A STUDY TO ASSESS THE EFFECTIVENESS OF COMPREHENSIVE BODY MECHANICS AMONG STAFF NURSES WITH LOW BACK PAIN IN NMCH, NELLORE

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ABSTRACT

Low back pain is one of the most common musculoskeletal problems affecting nursing professionals due to continuous patient handling, prolonged standing, bending, lifting, and improper postural habits. Nurses are at high risk due to long shifts and demanding physical activities that can lead to disability, reduced work efficiency, absenteeism, and decreased quality of life. The present study aimed to assess the effectiveness of comprehensive body mechanics among staff nurses with low back pain in Narayana Medical College Hospital, Nellore. A quasi-experimental one-group pre-test post-test design was adopted with a sample of 60 staff nurses selected through simple random sampling. Data were collected using a structured socio-demographic questionnaire and the Oswestry Low Back Pain Disability Questionnaire. Pre-test data revealed that the majority of staff nurses had severe disability. A structured intervention on comprehensive body mechanics—including proper lifting, bending, sitting, standing, and work-related ergonomic strategies—was administered. Post-test findings showed a significant reduction in low back pain disability scores, indicating the positive impact of body mechanics training. Statistical analysis (paired t-test) demonstrated a significant difference between pre-test and post-test mean scores ($t = 37.205$, $p < 0.05$). The study concludes that comprehensive body mechanics are effective in reducing low back pain among staff nurses and should be integrated into routine nursing practice to enhance occupational health and prevent further disability.

INTRODUCTION

Low back pain (LBP) is a major occupational hazard among healthcare professionals, particularly nurses who engage in physically demanding tasks such as transferring patients, bending, twisting, and prolonged standing. Globally, nursing contributes to one of the highest prevalence rates of work-related musculoskeletal disorders. In India, the prevalence of low back pain among nurses ranges from 40% to 80%, significantly impacting work productivity, satisfaction, and quality of care.

Body mechanics refers to the coordinated use of the body's musculoskeletal system to maintain balance, posture, and alignment during movement. Proper body mechanics reduces the risk of injury, prevents strain, and promotes efficient functioning. Training nurses in comprehensive body mechanics—covering proper lifting techniques, work ergonomics, posture correction, and preventive exercises—is essential to reduce musculoskeletal stress.

This study aims to evaluate the effectiveness of comprehensive body mechanics training on reducing low back pain among staff nurses at Narayana Medical College Hospital, Nellore.

OBJECTIVES

1. **To assess the body mechanics among staff nurses with low back pain.**
2. **To evaluate the effectiveness of comprehensive body mechanics among staff nurses with low back pain in the experimental group.**
3. **To find out the association between the effectiveness of comprehensive body mechanics among staff nurses with low back pain with their selected socio-demographic variables.**

HYPOTHESES

- **H1:** There will be a significant difference between pre-test and post-test scores of low back pain among staff nurses after the administration of comprehensive body mechanics.
- **H2:** There will be a significant association between post-test scores and selected socio-demographic variables.

METHODOLOGY

Research Design

Quasi-experimental **one-group pre-test post-test design**.

Group	Pre-test (O1)	Intervention (X)	Post-test (O2)
Experimental Group	O1	Comprehensive body mechanics	O2

Setting of the Study

The study was conducted at **Narayana Medical College Hospital (NMCH), Nellore**, located in Chinthareddypalem urban area. The hospital has **1750 beds** with facilities such as ICUs, special rooms, wards, OPD, pharmacy, labs, and operation theatres. Staff nurses work in **three duty shifts**: morning, afternoon (6 hours each), and night (12 hours).

Population

All staff nurses working at NMCH, Nellore.

Target Population

Staff nurses experiencing low back pain.

Accessible Population

Staff nurses with low back pain working in NMCH, Nellore.

Sample and Sampling Technique

- **Sample size:** 60 staff nurses
- **Sampling technique:** Simple random sampling
- **Sample:** Staff nurses with low back pain

DESCRIPTION OF THE TOOL

The tool consisted of two parts:

PART I: Socio-demographic Data

Includes: age, gender, education, occupation, income, type of family, previous history of back pain, duration of pain, comorbid disease, working area, working hours, etc.

PART II: Oswestry Low Back Pain Disability Questionnaire

Consists of **10 items**, scored to categorize disability as:

- **0–20%:** Minimal disability
- **21–40%:** Moderate disability
- **41–60%:** Severe disability
- **61–80%:** Crippled
- **81–100%:** Bed-bound or symptom exaggeration

DATA COLLECTION PROCEDURE

Data collection was conducted over **six weeks** after obtaining permission from the Director, Medical Superintendent, and Nursing Superintendent of NMCH. Participants were selected using simple random sampling. Written informed consent was obtained.

