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A comparative Study Of Blood Sugar Levels And Some Functional Indicators Between Students Who Skip Breakfast And Students Who Do Not. Exercises For a Fitness Conference

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Abstract

Objectives. To identify the correlation between some physiological variables of blood sugar, systolic blood pressure, diastolic blood pressure, and respiratory rate among female students who abstain from breakfast and those who do not abstain from breakfast.

Materials and Methods. The researcher defined his research population as female students in the College of Physical Education and Sports Sciences, Dhi Qar University, first year, Section A, consisting of 35 students, The research sample included (20) students, divided into 10 students who abstained from breakfast and 10 who did not abstain from breakfast, representing a percentage of 57%. , Tools Used **(** Blood pressure measuring device**,** Blood glucose measuring device**,** Cotton , Sterile , Gloves**,** Needles for the glucose meter**,** Glucose meter strips **) ,** Statistical methods (The researcher used the SPSS statistical package, version 2023, and the data were processed using the t-test for independent samples, the arithmetic mean, the standard deviation, and the skewness coefficient.)

Results. This study showed that blood glucose levels decrease before breakfast and are within normal levels during fasting, but that glucose levels increase after breakfast. The potential for using blood glucose levels as a measure to improve students' concentration levels during practical lectures.

Conclusion. The researcher in this study recommends conducting future studies on the same topic, with a broader range of cases, as well as studying students' glucose levels at different levels, which would help increase concentration levels and improve performance. The importance of controlling blood glucose levels is to maintain regular physical and nervous activity. Reducing these levels reduces stress and increases understanding and the ability to perform practical and scientific lectures.

Keywords : Nutrition, Blood Glucose, Systolic Blood Pressure, Diastolic Blood Pressure, Heart Rate.

Introduction

Nutrition is (the science of studying the components of the human body's nutritional needs and the extent of their utilization according to the following variables: age, gender, climate, function, biological condition, health status, biological processes, chemical reactions,

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tissue formation, and energy generation) (Breakfast2020). Nutrition refers to the food obtained by living organisms. Food is the substance that, when consumed by humans, interacts with the internal systems and enables the body to grow and maintain health. This includes all solid materials, water, and water-soluble substances (any edible substance from an animal or plant source that provides the organism with its nutritional needs). (Mehrabani 2020)

Nutrition is the method by which humans obtain the food they eat, which undergoes various metabolic processes to produce and release energy for use in our daily activities or during physical activity. Accordingly, nutrition can be defined as "the set of different processes by which a living organism obtains food or essential nutrients." Nutrition is therefore responsible for general vital processes (Really2020). Nutrition is one of the important factors in raising physical efficiency, increasing recovery speed, and resisting fatigue. Nutrition is an example of the connection between the external environment and the human body. Malnutrition significantly affects blood sugar and blood pressure levels during exercise and skipping breakfast. Skipping breakfast late in the day leads to low blood sugar and blood pressure throughout the day, leading to dizziness, weakness, lack of concentration and attention, and feelings of fatigue and lethargy. This may also affect the levels of some important elements in the body, such as some vitamins and minerals.

Materials and Methods

Study Participants.

The physical fitness lecture is one of the most important courses in the College of Physical Education and Sports Sciences. Through the researcher's review of the physical fitness lecture, and as a sports nutritionist at the College of Physical Education and Sports Sciences, he noticed a problem occurring among female students who exercised during the physical fitness lecture: they experienced a decline in their performance, feeling thin, dizzy, nauseous, and experiencing vomiting. Given that the physical fitness lecture requires intense and sustained physical effort, such as running, muscle flexibility, and some strength training exercises, which require greater energy after exerting great effort during the exercise, the researcher concluded that breakfast has a clear effect on blood sugar and some functional indicators, such as systolic and diastolic blood pressure and heart rate, among female students. Research Population: The researcher defined his research population as female students in the College of Physical Education and Sports Sciences, Dhi Qar University, first year, Section A, consisting of 35 students. Research Sample: The research sample included

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(20) students, divided into 10 students who abstained from breakfast and 10 who did not abstain from breakfast, representing a percentage of 57%.

Study organization.

The methods used in scientific research vary depending on the type of problem and the stages the research goes through to solve it. Therefore, the researcher used the descriptive method using a survey method because it is appropriate for solving this problem.

Statistical analysis.

Statistical methods: The researcher used the SPSS statistical package, version 2023, and the data were processed using the t-test for independent samples, the arithmetic mean, the standard deviation, and the skewness coefficient.

Results

Pre-Test Overview

Pre-test measurements were conducted on November 29, 2024, prior to any physical exertion. These assessments evaluated blood glucose levels, systolic blood pressure (SBP), and diastolic blood pressure (DBP). This allowed for an accurate baseline comparison to post-exercise values. The tests followed a standardized protocol for consistency.

Main Experiment

The main experimental session began at 9:00 AM on the same day. Participants performed a five-minute warm-up in the fitness lecture field, followed by a five-minute break. The primary exercise phase consisted of a mastery exercise (as described in the pilot), performed until the point of exhaustion.

Post-Test Overview

Post-tests were conducted at 9:30 AM, immediately after the physical activity. Identical procedures and environmental conditions were maintained for data consistency.

