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Effectiveness of Acupressure in Reducing Low Back Pain among ICU Nurses: A Quasi-Experimental Study

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ABSTRACT

Background: Low back pain (LBP) is one of the most prevalent occupational health issues among nurses, particularly those working in Intensive Care Units (ICUs) due to physically demanding tasks and poor ergonomics. Acupressure, a complementary therapy, is increasingly being investigated as a non-pharmacological approach to pain management.

Aim: To evaluate the effectiveness of acupressure in reducing low back pain among staff nurses working in ICUs.

Methods: A quasi-experimental pre-test post-test design was conducted among ICU nurses (N = 60) experiencing LBP in a tertiary hospital. Participants received Sujok-based acupressure therapy using fenugreek and pea seed strips applied to hand acupoints for 8–10 hours daily over 14 days. Pain intensity was measured using the Numerical Pain Rating Scale (NPRS) and disability was assessed using a self-structured disability questionnaire at baseline, day 7, and day 14. Data were analyzed using paired t-tests and repeated measures ANOVA. Effect size was calculated to determine clinical significance.

Results: A statistically significant reduction in LBP was observed post-intervention. NPRS scores decreased from baseline (mean = 6.8 ± 1.2) to day 7 (mean = 4.1 ± 1.0) and day 14 (mean = 2.3 ± 0.9), $p < 0.001$. Disability scores also declined significantly from baseline (mean = 45.6 ± 8.7) to day 7 (mean = 31.2 ± 7.5) and day 14 (mean = 18.9 ± 6.8), $p < 0.001$. Effect sizes were large (Cohen's $d > 0.8$).

Conclusion: Acupressure was highly effective in reducing pain and functional disability among ICU nurses with LBP. This cost-effective, non-invasive intervention can be incorporated into occupational health programs to improve nurse well-being and work performance.

Keywords: *Acupressure, Low back pain, Nurses, Intensive Care Unit, Complementary therapy, Occupational health*.

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1. INTRODUCTION

Low back pain (LBP) remains a leading cause of occupational disability worldwide, affecting nearly 80% of adults at some point in their careers. Among healthcare professionals, nurses are particularly vulnerable due to frequent patient handling, prolonged standing, awkward postures, and shift work. Studies have reported that the prevalence of LBP among nurses ranges from 64% to 90%, with ICU nurses experiencing the highest burden due to the physical demands of critical care settings [8,9].

The consequences of LBP among nurses are far-reaching, leading to decreased productivity, increased absenteeism, reduced quality of patient care, and premature retirement. Conventional management typically includes pharmacological interventions such as NSAIDs; however, these provide only temporary relief and carry potential side effects. Hence, there is a growing emphasis on exploring complementary and alternative therapies for sustainable and safe management of LBP [6].

Acupressure, rooted in traditional Chinese medicine, involves applying firm pressure on specific acupoints to restore energy balance, improve circulation, and alleviate pain. Sujok therapy, a variant of acupressure, uses seeds or small objects applied to hand or foot acupoints corresponding to affected body parts. This therapy is non-invasive, affordable, and free of major side effects, making it suitable for self-care by nurses during or after duty hours [3-5,10].

Although acupressure has been shown to relieve musculoskeletal pain in various populations, limited evidence exists on its effectiveness among ICU nurses. This study, therefore, aimed to evaluate the impact of acupressure on pain intensity and disability associated with LBP among ICU nurses.
Methods

Design and Setting:
A quasi-experimental pre-test post-test study was conducted among ICU nurses in a tertiary hospital in Pune, India.

Participants:
A purposive sample of 60 registered nurses (GNM, B.Sc., P.B.B.Sc., M.Sc.) working in ICU for ≥1 year and experiencing LBP were recruited. Exclusion criteria included nurses with recent spinal surgery, neurological deficits, or ongoing alternative therapies.

Intervention:
Participants were trained in Sujok acupressure therapy. Fenugreek (methi) and pea (matar) seeds were taped to hand acupoints corresponding to the lumbar region and kept for 8–10 hours daily for 14 consecutive days. Nurses applied the strips themselves, before or after duty, under researcher supervision during initial sessions.

