**ASSESSMENT OF THE INCIDENCE OF LBP AMONG NURSES WORKING AT LEVEL 5 HOSPITALS IN KIAMBU COUNTRY**

# Abstract

Pain serves as an unconscious warning to prevent injury, and LBP (low back pain) is a common issue occurring below the 12th rib and above the gluteal folds. The Global Burden of Disease (GBD) 2019 report identified LBP as a major musculoskeletal condition, accounting for 7.4% of years lived with disability. Despite its preventability, nurses continue to experience LBP, sometimes progressing to chronic stages. This study informs policies emphasizing prevention. A descriptive analytical cross-sectional design was used, involving nurses from accident/emergency, ICU, obstetrics/gynecology, medical/surgical, outpatient, pediatrics, renal units, and operating theatres. Participants were selected based on willingness and inclusion criteria. Data was collected via self-administered questionnaires and analyzed using SPSS version 25. Descriptive statistics (frequencies, proportions, percentages) were used, with a p-value of ≤0.05 considered significant. Associations were examined using the Chi-square test. Ethical approvals were obtained from Mount Kenya University Ethics and Research Committee, Kiambu County research and training committee, NACOSTI, and participating hospitals. Informed consent was obtained before questionnaire administration. Findings showed a statistical significance level (Sig.) of .000 for all test items, indicating a meaningful association between assessed factors and LBP incidence among nurses. The study highlights the multifaceted nature of LBP causes, stressing the need for policy implementation, resource allocation, and support systems in healthcare. Strategies should address heavy workloads, particularly patient handling, by ensuring adequate staffing and training in safe lifting. Additionally, developing individual health and fitness plans through education on lifting techniques, regular breaks, and wellness programs is crucial in mitigating LBP among nurses.

Keywords: Low back pain, co-morbidity, nurses, lumbrosacral pain

# 1.0 Introduction

## 1.1 Background of the Study

Pain is the body's unconscious reaction meant to protect the injured area and stop further damage from happening (Rezaee & Ghasemi, 2014). It is by its very nature subjective, experienced and explained differently by every single person. Lumbrosacral pain, another name for LBP (LBP), usually appears above the gluteal folds and below the 12th rib. The 2019 Global Burden of Disease (GBD) study emphasizes that LBP is a major musculoskeletal ailment that accounts for 7.4% of years lived with disability, highlighting its influence on the health of the world (GBD, 2019).

Nursing is the career with the highest risk of LBP among the top 10. Because nurses deal with LBP on a daily basis, their incidence is higher than that of other professions (Annamaria & Vincenza, 2019). Physical, individual, and ergonomic risk factors for LBP are part of nursing tasks. Every year, millions of nurses throughout the globe obtain medical reports, work less productively, or quit their jobs before the acceptable age (Dlungwane, et al 2018; Abolfotouh et al., 2015).

## 1.2 Problem Statement

Worldwide, LBP has a big influence on people's life, mostly because of how it affects productivity at work. The Global Burden of Disease indicates that it is one of the main causes of disability, emphasizing LBP as a worldwide health issue (Wang et al., 2018).

Studies that are region-specific show this pattern. 68.4% in West Africa, 67.95% in North Africa, and 59% in South Africa were the different incidence rates of LBP among nursing staff revealed by an African research in 2018 (Semachew et al., 2018; Indrayani et al., 2024).

These high rates highlight how pervasive this problem is among African nurses. At Kenyatta National Hospital, issues such as lifting heavy weights, poor patient posture, and overexertion were blamed for a high rate of musculoskeletal illnesses, especially LBP, among nursing personnel. At 74.2%, the incidence rate was very high (Mugga, 2014; Banga et al., 2024).

An in-depth investigation conducted at Thika Level 5 Hospital found that 85% of nurses working in the reproductive health department had low back discomfort. A nurse-to-patient ratio that was far lower than WHO recommendations, lengthy workdays, forward-bending operations, and a dearth of assistive equipment for patient lifting were all contributing reasons. In order to address and reduce the risk factors for LBP in healthcare settings, our results highlight the need of focused treatments (Munyau et al., 2020).

# 2.0 Literature Review

## 2.1 Incidence of LBP among Nurses

Particularly in the case of nursing staff, LBP has a major negative influence on people's quality of life and productivity at work on a worldwide scale. According to Wang et al. (2018), it is now one of the main causes of disability in the globe.

There is a regional disparity in the incidence of LBP among nurses. LBP affects 45% of nurses in England and 63% of nurses in Australia. Rates are also rather high in China (56% of nurses afflicted) and Hong Kong (40.6%). On average, around 44.1% of African nurses experience this. But at 68.46%, it's the highest percentage in the West African area; North Africa comes in second at 67.95%. A significant incidence rate of LBP was shown by a special cross-sectional analytical research done in 2009 at the Farhat Hached Teaching Hospital in Tunisia, which found that 58.8% of nurses experienced it (Kasa et al., 2020).

Thirty percent of orthopaedic nurses in a Canadian research reported suffering from LBP. Additionally, 25% of intensive care nurses reported low back discomfort. In order to lessen the prevalence of LBP among Canadian nurses, ergonomic measures were deemed essential. The sources used are Afshari et al. (2018).

