

# Prevalence of Non-Specific Low Back Pain among Nursing Staff Working At Multispeciality Hospitals in Kolhapur City

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**Abstract:- Background:** Non-specific low back pain (NSLBP) is a prevalent and debilitating condition worldwide, particularly among individuals engaged in occupations that involve prolonged periods of standing, lifting, and repetitive movements. Among healthcare professionals, nurses represent a high-risk group for NSLBP due to the physically demanding nature of their work, which often involves lifting patients, transferring them between beds and wheelchairs, and long hours of standing. Multi specialty hospitals in urban settings like Kolhapur City typically have a high volume of patients and demanding work environments, further exacerbating the risk of NSLBP among nursing staff. **Result:** In a study involving 250 nursing staff who work experience for more than 5 yrs., 41.60% (104 participants) exhibited positive low back pain, while 48.40% (146 participants) had normal scores on VAS Scale, modified Oswestry Questionnaire. Participants with low back pain. Most participants (146) were aged between 30-40 years, with a mean age of 34.32 ( $\pm 3.36$ ) years. Interestingly, a higher prevalence of low back pain was observed in participants have work experience of more than 5 years

**Conclusion:** This study underscores the susceptibility of low back pain in nursing staff who have work exp. Of more than 5 yrs., indicating a heightened risk of muscle spasm. Low back pain, adversely affects individuals' quality of life and work performance. It stresses the necessity for spine surgeons, physiotherapists, and physical trainers to promote awareness regarding biomechanical principles, proper weightlifting techniques, and execution to prevent future physical injuries.

**Keywords:** low back pain, Pain, musculoskeletal Disorder, VAS scale.

## INTRODUCTION

Non-specific low back pain (NSLBP) is a prevalent and debilitating musculoskeletal disorder that affects

individuals across various professions and age groups, with notable implications for occupational health and well-being. Among healthcare professionals, nurses constitute a high-risk group for NSLBP due to the physically demanding nature of their work. This introductory chapter sets the stage for understanding the significance of NSLBP among nursing staff working in multi specialty hospitals in Kolhapur City, India.

The chapter begins by providing an overview of NSLBP, its prevalence, and its impact on healthcare professionals globally. It highlights the unique challenges faced by nurses, such as patient handling and long hours of standing, which contribute to their increased vulnerability to NSLBP. The urban setting of Kolhapur City and the characteristics of multi specialty hospitals in this context are discussed to frame the study's focus.

Clear objectives are outlined to guide the research process. These objectives include determining the prevalence of NSLBP among nursing staff, identifying associated risk factors, exploring the impact of NSLBP on nursing professionals, and proposing interventions to mitigate the burden of NSLBP in the workplace.

This section outlines the rationale behind conducting research on NSLBP among nursing staff working in multi specialty hospital in Kolhapur city. It emphasizes the gap in the existing literature regarding this specific occupational group and the need to address NSLBP comprehensively to improve the well-being of healthcare workers.

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The chapter delineates the scope of the study, including the target population (nursing staff in multi-specialty hospitals) and geographical focus (Kolhapur City). It also acknowledges potential limitations, such as the cross-sectional nature of the study and the reliance on self-reported data.

This section discusses the potential contributions of the research to both academia and practice. It highlights the importance of understanding NSLBP among nursing staff for occupational health promotion, injury prevention, and the enhancement of healthcare delivery in multi-specialty hospital settings.

Finally, an outline of the subsequent chapters is provided, delineating how each chapter contributes to achieving the stated objectives and addressing the research questions. Through this comprehensive introduction, the reader gains a clear understanding of the rationale, objectives, scope, and significance of the study on NSLBP among nursing staff in multi-specialty hospitals in Kolhapur City.

Non-specific low back pain (NSLBP) is a complex and multifactorial condition characterized by pain and discomfort in the lower back region without a specific identifiable cause. While NSLBP can result from various factors, including muscle strains, ligament sprains, disc degeneration, and poor posture, its precise anatomical origins are often elusive. However, several anatomical structures within the lumbar region are commonly implicated in NSLBP.

The lumbar spine, consisting of five vertebrae (L1-L5), forms the lower portion of the vertebral column. Intervertebral discs located between the vertebrae provide cushioning and support, but degeneration or injury to these discs can contribute to NSLBP.

Intervertebral discs are fibrocartilaginous structures that act as shock absorbers between adjacent vertebrae. Degenerative changes, such as disc herniation or disc bulge, can impinge on nearby nerves and cause pain and inflammation, contributing

to NSLBP.