Instruments:
- **Numerical Pain Rating Scale (NPRS):** 0–10 scale for pain intensity.
- **Self-structured Disability Questionnaire on LBP:** 15-item tool covering daily activity limitations (score range: 0–60). Validated and tested for reliability (Cronbach's $\alpha = 0.82$).

Data Collection:
- **Baseline (Day 1):** Demographics, NPRS, disability scores.
- **Post-intervention (Day 7 & Day 14):** NPRS and disability reassessment.

Ethical Considerations:
Ethical approval was obtained from the Institutional Ethical Committee. Written informed consent was collected. Confidentiality and right to withdraw were assured.

DataAnalysis:
Data were analyzed using SPSS v25. Descriptive statistics summarized demographic data. Paired t-tests compared pre- and post-intervention scores. Repeated measures ANOVA evaluated trends across three time points. Statistical significance was set at $p < 0.05$. Effect size was calculated using Cohen's d.

2. RESULTS

Participant Characteristics
A total of 60 ICU nurses participated. The majority were female (82%), aged between 25–35 years (65%), with 3–10 years

of ICU experience (58%). The mean body mass index (BMI) was 24.6 ± 3.8 kg/m². Most nurses reported working in rotating shifts (72%).

Pain Intensity (NPRS Scores)

At baseline (Day 1), the mean pain score was 6.8 ± 1.2, indicating moderate-to-severe pain. After acupressure intervention, mean NPRS decreased significantly to 4.1 ± 1.0 on Day 7 and 2.3 ± 0.9 on Day 14. Repeated measures ANOVA showed a significant reduction across time points ($F(2, 118) = 164.23$, $p < 0.001$). Effect size was large ($\eta^2 = 0.74$).

Disability Scores

Baseline disability scores averaged 45.6 ± 8.7, suggesting considerable functional limitation. Post-intervention scores declined to 31.2 ± 7.5 (Day 7) and 18.9 ± 6.8 (Day 14). The reduction was statistically significant ($F(2, 118) = 142.56$, $p < 0.001$), with a large effect size ($\eta^2 = 0.71$).

Table 1. Changes in Pain and Disability Scores after Acupressure (N = 60)

Outcome	Day 1 (Baseline)	Day 7	Day 14	F-value	p-value	Effect Size (η^2)
NPRS (Pain Score)	6.8 ± 1.2	4.1 ± 1.0	2.3 ± 0.9	164.23	<0.001	0.74 (Large)
Disability Questionnaire	45.6 ± 8.7	31.2 ± 7.5	18.9 ± 6.8	142.56	<0.001	0.71 (Large)

