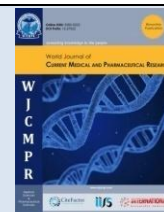




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A STUDY TO ASSESS THE EFFECT OF CAT-CAMEL STRETCH EXERCISE ON REDUCING THE LEVEL OF BACKPAIN AMONG FACTORY WORKERS IN SELECTED INDUSTRY AT KANPUR, UTTAR PRADESH

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ARTICLE HISTORY	ABSTRACT
Received on: 19-08-2026 Revised on: 22-09-2026 Accepted on: 13-10-2026 Keywords: Cat-Camel exercise; back pain; factory workers; occupational health; stretching exercise; nursing research. Corresponding Author Dr. Anjali Shukla	Back pain is one of the most common musculoskeletal problems among factory workers due to prolonged standing, heavy lifting, and repetitive physical activities. It negatively affects physical health, work performance, and overall quality of life. The present study was conducted to assess the effect of Cat-Camel stretch exercise on reducing the level of back pain among factory workers in a selected industry at Kanpur, Uttar Pradesh. A quantitative research approach with a true experimental pre-test and post-test only design was adopted for the study. The study was conducted at Star Footwear, Kidwai Nagar, Kanpur. A total of 60 factory workers with back pain were selected using a non-probability purposive sampling technique. Data were collected using a structured demographic proforma and Likert scale to assess the level of back pain. The demographic findings revealed that the majority of participants were in the age group of 41–50 years (40%). Most of them were engaged in prolonged standing work (51.67%), and 56.67% worked for 8–10 hours per day. Nearly 46.67% had less than 5 years of work experience, and 61.67% did not practice regular physical exercise. In terms of duration of back pain, 51.67% of participants reported experiencing pain for less than 6 months. The Cat-Camel stretch exercise was administered to the participants for a period of 7 days. The comparison between pre-test and post-test findings showed a reduction in the level of back pain among factory workers after the intervention, indicating the effectiveness of the exercise. The study concluded that Cat-Camel stretch exercise is a simple, safe, and cost-effective intervention that can significantly reduce back pain among factory workers. It can be easily incorporated into daily routines and workplace health programs to promote better physical health and productivity. Keywords: Back pain, Cat-Camel stretch exercise, factory workers, exercise therapy, true

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INTRODUCTION

Health is an essential component of human well-being and productivity. The World Health Organization (WHO) defines health as a state of complete physical, mental, and social wellbeing and not merely the absence of disease. Maintaining good physical health is particularly important for individuals engaged in physically demanding occupations such as factory work. Workers who experience physical discomfort or musculoskeletal disorders may face difficulty performing their daily tasks effectively. Musculoskeletal disorders are among the most common occupational health problems affecting workers worldwide. These disorders include conditions such as muscle strain, joint pain, and back pain, which often develop due to repetitive movements, heavy lifting, and prolonged physical effort.

According to global estimates, nearly 1.71 billion people suffer from musculoskeletal disorders, making them a major cause of disability and reduced quality of life [1].

Low back pain is one of the most frequently reported musculoskeletal problems across all age groups. It is estimated that about 70–80% of adults experience low back pain at some point in their lives. The condition can occur due to muscle strain, ligament injury, intervertebral disc problems, or poor posture. In many cases, low back pain can limit mobility and interfere with an individual's ability to perform routine activities. Low back pain has become a significant public health concern due to its increasing prevalence [2].

Back pain is an important occupational health concern that can interfere with comfort, mobility, productivity, and

quality of life. Factory workers be exposed to physical demands such as prolonged standing, heavy lifting, repetitive movements, and extended working hours, all of which can contribute to musculoskeletal discomfort. Exercise-based approaches are attractive in occupational settings because they can be inexpensive, require little equipment, and may be incorporated into routine worker-health activities. The Cat-Camel movement is a simple spinal mobility exercise involving controlled flexion and extension of the spine. The present study examined whether a short, supervised program of Cat-Camel stretching was associated with a reduction in back-pain scores among factory workers in Kanpur [3].

