

## The Impact of a Proposed Physical and Sports Program on Lipid Ratio for Type 2 Diabetes Patients

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### ABSTRACT

The aim of this study was to investigate the impact of a proposed physical and sports programme on the lipid ratio of type 2 diabetes patients. In this study we adopted an experimental approach, and the sample consisted of 15 patients with type 2 diabetes; the study consisted of a 'pre-test-post-test' experimental investigation.

This investigation was interested in measuring the lipid ratio before and after the physical and sports programme, which was designed and implemented over a 12-week period. The equipment used was in line with investigations in this field. The data was collected and analysed statistically. The results showed that there were significant differences between the pre-test and post-test lipid ratios in type 2 diabetic patients; the proposed programme had a significant impact on improving patients' physical condition.

**Keywords:** physical activity and sport, lipid ratio, type 2 diabetes.

### 1. INTRODUCTION

Diabetes mellitus (DM) is the leading public health challenge worldwide (Abere Woretaw Azagew et al, 2024, p. 2) is one of the most common chronic metabolic diseases marked by high blood sugar (hyperglycemia) which may lead to life threatening, debilitating, and expensive consequences and to a lower life expectancy, Type 2 diabetes mellitus (T2DM), makes up over 90% of all instances of the disease and is characterized by insulin resistance (IR) and  $\beta$ -cell dysfunction at the beginning of the disease (Maha F. Yaseen , Fayhaa M. Khaleel, 2024, p. 283) diabetes belongs to one of the largest global health crises of this century. Diabetes is a chronic disease that occurs either when the pancreas does not produce enough insulin or when the body cannot effectively use the insulin it produces. Insulin is a hormone that regulates blood

sugar level. Hyperglycemia, or raised blood sugar, is a common effect of uncontrolled diabetes and over time leads to serious damage to many of the body's systems, especially the nerves and blood vessels. (Awadhesh Kumar et al, 2024, p. 3) Diabetes Mellitus type II, earlier considered as an endocrinological disorder is now more regarded as an inflammatory disorder along with lipid aberrations. It demands for regular monitoring, healthy dietary habits and lifestyle modification (Amber Zaidi et al, 2023, p. 1) this type is a growing pandemic estimated to affect up to 529 million individuals globally, with a substantial impact on healthcare costs and patient morbimortality and quality of life (Rafael Gonzalez-Manzanares et al, 2024, p. 2) accordingly the world is witnessing a significant increase in the prevalence of obesity and type 2 diabetes (Ammar Issa Taresh, 2024, p. 105) Obesity is defined as an excessive accumulation of body fat that poses a risk to health. It is commonly measured using the Body Mass Index (BMI), which is calculated by dividing a person's weight in kilograms by the square of their height in meters. According to the World Health Organization (WHO), a BMI of 30 or higher is classified as obese. Obesity is a complex condition resulting from a combination of genetic, behavioral, and environmental factors. It is associated with numerous health risks, including cardiovascular diseases, hypertension, and type 2 diabetes (Ammar Issa Taresh, 2024, p. 106) Adverse blood lipid status may play a key role in accelerating insulin resistance in various chronic diseases, including obesity (Xingyan Xu et al, 2024, p. 2)

Sport as an important part of leisure time has not been spared from all these changes. It is increasingly a reflection of social conditions: on the one hand, many new trend sports have emerged that satisfy the hunger for fun, experience, adventure and enjoyment, but at the same time they also address the growing concern for health. They show the rather positive and cheerful side of sport (Walter Tokarski et al, 2023, p. 3) Physical activity is generally defined as any movement of the body driven by skeletal muscles under which energy expenditure takes place. Exercise is a physical activity that is structured, planned, and repeated with the aim of increasing physical fitness (Oliver Schubert-Olesen et al, 2022, p. 1)

Exercise has a significant positive impact on health. When exercising, the body secretes endorphins, hormones that act as natural pain relievers and promote feelings of happiness. In addition, exercise helps improve blood circulation, which in turn helps optimize the supply of oxygen and nutrients throughout the body (Rifki Saefullah et al, 2024, p. 66) consequently Physical activity (PA) has many positive health effects, including an increased life expectancy and lower chances of being diagnosed with type 2 diabetes mellitus (Willem I.J. de Boer et al, 2023, p. 1)

