

The effect of physical exercise on the glycemic index of non-smoking football players during the training session

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Abstract:

The study aims to highlight the differences between the glycemic levels of non-smoking football players, depending on the type of exercise applied (high and low intensity). We relied on the experimental approach because of the interference in the intensity of exercise on the research sample consisting of a male team and another female group. After conducting the selected physical tests, the lateral jumping test and the twenty-minute running test, we concluded that:

1. There are statistically significant differences between the levels of glycemic index between resting and low-intensity exercise for both sexes, in favor of exercise.

2. There are statistically significant differences between the levels of glycemic index between rest and high-intensity exercise for both sexes, in favor of exercise.

Keywords: physical exercise, glycemic index, smoking, soccer players.

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Introduction:

1- The problem of research:

The practice of competitive sports activities is one of the means that help the individual to refine his talents and tendencies and create good habits and acquire moral and social qualities. It also helps them to self-control, courage, and respect and attracts them to respect the system and cooperation among them, and it also provides them with physical fitness that guarantees them a balanced and integrated life. There are some concepts about women's practice of competitive sports activities. These concepts may be artificially made by the man himself or by chance and transmitted over the years until they became a fixed reality in society and became inherited through generations and instilled in the minds of participants in sports activities,

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as several competitive team sports have emerged and football occupies the first place, (Al-Khouli and Al-Shafi, 2000, (p. 36)).

Football is one of the large games that has expanded to the point that it has become the most popular sport in the world after the public's awareness of its health, educational and competitive benefits has increased despite their different ages, culture, and classes, and football has known a great development in various eras because of its effective role in improving the physical fitness of the individual in order to obtain a high sports structure, in addition to that the practice of football is not limited to males only, but to females Also, (Al-Saffar, 1992, p. 29).

Physical exercise is defined as the physical positions and movements that shape the body and develop its motor ability, which leads to an educational purpose in order to reach the best possible ability in performance for the sports and professional field and work in various areas of life, in accordance with the principles and foundations Educational and scientific for the purpose of shaping and building the body and the development of his various motor abilities to achieve the best level possible in sports and professional performance and in different areas of life."(Mahmoud, 2016, p. 57).

Dr. Ahmed El-Sayed and Dr. Ahmed Mohamed Abdel Aziz define physical exercise as "a set of physical positions and movements with an educational purpose, which aims to form and build the body and develop its various motor abilities with its reliance on scientific and educational foundations to reach the individual to the highest level of motor performance that helps him in all areas of his life, but needs energy to carry it out, (Tout and Abdulaziz, 2012, p. 22).

The sources of energy during physical activity are carbohydrates and fats, and it should be noted here that the greater the intensity of the physical load, and the less the period of its permanence, the more the main source of energy is carbohydrates and vice versa, and it has been shown from studies in this area that eating a meal rich in carbohydrates helps not to feel stressed, and carbohydrates include sugary and starchy substances where they turn several times until they reach the so-called blood sugar.

(Alfandi and Shawkat, 1999, p. 147).

Blood sugar, also called glucose sugar (dextrose) or dextrose (Dextrose) and this type of sugar is found in fruits such as grapes and vegetables such as onions, sweet corn, and others, and glucose is melted at a degree (146 ° C) and is soluble in water, but it does not dissolve in alcohol. (Suleiman and Al-Rawi, 1998, p. 72).

The level of blood sugar in the human body is almost constant, and this is what Samia Khalil pointed out, as she stated that "the blood contains a constant level of about (100 mg /cm³) blood glucose", (Mohammed, 2006, p. 222).

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Glucose is the main source of energy in the body as this energy is necessary and needed by the human body to perform physical exercise and this energy is liberated by breaking the bonds between the sugar molecules of glucose as it turns into carbon dioxide and water in a process called cellular respiration, and the energy released, whether it is from glucose sugar or other nutrients where it is stored in the cells of the body in the form of a compound called adenosine triphosphate (ATP), which is also called the energy complex, as the release of energy from glucose sugar is in two stages, the first: anaerobic, which means the dissolution of sugar (breaking the bonds between the molecules of glucose sugar) without the presence of oxygen and this process occurs in the cytoplasm of the cell, and the second stage: it is aerobic, which depends directly on oxygen, as this process occurs in the energy houses (mitochondria) through a cycle called (Krebs cycle), where the enzymes necessary for the occurrence of these energy houses (mitochondria) were found in the energy houses (mitochondria). Interactions.