Figure 1. Trend in Pain Scores (NPRS) across Intervention Period

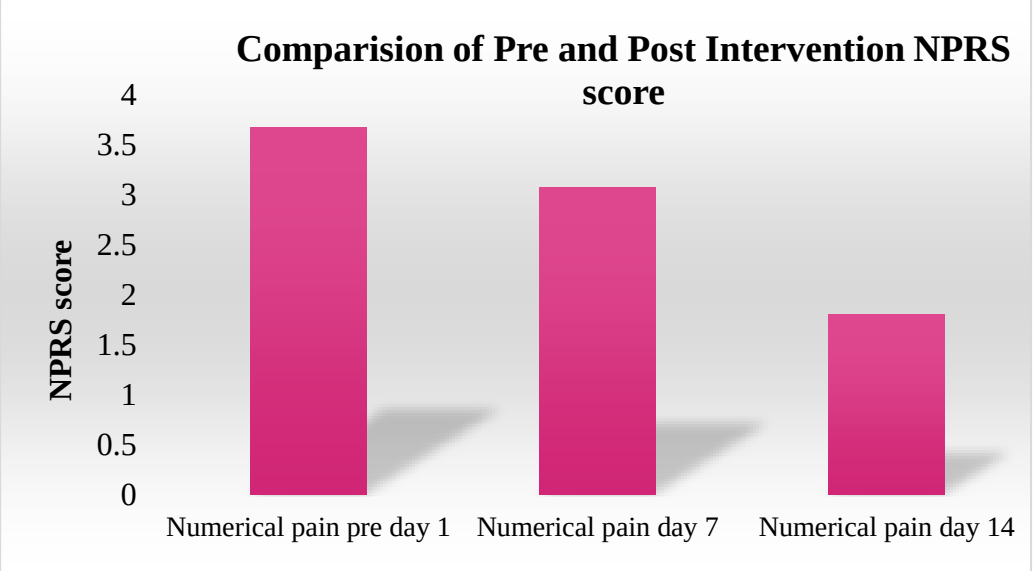
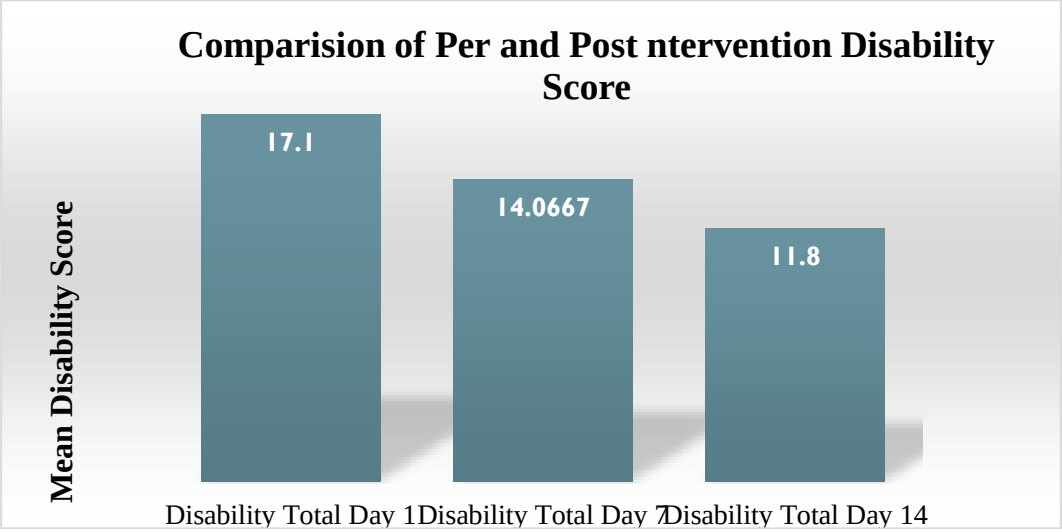


Figure 2. Reduction in Disability Scores across Intervention Period



3. DISCUSSION

This study demonstrated that acupressure significantly reduced both pain intensity and disability levels among ICU nurses suffering from LBP. The findings align with international evidence supporting acupressure [7,10] as a safe, non-invasive, and cost-effective method of pain management.

Movahedi et al. (2020) [1] reported similar outcomes in Iran, where acupressure improved quality of life and reduced chronic back pain among nurses. Suliman (2018) [5,9] highlighted the high prevalence of LBP among Jordanian nurses, emphasizing the urgent need for occupational health interventions. Our study extends this knowledge by showing that Sujok acupressure, specifically using seed therapy, can bring rapid and sustained improvement within 14 days.

The large effect sizes observed in our study suggest not only statistical but also clinical significance. Reduction in disability is particularly important, as functional impairment directly affects nursing performance and patient safety.

Unlike pharmacological treatments, acupressure carries no risk of side effects, making it a sustainable intervention. Moreover, it empowers nurses to practice self-care, improving both personal health and professional output.

4. CONCLUSION

Acupressure was found to be a highly effective complementary therapy for reducing pain and disability associated with LBP among ICU nurses. Given its simplicity, low cost, and absence of side effects, acupressure can be integrated into occupational health programs and training modules for nursing professionals.

Implications for Nursing Practice

- Hospitals should consider introducing acupressure training as part of staff wellness programs.
- Nurse managers can promote acupressure as a preventive and rehabilitative tool for musculoskeletal problems.
- Incorporating complementary therapies may reduce absenteeism, enhance productivity, and improve patient care quality.

Limitations

- Conducted in a single hospital, limiting generalizability.
- Self-reported pain measures may be subject to bias.
- Long-term sustainability of acupressure benefits was not assessed.
- Recommendations for Future Research
- Multi-center randomized controlled trials with larger sample sizes.
- Longitudinal studies assessing long-term effects of acupressure.
- Comparative studies between acupressure and other non-pharmacological interventions.

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