In Malaysia, 74.8% of nurses in public hospitals had lower back pain each year, according to Ibrahim (2019). Over eighty-two percent of Taiwanese nurses had LBP at some point in their careers. Public hospital nurses in South Africa reported LBP at a rate of 84% despite the country's advanced medical infrastructure. This demonstrates that, despite a country's advanced technology, nurses should prioritize preventative measures while working. Approximately 86% of ambulance nurses in Taiwan reported suffering from LBP. LBP affects 67% of nurses who work in orthopaedic departments. In a 2019 study, Ibrahim et al.

There is a considerable geographical disparity in the incidence of LBP (LBP) among African nurses. On a yearly basis, 57% of nurses on the continent have lower back pain. This rate, however, varies among areas: In the West African region, a striking 68% of nurses experience LBP, representing the highest incidence rate. North Africa and South Africa also report substantial incidences, with 67.95% and 59% of nurses affected, respectively. A literature meta-analysis conducted over a twelve-month period revealed that the incidence of LBP among nurses is approximately 65%, indicating a widespread issue within the nursing profession. This high prevalence rate demonstrates the urgent need for attention and intervention from relevant authorities and healthcare organizations. The findings of Semachew (2018) highlight the severity of LBP among nurses in Africa and its impact on their health and productivity, underscoring the necessity for targeted strategies to address and mitigate this occupational health challenge.

Intensive care unit (ICU) nurses recorded a high incidence of LBP in public hospitals of Amhara region, Ethiopia. Yearly, nurses experienced LBP at 76%. Despite LBP being a great concern, its magnitude and factors contributing to its existence is scarce in the public domain. Evidence of the LBP existence is also scarce in Ethiopia among nurses. High use of analgesics was also evident at 58.5%, especially for nurses who had LBP radiating to lower limbs at 27.8%. among the ICU nurses. 35.5% of nurses with LBP had to be allowed to be away from work leading to low work output hence reduced productivity (Tefera et al., 2021).

Mutanda (2017) found that in Uganda the most common musculoskeletal problem among nurses was LBP at 58.7%. Nurses in Mulago National Hospital were having stress due to psychosocial mental status related to duties that they perform. In Uganda, 47% of lost work rate among health workers are due to musculoskeletal problems among hospital staff in Mulago National hospital. The nursing profession was ranked top most nationally being the most common profession mostly affected by musculoskeletal disorders especially LBP. Private facilities recorded low incidence of LBP: by four times lower in private facilities in Uganda (Mutanda et al., 2017).

Almaghrabi (2021) found that many nurses had often experienced LBP cumulatively, with an incidence of 82.9%. He found that complains of LBP among nurses was at 53.6% as per the last days of the study. Within a year LBP incidence at King Abdul-Aziz University Hospital in Saudi Arabia was 85.5%. For the last one year of the study, only 14.4% of nurses had not experienced LBP, 50.0% among nurses in the University Hospital had LBP persisting for less than a week. For one year previously, 7.7% of nurses confirmed to have suffered LBP daily (Almaghrabi et al., 2021)

The percentage of nurses in Jeddah, Saudi Arabia, who reported experiencing low back discomfort was 61.7%. Of the nurses surveyed, 51.2% reported experiencing severe to moderate back pain. Twenty percent of all cases were reported by nurses working in obstetrics and gynecology departments. According to the study done, 33.3% of the nurses experienced LBP prior employment as a nurse while 66.7% suffered LBP after employment as nurses. The statistics are a great concern and calls for intervention (Gaowgzeh et al., 2019).

# 3.0 Research Methodology

A cross-sectional study design that is both analytical and descriptive is used in this research. Three level five hospitals in Kiambu County were used for the study: Kiambu Level 5 Hospital, Thika Level 5 Hospital, and Gatundu Level 5 Hospital. Thika Level 5 Hospital is owned by the county government of Kiambu. All nurses who met the predetermined inclusion criteria and indicated a desire to participate were eligible to be included in the research. Total sample to be used in study was 391 nurses. All nurses who have worked in Thika, Kiambu and Gatundu Level Five Hospitals for at least three months were legible for the study. No nurse was coerced into participating in the study.

This research used SPSS, or the Statistical Package for the Social Sciences, version 25, to do its statistical analysis. Descriptive statistics, such as percentages, proportions, and frequencies, were used to display the data. Statistical significance was defined as a p-value of 0.05 or below. A one-sample T-test and a Chi-square test were used to find the correlation between the variables. Both the Mount Kenya University Ethics and Research Committee and the Kiambu County Research and Training Committee gave their stamp of approval before the study could begin. The researcher sought approval from NACOSTI, and also from the respective hospitals included in the study. Informed consent from the research subjects before administration of the questionnaire was as well obtained. To ensure total confidentiality, questionnaires did not have names and information given was handled with confidentiality.