(Saleh and Ashir, 1982, p. 341).

From all of the above, the problem of our research crystallizes in the following question:

2-The main question:

- Is there a difference in the blood sugar index of non-smoking football players during the training session depending on the type of physical exercise?

3-Partial questions:

Is there a difference in the blood sugar index as a result of the type of physical exercise during the training session among the research sample of male football players?

Is there a difference in the blood sugar index as a result of the type of physical exercise during the training session among the research sample of female football players?

4- Research hypotheses :

Through research questions, hypotheses can be formulated that will contribute to the completion of this study through Test them and coming up with facts, and from here we can formulate the hypotheses of the study as follows:

4.1 Main hypothesis:

- There is a difference in the blood sugar index of non-smoking football players during the training session depending on the type of physical exercise.

4.2 Partial hypotheses:

1- There is a difference in the blood sugar index as a result of the type of physical exercise during the training session among the research sample of male football players.

2- There is a difference in the blood sugar index as a result of the type of physical exercise during the training session among the research sample of female football players.

5- Research Objectives:

1. Find out if there is a difference in the blood sugar index as a result of the type of physical exercise during the training session among non-smoking football players of the male class.

2. Check if there is a difference in the blood sugar index as a result of the type of physical exercise during the training session among non-smoking female football players.

6- The importance of research:

1- Know the real-time responses to the blood sugar index of non-smoking players through physical exercises of different intensities.

2- Measuring the values of blood sugar concentration in non-smoking football players as a result of physical exercises of different intensities.

3- Comparison of the percentage of difference in blood sugar concentration in non-smoking players as a result of physical exercises of different intensities.

7- Definition of search terms:

7.1 Physical exercise:

" It is some physical movements that are placed on special rules in which Educational foundations and scientific, physiological, and anatomical principles, are performed once or again."(Mahmoud, 2016, p. 56).

7.2 Blood sugar:

Blood sugar is known as glucose and there are many sugars in the blood, but they are within glucose, as it is the main energy source for the body, glucose is stored in the body in the form of glycogen and its concentration is supervised by several hormones, especially insulin.

" It is a monosaccharide with six carbon atoms (6), fructose and galactose quickly They also turn into body glucose, which in turn is used as a main source of energy by many cells in the body such as brain cells and red and white blood cells. (Muhammad and Ahmadi, 2004, p. 22).

7.3 Smoking:

Scientific definition: Tobacco is the leaves of a tree called (tabacum Nicotiana) of the Solanaceae family Solanacea.Fam) and includes the genus Nicotiana more than sixty species of these shrubs, and is not used in the field of smoking and chewing only nicotine, which is the wild

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type of tobacco, and is a highly toxic semi-alkaline substance (a drop and one is enough to kill a man) and cause compulsive addiction *Encyclopaedia Britannica*, 1982

Procedural definition: Smoking in this research is meant smoking regular cigarettes and

(shisha/waterpipe)

7 - 4 - Football:

"It is a team game played in a rectangular stadium with a length of 90 to 120 meters and a width between 45 and 90 meters on both sides of the field (longitudinally) there are two goals with a length of 7.32 meters and a height of 2.2 meters, guarded by a goalkeeper who prevents the goal from being scored in his net, the sharpener is governed by 3 referees plus a fourth referee whose work is to monitor the time of the match for 90 minutes", (Anis and Montaser, 1998, p. 378).

8 – Previous, related and similar studies:

8-1 a study of (Abdel Hamid, 2010) entitled: The effect of increased physical exertion intensity on biochemical variables in the blood and some basic skills in football, and the study aimed to Knowing the effect of physical effort by running on a conveyor belt on the concentration of white blood cells, hemoglobin, blood sugar, cholesterol, enzymes creatinephosphokinase and lactate dehydrogenase in the blood, the researcher used the descriptive approach (case study) on a sample of football players in the Iraqi Al-Sumud Club, the study was conducted in the club's stadium and in the isotopic laboratory for medical analyzes in Fallujah.