Facet joints, also known as zygapophyseal joints, are paired joints located at the back of each vertebra, facilitating spinal movement and stability. Facet joint osteoarthritis, inflammation, or degeneration can result in localized back pain, commonly observed in NSLBP.

Various muscles and ligaments provide support and stability to the lumbar spine. Muscle strains or ligament sprains due to overuse, sudden movements, or poor ergonomics can lead to NSLBP.

The lumbar spine houses nerve roots that exit the spinal cord and travel through small openings between the vertebrae. Compression or irritation of these nerve roots, known as radiculopathy, can cause radiating pain, numbness, or weakness in the lower back and legs, often associated with NSLBP.

The pelvis, including the sacrum and iliac bones, forms the foundation of the spine and plays a role in weight-bearing and movement. Dysfunction or inflammation of the sacroiliac joints, where the sacrum meets the ilium, can contribute to NSLBP.

Understanding the anatomical structures involved in NSLBP is essential for diagnosing and managing the condition effectively. However, it's important to note that NSLBP is often influenced by various biomechanical, psychosocial, and lifestyle factors, making its management multidimensional and individualized. A comprehensive approach that addresses both anatomical and non-anatomical factors is necessary for the effective treatment and prevention of NSLBP. Non-specific low back pain (NSLBP) is a prevalent occupational health issue among nursing staff, stemming from the demanding physical tasks and ergonomic challenges inherent in their profession. Biomechanical factors play a significant role in the development and exacerbation of NSLBP among nursing staff, influencing spinal loading, muscle activation patterns, and spinal stability. This section explores the biomechanical mechanisms underlying NSLBP among nursing staff and identifies ergonomic risk factors associated with the condition.

Nursing staff frequently engage in tasks that involve manual patient handling, lifting, transferring, and repositioning, placing significant loads on the lumbar spine. Prolonged periods of standing and walking, coupled with awkward postures during patient care

activities, further contribute to spinal loading and postural stress. The repetitive nature of these tasks and inadequate recovery periods increases the risk of tissue fatigue, micro trauma, and cumulative stress on spinal structures, predisposing nursing staff to NSLBP.

Improper lifting and handling techniques are common ergonomic risk factors for NSLBP among nursing staff. Techniques such as bending at the waist, twisting the spine, and lifting with the back instead of the legs can lead to excessive spinal flexion, shear, and compression forces, increasing the risk of musculoskeletal injury and NSLBP. Inadequate training in safe patient handling practices and the absence of mechanical lifting aids exacerbate the biomechanical strain on nursing staff, contributing to the prevalence of NSLBP in this population.

Core muscle strength and stability are essential for maintaining proper spinal alignment, distributing loads evenly across spinal segments, and resisting external forces during physical tasks. Weakness or imbalances in the core musculature, including the transverse abdominis, multifidus, and pelvic floor muscles, compromise spinal stability and increase the risk of NSLBP among nursing staff. Poor core muscle endurance and control exacerbate biomechanical stress on the lumbar spine during repetitive movements and lifting tasks, leading to muscle fatigue, compensatory movements, and increased susceptibility to injury.

Ergonomic factors in the work environment significantly influence the biomechanics of NSLBP among nursing staff. Suboptimal workstation design, improper equipment layout, and inadequate ergonomic support contributes to poor posture, awkward body mechanics, and increased biomechanical stress on the spine. Factors such as excessive reaching, bending, and twisting motions, coupled with prolonged static postures, exacerbate spinal loading and musculoskeletal strain, predisposing nursing staff to NSLBP. Addressing ergonomic risk factors through workplace modifications, ergonomic training, and the provision of ergonomic equipment can mitigate the biomechanical burden on nursing staff and reduce the incidence of NSLBP.

In response to NSLBP and musculoskeletal discomfort, nursing staff may adopt compensatory

biomechanical strategies to alleviate pain and maintain task performance. These adaptations may include alterations in movement patterns, changes in posture, and shifts in weight distribution to offload painful structures. While these compensatory mechanisms may provide temporary relief, they can lead to maladaptive movement patterns, muscle imbalances, and further biomechanical stress on the spine, perpetuating the cycle of NSLBP. Identifying and addressing maladaptive biomechanical adaptations through ergonomic interventions and rehabilitative strategies is essential for preventing chronicity and recurrence of NSLBP among nursing staff.