# 4.0 Results and Findings

## 4.1 Descriptive Analysis on assessment of the incidence of LBP among nurses

It is essential to evaluate nurses' occupational health in order to guarantee their wellbeing and uphold standards of high-quality patient care. As a result of the strenuous physical nature of their work, many nurses suffer from chronic LBP In order to develop treatments and preventative strategies to lessen the burden of LBP, it is essential to understand its prevalence and the causes linked to it. In this context, Tables 1, 2, and 3 present comprehensive data on the assessment of LBP incidence among nurses, focusing on nurse-related factors, comorbidity issues, and lifestyle contribution.

**Table 1: Nurse responses on the assessment of the incidence of LBP among nurses**

|  |  |  |  |
| --- | --- | --- | --- |
| **No** | **Test Item** | **F** | **%** |
| 1 | Experienced LBP related to nursing duties | | |
|  | Yes | 249 | 79.6% |
|  | No | 64 | 20.4% |
| 2 | Treated for LBP for the last three months | | |
|  | Yes | 132 | 43.0% |
|  | No | 175 | 57.0% |
| 3 | If yes, have you been absent from duty for more than 3 days due to LBP in the last three months? | | |
|  | Yes | 42 | 31.8% |
|  | No | 90 | 68.2% |
| 4 | On a Scale of 0-10, how do you rate the LBP are experiencing? | | |
|  | No pain/zero pain | 49 | 15.8% |
|  | 1-3 (mild pain) | 74 | 23.8% |
|  | 4-6 (moderate pain) | 155 | 49.8% |
|  | 8-10(Severe pain) | 33 | 10.6% |
| 5 | Has the LBP spread down your leg at some time in the last 2 weeks? | | |
|  | Yes | 132 | 42.9% |
|  | No | 176 | 57.1% |
| 6 | Does the LBP limit your activity? | | |
|  | Yes | 180 | 58.4% |
|  | No | 128 | 41.6% |
| 7 | Do you feel your back may not get better due to pain? | | |
|  | Yes | 104 | 33.9% |
|  | No | 203 | 66.1% |
| 8 | Has the LBP been extremely troublesome in the last 2 weeks? | | |
|  | Yes | 82 | 26.7% |
|  | No | 224 | 73.0% |

Table 4 offers an exhaustive examination of nurse-related factors influencing the occurrence of LBP among nurses, meticulously presenting frequencies and percentages to elucidate the prevalence and consequences of LBP within this professional cohort.

The incidence of LBP related to nursing duties emerges prominently, with 249 nurses, comprising 79.6% of the sample, reporting experiences of LBP attributable to their work responsibilities. These findings are similar to a study done in Saudi Arabia, where the incidence of LBP was found to be 82.9% among nurses (Almaghrabi *et al.,* 2021) conversely, 64 nurses (20.4%) conveyed no instances of LBP in connection with their duties. An insightful aspect revealed by the data is the treatment history for LBP over the last three months. Among the surveyed nurses, 132 individuals (43.0%) sought treatment for LBP during this period, whereas 175 nurses (57.0%) did not pursue any form of treatment for their condition.

Moreover, the impact of LBP on work related services showed a significant concern, with 42 nurses (31.8%) disclosing absenteeism exceeding three days due to LBP within the last three months. This underscores the considerable influence of LBP on workforce attendance, contrasting with 90 nurses (68.2%) who did not report any absenteeism attributed to LBP. A similar study done in Ethiopia found similar findings where 35.5% of nurses reported being off duty for more than three days due to LBP (Tefera *et al*.,2021). Pain severity ratings unveil a spectrum of experiences among nurses, ranging from no pain or zero pain (15.8%) to severe pain (10.6%), as delineated by ratings on a scale of 0-10. Additionally, 49.8% of the nurses, or 155 individuals, reported experiencing moderate pain.

The data also underscores the profound impact of LBP on daily activities, with 180 nurses (58.4%) reporting limitations imposed by LBP, while 128 nurses (41.6%) did not encounter such activity restrictions.

In summation, the findings underscore the pervasive nature of LBP among nurses and its profound repercussions on workforce productivity and well-being. The detailed breakdown of frequencies and percentages within Table 4 accentuates the imperative for targeted interventions aimed at mitigating LBP within the nursing profession.

According to Ibrahim, M. I at el (2019), a significant number of Chinese nurses suffer from LBP, which hinders their capacity to carry out their job duties and causes high rates of absenteeism.

**Table 2: Co-morbidity Table on the assessment of the incidence of LBP among nurses**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Test Item** | **F** | **%** |
| 1 | Diabetic mellitus |  |  |
|  | Yes | 37 | 12.1% |
|  | No | 268 | 87.9% |
| 2 | Cardiovascular disorders |  |  |
|  | Yes | 36 | 11.7% |
|  | No | 273 | 88.3% |
| 3 | Anxiety and depressive disorders |  |  |
|  | Yes | 23 | 7.5% |
|  | No | 285 | 92.5% |
| 4 | Ccigarette’s smoking |  |  |
|  | Yes | 35 | 11.1% |
|  | No | 279 | 88.9% |

A thorough evaluation of the prevalence of LBP among nurses with respect to several comorbidities and health variables is shown in Table 5. Through frequencies and percentages, this table offers valuable insights into the prevalence of comorbidities such as diabetes mellitus, cardiovascular disorders, anxiety, depressive disorders, and smoking habits among nurses.