NEED OF THE STUDY

Low back pain is one of the most common musculoskeletal disorders affecting the working population worldwide. According to the World Health Organization, nearly 60–70% of adults experience low back pain at least once in their lifetime, and it is a leading cause of disability and work absenteeism. Industrial and factory workers are particularly vulnerable because of prolonged standing, repetitive movements, lifting heavy materials, and poor ergonomic conditions. These occupational factors significantly increase the risk of developing chronic back pain among workers [4].

Industrial workers represent a major workforce in developing countries like India, where occupational health hazards are common. Studies indicate that approximately 45–65% of factory workers report experiencing back pain during their working life. Continuous bending, twisting of the spine, and lifting heavy loads create excessive strain on spinal muscles and ligaments, leading to discomfort and reduced productivity. Therefore, prevention and management of back pain among factory workers is an important public health concern [5].

Low back pain not only affects the physical health of workers but also has a significant economic impact. Globally, musculoskeletal disorders account for nearly 30% of all occupational injuries, and low back pain alone contributes to over 149 million lost working days annually. This leads to reduced work efficiency, increased medical expenses, and decreased quality of life among workers. Addressing back pain through simple and cost-effective interventions can help improve both worker health and productivity [6].

PROBLEM STATEMENT

A study to assess the effect of cat-camel stretch exercise on reducing the level of back pain among factory workers in selected industry Kanpur, Uttar Pradesh.

OBJECTIVES

- To assess the level of back pain among factory workers before the Cat-Camel stretch exercise intervention.
- To administer Cat-Camel stretch exercise to factory workers for 7 days.
- To assess the level of back pain among factory workers after the intervention.
- To compare pre-test and post-test back-pain scores.

Hypothesis: “A hypothesis is a tentative prediction or explanation of the relationship between the variables.”.

- H1 There is a considerable decrease in the degree of back pain among factory workers after the administration of Cat-Camel stretch exercise.

- H0 There is not a significant relationship between the degree of back pain and the selected socio-demographic characteristics of factory workers.

Research Approach

- The present study adopted a quantitative research approach. This approach was considered appropriate
- as the study aimed to objectively evaluate the effect of the Cat-Camel stretch exercise on the level of
- back pain among factory workers using Likert scale measured before and after the intervention.

Research Design

A True-experimental pre-test post-test only design was used. In this design, the level of back pain among factory workers were assessed prior to the administration of the Cat-Camel stretch exercise (pre-test) and again, after the intervention (post-test) to determine its effectiveness.

VARIABLES OF THE STUDY

Independent Variable: Cat-Camel stretch exercise

Dependent Variable: Level of back pain among, factory workers

Setting Of The Study

- The study was conducted in a Star Footwear, 133/212 Kidwai Nagar, Kanpur, Uttar Pradesh. The setting
- was chosen because a large number of workers were involved in prolonged standing, bending, repetitive
- movements, and manual labor, all of which increase the risk of developing back pain.

Population

- The population of the study consisted of factory workers employed in the selected industry in Kanpur,
- Uttar Pradesh, who were experiencing back pain.

Target Population

- All factory workers suffering from mild, moderate and severe back pain.

Accessible Population

- Factory workers with back pain who were available during the data collection period and willing to participate in the study.

Sample

- The sample included factory workers who met the inclusion criteria and were selected from the chosen industry.

Sample Size

- The sample size for the present study was 60 factory workers.

Sampling Technique

- A non-probability purposive sampling technique was adopted, as it allowed the investigator to select
- participants who met the specific criteria required for the study.

Sampling Criteria

Inclusion Criteria

Factory workers who were:

- Experiencing mild to moderate back pain.
- Aged between 20 and 50 years. Working for at least 6 hours per day.
- Willing to participate in the study.
- Available during the data collection period.

Exclusion Criteria

Factory workers who were:

- Suffering from severe spinal disorder or trauma.