Non-specific low back pain (NSLBP) involves a complex interplay of physiological processes within the musculoskeletal, nervous, and sensory systems. While the exact physiological mechanisms underlying NSLBP are not fully understood, several factors contribute to the development and persistence of pain in the lower back region.

This section explores the physiology of NSLBP across various physiological systems, including nociception, musculoskeletal function, neurophysiology, and psychosocial factors. Nociception refers to the physiological process of detecting and transmitting pain signals from peripheral tissues to the central nervous system (CNS). In NSLBP, nociceptive pathways are activated by tissue damage, inflammation, or mechanical strain in structures such as muscles, ligaments, intervertebral discs, and facet joints. Peripheral nociceptors transmit pain signals via A-delta and C-fibers to the dorsal horn of the spinal cord, where they synapse with second-order neurons. From there, pain signals are relayed to higher brain centers via ascending pathways, leading to the perception of pain in the lower back region.

Musculoskeletal factors play a significant role in the development of NSLBP. Dysfunction in the muscles, ligaments, and joints of the lumbar spine can lead to altered biomechanics, increased stress on surrounding tissues, and the generation of pain signals. Imbalances in muscle strength, flexibility, and coordination can result in excessive loading on certain structures, contributing to tissue damage and pain. Additionally, poor posture, repetitive movements, and occupational hazards can further exacerbate musculoskeletal dysfunction and NSLBP.

Neuroplastic changes within the central nervous system (CNS) contribute to the sensitization and amplification of pain in NSLBP. Persistent nociceptive input from peripheral tissues can lead to neuronal hyper excitability, altered pain processing, and changes in neural connectivity within the CNS. This phenomenon, known as central sensitization, results in an increased perception of pain, lowered pain thresholds, and the spread of pain beyond the initial site of injury. Central sensitization is thought to play a crucial role in the chronicity and recurrence of NSLBP. Psychological and social factors exert a profound influence on the experience and management of NSLBP. Psychosocial factors such as stress, anxiety, depression, fear avoidance beliefs, and catastrophizing can modulate pain perception, exacerbate disability, and hinder recovery in individuals with NSLBP. Maladaptive coping strategies, negative attitudes towards pain, and perceived social support also influence the course and outcome of NSLBP. The biopsychosocial model of pain emphasizes the interaction between biological, psychological, and social factors in shaping the experience of NSLBP and highlights the importance of addressing psychosocial factors in its management.

Inflammation plays a dual role in NSLBP, both as a protective response to tissue injury and as a contributor to pain and dysfunction. Inflammatory mediators released in response to tissue damage, such as cytokines, prostaglandins, and bradykinin, sensitize nociceptors, increase vascular permeability, and promote the recruitment of immune cells to the affected site. While acute inflammation is necessary for tissue healing and repair, chronic inflammation can perpetuate pain and tissue damage in NSLBP. Dysregulation of inflammatory pathways, impaired tissue healing, and the persistence of inflammatory mediators contribute to the chronicity and recurrence of NSLBP.

The nervous system exhibits remarkable plasticity and adaptive capabilities in response to injury, pain, and environmental stimuli. Neuroplastic changes occur in both peripheral and central nervous system structures in individuals with NSLBP, leading to alterations in pain processing, motor control, and sensory perception. These neuroplastic changes can manifest as sensitization of peripheral nociceptors, reorganization of cortical maps, and adaptive changes in muscle recruitment patterns. Understanding the neuroplasticity of pain in NSLBP is crucial for

developing targeted interventions to modulate pain perception, restore function, and promote recovery. Biomechanical factors influence the distribution of mechanical load within the lumbar spine and contribute to the development of NSLBP. Altered spinal biomechanics, such as excessive lumbar lordosis, reduced intervertebral disc height, and increased spinal curvature, can lead to abnormal loading on spinal structures and tissues, resulting in tissue damage and pain. Biomechanical factors interact with musculoskeletal and neuromuscular function to determine spinal stability, movement patterns, and susceptibility to injury in individuals with NSLBP.

Genetic factors may predispose individuals to NSLBP by influencing pain sensitivity, tissue resilience, and susceptibility to musculoskeletal disorders. Variations in genes encoding for inflammatory cytokines, neurotransmitter receptors, and structural proteins have been implicated in the pathogenesis of NSLBP. Environmental factors such as occupational hazards, physical activity levels, ergonomic factors, and lifestyle habits also contribute to the development and exacerbation of NSLBP by influencing biomechanical, physiological, and psychosocial factors.