The data reveals that among the surveyed nurses, 37 individuals (12.1%) reported having diabetes mellitus, while the majority, comprising 268 nurses (87.9%), did not report this condition. Similarly, concerning cardiovascular disorders, 36 nurses (11.7%) disclosed they had the condition, while 273 nurses (88.3%) reported no such disorders. These findings shed light on the presence of comorbidity conditions among nurses, underscoring the need for comprehensive health assessments and targeted interventions to address potential risk factors associated with LBP.

Mental health aspects such as anxiety and depressive disorders were also explored. It shows that 23 nurses (7.5%) reported experiencing these disorders, whereas the majority, totaling 285 nurses (92.5%), did not disclose such conditions. This insight into the mental well-being of nurses is crucial, as mental health can significantly impact physical health outcomes, including the experience and management of LBP. Lastly, the table examines smoking habits among nurses, revealing that 35 individuals (11.1%) reported a history of smoking cigarettes. This finding underscores the importance of lifestyle factors in influencing health outcomes, including the potential exacerbation of LBP symptoms among smokers.

Taken as a whole, Table 5 sheds light on the complex nature of nurses' health profiles and the risk variables linked to LBP. Consistent with previous research, this study found that healthcare workers were more likely to have LBP when comorbidities and lifestyle variables were included. The elevated cholesterol levels that cause calcifying lesions of the blood vessels are a direct result of comorbid diseases including diabetes and cardiovascular illnesses, which Shahid et al. (2021) shown to be strong predictors of LBP (LBP) in nurses. This highlights the need of addressing these health concerns in order to avoid LBP. Kazemi et al. (2022) also found that nurses are more likely to suffer from lower back pain if they suffer from anxiety or depression, further supporting the idea that nurses' mental health is vital to their physical health. It is also well-established that smoking causes lower back pain. Nkhata (2020) states that smoking greatly increases the likelihood of developing LBP because it decreases the amount of blood and nutrients that reach the spine, making the discomfort worse. The results of this survey corroborate this, showing that a sizeable portion of the nursing workforce had smoked at some point in their careers.

**Table 3: Activity Table on the assessment of the incidence of LBP among nurses**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Test Item** | **F** | **%** |
| 1 | How often do you engage in physical activity lasting 30 minutes per session within a week? | | |
|  | - Never | 151 | 48.1% |
|  | - Three Times | 123 | 39.2% |
|  | - Above Three Times | 40 | 12.7% |
| 2 | How many hours do you work in a week? |  |  |
|  | - Less than 40 hours | 28 | 9.0% |
|  | - 40 hours | 147 | 47.1% |
|  | - More than 40 hours | 137 | 43.9% |
| 3 | While on duty do you take at least one-hour rest? | | |
|  | - Yes | 104 | 33.2% |
|  | - No | 207 | 66.1% |
| 4 | Do you exercise to strengthen your low back muscles? | | |
|  | - Yes | 144 | 45.9% |
|  | - No | 170 | 54.1% |

Table 3 provides a comprehensive assessment of the activity levels and work-related factors influencing the incidence of LBP (LBP) among nurses. Through frequencies and percentages, this table offers valuable insights into nurses' engagement in physical activity, working hours, rest breaks during duty, and participation in back-strengthening exercises.

The data reveals that a significant proportion of nurses do not engage in regular physical activity, with 151 individuals (48.1%) reporting never engaging in physical activity lasting 30 minutes per session within a week. Conversely, 123 nurses (39.2%) reported engaging in physical activity three times a week, while 40 nurses (12.7%) reported engaging in physical activity more than three times a week. This highlights a potential area for improvement in promoting physical activity among nurses to mitigate the risk of LBP and enhance overall health and well-being.

When asked about their typical workweek, 147 nurses (47.1% of the total) said they worked a conventional 40-hour shift. A significant number of nurses, 137 in total (43.9%), reported working more than 40 hours per week. This finding raises concerns about potential work-related factors contributing to LBP, such as prolonged sitting or heavy lifting, which may be more prevalent among nurses working longer hours.

Another significant finding relates to rest breaks during duty, with only 104 nurses (33.2%) reporting taking at least one-hour rest while on duty. In contrast, a substantial majority of nurses, totaling 207 individuals (66.1%), reported not taking any rest breaks during duty. This highlights a potential area for organizational intervention to promote rest breaks and alleviate the physical strain associated with prolonged periods of activity.

Lastly, the data shows that a considerable proportion of nurses do not actively participate in exercises to strengthen their low back muscles, with 170 individuals (54.1%) reporting no engagement in such exercises. Conversely, 144 nurses (45.9%) reported exercising to strengthen their low back muscles. This underscores the importance of promoting preventive measures, such as regular exercise and ergonomic practices, to reduce the risk of LBP among nurses.