## 2. RESEARCH METHODOLOGY

As the topic is about the impact of a proposed physical and sports program on lipid ratio for patients with type 2 diabetes we used an experimental approach for the study

## 3. RESEARCH VARIABLES

**Independent Variable:** The proposed physical and sports program    **Dependent Variable:** Lipid ratio of patients with type 2 diabetes

## 4. PARTICIPANTS

The sample is a part of the community, and research using the sampling method is a study that examines a specific part or a specific proportion of the original community, and then ends with generalizing the results to the total community members (Boudawed abd El yamine, Attallah Ahmed, 2009, p. 68)

The research sample was selected intentional method from patients, numbering 15 patients with type 2 diabetes.

| Number | Average Age | Average Tall | Average weight |
|--------|-------------|--------------|----------------|
| 15     | 47,33       | 175 cm       | 86,26 kg       |

## 5. RESEARCH INSTRUMENTS

The researcher used skinfold thickness gauge (harpenden skinfold pliers), this device is used to measure the thickness of the skin and the amount of fat present in the skin folds



Initially, skinfold thickness measurements were taken in four areas:

- Skinfold thickness in the area of the triceps muscle
- Skinfold thickness in the area under the scapula:
- Skinfold thickness in the abdominal area
- Skinfold thickness in the biceps muscle

Re-measurements were taken after applying the program for three months



## 6. DATA ANALYSIS

We used version 26 of the SPSS program to obtain accurate results, the statistical tools including mean, standard deviation and T-test.

## 7. RESULTS AND DISCUSSION

**T- Test results between pre-test and post-test measuring of lipid ratio**

| Varibales   | Test      | Mean  | Sd   | df | Significance level | Sig   |
|-------------|-----------|-------|------|----|--------------------|-------|
| Lipid ratio | Pre-test  | 28,34 | 2,68 | 14 | 0.05               | 13.18 |
|             | Post-test | 24,27 | 2,63 |    |                    |       |

**Statistical decision: there were significant differences**

**The differences are in favor of the post-test**

The results of the table above for the paired samples t-test between the pre- and post-measurements in the lipid ratio in type 2 diabetes patients show that there are statistically significant differences, as sig equals (0.000) was less than the significance level (0.05), Consequently, there are significant differences in the variable favoring the post-measurement, as the difference between the two means was statistically significant. This confirms that the difference between the arithmetic means of both measurements varies in terms of statistical confidence and is significant from an evidential perspective for the "t" test. These statistical differences are not due to chance but are attributed to the implemented program. Thus, the fat percentage was significant, and we note that this improvement, specifically the reduction in fat percentage, is a direct result of the proposed physical and sports program.

The acceptance or rejection of study hypothesis is determined based on the results obtained in the table above and the analysis of its results, where the probability value was less than the significance level ( $p=0.000<0.05$ ). Thus, the researcher acknowledges the existence of statistically significant differences in the lipid ratio between the pre-test and post-test measurements.

The study of the results of the differences between the pre-test and post-test measurements in patients with type 2 diabetes forms part of the foundations of this study according to the proposed program based on physical activity aimed at reducing body fat percentage. The results of the measurements in the same group were statistically significant in favor of the post-test measurement, and these statistical differences are not due to chance but are attributed to the applied program. Therefore, we indicate in this regard that this improvement is practically due to the proposed program.

## 8. CONCLUSION

In conclusion, most studies indicate a significant and dangerous increase in the percentage of people suffering from obesity and diabetes, which necessitates follow-up and conducting studies to help overcome these diseases. This is what our study came up with by proposing a physical and sports program and knowing its effect on the percentage of fat in people with type 2 diabetes, thus reducing the serious complications of this disease. Finally, the study recommended that people with type 2 diabetes should practice physical and sports activity for a long time and make it as a habit.

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