The study found: There is an effect of increased physical exertion on the concentration of biochemical variables, and the existence of significant correlations between the skill of scoring from stability with both white blood cells, hemoglobin and blood sugar, and in particular: There is a positive effect of physical exertion of high intensity on blood sugar after performing physical exertion of heightened intensity.

8-2 (Mahmoud and Al-Hiti, 2012) entitled: The - effect of high-intensity physical exertion on the enzyme creatinephosphokinase and glucose sugar and energy expended to the heart and its relationship to speed endurance for football players, and has aimed The study aims to identify the effect of high-intensity physical exertion on the enzyme creatinephosphokinase, glucose sugar and energy expended to the heart of football players, as well as to identify the relationship between creatinephosphokinase and glucose sugar and energy expended to the heart of football players.

The researcher used the descriptive approach on a sample of 23 players for the Golan Club in Fallujah Stadium and its hospital laboratory, the researcher relied on the test tool and reached the following results: There were statistically significant differences between the results of the pre-and

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post-tests for some physiological variables and the energy expended to the heart and in favor of the post-tests, the emergence of a significant correlation between speed tolerance and both the glucose variable and the energy variable expended to the heart after physical exertion High intensity on the ergometric bike.

8-3 a study of (Al-Faqih, 2012) entitled: The effectiveness of an aerobic exercise program on some biochemical variables for young football players, and the study aimed to identify the effectiveness of aerobic exercise on some biochemical variables (Concentration of cholesterol, triglycerides, total lipids, glucose) among young football players under 19 years, the researcher used the experimental approach on one group using pre- and post-measurements, on a sample of football players for under 19 years in Al-Qunfudhah Governorate, Saudi Arabia, the researcher reached the following results: The proposed aerobic exercises have a statistically significant positive effect on all biochemical changes (cholesterol concentration - triglycerides - total lipids - Glucose concentration).

8-4 Study of (Mahmoud, Awad, and Khaled, 2016) entitled Study of the immediate responses to some biochemical blood variables due to increased intensity aerobic physical exertion and their correlation with the skill of scoring from stability in football, The study aimed to know the immediate responses through running with high intensity aerobic physical exertion on the conveyor belt in the concentration of some biochemical blood variables, which are hemoglobin, white blood cells, and blood sugar.

The researcher used the descriptive approach on a sample consisting of (16) players of Al-Samoud Youth Football Club, in their own stadium and by conducting analyzes in the Al-Amer laboratory for pathological analyzes, and the study reached the following results: There is an effect of aerobic physical effort on the concentration of biochemical variables in the blood, there was a negative effect of escalating physical effort on the level of performance of the scoring skill of stability in football, and the existence of significant correlations between each of the scoring skill of stability with Both leukocytes, hemoglobin and blood sugar had a positive effect of heightened physical exertion on blood sugar after performing heightened physical exertion.

9 - Field Procedures:

9 - 1 - Methodology: We considered the research method is the experimental method because we conducted measurement and testing after our intervention and change the intensity of performance from low to high intensity.

9 - 2 - Society and sample research: The community of our original research consists of football teams active in Algeria for males and females, our research sample has been selected in the intended way available (intentional sample) and the category taken was from the class of adults and they are two teams from the clubs of the state of Biskra, and the sample has been characterized by the following characteristics:

Table(01):represents the median age, height, weight and body mass of the two samples.

Sex	N	Age/Year		Weight/kg		Length/Meter		Body mass	
	16	\bar{X}	S	\bar{X}	S	\bar{X}	S	\bar{X}	S
males	08	23,63	2,77	68,200	6,52	174,88	7,33	22,93	1,71
females	08	23,00	1,60	55,200	7,39	160,25	10,41	20,55	5,013
\bar{X} : arithmetic mean N : number of sample members S : deviation Normative									

9 – 3 – Data collection tool: We chose the following two tests with blood sugar concentration measurement:

9 – 3 – 1 – Side jump test for: Sang 1882, reference (talk, p.103, Nekkache), note the following figure:



Note: Perform at maximum intensity and for a minute.