Overall, Table 5 provides valuable insights into the activity levels and nurse-related factors influencing the incidence of LBP among nurses. The frequencies and percentages presented underscore the importance of promoting physical activity, optimizing working conditions, promoting rest breaks, and encouraging back-strengthening exercises to mitigate the risk of LBP and promote the overall health and well-being of nurses in the workplace.

These results are in line with prior research that looked at how physical activity, work schedules, breaks, and exercise affect the prevalence of LBP among healthcare workers. In order to lower the frequency of LBP among nurses, for example, frequent physical activity and good ergonomic practices are crucial, according to a research by Owen and Garg (2016). They discovered that compared to their sedentary counterparts, nurses who regularly participated in physical exercise had a lower likelihood of reporting LBP. In a similar vein, Trinkoff et al. (2016) highlighted the detrimental effects of extended workdays and insufficient rest periods on the musculoskeletal health of nurses, indicating that rest period promotion strategies within organizations may assist lessen lower back pain (LBP).

The significance of back-strengthening exercises is also well-documented. Nkhata *et al,* (2020) demonstrated that regular participation in exercises targeting the back muscles significantly reduced the risk of LBP among nurses. Their findings support the data presented in Table 4, which indicates that a substantial number of nurses do not engage in such preventive measures, highlighting an area for potential intervention.

**Table 4: Summary Statistics on experience of LBP related to nursing duties**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Variable** | | | **Have you experienced LBP related to your nursing duties?** | | | | |
| **Yes** | **No** | | | |
| Age in years | 21 - 30 | F | 120 | | 48 | | |
| % | 71.4% | | 28.6% | | |
| 31 - 40 | F | 2 | | 0 | | |
| % | 100.0% | | 0.0% | | |
| 41 - 50 | F | 124 | | 16 | | |
| % | 88.6% | | 11.4% | | |
| 51 - 60 | F | 3 | | 0 | | |
| % | 100.0% | | 0.0% | | |
| Gender | Male | F | 53 | | | 27 | |
| % | 66.3% | | | 33.7% | |
| Female | F | 193 | | | 37 | |
| % | 83.9% | | | 16.1% | |
| Working Experience in years | Below 1. | F | 20 | | | 16 | |
| % | 55.6% | | | 44.4% | |
| 1-5 | F | 50 | | | 25 | |
| % | 66.7% | | | 33.3% | |
| 6-10 | F | 46 | | | 9 | |
| % | 83.6% | | | 16.4% | |
| 11 and above | F | 131 | | | 13 | |
| % | 91.0% | | | 9.0% | |
| Current deployment | Accident/emergency | F | 21 | | | 4 | |
| % | 84.0% | | | 16.0% | |
| Maternity | F | 60 | | | 11 | |
| % | 84.5% | | | 15.5% | |
| ICU | F | 9 | | | 4 | |
| % | 69.2% | | | 30.8% | |
| Operating theatres | F | 26 | | | 6 | |
| % | 81.3% | | | 18.8% | |
| Outpatient | F | 34 | | | 6 | |
| % | 85.0% | | | 15.0% | |
| Medical/ surgical wards | F | 41 | | | 11 | |
| % | 78.8% | | | 21.2% | |
| Paediatrics | F | 22 | | | 8 | |
| % | 73.3% | | | 26.7% | |
| Others | F | 34 | | | 14 | |
| % | 70.8% | | | 29.2% | |
| BMI | below 18.5 kg/m | F | 18 | | | 0 | |
| % | 100.0% | | | 0.0% | |
| between 18.6-24.9kg/m | F | 117 | | | 47 | |
| % | 71.3% | | | 28.7% | |
| between 25 - 29 five kg/m | F | 81 | | | 11 | |
| % | 88.0% | | | 12.0% | |
| above and 30kg/m | F | 29 | | | 1 | |
| % | 96.7% | | | 3.3% | |
| Diabetic mellitus | Yes | F | 30 | 5 | | | |
| % | 85.7% | 14.3% | | | |
| No | F | 211 | 57 | | | |
| % | 78.7% | 21.3% | | | |
| Cardiovascular disorders. | Yes | F | 30 | 4 | | |
| % | 88.2% | 11.8% | | |
| No | F | 215 | 58 | | |
| % | 78.8% | 21.2% | | |
| Smoked | Yes | F | 24 | 11 | | | |
| % | 68.6% | 31.4% | | | |
| No | F | 224 | 53 | | | |
| % | 80.9% | 19.1% | | | |

The data indicates various levels of LBP experienced by nurses related to their duties, categorized by age, gender, working experience, current deployment, BMI, diabetic mellitus status, cardiovascular disorders, and smoking status. Among nurses aged 21-30 years, 71.4% reported experiencing LBP. This figure dramatically increases to 100.0% for those aged 31-40 years and 51-60 years, though it's worth noting that the sample sizes for these groups are very small (2 and 3 respondents, respectively). For nurses aged 41-50 years, the percentage is 88.6%.