In summary, the physiology of NSLBP involves a complex interplay of nociceptive, musculoskeletal, neurophysiological, inflammatory, psychosocial, and biomechanical factors. Understanding the physiological mechanisms underlying NSLBP is essential for developing comprehensive and targeted interventions to alleviate pain, restore function, and improve the quality of life for individuals affected by this debilitating condition.

## METHODOLOGY

Study Duration: 6 Months

Method of research: Prospective

Type of study: Observational study

Study design: Cross-sectional prevalence study

Sample size: 104

Selection criteria:

Inclusion criteria:

1. Male and female nursing staff working in multi specialty hospitals in Kolhapur.
2. Age between 30- 45 yrs.
3. Working experience of more than 5 yrs.

Exclusion criteria:

1. History of Spinal fracture
2. Spinal trauma
3. Spinal or abdominal surgeries
4. Neurological deficit.
5. Spinal stenosis
6. Inflammatory spinal condition
7. Arthritic condition

### PROCEDURE

This study was an observational study with selection of nursing staff with LBP Inclusion and exclusion criteria were considered.

The study protocol was presented for approval in front of institutional ethical committee and protocol committee of D. Y. Patil Education Society, deemed to be university Kolhapur and

D.Y. Patil College of Physiotherapy, Kolhapur and Ethical approval was granted by the committee. Written consent is taken from Subjects willing to participate.

Incidence of LBP is a prevalent study which is performed nursing staff in and around construction sites in Kolhapur city.

The observational study titled “prevalence of nonspecific low back pain among nursing staff working at multi specialty hospitals in Kolhapur city” was conducted in the Kolhapur region. Potential subjects were approached and provided with an explanation of the study's purpose. Written consent was obtained from those willing to participate.

Participants for the study were recruited from several construction sites across the Kolhapur region. They underwent assessments using VAS scale and modified Oswestry questionnaire.

The study focused nursing staff including both female and male individuals aged between 30 and 45 years, who had been actively engaged in work for a minimum of 3 years. These participants reported experiencing LBP that began after their initiation of activities. Eligible subjects meeting these criteria were invited to participate in the study.

The study excluded staff who had recently spine surgery or recent fracture, this exclusion criteria aimed to focus specifically on nursing staff without prior significant Spine related conditions.

The nature of the study was explained to interested subjects, and written consent was obtained from all participants. Demographic data including name, age, and gender were collected using a standardized data collection sheet.

VAS scale and modified Oswestry questionnaire were recorded on a data collection sheet for all 104 participants. Subsequently, a master chart was prepared, containing participant numbers, age, VAS on rest, VAS on movement, MODQ score.

The statistical analysis utilized appropriate biostatistical tools and was conducted using the master chart data. This analysis aimed to calculate prevalence of nonspecific low back pain among nursing staff working at multi specialty hospitals in Kolhapur city.

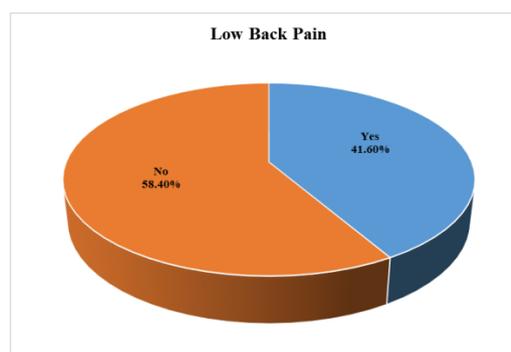
The results were presented graphically for clarity. The study also calculated the average no. of participants affected by LBP.

Finally, study declared the results, discussion and conclusion.

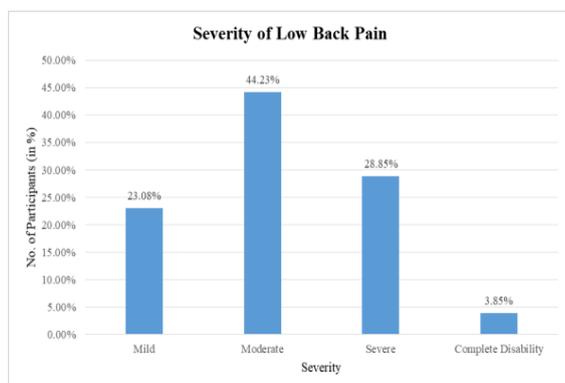
### RESULTS

Variable	Mean	SD
Age	34.32	4.93
Work Experience	7.30	2.17
VAS On Rest	0.96	0.80
VAS On Activity	6.54	0.86
MODQ Score	20.53	8.18
MODQ (%)	0.42	0.15

