Section: Orthopaedics

Original Research Article

EVALUATION OF LOW BACK PAIN IN OBESE PATIENTS AND ITS CORRELATION WITH BMI

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Received : 30/01/2025
Received in revised form : 27/02/2025
Accepted : 17/03/2025

Keywords:
Low back pain, Obese, BMI.

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DOI: 10.47009/jamp.2025.7.2.245

Source of Support: Nil,
Conflict of Interest: None declared

Int J Acad Med Pharm
2025; 7 (2); 1218-1220

Abstract

Background: Low back pain (LBP) is the most prevalent musculoskeletal disorder among adults, affecting up to 84% of the population. Hence, the present study was conducted for evaluating low back pain in Obese patients and its correlation with BMI. **Materials and Methods:** A total of 100 obese and overweight patients and 100 controls were enrolled. The body mass index (BMI) was calculated as weight (kg) divided by the square of height (m2). Subjects with BMI below 18.5kg/m2 were considered underweight, those with BMI of 18.5 – 24.9kg/m2 as being normal, those with BMI ≥25kg/m2 as being overweight and those with BMI ≥30kg/m2 as being obese Body mass index (BMI) was calculated. Correlation of BMI with low back pain was evaluated. Pain was assessed using VAS on a scale of 0 to 10 with 0 indicating no pain and 10 indicating severe unbearable pain. All the results were recorded in Microsoft excel sheet and were subjected to statistical analysis using SPSS software. **Results:** The age distribution across the two groups was similar (p=0.4553). The highest number of cases 27 (27.0%) were present in the age groups of 51-60 years in the test group and 27 (27.0%) again in the age group of 41-50 years in the control group. The least number of cases 14 (14.0%) in the test group and 10 (10.0%) belonged to the age group of > 60 years respectively. It was observed that the average VAS scores were significantly higher in the test group as compared to the control group (p=0.0375). **Conclusion:** Low back pain is one of the major causes of years spent with disability and health care costs worldwide. In fact, low back pain and migraines have been identified as the leading causes of years lived with disability in high-income and middle-income nations. Obesity is a significant risk factor for low back pain, with excess weight putting strain on the spine.

INTRODUCTION

Low back pain (LBP) is the most prevalent musculoskeletal disorder among adults, affecting up to 84% of the population. The symptoms of LBP can originate from various anatomical structures, including nerve roots, muscles, fascia, bones, joints, intervertebral discs (IVDs), and abdominal organs.[1,2]

Additionally, symptoms may arise from abnormal neurological pain processing, leading to neuropathic LBP. Diagnosing patients with LBP poses significant challenges and necessitates intricate clinical decision-making. However, accurately identifying the source of the pain is crucial for determining the appropriate treatment strategy. Furthermore, clinicians must recognize that psychological factors, such as stress, depression, and anxiety, can also influence LBP.[3] A comprehensive patient history should encompass substance use, detailed health background, occupational factors, habits, and psychosocial influences.[4] Clinical information is the primary factor that shapes the initial assessment, while magnetic resonance imaging (MRI) should be utilized only when clinical findings are ambiguous or when neurological deficits or other medical issues are present.[5] Hence; the present study was conducted for evaluating low back pain in Obese patients and its correlation with BMI.

MATERIALS AND METHODS

The current research commenced for evaluating low back pain in Obese patients and its correlation with

ISSN (O): 2687-5365; ISSN (P): 2753-6556

BMI. A total of 100 obese and overweight patients and 100 controls were enrolled.

The body mass index (BMI) was calculated as weight (kg) divided by the square of height (m2). Subjects with BMI below 18.5kg/m2 were considered underweight, those with BMI of 18.5 – 24.9kg/m2 as being normal, those with BMI ≥25kg/m2 as being overweight and those with BMI ≥30kg/m2 as being obese Body mass index (BMI) was calculated. Correlation of BMI with low back pain was evaluated. Pain was assessed using VAS on a scale of 0 to 10 with 0 indicating no pain and 10 indicating severe unbearable pain. All the results were recorded in Microsoft excel sheet and were subjected to statistical analysis using SPSS software.

RESULTS

The age distribution across the two groups was similar (p=0.4553). The highest number of cases 27 (27.0%) were present in the age groups of 51-60 years in the test group and 27 (27.0%) again in the age group of 41-50 years in the control group. The least number of cases 14 (14.0%) in the test group and 10 (10.0%) belonged to the age group of > 60 years respectively. It was observed that the average VAS scores were significantly higher in the test group as compared to the control group (p=0.0375).

Table 1: Age-wise distribution.