Gender-wise, 66.3% of male nurses and 83.9% of female nurses reported LBP. Regarding working experience, 55.6% of those with 1 year and below, 66.7% of those with 1-5 years, 83.6% of those with 6-10 years, and 91.0% of those with over 11 years of experience reported LBP. When considering current deployment, the percentages vary slightly: 84.0% in Accident and Emergency, 84.5% in Maternity, 69.2% in ICU, 81.3% in Operating Theatres, 85.0% in Outpatient, 78.8% in Medical/Surgical Wards, 73.3% in Pediatrics, and 70.8% in other departments reported LBP.

Regarding BMI, 100.0% of nurses with a BMI below 18.5 kg/m² reported experiencing LBP, though the sample size is small. For those with a BMI between 18.6-24.9 kg/m², 71.3% reported pain. This percentage increases to 88.0% for a BMI between 25-29.9 kg/m², and 96.7% for those with a BMI above 30 kg/m². Diabetic status shows 85.7% of diabetic nurses and 78.7% of non-diabetic nurses reported LBP. For cardiovascular disorders, 88.2% of those with the condition and 78.8% of those without it reported pain. Lastly, 68.6% of nurses who smoked and 80.9% of non-smokers reported experiencing LBP.

The most affected groups with the highest percentage of "Yes" responses include nurses aged 31-40 years and 51-60 years, both with 100.0%, although their sample sizes are very small. Nurses with a BMI below 18.5 kg/m² also reported 100.0% LBP, but again, with a small sample size. More consistently affected groups with larger sample sizes include nurses with over 11 years of experience (91.0%), those with a BMI above 30 kg/m² (96.7%), nurses aged 41-50 years (88.6%), and female nurses (83.9%).

## 4.2 Inferential Analysis on assessment of the incidence of LBP among nurses

To examine the statistical association on LBP among nurses, one-sample tests were performed on different components of the evaluation of LBP. The findings are shown in Table 5. A test result of 0, which indicates no presence or impact, is used to examine each test item. The table provides mean differences and confidence intervals for each test, as well as data like t-values, degrees of freedom (df), and significance levels (Sig.).

**Table 5: One sample Test on assessment of the incidence of LBP among nurses**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **One-Sample Test** | | | | | | |
| **Test Item** | **Test Value = 0** | | | | | |
| **T** | **df** | **Sig. (2-tailed)** | **Mean Difference** | **95% Confidence Interval of the Difference** | |
| **Lower** | **Upper** |
| Experienced LBP related to nursing duties | 52.751 | 312 | .000 | 1.204 | 1.16 | 1.25 |
| Treated over the previous three months due to low back discomfort. | 55.476 | 306 | .000 | 1.570 | 1.51 | 1.63 |
| If so, how many days were missed from work over the course of the previous three months due to LBP. | 53.288 | 226 | .000 | 1.683 | 1.62 | 1.75 |
| On a Scale of 0-10, rating the LBP being experienced. | 51.077 | 310 | .000 | 2.553 | 2.45 | 2.65 |
| Spreading of LBP down the leg at some time in the last 2 weeks. | 55.638 | 307 | .000 | 1.571 | 1.52 | 1.63 |
| LBP limiting activity. | 50.329 | 307 | .000 | 1.416 | 1.36 | 1.47 |
| Feeling LBP may not get better due to pain. | 61.400 | 306 | .000 | 1.661 | 1.61 | 1.71 |
| LBP extremely troublesome in the last 2weeks. | 67.784 | 306 | .000 | 1.736 | 1.69 | 1.79 |
| BMI. | 56.660 | 303 | .000 | 2.441 | 2.36 | 2.53 |
| Diabetic mellitus | 100.328 | 304 | .000 | 1.879 | 1.84 | 1.92 |
| Cardiovascular disorders. | 103.030 | 308 | .000 | 1.883 | 1.85 | 1.92 |
| Anxiety and depressive disorders. | 128.333 | 307 | .000 | 1.925 | 1.90 | 1.95 |
| Cigarette smoking | 106.167 | 313 | .000 | 1.889 | 1.85 | 1.92 |
| Engaging in physical activity lasting 30 minutes per session within a week. | 20.212 | 313 | .000 | 1.742 | 1.57 | 1.91 |
| Working more than 40 hours in a week. | 64.959 | 311 | .000 | 2.349 | 2.28 | 2.42 |
| Taking at least one-hour rest while on duty. | 24.668 | 312 | .000 | 1.735 | 1.60 | 1.87 |
| Exercising to strengthen low back muscles | 54.728 | 313 | .000 | 1.541 | 1.49 | 1.60 |

The significance level (Sig.) for all test items is reported as .000, indicating statistical significance at the p < .05 level. This implies that the mean differences observed for each test item are unlikely to have occurred by chance, suggesting a meaningful association between the assessed factors and the incidence of LBP among nurses.

The mean differences and confidence intervals provide additional insights into the magnitude and direction of the observed effects. For instance, significant mean differences are observed in responses related to experiencing LBP, being treated for LBP, absence from duty due to LBP, pain severity, symptom presence, activity limitation, perceived recovery prospects, health conditions such as BMI, diabetes mellitus, cardiovascular disorders, anxiety and depressive disorders, smoking habits, physical activity levels, working hours, rest breaks, and engagement in back-strengthening exercises.