Low back Pain	No. of Participants	Percentage
Yes	104	41.60%
No	146	58.40%
Total	250	100%



Severity	No. of Participants	Percentage
Mild	24	23.08%
Moderate	46	44.23%
Severe	30	28.85%
Complete Disability	4	3.85%
Total	104	100%



## DISCUSSION

Start by summarizing the prevalence of NSLBP globally and in healthcare settings. Discuss its impact on healthcare workers, particularly nurses, given their physically demanding work. Review existing literature on NSLBP among nursing staff, focusing on studies conducted in hospital settings and any specific findings related to prevalence, risk factors, and impact. Reflect on the methodology used in your study, including sample size, data collection methods, and any limitations. Discuss how these factors may have influenced the findings and compare them to similar studies. Present the prevalence rate of NSLBP among nursing staff in multi specialty hospitals in Kolhapur city as found in your study. Compare these findings with other studies to contextualize the results. Discuss the risk factors identified in your study that contribute to NSLBP among nursing staff, such as heavy lifting, prolonged standing, or inadequate ergonomics. Explore how these factors align with previous research. Address the implications of NSLBP on nursing staff, including decreased productivity, increased absenteeism, and potential impact on patient care quality. Discuss strategies for mitigating these effects. Propose interventions or changes in hospital policies and practices to reduce the prevalence of NSLBP among nursing staff. This could include ergonomic training, workplace modifications, or wellness programs. Acknowledge any limitations of your study, such as

potential biases, sample representativeness, or data collection challenges. Discuss how these limitations may have influenced the findings and suggest areas for future research. Summarize the key findings of your study, reiterate the importance of addressing NSLBP among nursing staff, and emphasize the need for further research and intervention in hospital settings to promote the health and well-being of healthcare workers. This structure should provide a comprehensive discussion of your thesis topic, integrating your study's findings with existing literature and offering insights for future research and practical implications. Begin by providing a thorough overview of NSLBP, defining it as pain localized below the costal margin and above the inferior gluteal folds, not associated with known pathology. Discuss the global burden of NSLBP, citing statistics from reputable sources like the World Health Organization (WHO) or relevant medical journals. Highlight the significance of studying NSLBP among nursing staff, considering their pivotal role in healthcare delivery and the physical demands of their profession. Conduct a comprehensive review of literature on NSLBP among nursing staff, emphasizing studies conducted in hospital settings. Summarize key findings regarding prevalence rates, risk factors (e.g., lifting patients, poor ergonomics), and impacts on nursing staff's well-being and work performance. Identify any gaps or inconsistencies in the existing literature that your study aims to address. Provide a detailed description of the methodology employed in your study, including the study design, recruitment process, inclusion/exclusion criteria, and data collection methods (e.g., surveys, interviews, medical records review). Discuss any challenges encountered during data collection and strategies implemented to address them. Acknowledge potential limitations of your study design and how they may have influenced the findings. Present the prevalence rate of NSLBP among nursing staff in multi specialty hospitals in Kolhapur city based on your study's data analysis. Provide demographic breakdowns (e.g., age, gender, years of experience) and any notable variations in prevalence rates among different groups. Compare your findings with prevalence rates reported in similar studies to assess consistency and variability across different populations and settings. Identify and discuss the primary risk factors associated with NSLBP among nursing staff based on your study's findings. Explore how factors such as heavy lifting, prolonged standing, awkward postures, and psychosocial

stressors contribute to the development of NSLBP. Consider the interplay between individual factors (e.g., age, fitness level) and occupational factors (e.g., workload, workplace design) in influencing NSLBP risk.

### CONCLUSION

This study underscores the susceptibility of low back pain in nursing staff who have work exp. Of more than 5 yrs., indicating a heightened risk of muscle spasm. Low back pain, adversely affects individuals' quality of life and work performance. It stresses the necessity for spine surgeons, physiotherapists, and physical trainers to promote awareness regarding biomechanical principles, proper weightlifting techniques, and execution to prevent future physical injuries. Keywords: low back pain, VAS scale, Pain, musculoskeletal Disorder.

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