



## Comparison between core exercise program with pilates exercise program in weight changes in overweight students<sup>☆</sup>



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### KEYWORDS

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### Abstract

**Objective:** To compare the effectiveness of core exercise program and pilates exercise program for weight changes in nursing students Hasanuddin University.

**Method:** This study uses an experimental method with a research design using two group pretest–posttest design. This research was conducted by providing core and pilates exercises given to 30 samples divided into 2 groups, namely the core group and the pilates group. Samples were measured by weight using kg (kilogram) scales to get the pre-test results. The exercises was given 12 times. After being given exercise, then the weight was measured again as a post-test result.

**Result:** The results of data analysis using paired sample t-test showed a value of  $p=0.00$  ( $p < 0.05$ ) so that the conclusion was that there were significant changes before and after giving core exercise and pilates exercise and the value of change for the core group was 2.46 and the value of change for the pilates group is 1.60 so it can be interpreted that core exercise is more effective in efforts to change the weight of overweight students at the Faculty of Nursing Hasanuddin University.

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## Introduction

The transition from high school students to college students accompanied by environmental changes from village to city resulted in changes in lifestyle and dietary patterns, from home-based food to instant food, whose nutritional status is unclear. This change in diet is accelerated by the rise of foreign food culture flows caused by advances in information technology and economic globalization. When students

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are faced with a variety of lecture assignments, they often do not have enough time to exercise and are coupled with careless food consumption without regard to the risks.<sup>1</sup> The impact of instant fast-food diets that are high in calories and fat and lack of physical activity such as sports are blamed as a source of increased metabolic diseases, one of which is characterized by being overweight.<sup>2</sup>

Overweight and obesity are conditions of increasing body weight due to excess fat storage.<sup>3</sup> The prevalence of obesity and overweight in adults (>18 years) in the world tends to increase by 39%, while the prevalence of overweight by 11% (men) and 15% (women). Based on the results of Riskesdas (2018), states that the prevalence of obesity in adults has increased since three periods. The increase in prevalence was 10.5% (Riskesdas 2007), 14.8% (Riskesdas 2013) and 21.8% (Riskesdas 2018). Similarly, the prevalence of overweight also increased from 11.5% (Riskesdas 2013) to 13.6% (Riskesdas 2018).<sup>4</sup>

Exercise is one of the most important and common components of weight loss and weight management programs.<sup>5</sup> Exercises that can help change your weight are core exercise and pilates exercise. Core muscles have a very important function in maintaining stability, support and balance of the body in carrying out activities. Being overweight causes the accumulation of fat to be centered on the stomach so that it can exert a weakening effect on the core muscles resulting in a decrease in the body's ability to maintain stability and balance due to excessive loads reaching the lower extremities so as to increase the risk of injury when doing activities.<sup>6</sup>

Pilates exercises, introduced by Joseph Pilates, are sets of activities that positively affect strength, posture, and flexibility of the body. Unlike most other exercises that only focus on the individual's physical aspects, Pilates exercises consider not only the individuals' physical dimension but also their mental aspects and they are based on balance between body and mind. 8 weeks Pilates exercises have positive effects on body composition in sedentary overweight and obese women. Pilates exercises can be applied for improving body composition.<sup>7</sup> Core exercise and Pilates exercise are choices in weight management. Both exercises can be done at home without having to go to the gym. However, the effectiveness of the two exercises is not yet certain. Therefore, researchers are interested in examining the comparative effectiveness between core exercise and pilates exercise for body weight in overweight students.

## Method

### Study object and location

The population in this study were all female students at the Faculty of Nursing Hasanuddin University.

The research was conducted in Nursing Faculty building and Physiotherapy Study Program building, Hasanuddin University, Makassar City, South Sulawesi, Indonesia. This study took place during 3 months starting from the preparation process until the processing of research data.

**Table 1** Characteristic of research subjects.

Subjects characteristics	Frequency	Percentage (%)
<i>Ages</i>		
18	5	16.7
19	15	50
20	8	26.7
21	2	6.7
Total	30	100
<i>Body weight (kg)</i>		
50–55	12	40
56–60	11	36.7
61–65	7	23.4
Total	30	100

## Data collection methods

This type of research is a pre-experimental design study, where the pre-experimental design is a study that aims to describe changes in body weight of overweight students after the provision of Core Exercise and Pilates Exercise. The research design used in this study is "two group pretest–posttest design". Sampling technique of the population with provisions that met the inclusion criteria and exclusion criteria set by the researchers. The inclusion criteria are; female students of Nursing Faculty Hasanuddin University who are registered and active during their studies; age range 18–22 years old; classified as overweight with BMI 23–24.9 kg/m<sup>2</sup>; sign the informed consent. While the exclusion criteria set are; unhealthy condition during the pre test; suffer from other disease that can be a barrier to researchers.

