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EFFECT OF SPORTS ACTIVITY ON THE HEALTH OF FEMALE STUDENT ACCORDING TO BLOOD LIPIDS

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[A]Study Design; [B]Data Collection

Abstract Blood lipid analyses were conducted on athletes and non-athletes to determine the extent to which certain blood parameters are affected by sports activity. The research objectives included identifying the results of blood fats for students in the Physical Education Department and comparing them with those of students in the Chemistry Department. The descriptive approach was used to suit the nature of the study , while the research sample was a group of female students from fourth-year students in the Department of physical Education, College of Education for Girls (athletes), and female students from the fourth year of the Department of Chemistry (non-athletes), with 10 female students from each department . Note that the mean age of the students was 23.15 years, SD=0.67, median 23, the mean height was165 cm, SD=5.36, median 166, and the mean weight was 67.2 kg, SD=3.54, median 67. Blood samples were taken for each female student during break time in order to analyze five blood indicators to identify the extent to which physical activity affects these indicators was determined by comparing the two groups using statistical analysis. The results were then discussed. In light of the findings, the researcher drew several conclusions. Regular physical activity is essential for female students, regardless of their university major, and should be practiced two to three times per week to be effective for general health and obesity prevention, and to help regulate blood lipid and lipoprotein levels, as it influences fat accumulation in the blood and subcutaneous tissue. Diet determines fat intake ,while exercise helps regular lipid levels. It is recommended to conduct periodic blood lipid tests for athletes and non-athletes alike to identify a person's health status early.

Key words: sports activity, athletes, non-athletes, blood lipides

Introduction

Physical activity decreases the risk of developing or dying from different cardiovascular diseases, not least because physical activity can partly prevent or slow the development of high blood pressure (Fuchs & Whelton, 2020). These achievements, which reflect this great development in the field of sports, especially during the past few years, were only the result of scientific development and its applications in sports aspect. Today, we are in dire

need of making more efforts to achieve sustainable progress that ensures for the sports movement a noticeable and broad, advanced progress on various levels, believing that scientific progress is the basic link that connects research findings correctly to form a harmonious chain based on studies and research. With respect to physical activity, organ system responses and adaptations typically determine the fitness level of the body (Ziauddin & Fagundes, 2023).These changes are of two types: temporary changes, meaning changes that occur temporarily in response to physical activity, but blood returns to its normal state at rest (Buyukyazi et al., 2010) and relatively permanent, meaning changes that occur in the blood as a result of training Exercise has a significant impact on blood components. For example, hemoglobin levels can increase by 1–2 g within months of regular training. Blood pH typically ranges between 7.35 and 7.45, and although intense exercise causes slight changes in acidity, the body quickly regulates this balance. Red blood cell (RBC) count can increase by approximately 10–20% in athletes who regularly engage in endurance training (Szymanowski et al., 2020; Shamaitijiang et al., 2024) Using blood lipid tests for athletes and non-athletes greatly helps to identify changes that occur in a person's blood during rest and physical exertion in both athletes and non-athletes. Studies using these tests and to compare athletes with non-athletes provide valuable insights (Bull et al., 2020).They indicated that physical activity stated that p affects individual health based on blood parameters, and the mechanism for developing and improving these components to serve the individual's health and avoid the risk of disease .

Blood is an important physiological indicator for athletes and non-athletes alike (Izadifar et al., 2017). Understanding the biological effects of this variable provides valuable information for professionals in the sports field, particularly regarding blood pressure regulation. It also serves as an important reminder to non-athletes of the benefits of engaging in regular physical activity The research problem lies in the significant lack of adherence to regular and scheduled medical examinations of blood indicators for most female students compared to developed countries, in addition to the lack of awareness among female students of engaging in physical activities to improve the health indicators from the perspective of blood lipids. Therefore, the researchers decided to study This study aims to explore the positive and negative effects of exercise on blood components in individuals.

The study aimed to evaluate certain blood indicators in students from the Department of Physical Education and Chemistry (Qiu et al., 2023) and to assess the impact of exercise on the health of female students. The findings indicate that participation in athletic activities has a positive effect on the health of female athlete.

Research Methodology

The researcher used the descriptive survey method, as it is appropriate approach to addressing the research problem (Fricker Naval, 2022)

Research Sample

The researchers' objectives for the study and the procedures used determine the nature of the sample chosen. The sample was selected from applications from the University of Kufa / College of Education for Girls / Department of Physical Education and Sports Sciences and Chemistry Department, with a number of ten from each department, and the students were chosen randomly. This sample represents 33% of the original population, noting that the number of fourth-year students was for the academic year 2024/2025 is (30), (31) students in the Sports and Chemistry departments, respectively..The mean age of the students was 23.15 years, sd.0.67, median 23, the mean height was 165 cm, SD=5.36, median was 166, and the mean weight was 67.2 kg, SD=.3.54, median was 67.