All things considered, Table 5 findings indicate that a number of variables, such as individual traits, lifestyle choices, and medical conditions, are highly correlated with the prevalence and consequences of LBP in nurses. These results have significant ramifications for the research as they demonstrate the complex nature of LBP and provide guidance for focused treatments meant to lower its incidence and lessen its detrimental impact on the health and wellbeing of nurses.

According to study by Sikiru & Hanifa S, (2016) LBP presently and within the last 12 months was reported by 300 respondents (73.53%). While for our study it reported 79.6% with a total of 316 respondents. A notable portion of nurses being underweight or obese underscores the role of BMI in exacerbating LBP risk. The study also highlights the profound impact of LBP on work performance, with implications ranging from absenteeism to intentions of leaving the nursing profession. These findings underscore the urgent need for interventions targeting LBP prevention and management, including promoting exercise regimens and ergonomic practices tailored to the unique demands of nursing duties. Moreover, addressing systemic factors contributing to workplace stress and ergonomic hazards is imperative to ensure the well-being and retention of nursing staff as reported by Abebe A.D (2015). Overall, the study underscores the complex interplay of individual and organizational factors in shaping the prevalence and impact of LBP among ICU nurses, emphasizing the importance of comprehensive strategies to safeguard the health and productivity of this vital workforce.

# 5.0 Summary, Conclusion and Recommendation

## 5.1 Summary on assessment of the incidence of LBP among nurses

Table 4 provides a thorough summary of the research's findings; it is worth noting that the study identified several health and lifestyle variables linked to LBP among nurses. For instance, a notable proportion of nurses reported being underweight or obese, which underscores the role of body mass index (BMI) in exacerbating the risk of LBP. Furthermore, the study revealed significant trends: Nurses with LBP were typically older (mean age 2.05 vs. 1.50) and more often female (mean score 1.79 vs. 1.58). Surprisingly, those with LBP had lower mean scores for medical conditions. Interestingly, current deployment showed a lower mean score for those with LBP (4.50 vs. 5.09), suggesting workload differences. Additionally, respondents with LBP had a higher mean BMI (2.49 vs. 2.22), indicating a possible weight-related correlation. Based on these findings, healthcare providers may better understand the complex interplay between demographics, health, and the prevalence of LBP among nurses, which can lead to more effective preventative and therapeutic strategies.

The findings of the one-sample tests, as shown in Table 5, provide further evidence of how individual and organizational variables interact to shape the frequency and severity of LBP among nurses. These tests indicated significant associations between LBP and personal characteristics such as BMI, health conditions including diabetes mellitus and cardiovascular disorders, lifestyle habits like smoking, physical activity levels, working hours, and engagement in back-strengthening exercises. These findings underscore the multifactorial nature of LBP and its significant impact on nurses' health and well-being.

The study also found that a considerable percentage of respondents experienced symptoms such as pain spreading down their leg and limitations in activity due to LBP. Moreover, a significant portion of nurses expressed concerns about the prognosis of their back pain, indicating the need for effective management strategies.

Overall, the comprehensive data provided in both tables offer valuable insights into the prevalence, severity, impact, and management of LBP among nurses, as well as the associated health and lifestyle factors. These findings emphasize the importance of implementing targeted interventions to prevent and manage LBP effectively, promote a healthy work environment, and safeguard the well-being and productivity of nursing staff.

## 5.2 Conclusion

LBP is common among nurses, according to the study's results, which has serious consequences for their well-being and productivity on the job. Factors such as BMI, health conditions, lifestyle habits, and working conditions play crucial roles in exacerbating the risk and impact of LBP among nurses. Urgent interventions are needed to prevent and manage LBP effectively, including promoting exercise regimens, ergonomic practices, and addressing workplace stress and hazards.

## 5.3 Recommendations

The results of this research highlight the critical need for a coordinated effort to alleviate the prevalence and consequences of LBP among healthcare workers. As a whole, these interventions should address health and safety in the workplace, personal wellness, and company policy. These are the steps that should be taken

The hospital management teams of level 5 hospitals in Kiambu county should implement ergonomic initiatives to optimize workstation setups, including proper chair and desk designs, to promote better posture and reduce strain on the lower back. They should lobby for adequate adjustable beds, assistive lifting devices, and invest in staff training to ensure proper utilization of these resources. They should foster a supportive organizational culture that prioritizes employee health and safety, open communication about musculoskeletal issues and provide resources for early intervention and treatment.

Disclaimer (Artificial intelligence)

Option 1:

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc.) and text-to-image generators have been used during the writing or editing of this manuscript.

Option 2:

Author(s) hereby declare that generative AI technologies such as Large Language Models, etc. have been used during the writing or editing of manuscripts. This explanation will include the name, version, model, and source of the generative AI technology and as well as all input prompts provided to the generative AI technology

Details of the AI usage are given below:

1.

2.

3.

# REFERENCES

Almaghrabi, A., & Alsharif, F. (2021). Prevalence of LBP and Associated Risk Factors among Nurses at King Abdulaziz University Hospital. International journal of environmental research and public health, 18(4), 1567.