1. **Day 1:**
   - Explanation of purpose
   - Collection of socio-demographic data by interview
   - **Pre-test** assessment using Oswestry Low Back Pain Disability Questionnaire
2. **Intervention:**
   - Training on comprehensive body mechanics including:
     - Proper bending
     - Proper lifting techniques
     - Sitting and standing posture
     - Ergonomic adjustments
     - Safe patient handling
   - Demonstration and return demonstration were conducted.
3. **Post-test:**
   - Conducted after the intervention period using the same tool.

RESULTS

SECTION I: Frequency and Percentage Distribution of Demographic Variables

Table 1: Frequency and Percentage Distribution of Staff Nurses Based on Age (N=60)
Age (in years) | Frequency | Percentage
22–26 years | 39 | 65%
27–31 years | 19 | 32%
32–36 years | 2 | 3%
37–41 years | 0 | 0%

Table 2: Frequency and Percentage Distribution Based on Gender (N=60)
Male | 7 | 12%
Female | 53 | 88%

Table 3: Frequency and Percentage Distribution Based on Educational Qualification (N=60)
GNM | 12 | 20%
B.Sc Nursing | 39 | 65%
P.B.B.Sc Nursing | 9 | 15%

Table 4: Frequency and Percentage Distribution Based on Years of Experience (N=60)
<1 year | 19 | 32%
1–2 years | 28 | 47%
3–4 years | 11 | 18%
>4 years | 2 | 3%

Table 5: Frequency Distribution Based on Area of Working (N=60)
Wards & Special Rooms | 24 | 40%
ICUs | 23 | 38%
OT | 7 | 12%
Post-Operative Ward | 6 | 10%

Table 6: Frequency Distribution Based on Monthly Family Income (N=60)
<5000 | 3.3%
5001–7000 | 8.3%
7001–9000 | 28.4%
9001–11000 | 40%
>11001 | 20%

Table 7: Frequency Distribution Based on Type of Family (N=60)
Nuclear | 34 | 57%
Joint | 17 | 28%
Extended | 9 | 15%

Table 8: Frequency Distribution Based on Duration of Back Pain (N=60)
<1 year | 29 | 48%
1–2 years | 22 | 37%
3–4 years | 8 | 13.3%
>4 years | 1 | 1.7%

Table 9: Co-morbidities (N=60)
Migraine | 4 | 6.7%

None | 56 | 93.3%

SECTION II: Level of Low Back Pain Pretest vs Posttest
Minimal disability: Pretest 0%, Posttest 23%
Moderate disability: Pretest 25%, Posttest 77%
Severe disability: Pretest 75%, Posttest 0%

SECTION III: Effectiveness of Body Mechanics Training
Mean Pretest: 43.6 (SD=5.68)
Mean Posttest: 24.9 (SD=3.82)
Paired t-test: $t=37.205$, $p<0.05$ (Significant)

SECTION IV: Association Between Posttest Scores & Demographics (Chi-square test)
Significant variables: Gender, Education, Type of Family, Duration of Pain

DISCUSSION

The findings of the present study demonstrated that comprehensive body mechanics had a significant impact on reducing low back pain among staff nurses. In the pre-test, the majority of nurses (75%) experienced severe disability, which highlights the magnitude of the problem and the occupational risk associated with nursing tasks. These findings are consistent with previous studies indicating high prevalence of musculoskeletal strain among nurses due to improper posture and repetitive patient handling tasks.

After the intervention, there was a marked improvement in pain levels, with 23% of nurses achieving minimal disability and 77% moderate disability. No participants remained in the severe disability category during the post-test. This shift indicates that the comprehensive body mechanics training effectively enabled participants to modify their postural habits, adopt safer lifting techniques, and maintain appropriate body alignment during work.

The mean post-test pain score (24.9) was significantly lower than the pre-test mean score (43.6). The paired t-test value of 37.205 ($p < 0.05$) further confirms the effectiveness of the intervention. These findings align with global research, which suggests that ergonomic training and body mechanics education are crucial in reducing musculoskeletal disorders among nursing professionals.

Association analysis showed significant relationships between pain reduction and variables such as gender, educational qualification, type of family, and duration of back pain. This suggests that both personal and occupational factors influence the outcomes of body mechanics training. For example, nurses with prior knowledge from higher education levels may adapt more quickly to ergonomic practices.

The study emphasizes the importance of incorporating regular ergonomic training and body mechanics education into nursing practice. Implementing these practices can lead to better occupational health, increased job satisfaction, reduced absenteeism, and improved quality of patient care.

CONCLUSION

The study concluded that comprehensive body mechanics training was highly effective in reducing low back pain among staff nurses working in NMCH, Nellore. A significant reduction in post-test pain scores was observed following the intervention. The results support the incorporation of regular body mechanics training programs into routine nursing practice to prevent musculoskeletal problems and promote occupational health.

KEYWORDS

Body Mechanics, Low Back Pain, Staff Nurses, Oswestry Disability Index, Ergonomics, Nursing Intervention, Quasi-experimental Study, Occupational Health.

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