
THE RELATIONSHIP BETWEEN *BODY FAT* PERCENTAGE AND *VISCERAL FAT* IN FIKK UNM STUDENTS

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Received: July 2025, Revised: August 2025, Accepted: September 2025

Abstract

The body will use calories as needed and store the excess in the form of fat tissue. Body fat percentage is a picture of the amount of fat stored in the body, while visceral fat is the fat that surrounds internal organs and is often associated with an increased risk of metabolic disease. This study aims to find out the correlation between body fat percentage and visceral fat. This study used an analytical observational design with a cross-sectional approach. The measurement of body fat percentage and visceral fat was carried out using the bioelectrical impedance analysis (BIA) method. The results of the analysis showed a significance value of $p = 0.000$ ($p < 0.05$) with a Pearson correlation coefficient of 0.757, which indicates a strong and significant relationship between the two variables. Thus, it can be concluded that body fat percentage has a strong positive correlation with visceral fat.

Keywords: Body fat percentage, visceral fat.

INTRODUCTION

The accumulation of uncontrolled food consumption and lack of physical activity, resulting in a calorie surplus. The body will use calories as needed and will store unused calories into fat tissue (Crudele et al., 2021). A calorie surplus that is maintained all the time is a major cause of weight gain and obesity. Obesity is defined as excess body fat that can interfere with health (H. Mohajan et al., 2023). Obesity contributes to a decline in quality of life (Blüher, 2020), Triggers of non-communicable diseases such as hypertension, type 2 diabetes, cardiovascular disease, high cholesterol (Kolnes et al., 2021), (Wong et al., 2021), (Zhou et al., 2024a).

Body composition is an important indicator of an individual's health and physical fitness. One component of body composition that receives substantial attention is body fat percentage, which reflects the proportion of fat stored in the body. Excess body fat, particularly when accumulated in the abdominal region, can lead to an increase in visceral fat. Visceral fat is the fat

that surrounds vital organs such as the liver, pancreas, and intestines. It is known to be more metabolically active and is strongly associated with various metabolic disorders including cardiovascular disease, type 2 diabetes, hypertension, and dyslipidemia.

University students, especially those who engage in health and sports-related academic programs, are expected to possess good levels of physical fitness and healthy body composition. However, lifestyle changes, academic pressures, high-calorie food intake, sedentary habits such as prolonged screen time, and inconsistent exercise routines may contribute to fat accumulation, even among students of physical education and sports sciences. This issue raises concerns because individuals who appear physically fit externally may still possess high levels of visceral fat, a condition often referred to as “hidden obesity.”

Measuring body fat percentage alone may not fully reflect harmful fat distribution in the body. Therefore, analyzing the relationship between overall body fat and visceral fat is essential to gain a deeper understanding of health risks in young adults. The availability of non-invasive body composition assessment tools, such as Bioelectrical Impedance Analysis (BIA), makes it easier to evaluate these components precisely in a college setting.

Students at the Faculty of Sports and Health Sciences (FIKK) of Universitas Negeri Makassar (UNM) represent a population that should ideally have optimal physical fitness profiles. Thus, understanding their body fat status—both overall and visceral—becomes important for developing early detection strategies and health promotion programs. Identifying whether a strong association exists between body fat percentage and visceral fat levels may provide valuable insights for improvement of training programs, nutritional guidance, and lifestyle interventions.

Based on this consideration, research examining the relationship between body fat percentage and visceral fat in FIKK UNM students is crucial to support preventive measures and ensure future sports professionals maintain healthy physiological conditions.

METHODOLOGY

This study is an analytical observational research with a *cross sectional* approach. The study involved 57 FIKK students who were randomly selected, aged 19-22 years. The research was carried out at the UNM FIKK Laboratory on July 30, 2024. The purpose of the study was to determine the relationship between *body fat* percentage and *visceral fat*. The percentage of *body fat* and *visceral fat* was measured by the *Bioelectrical impedance analysis* method. *Bioelectrical impedance analysis* is one of the tools used to measure body composition. (Muthouwali et al., 2017) (Muthouwali et al., 2017). Data analysis was carried out using *Pearson correlation analysis*. This analysis is a parametric analysis conducted to analyze the relationship and tightness of the



relationship between one independent variable and one dependent variable with an interval or ratio data scale. The pearson correlation is between -1 to 1, which means a negative and positive relationship. Meanwhile, the closeness of the relationship in the Pearson correlation can be seen from the magnitude of the *Pearson Correlation* value obtained. The greater the Pearson Correlation value produced, the stronger the relationship between variables.

RESULTS

The following will be described the data from the research results of *the body fat* and *visceral fat* percentage of 57 FIKK students as research subjects.

Table 1. Description of Statistics

	N	Range	Minimum	Maximum	Mean
Percentase <i>body fat</i>	57	36.0	2.9	38.9	15.158
<i>Visceral fat</i>	57	16.0	1.0	17.0	3.149

Based on table 1 data. From 57 subjects, a *body fat* percentage value was obtained, with a *body fat* percentage range of 36% obtained from the highest value of *body fat* percentage of 38.9% and the lowest value of 2.9%. The average percentage of *the subject's body fat* was 15.158%. The *visceral fat* value of 57 subjects, with a range of 16 was obtained from the highest value of *visceral fat* of 17 and the lowest value of 1. The average *visceral fat* of subjects was 3.149.