9 – 3 – 2 – 20 minutes running test ball :

With the signal, the player moves the ball and runs, the clock begins to count at the start and stops at the end of 20 minutes, running is done in a light format, knowing that the depletion of sugars has been determined by many researchers at 20`.

9 – 3 – 3 – Measurement of blood sugar concentration:

The athlete's finger is pricked by a special lancet, and when the blood comes out, we put it in the electronic chip connected to the device [electronic device of the type (On Call Plus)] after the result appears, it is written down and the unit of measurement for the given results is: Mg/dl.



The device used is a medical electronic device manufactured by the American company (AconLaboratories), this is what makes our results placed, knowing that its results are accurate and comply with ISO -15197: 2013.

9 – 3 – 4 – Scientific foundations of the tool used:

To calculate the stability of the tests in our study, we used the method of calculating the stability coefficient by half fractionation in the male sample and we got a result of (62.2) for Cronbach's alpha, which is a sufficient result, and for the female sample, we got (0.79) for Cronbach alpha, which is also good, through the results obtained for males and females, it can be said that the stability coefficient for blood sugar tests for our study has an acceptable rate, knowing that we used the package Statistical Humanities (SPSS).

10 – Presentation and analysis of the results of the study:

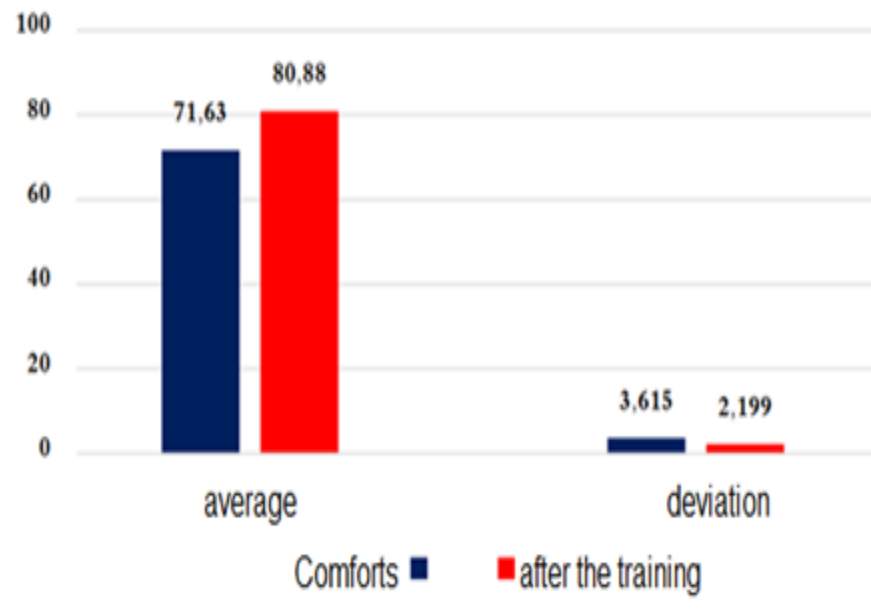
10- 01 - Presentation and analysis of the results of the first hypothesis: The text of the hypothesis is:

Is there a difference in the blood sugar index as a result of the type of physical exercise during the training session among the research sample of male football players?

10-01-01- Presentation and analysis of the results of the high-intensity physical exercise act (Song test) on the male blood sugar index:

Table (02): Effect of high-intensity physical exercise on male glycemic index:

Statistical milestones	Comfort		After high-intensity exercise		Statistical significance
	\bar{x}	S	\bar{x}	S	
Mg/dl	71,63	±3,615	80,88	2,199±	**