Research tools and equipment are the means by which researchers collect data and address the research problem to achieve the study objectives, regardless of the specific tools or equipment used:

- A 2mL medical syringe with (25 syringes);
- A turntable;
- 25 blood storage tubes (EDTA), manufactured in Jordan;
- Medical cotton with antiseptic solution for sterilization;
- Physical fitness lab at the College of Education for Girls.

Research Field Procedures

On February 9, 2025, the researchers met the randomly selected sample from the two departments (Physical Education and Chemistry). Approval was obtained from Professor Dr. Hamida Obaid Abdul Amir, Head of the Department of Physical Education and Sports Sciences, and Professor Dr. Faiz Al-Ramahi, Head of the Department of Chemistry, to collect blood samples from the selected female students . The participants were informed about the objectives of the study, the overall research purpose, and their roles and responsibilities as participants in the study (the students' verbal consent was obtained). The date was set for February 17, 2025. To conduct the analysis of the sample, blood samples of 2 cc were drawn, and the blood samples were transferred directly to the hematology laboratory after collection at Al Sadr Teaching Hospital (approval was obtained from Dr. Lina Arear, head of the blood analysis laboratory)to conduct the analysis and extract the results.

Exploratory experiment

The experiment was conducted on February 13, 2025, on two fourth-year students from the Chemistry Department and two students from the Sports Department. Blood samples were collected from the students during their break, and blood transfusion procedures were monitored. The procedure for transfusion to the laboratory at Al Sader Hospital and the hospital's hematology laboratory were monitored to ensure that all variables that may accompany work were controlled. In light of the exploratory experience the researchers were able to identify the following;

A. The extent of the students' understanding and comprehension of the test vocabulary.
B. Verifying the validity of the tools and equipment used.
C. Obstacles faced by the researchers when conducting the test, with the aim of overcoming them.
D. The number of the team assisting in implementing the test.
E. The time required to conduct the test..

Results

Presentation and Analysis of Blood Fats

Table 1. Results of blood test measurements of lipoproteins (LDL, HDL, vLDL), as well as lipids (Total Cholesterol, STG) for the study sample.

A- Physical Education Department

Tests	LDL mg/dl	HDL mg/dl	vLDL mg/dl	Total Cholesterol mg/dl	TG mg/dl
1	73	52	14.4	139	72
2	42	49	10.8	101	54
3	72.8	60	23.2	156	116
4	75.8	58	11.2	145	56
5	83.6	66	22.4	172	112
6	60.6	58	13.4	132	67
7	74.2	74	30.8	179	154
8	61	62	18	141	90
9	99	68	13.6	180	68
10	89	66	14.3	169	71.5

B- Chemistry Department

Tests	LDL mg/dl	HDL mg/dl	VLDL mg/dl	Total Cholesterol mg/dl	TG mg/dl
1	84.2	45	36.8	166	184
2	97	41	24	162	120
3	65	46	35	146	175
4	98	51	26	175	130
5	77.6	53	14.4	145	72
6	79	60	33	172	165
7	90.2	43	30.8	164	154
8	78.4	56	37.6	172	188
9	68.8	61	35.2	165	176
10	60.8	42	37.2	140	186

*-The normal ranges of lipid profile components, are as follows: LDL 108–188 mg/dl, .HDL (Low level <40 and High level ≥60) mg/dl), VLDL (<38 mg/dl), Total Cholesterol (150–200)mg/dl, Serum Triglycerides (35-160) mg/dl.

Table 2. Mean, standard deviation, calculated and tabulated t-value, and statistical significance of the blood lipid variables for the study sample.

Tests	Chemistry		Sport		t	Sig.
	X	SD	X	SD		
LDL	79.9	12.74	73.1	16.02	1.050	0.308
HDL	49.8	7.46	61.30	7.54	3.427	0.003
VLDL	31	7.47	17.21	6.40	4.430	0.000
Total Cholesterol	160.7	12.51	151.4	24.84	1.057	0.309
TG	155	37.37	86.05	32.02	4.430	0.000

Degrees of freedom =18, and a margin of error (0.05).

All research variables showed statistically significant differences, as the sig. value was less than the significance level of (0.05), except for LDL and cholesterol, where the sig. value was greater than the significance level of (0.05).

Discussion

Discussion of Blood Lipids

Low-density lipoproteins (LDL)

The results showed that female chemistry students had higher levels of LDL in their blood samples (79.9 mg/dl) compared to female physical education students (73.1 mg/dl), but this difference was not statistically significant and all values were within normal ranges. These proteins play an important role in transporting cholesterol from the liver to the body's various cell tissues, building cell membranes and producing specific hormones. An increase in the levels of these proteins is considered a risk factor (Markin et al., 2023), serving as an indicator of atherosclerosis due to the accumulation of cholesterol and low-density lipoproteins on the inner walls of the arteries.