Table 2. Correlation of *Body fat percentage* with *visceral fat*

		Percentase <i>body fat</i>	<i>Visceral fat</i>
Percentase <i>body fat</i>	Pearson Correlation	1	.757**
	Sig. (2-tailed)		.000
	N	57	57
<i>Visceral fat</i>	Pearson Correlation	.757**	1
	Sig. (2-tailed)	.000	
	N	57	57

Table 2 data. Showing the value of the relationship between the variable *percentage of body fat* and *visceral fat*, which is 0.757. Using the correlation interpretation table table, it is known that the correlation number is in the range of 0.60-0.799, which means that the relationship between the percentage of *body fat* and *visceral fat* is relatively strong. These results also show that the relationship between *body fat percentage* and *visceral fat* is positive (0.757), meaning that if the *body fat percentage* increases, *visceral fat* will also increase and vice versa.

Based on table 2. It shows a p-value, which is 0.000. If the value of 0.000 is less than 0.05 (p-value < 0.05), it is proven with a significance level of 5% that the variables of *body fat* and *visceral fat* percentage have a statistically significant correlation.



DISCUSSION

The purpose of the study was to determine the relationship between *body fat* percentage and *visceral fat* in FIKK UNM students. Findings from 57 subjects found the highest *body fat* percentage of 38.9%. This value is categorized as below average or bad based on research from (Jayadilaga et al., 2023). In general, the percentage of *body fat* $\geq 25\%$ for men and $\geq 35\%$ for women is an obese category (Macek et al., 2020). *Body fat percentage* is used as an indicator of obesity (Meiyanti et al., 2022), and also describe the risk of degenerative diseases (Putri & Lubis, 2021). Research results (Macek et al., 2020) He said that controlling the percentage of *body fat* below the threshold can help reduce the risk of cardiovascular disease. Body fat distribution is an important factor in assessing the risk of cardiovascular disease, as well as the prevention and treatment of obesity-related metabolic disorders (Jabłonowska-Lietz et al., 2017).

The highest *visceral fat* value based on the results of the study was 17. Benchmark *visceral fat* level, 1-9 normal, 10-14 high, ≥ 15 very high (Eimuhi, 2019). Research (Wahyuni et al., 2017) The results of the visceral fat health examination on a scale of 9-14 are a category of high *visceral fat*. High amounts of *visceral fat* buildup give rise to central obesity (Meiyanti et al., 2022) and the occurrence of metabolic syndromes that are at risk of degenerative diseases (Rizkiah et al., 2023). Research results (Dieny et al., 2020), *Increased visceral fat* in adolescents obesity is associated with an increase in metabolic syndrome scores, which indicates a worsening metabolic profile of the body. *Visceral fat* is associated with insulin resistance (De Mutsert et al., 2018), supported by research results (Kim et al., 2022) which states that high *visceral fat* is a risk of developing type 2 diabetes and is also related to the risk of developing cardiovascular disease (Qiu et al., 2020). Increased *visceral fat* is associated with increased mortality (Sukkriang et al., 2021).

The results showed that the correlation between the percentage of *body fat* and *visceral fat* was positive (0.757), meaning that if the percentage of *body fat* increased, *visceral fat* also increased and vice versa. Similar results from the study (Naulia et al., 2023), Obtaining correlation results between body fat percentage and visceral fat percentage there is a significant relationship ($p < 0,05$), Where the correlation coefficient value obtained shows a fairly strong and one-way relationship with each other ($p = 0.000$, $r = .495^{**}$), meaning that if the percentage of body fat increases, the visceral fat value will also increase, and vice versa, if the total body fat level is low, the visceral fat value will also decrease. The results of the study are in accordance with the research of the (Jabłonowska-Lietz et al., 2017), The amount of body fat in humans correlates significantly with the amount of *visceral fat*.

The body fat distribution consists of the percentage of body fat, visceral fat tissue, and subcutaneous fat tissue. There is a link between increased visceral fat and BMI (Utami &



Lestariana, 2022). The distribution of body fat is sexually dimorphic and it is known that men have more visceral fat and women have more subcutaneous fat in general (Elffers et al., 2017). The difference is not only in the percentage of body fat but in the distribution in parts of the body (Nauli & Matin, 2019). In this study, it does not distinguish between sexes so that it becomes an input for future research with the same theme, it is necessary to consider gender to get more accurate results.

CONCLUSION

Based on the results of data analysis, it can be concluded that the percentage of *body fat* with *visceral fat* has a significant, positive and strong relationship. A p value of 0.000 (less than 0.05) indicates a statistically significant relationship and a positive sign in *the Pearson Correlation* value (0.757) shows that the percentage of *body fat* and *visceral fat* has a direct relationship. Furthermore, *the Pearson Correlation* value also shows the closeness of the relationship between variables. A value of 0.757 indicates a strong correlation. The greater the percentage of *body fat*, the *more visceral fat* will increase, or vice versa.

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