## Data analysis methods

The data obtained are primary data based on the results of pre-test and post-test body weight measurements. The data obtained is then processed using the SPSS data processing program. Data analysis techniques in this study used Descriptive Statistics Test, Saphiro–Wilk Test to test normally distributed samples, Levene's test to find out homogeneity of samples whether at the beginning of the study the samples departed from the same conditions, and Paired Sample T-tests and Independent sample-tests for hypothesis testing.

## Result

### Characteristics of research subjects

The results of the characteristic data in Table 1, show that the number of subjects aged 18 years was 5 people (16.7%), age 19 years were 15 people (50%), age 20 years were 8 people (26.7%) and age 21 years were 2 people (6.7%). Thus based on age characteristics, the most subjects are 19 years old and the least is 21 years old.

Based on weight grouping, the number of subjects with a body weight of 50–55 kg was 12 people (40%), body weight was 56–60 as many as 11 people (36.7%) and body weight 61–65 kg were 7 people (23.4%). Thus based

**Table 2** Effect of core exercise program on body weight change.

Group	N	Mean $\pm$ SD	p
<i>Core exercise</i>			
Pre test	15	58.27 $\pm$ 3.751	0.000
Post test	15	56.73 $\pm$ 3.770	

**Table 3** Effect of core exercise program on body weight change.

Group	N	Mean $\pm$ SD	p
<i>Pilates exercise</i>			
Pre test	15	56.67 $\pm$ 4.746	0.000
Post test	15	55.07 $\pm$ 4.559	

**Table 4** Comparison of core exercise and pilates exercise program in body weight changes.

Group	Mean $\pm$ SD	p
Core exercise	2.46 $\pm$ 3.773	0.304
Pilates exercise	1.60 $\pm$ 4.559	

on weight grouping, most subjects were students weighing 50–55 kg and the least were students weighing 61–65 kg.

### Effect of core exercise and pilates exercise program on weight change

Saphiro Wilk normality test results indicate that all data are normally distributed. In the core exercise group the results of the pretest and posttest were  $p=0.484$  and  $p=0.172$  ( $p > 0.05$ ) and the pilates exercise group obtained the pretest and posttest results of  $p=0.057$  and  $p=0.069$  ( $p > 0.05$ ) a reference for the subsequent paired *T*-test.

Based on Table 2, the results showed that the average value in the Core exercise group was 58.27 and after treatment was 56.73 with a change value of 2.46. Statistical test results obtained a significant value obtained value  $p=0.00$  ( $p < 0.05$ ) which indicates that there are significant changes before and after 12 times treatment of core exercise.

Based on Table 3, the results showed that the average value in the pilates exercise group was 56.67 and after treatment was 55.07 with a change value of 1.60. Statistical test results obtained  $p$  value = 0.00 ( $p < 0.05$ ) which indicates that there are significant changes before and after 12 times treatment of pilates exercise.

Based on Table 4, the results obtained an average value of weight change in the Core exercise group was 2.46 and obtained an average value of weight change in the pilates exercise group was 1.60. Based on the results of independent test *t*-test samples obtained  $p$  value = 0.304 ( $p > 0.05$ ) for the Core exercise group and  $p=0.354$  ( $p > 0.05$ ) for the pilates exercise group which means there is no significant difference between the Core groups exercise and pilates exercise for changes in body weight.

## Discussion

In people with overweight or obesity which is measured by higher waist circumference, the core muscles are strengthened to reduce regional fat and improve core stability. The core muscle strengthening is an important aspect of training protocol in obese individuals with predominant abdominal obesity. Core stability is important for efficient biomechanical function to maximize force generation and minimize joint loads in all types of activities ranging from running to throwing. Core has been linked through a kinetic chain formed with lower and upper extremities. Hence, the core is center to all forms of functions and performance tasks. The stronger core will help to maximize upper and lower extremity function.<sup>8</sup>

This research shows weight loss after 12 weeks core exercise. Changes in body weight can be associated with various physiological changes such as activation of core muscles which further results in an increase in the tone of the abdominal muscles and thereby mobilizing fat which leads to fat reduction.<sup>9</sup>

Pilates designed a comprehensive method of muscle stretching and strengthening with the goal of building a strong body. Pilates exercise presented a significant increase in lean mass and decrease in fat mass, it can be concluded that pilates may be considered an alternative exercise program for improving body composition.<sup>10</sup>

Core exercise shows a higher mean value compared to pilates exercise because some forms of core exercise are dynamic exercises, so that all core muscle elements in the abdomen and back are involved, which can reduce levels of fat in the body, whereas pilates exercise places more emphasis on static exercises for some movements so as to train the strength of the surrounding muscles, arms, abdomen and back. Pilates exercise can actually reduce weight, but it's better at increasing lumbar flexibility.

## Conclusion

There was no significant difference between the core exercise and Pilates exercise groups for changes in body weight but based on the difference in the pre-test and post-test changes for the Core group was 2.46 and based on the difference in the pre-test and post-test changes in the Pilates group was 1.60 thus showing that the provision of Core exercise is more effective than pilates exercise even with insignificant differences.

## Conflict of interest

The authors declare no conflict of interest.

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