Table 1. Sample Homogeneity for Basic Demographic Variables

Variables	Arithmetic Mean	Standard Deviation	Coefficient of Skewness
Height	158.2 cm	9.1	1.7
Weight	65.8 kg	6.2	1.06
Age	23 years	2.2	1.04

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Table 2 Pre- and Post-Test Results for Students Who Abstained from Breakfast

Variables	Pre-Test Mean	Pre-Test SD	Post-Test Mean	Post-Test SD	T Value	Sig.
Glucose	71.60	20.74	102.60	4.8	2.84	0.04
Heart Rate (HR)	93.00	16.77	105.60	14.97	3.19	0.03
Systolic BP (SBP)	124.80	3.70	111.40	9.47	4.33	0.01
Diastolic BP (DBP)	82.60	4.22	74.60	4.28	3.47	0.02

Table 2 shows that for abstaining students, glucose levels significantly increased from a pre-test mean of 71.60 to 102.60 ($t = 2.84$, $p = 0.04$). Heart rate also rose from 93.00 to 105.60 ($t = 3.19$, $p = 0.03$). Systolic blood pressure decreased from 124.80 to 111.40 ($t = 4.33$, $p = 0.02$), and diastolic pressure dropped from 82.60 to 74.60 ($t = 3.47$, $p = 0.02$). These results indicate significant physiological changes after physical activity in students who skipped breakfast.

Table 3. Pre- and Post-Test Results for Students Who Consumed Breakfast

Variables	Pre-Test Mean	Pre-Test SD	Post-Test Mean	Post-Test SD	T Value	Sig.
Glucose	100.80	10.05	116.20	12.85	3.76	0.02
Heart Rate (HR)	104.50	12.87	95.00	5.47	3.85	0.01
Systolic BP (SBP)	130.06	9.31	110.00	11.57	2.36	0.05
Diastolic BP (DBP)	83.20	10.54	80.00	5.83	2.83	0.05

Table 3 indicates that non-abstaining students experienced a significant increase in glucose from 100.80 to 116.20 ($t = 3.76$, $p = 0.02$), while heart rate decreased from 104.50 to 95.00 ($t = 0.01$). Systolic pressure dropped from 13.20 to 11.00 ($t = 2.36$, $p = 0.05$), and diastolic pressure from 83.20 to 80.00 ($t = 2.83$, $p = 0.05$). These findings reflect physiological shifts after exercise in students who consumed breakfast.

Discussion.

The data from Tables 2 and 3 indicate clear physiological differences between students who ate breakfast and those who abstained from it before engaging in physical exercise. The most prominent changes were observed in glucose levels, heart rate, and both systolic and diastolic blood pressure. In the **abstaining group**, a significant rise in glucose levels was noted from pre-test (71.60 mg/dL) to post-test (102.60 mg/dL). This increase is likely a result of the body's compensatory mechanism, where the liver releases stored glucose into the bloodstream to meet the energy demand during exercise. However, the initial low glucose levels in this group suggest that their bodies were not adequately prepared for physical

exertion, which could lead to symptoms such as dizziness, nausea, fatigue, and cognitive disturbances. These symptoms reflect impaired functioning of both the central nervous and cardiovascular systems due to a lack of readily available energy substrates.

In contrast, the **non-abstaining group** had a higher baseline glucose level (100.80 mg/dL), increasing to 116.20 mg/dL after exercise. This suggests that consuming breakfast provided sufficient glucose availability to support both resting metabolic needs and the additional demands of physical activity. Consequently, students who ate breakfast maintained better homeostasis and functional performance, as evidenced by more stable physiological indicators.

Heart rate patterns also differed. In the abstaining group, heart rate increased from 93.00 bpm to 105.60 bpm post-exercise, while in the non-abstaining group, heart rate actually decreased from 104.50 bpm to 95.00 bpm. This could imply a more controlled cardiovascular response among students who consumed breakfast, likely due to more balanced autonomic regulation and better energy management during exertion.

Blood pressure results followed similar trends. Systolic blood pressure decreased significantly in both groups after exercise, which is consistent with post-exercise hypotension, a known physiological phenomenon. However, the decrease was more pronounced in the non-abstaining group, indicating better cardiovascular adaptation. Diastolic pressure also dropped post-exercise in both groups, further supporting the improved vascular response among those who had breakfast.

The findings align with established physiological mechanisms. Glucose is the brain's primary energy source, and insufficient availability (as in the fasting condition) can impair cognitive and motor functions. During exercise, muscles can uptake glucose independent of insulin, which explains the post-exercise increase in blood glucose in both groups. However, regular food intake enhances insulin sensitivity, meaning that breakfast consumption may improve metabolic flexibility and reduce the risk of adverse responses during physical activity (Adel, 2009).

In conclusion, consuming breakfast before physical activity plays a critical role in maintaining physiological balance, supporting better glucose regulation, cardiovascular response, and overall exercise tolerance. Students who skip breakfast are at higher risk of functional disturbances during physical exertion due to inadequate metabolic preparedness.

Conclusions.

This study revealed that blood glucose levels tend to decrease before breakfast and remain within normal limits during fasting, but significantly increase after breakfast. These

findings highlight the potential of blood glucose levels as a key indicator to enhance students' concentration during practical lectures. Therefore, the researcher recommends conducting further studies on this topic with a broader sample and varying levels of activity and measurement times to gain deeper insights into the relationship between glucose levels, concentration, and academic performance. Maintaining stable blood glucose levels is essential for supporting optimal physical and neurological function, reducing stress, enhancing comprehension, and improving students' ability to engage in both practical and theoretical learning.

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Conflict of interest

Have no conflict of interest to declare.

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