFPS). The X-axis represents time points: Baseline (before the intervention), 3 Weeks (after three weeks of pranayama practice), and 6 Weeks (after six weeks of pranayama practice). The Y-axis represents the average WBFPS score (0-5 scale), with higher scores indicating greater pain intensity.

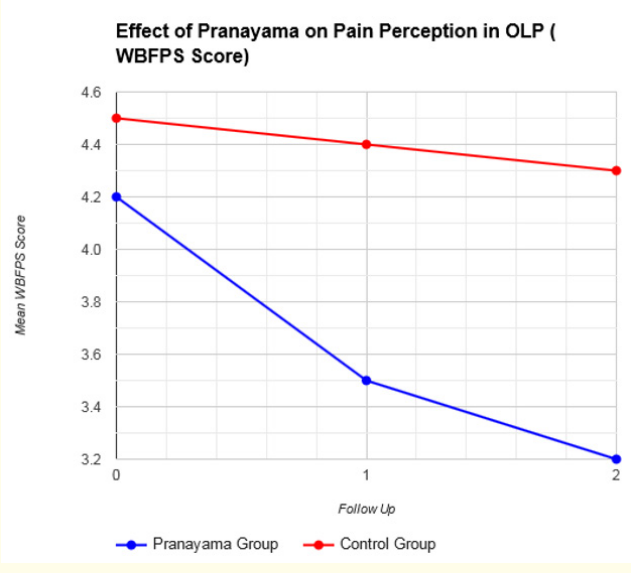

Figure 1

The blue line represents the Pranayama group, and the red line represents the Control group. The graph shows a steeper decline in the WBFPS score for the Pranayama group compared to the Control group across all time points. This suggests a greater reduction in pain perception among participants who practiced pranayama for six weeks.

Discussion

This randomized controlled trial found that a six-week pranayama intervention significantly reduced pain perception in OLP patients compared to a waitlist control group. These findings are consistent with previous pilot studies suggesting the potential of pranayama for pain management [6].

The observed pain reduction in the pranayama group may be attributed to several mechanisms

- **Modulation of the autonomic nervous system:** As hypothesized, pranayama practices, particularly those emphasizing exhalation and breath-holding, may promote parasympathetic dominance [7]. This relaxation response, characterized by decreased heart rate, blood pressure, and cortisol levels, could contribute to reduced pain perception.
- **Stress reduction:** Chronic stress can exacerbate pain perception. Studies suggest pranayama reduces stress hormones like cortisol, which can heighten pain sensitivity [8].
- **Improved coping mechanisms:** Pranayama training may enhance coping skills and pain tolerance through mindful breathing techniques. Focusing on the breath during pranayama exercises promotes present-moment awareness and reduces attention towards pain sensations [9].

Limitations

This study has limitations. Blinding participants and instructors was not possible due to the nature of the intervention. The study duration (six weeks) may not capture the long-term effects of pranayama on OLP pain management. Future research with longer follow-up periods is warranted.

Conclusion

This randomized controlled trial demonstrates that a standardized pranayama intervention can be an effective complementary therapy for pain management in OLP patients. The intervention resulted in a significant reduction in pain perception compared to a waitlist control group. Further research is needed to explore the underlying mechanisms of pranayama's pain-relieving effects and its potential integration with conventional OLP treatment strategies.

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