Age Range (Year)	Overweight & Obese-BMI>25		Normal BMI (18.5-24.9)	
	Number	Percentage	Number	Percentage
20-30	15	15.0	17	17.0
31-40	19	19.0	27	27.0
41-50	25	25.0	27	27.0
51-60	27	27.0	19	19.0
>60	14	14.0	10	10.0
Total	100	100.0	100	100.0

Table 2: Comparison of gender-wise distribution

Gender	Overweight & Obese-BMI>25		Normal BMI (18.5-24.9)	
	Number	Percentage	Number	Percentage
Male	44	44.0	42	42.0
Female	56	56.0	58	58.0
Total	100	100.0	100	100.0
P value	1.0			

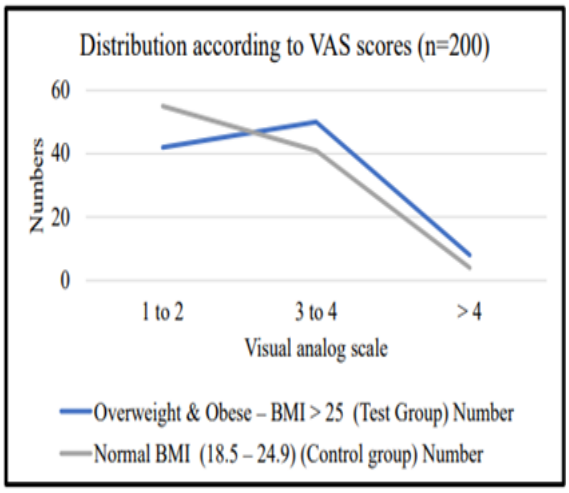

Figure 1: Comparison of VAS

DISCUSSION

Low back pain (LBP) is characterized as a symptom rather than a distinct disease. This condition may arise from degenerative changes in the spinal structure, various injuries, occupational factors, and congenital anomalies. A significant contributing factor frequently identified in literature is obesity. LBP is a prevalent issue affecting a substantial portion of the global population, with approximately 70-80% of individuals experiencing it at least once in their lifetime. This type of pain is localized in the lumbar region and may also involve the sciatic nerve. Back pain is categorized into acute and chronic forms, with treatment approaches varying based on the patient's condition. Management typically includes stages such as pharmacological intervention and physical therapy.[6-8] Hence; the present study was conducted for evaluating low back pain in Obese patients and its correlation with BMI.

The age distribution across the two groups was similar (p=0.4553). The highest number of cases 27 (27.0%) were present in the age groups of 51-60 years in the test group and 27 (27.0%) again in the age group of 41-50 years in the control group. The least number of cases 14 (14.0%) in the test group and 10 (10.0%) belonged to the age group of > 60 years respectively. It was observed that the average VAS scores were significantly higher in the test group as compared to the control group (p=0.0375).

Koutenaei et al performed this cross-sectional study to examine or investigate the correlation between LBP and Body Mass Index (BMI), Body Fat Percentage (BFP), Waist to Hip Ratio (WHR), and Waist to Height Ratio (WHtR). This study included 60 women who were randomly recruited in the study using convenience sampling method. There were 30 women who had low back pain and the remaining 30 were healthy. Their height, weight, waist circumference, hip circumference, and skin fold

ISSN (O): 2687-5365; ISSN (P): 2753-6556

thickness at triceps, quadriceps, and supra-iliac were measured. The mean BMI was higher in LBP patients. A statistically significant difference was not present between the two groups (P=0.17). The mean values of WHR [(P=0.04), WHtR (P=0.04), and BFP (P=0.03)] in cases of LBP were found significantly higher than those in the control group.[9]

In a study conducted by Arellano-Hidalgo et al the risk factors associated with low back pain in Naval personnel were assessed. The study assessed 66 cases of low back pain and 132 controls. Of the total population, the males constituted 90.4%, the median age was 26 years (IR: 36-77). The low back ache presence was found significant Review of Literature 36 in the multivariate analysis with overweight / obesity (OR = 2.24; 95% CI:1.16-4.28) and dyslipidemia, (OR = 2.00; 95% CI:1.47-5.66). Association between overweight / obesity and dyslipidemia and the presence of low back pain in naval personnel is found.[10]

Meman et al conducted a study to assess the relationship of various risk factors with low back pain (LBP) over a period of 6 months among young sedentary individuals. This prospective cohort study included 187 students scoring less than 600 metabolic equivalent (MET) minutes/week on the international physical activity questionnaire (IPAQ) "were recruited using convenience sampling. Participants were assessed for body mass index (BMI), hamstring and iliopsoas muscle tightness, abdominal and back muscle strength and endurance, and trunk range of motion (ROM) at baseline. The Logistic regression analysis showed that there was a significant positive correlation between low back pain and trunk flexion ROM with odds ratio of 1.671 ($P < 0.001$), LBP and trunk extension ROM with odds ratio of 1.602 ($P < 0.001$), LBP and abdominal endurance with odds ratio of 1.602 ($P < 0.001$), LBP and BMI of overweight with odds ratio of 1.534 ($P < 0.001$), LBP and BMI of obese with odds ratio of 1.429 ($P < 0.001$). The study shows that there is a statistically significant correlation between trunk flexion and extension ROM, abdominal muscle endurance and BMI of obese & overweight category with low back pain, among young sedentary individuals.[11]

CONCLUSION

Low back pain is one of the major causes of years spent with disability and health care costs worldwide. In fact, low back pain and migraines have been identified as the leading causes of years lived with disability in high-income and middle-income nations. Obesity is a significant risk factor for low back pain, with excess weight putting strain on the spine.

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ISSN (O): 2687-5365; ISSN (P): 2753-6556