Boughattas, W., Maalel, O. E., Maoua, M., Bougmiza, I., Kalboussi, H., Brahem, A., Chatti, S., Mahjoub, F., & Mrizak, N. (2017). LBP among nurses: Prevalence, and occupational risk factors. Occupational Diseases and Environmental Medicine, 05(01), 26–37.

Cochran, W. G. (2007). Sampling techniques. John Wiley & Sons. Tejada, J. J., & Punzalan, J. R. B. (2012). On the misuse of Slovin’s formula. The Philippine Statistician, 61(1), 129-136.

Diarmuid Horgan, Helen Purtill, Eva Ryan & Kieran O’Sullivan (2022) The impact of manual handling training on beliefs regarding LBP, European Journal of Physiotherapy, 24:3, 151-157, DOI: 10.1080/21679169.2020.1815837

Gaowgzeh, R. A. (2019). LBP among nursing professionals in Jeddah, Saudi Arabia: Prevalence and risk factors. Journal of Back and Musculoskeletal Rehabilitation, 32(4), 555–560. https://doi.org/10.3233/bmr-181218

Hignett, S. (2003). Intervention strategies to reduce musculoskeletal injuries associated with handling patients: a systematic review. Occupational and environmental medicine, 60(9), e6-e6.

Kasa, A. S., Workineh, Y., Ayalew, E., & Temesgen, W. A. (2020). LBP among nurses working in clinical settings of Africa: Systematic review and meta-analysis of 19 years of studies. BMC Musculoskeletal Disorders, 21(1). https://doi.org/10.1186/s12891-020-03341-y

Lahiri S, Markkanen P, Levenstein C. (2018). Back pain and work-related factors among health care workers in Massachusetts hospitals. Journal of Occupational and Environmental Medicine, 60(2), 152-161.

Middleton, F. (2023, January 30). Reliability vs. Validity in Research | Difference, Types and Examples. Scribbr. Retrieved May 16, 2023, from

Negash, N. A., Tadele, A., & Jember Ferede, A. (2022). Prevalence and associated factors of LBP among healthcare professionals at University of Gondar Comprehensive and specialized hospital, Northwest Ethiopia: Cross-sectional study. Journal of Pain Research, Volume 15, 1543–1552. https://doi.org/10.2147/jpr.s351987

Odebiyi, D. O., & Okafor, U. A. C. (2023). Musculoskeletal disorders, workplace ergonomics and injury prevention. In Ergonomics-new insights. IntechOpen.

Pasdar, Y., Hamzeh, B., Karimi, S., Moradi, S., Cheshmeh, S., Shamsi, M. B., & Najafi, F. (2022). Major dietary patterns in relation to chronic LBP; a cross-sectional study from RANCD cohort. Nutrition Journal, 21(1). https://doi.org/10.1186/s12937-022-00780-2

Polit, D. F., & Beck, C. T. (2013). Essentials of nursing research, 8th ed. study guide: Appraising evidence for nursing practice.

Shahid, S., Akhter, Z., Sukaina, M., Sohail, F., & Nasir, F. (2021). Association of diabetes with Lower back pain: A narrative review. Cureus, 13(6). https://doi.org/10.7759/cureus.15776

Sikiru & Hanifa S. (2010). Prevalence and risk factors of LBP among nurses in a typical Nigerian hospital. African Health Sciences, 10(1), 26–30.

Smedley, B. D., Stith, A. Y., & Nelson, A. R. (2003). Racial and ethnic disparities in diagnosis and treatment: a review of the evidence and a consideration of causes. Unequal treatment: Confronting racial and ethnic disparities in health care.

Waters, T. R., Nelson, A., Hughes, N., & Menzel, N. (2009). Safe patient handling training for schools of nursing. Curricular materials.

Yassi A, Lockhart K. (2018). Work-relatedness of LBP in nursing personnel: a systematic review. International Journal of Occupational and Environmental Health, 24(1-2), 8-21.

Annamaria V, Vincenza P. Assessing and preventing low back pain in nurses. Implications for practice management. Acta Bio Medica: Atenei Parmensis. 2019;90(Suppl 6):53.

Abolfotouh SM, Mahmoud K, Faraj K, Moammer G, ElSayed A, Abolfotouh MA. Prevalence, consequences and predictors of low back pain among nurses in a tertiary care setting. International orthopaedics. 2015 Dec;39:2439-49.

Rezaee M, Ghasemi M. Prevalence of low back pain among nurses: predisposing factors and role of work place violence. Trauma monthly. 2014 Nov;19(4).

Indrayani NL, Kao CY, Suyasa IG, Padmalatha KM, Chang JH, Wang CJ. Effectiveness of exercise programs to reduce low back pain among nurses and nursing assistants: A systematic review and meta-analysis. Journal of safety research. 2024 Jan 25.

Banga D, Samuel T, Yihune M, Bekele G, Molla E, Borie YA, Melese A, Agena A, Yeheyis T. Prevalence of low back pain and associated factors among nurses working in public hospitals of Hawassa city, southern Ethiopia: A cross-sectional study. Heliyon. 2024 May 15;10(9).