- Diagnosed with slipped disc or having a history of spinal surgery.
- Having neurological deficits.
- Under medical treatment for severe musculoskeletal disorders

TOOL FOR DATA COLLECTION

The data collection tool consisted of two sections:

- **Section A:** Demographic Variables Included age, among the 60 participants, the majority 24 (40%) belonged to the age group of 41-50 years. About 22 (36.67%) workers were in the age group of 31-40 years. A smaller proportion, 10 (16.67%), belonged to the age group of 20-30 years, while only 4 (6.66%) workers were above 50 years of age. This indicates that most of the factory workers participating in the study were middle-aged.)

SECTION B

- Likert Scale A standardized Likert Scale ranging from 0 to 5 was used to assess the level of back pain. the chi-square test. The findings revealed that the calculated chi-square values for some variables were statistically significant at the 0.05 level. Hence, the research hypothesis (H₁) was accepted. The null hypothesis (H₀) was accepted indicating there is no significant association between pre-test level of back pain and selected socio-demographic variables.

RESULTS AND DISCUSSION

Table 01: Frequency and Percentage Distribution of Factory Workers According to Their Pre-Test and Post-Test Levels of Back Pain

S. No.	Level of back pain	Pre-test (f)	Pre-test (%)	Post-test (f)	Post-test (%)
1	Mild (10–20)	0	0%	4	6.67%
2	Moderate (21–35)	3	5%	37	61.67%
3	Severe (36–50)	57	95%	19	31.67%
	Total	60	100%	60	100%

Note: The post-test frequency for moderate back pain is 37 out of 60, which corresponds to 61.67%, not 66.67%.

Table 02: Comparison of Pre-Test and Post-Test Mean Scores, Mean Percentages, and Standard Deviations of Back Pain Among Factory Workers

S. No.	Test	Mean	Mean difference	Mean percentage	Standard deviation (SD)
1	Pre-test	41.07	12.75	68.45%	3.29
2	Post-test	28.32	—	47.20%	8.32

Table 03: Effectiveness of Cat-Camel Stretch Exercises in Reducing Back Pain Among Factory Workers

S. No.	Test	Mean	Mean difference	SD	Calculated t-value	Table value
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Pr e- test	41.07	12.75	3.013	11.81	1.98 at the 0.05 level of significance
Post-test	28.32	—	7.844	—	—

Note: Please verify the standard deviations and calculated t-value against the original data before final submission.

Interpretation of the Findings

Among the 60 factory workers, back-pain scores decreased following a seven-day programme of Cat-Camel stretching exercises. The mean back-pain score decreased from 41.07 in the pre-test to 28.32 in the post-test, with a mean difference of 12.75. The percentage of participants classified as having severe back pain decreased from 95% in the pre-test to 31.67% in the post-test. These findings suggest that Cat-Camel stretching exercises may help reduce back pain among factory workers. However, the results should be interpreted cautiously, and the statistical findings should be verified using the original participant-level data before publication.

Section E: Association between Pre-Test Back-Pain Scores and Selected Demographic Variables

The association between pre-test back-pain scores and selected demographic variables was analysed using the chi-square test. The findings indicated that the calculated chi-square values for some demographic variables were statistically significant at the 0.05 level of significance. For variables with statistically significant associations, the null hypothesis (H₀) was rejected and the research hypothesis (H₁) was accepted. For variables without statistically significant associations, the null hypothesis (H₀) was retained. Therefore, the association between pre-test back-pain scores and demographic variables should be interpreted separately for each variable based on its calculated chi-square value and corresponding level of significance.

CONCLUSION

In the pre-test assessment of back pain among 60 factory workers, the majority of participants 57 (95%) experienced severe back pain, while 3 (5%) had moderate pain and none had mild pain. In the post-test assessment, a considerable improvement was observed. Out of 60 participants, 19 (31.67%) had severe pain, 37 (61.67%) had moderate pain, and 4 (6.67%) had mild pain. This clearly indicates a reduction in the level of back pain after the intervention.

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AUTHOR CONTRIBUTION

All Authors are Contributed Equally.

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