

Overweight BMI as a Risk Factor for Low Back Pain: An Observational Study from Primary Health Care

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ABSTRACT

Background: Overweight is the most common cause of low back pain (LBP). The prevalence of LBP is very gender- and age-specific. Overweight BMI might lead to an increased axial load of the L4–L5 disc and facet joints, and enhance the risk of degenerative that cause LBP.

Method: This is a cross-sectional study to analyze the BMI as a risk factor for LBP.

Results: There were 59 patients (81.9%) with normal BMI 13 patients (18.1%) with overweight BMI, 39 patients with LBP (54.2%), and 33 patients (45.8%) without LBP. The chi-square test results obtained a significance value of 0.015 ($p < 0.05$) with the odds ratio 6.089.

Discussion: This study is in agreement with other studies which revealed that higher BMI was significantly associated with LBP in men (for overweight, odds ratio = 1.097, $P < 0.001$; for obesity, odds ratio = 1.163, $P < 0.001$) and in women (for overweight, odds ratio = 1.174, $P < 0.001$; for obesity, odds ratio = 1.211, $P < 0.001$).

Conclusion: Overweight BMI is a risk factor for LBP. Patients who had overweight BMI had a greater 6.089 times risk of LBP than patients who had normal BMI.

Keywords: Low back pain, Overweight BMI, Cross-sectional study

INTRODUCTION

Low Back Pain (LBP) is a chronic problem that affects the musculoskeletal system. LBP is a common symptom found in primary health care and ranks first among the causes of disability in the world (1).

Back pain is broadly classified into three categories. Acute pain lasts for six weeks or less, subacute conditions range from six weeks to three months, while chronic pain lasts more than three months (2). LBP is one of the pain complaints that makes patients come for treatment starting from the beginning of the incident, because it disrupts their daily life, such as working, bending, lifting weights, walking, and even sleep can be disturbed because of the pain (3).

The etiology of LBP includes infection, degenerative disease, malignancy, trauma, congenital abnormalities, metabolic disease, autoimmune disease, and an increase in BMI causing an increase in the body's resistance load. Body Mass Index (BMI) is a quick technique for determining the nutritional condition of adults, especially in terms of being underweight or overweight. Based on WHO data, around 33% of people in developing countries experience prolonged pain. The prevalence of low back pain in Indonesia ranges from 7.6% - 37%, although it is still not known for certain (3.4).

There has been no research regarding the relationship between BMI and the incidence of LBP at the Purwodadi Community Health Center. Therefore, we aim to find out whether there is a relationship between BMI and the incidence of LBP at the Purwodadi Community Health Center.

METHODS

This analytical observational study used a cross-sectional design to analyze the relationship between BMI and the incidence of LBP. The research population was female patients who came to the general clinic at the Purwodadi Community Health Center.

RESULT

The patients sampled in this study were 72 patients who were women over 50 years old. Based on the research that has been carried out, it is known that the average age of the patients sampled in this study is 60 years, the average height is 1.57 meters, and the average body weight is 57.82 kg. Apart from that, it is also known that the average body mass index (BMI) in this study was 23.44.

Table 1: Number of Patients Based on BMI Group

BMI Group	Number	Percentage
Underweight	0	0%
Normal	59	81,9%
Overweight	13	18,1%
Obesity	0	0%
Total	72	100%

Based on Table 1, it is known that there were no patients included in the underweight and obese BMI groups. The majority of patients were included in the normal group, namely 59 patients (81.9%), and overweight were 13 patients (18.1%). In this case, the underweight and obese groups were eliminated, so that only the normal and overweight groups were analyzed.

Patients with complaints of low back pain were grouped into positive or negative groups. The number of patients according to radiological imaging groups can be presented in Table 2 as follows:

Table 2: Number of Patients Based on complaints of lower back pain

Low back pain	Number	Percentage
Positive (+)	39	54,2%
Negative (-)	33	45,8%
Total	72	100%

Based on Table 2, it is known that 39 patients (54.2%) were positive for low back pain, and 33 patients (45.8%) had no complaints of low back pain.

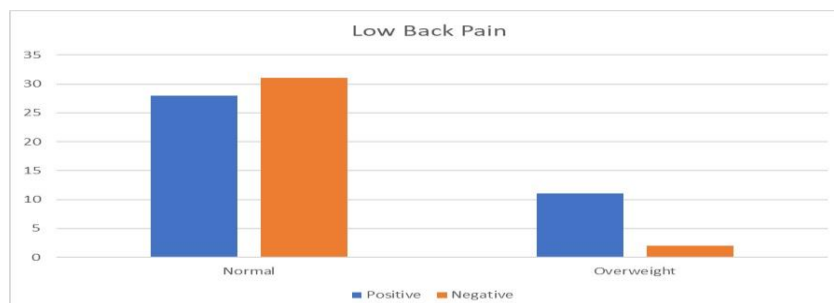


Figure 1: Bar Diagram Comparison of BMI Patient

The bar diagram in Figure 1 above shows that patients who do not suffer from LBP are most common in the group of patients who have a normal BMI. Meanwhile, patients suffering from LBP are often found in patients who have an overweight BMI. Cross-tabulation of BMI with the incidence of LBP can also be presented in Table 3 as follows:

Table 3: Cross-tabulation of BMI with Low Back Pain

BMI	Low Back Pain		Total
	Negative	Positive	
Normal	31	28	59
Overweight	2	11	13
Total	33	39	72

Based on the results of the Pearson chi-square test to determine whether there is an influence of BMI on the incidence of LBP, a significance value of 0.015 ($p < 0.05$) was obtained. This proves that there is a significant influence of BMI on the incidence of LBP.

The risk of patients with an overweight BMI experiencing LBP can be determined based on the odds ratio from the chi-square test. The odds ratio value was 6.089 (95% CI 1.241 – 29.888). Patients with an overweight BMI have a 6 times higher risk of suffering LBP.

DISCUSSION

Of the 72 samples in this study, 59 patients were found to be in the normal BMI category, and 13 other patients were in the overweight BMI category. Apart from that, 39 patients were positive for LBP, and 33 other patients were negative.

The results of previous research conducted by Singh et al (5) with bivariate analysis, obtained using the Chi-Square Test obtained a p-value of 0.038, meaning there is a significant relationship between BMI and lower back pain. The results of this research are the research I conducted at the Purwodadi Community Health Center using the chi-squared test to obtain a significance value of 0.015 ($p < 0.05$), which means that there is a significant influence of BMI on the incidence of LBP. In the research discussion, it is stated that excess body weight can cause weak abdominal muscle tone so that a person's center of gravity will be pushed forward and cause lumbar lordosis to increase, which then causes fatigue in the paravertebral muscles, this is a risk of LBP (5).

This research is in line with that conducted by Sari (6) who said that there was a relationship between BMI as a risk factor for LBP ($p\text{-value} = 0.036 < 0.05$). This is to the research we conducted at the Purwodadi Community Health Center regarding the effect of BMI on LBP which had significant results with a significance value of 0.015 ($p < 0.05$) and an odds ratio of 6.089 which shows that patients who have an overweight BMI have a 6.089 times higher risk more positive for LBP than patients who have a normal BMI.

CONCLUSION

The results of data analysis prove that BMI has a significant influence on the incidence of LBP, overweight BMI has a 6.089 times greater risk of positive LBP compared to patients who have a normal BMI.

Declaration by Authors

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