The slight decrease in the levels of these proteins in the blood of female physical education students, compared to the arithmetic mean, is an indication of the role of exercise and physical activity in reducing the risk of atherosclerosis Atherosclerosis is prevented by lowering LDL levels. This reduces the likelihood of high blood cholesterol levels, as exercise helps the body consume energy and prevents it from accumulating as fat in the blood .

The LDL level can be calculated using the following equation:

LDL=TC – HDL - (Triglyceride / 5) (Wilson et al., 2021).

- TC Total cholesterol level.
- HDL High density cholesterol level.
- Triglyceride level.

High-density lipoproteins (HDL)

Atherosclerosis is known to be aided by dyslipidemia (hypercholesterolemia, hypertriglyceridemia, elevated low-density lipoprotein (LDL-C) levels, and/or reduced high-density lipoprotein (HDL) (Doewes et al., 2023).

The results showed that female physical education students had statistically higher HDL levels in their blood (61.30 mg/dl), compared to female chemistry students (49.4 mg/dl). These proteins play an important role in removing excess cholesterol from various body tissues and return it to the liver for excretion. High-density lipoproteins are

believed to prevent cholesterol from accumulating on the inner walls of the arteries, thereby protecting against atherosclerosis (Jebari-Benslaiman et al., 2022).

The proportion of these proteins is affected by several factors, including genetics, exercise, gender, and nutrition. The high level of these proteins in the blood of female physical education students indicates the role of exercise and sports in reducing the risk of atherosclerosis (Barnard et al., 2019).

Very low-density lipoproteins (VLDL)

The results showed that female chemistry students had a statistically higher levels of VLDL in their blood (31 mg/dl) compared to female physical education students (17.21 mg/dl). This is because these proteins play an important role in carrying and triglycerides (resulting from increased consumption of starchy and sugary foods and excess calories) from the blood. The liver stores them in fat cells distributed throughout the body (Huang & Lee, 2022).

High levels observed in chemistry students indicate elevated blood triglycerides, which reflect the conversion of excess sugars and starches into stored fat within adipose cells when they are not utilized for energy production A continued rise in triglyceride levels is considered a significant risk factor for atherosclerosis. Regular exercise greatly helps reduce fat accumulation on the inner walls of the arteries, thereby lowering the risk of arterial narrowing, heart attacks, and strokes. Al-Khalidi, Jasim & Takleef (2018) state that this practice helps the body consume energy, preventing its accumulation in the blood as fats, which is consistent with the results of the current study. Jasim & Takleef (2018) state this practice actually helps in consuming energy in the body and preventing for its accumulation in the blood as fats, for example, and this is what the results of the current study confirmed.

Discussion of the results of serum triglycerides (TG)

In the research sample, the results showed that female physical education students had a statistically lower serum triglyceride(TG)level level in their blood (86.05 mg/dl) compared to female chemistry students (155 mg/dl). The lower STG level in the blood of female physical education students was due to the positive effects of exercise (Al-Khalidi & Al-Ghazali, 2017) Triglycerides are small fat particles that constitute approximately 95% of the body's stored fats. Measuring blood triglyceride levels provides an indication of the number of these fat particles circulating in the bloodstream. When a person consumes excess carbohydrates that are not used for energy, the surplus is converted into triglycerides. If these triglycerides are not utilized for energy production, the excess is stored in fat cells distributed throughout the body. The entire body (abdominal area, thighs, arms, neck, etc.) has been found to be linked to atherosclerosis (Libby et al., 2022).

Sultana et al. (2015) reported that triglyceride (TG) levels in their sample were within the normal range established by the World Health Organization (WHO).

Discussion of cholesterol results

The results showed that the blood cholesterol levels of the female physical education students were similar (151.4 mg/dl) compared to the female chemistry students (160.7 mg/dl), but did not show a statistically significant difference.

A close examination of the results reveals an increase in the blood cholesterol levels of the female chemistry students compared to the female physical education students, but this was not significant enough to indicate a statistical difference.Blood cholesterol levels in normal cases ranges between 150–200 mg/dl, and an increase

above this range is considered a dangerous indicator for the body of atherosclerosis and heart disease. As we notice that female chemistry students, through the results, showed the beginning of a rise in cholesterol levels, and these results demonstrates the importance of practicing physical exercise and regulating food to maintain a moderate percentage of cholesterol (Brun et al., 2018).

Conclusions

Exercising helps individuals regulate their blood lipids levels, which positively impacts their health. Regular physical activity is essential for female students, regardless of their university major, and should be practiced 2–3 times per week to be effective in general health and fitness, and to help regulate blood lipid and lipoprotein levels, as it has implications for fat accumulation in the blood and under the skin. Studies have shown that cholesterol and LDL are not significantly affected by exercise, while TG, HDL, and VLDL are significantly and directly affected. Exercise, along with a balanced diet, is best for regulating blood lipids and maintaining a healthy body. The amount of fat entering the body depends on diet, but exercise can help regulate it. Furthermore, periodic monitoring of blood lipid levels is recommended for both athletes and non-athletes to identify a person's health status at an early stage.

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