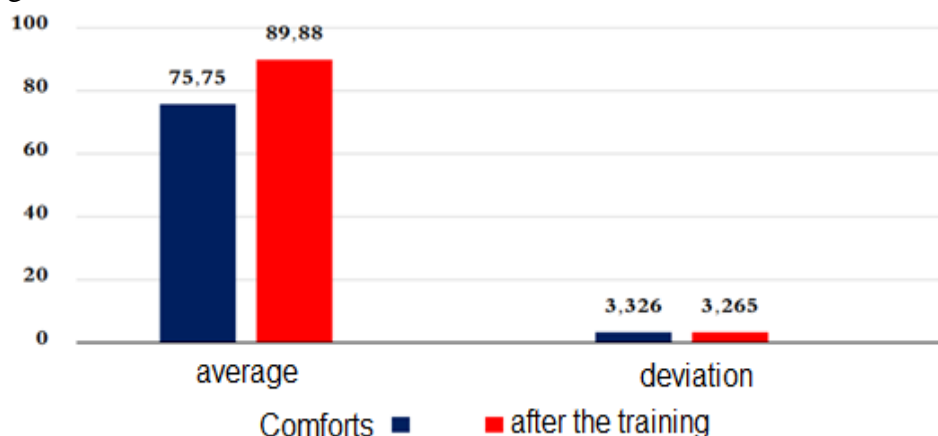
From Table No. 02 and its graph, we can see the following: The (arithmetic mean of the blood sugar index at rest: (Mg/dl 71.63) with a standard deviation of ($\pm 3,615$), while after the high-intensity voltage, the arithmetic mean of the blood sugar index (Mg/dl (80.88)) with a standard deviation of ($2,199\pm$), and the value of the differences for T-Student is a function at the level of 0.01.

10-01-02 Presentation and analysis of the results of low-intensity physical exercise (20` test) on the male blood sugar index:

Table (03): Low-intensity physical exercise on the male blood sugar index:

Statistical milestones	Comfort		After low-intensity exercise		Significance Statistics
	\bar{X}	S	\bar{X}	S	
Mg/dl	75,75	3,326 \pm	89,88	3,265 \pm	**

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From Table No. 03 and its graph, we notice the following: The arithmetic mean of the blood sugar index at rest: (Mg/dl 75.75) with a standard deviation of ($\pm 3,326$), but after the low-intensity voltage, the arithmetic mean of the blood sugar index (Mg/ dl 89.88) with a standard deviation of (3,265 \pm), while the value of the differences for T-Student is a function at the level of 0.01.

10-02 - Presentation and analysis of the results of the second hypothesis: The text of the hypothesis is:

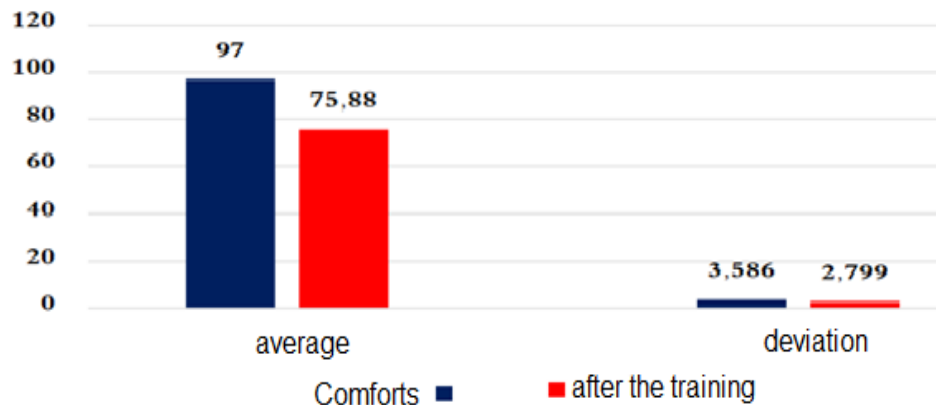
Is there a difference in the blood sugar index as a result of the type of physical exercise during the training session among the research sample of female football players? .

10-02-01- Presentation and analysis of the results of the high-intensity physical exercise act (Song test) on the female blood sugar index:

Table (04): Effect of high-intensity physical exercise on female glycemic index:

Statistical milestones	Comfort		After high-intensity exercise		Statistical significance
	\bar{X}	S	\bar{X}	S	
Mg/dl	97,00	3,586 \pm	75,88	2,799 \pm	**

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From Table No. 04 and its graph, we can see the following: The arithmetic mean of the blood sugar index at rest: (Mg/dl 97.00) with a standard deviation of (($\pm 3,586$), but after the high intensity voltage, the arithmetic mean of the blood sugar index ((Mg/ dl 75.88) with a standard deviation ($2,799 \pm$), while the value of the differences for T-Student is a function at the level of 0.01.

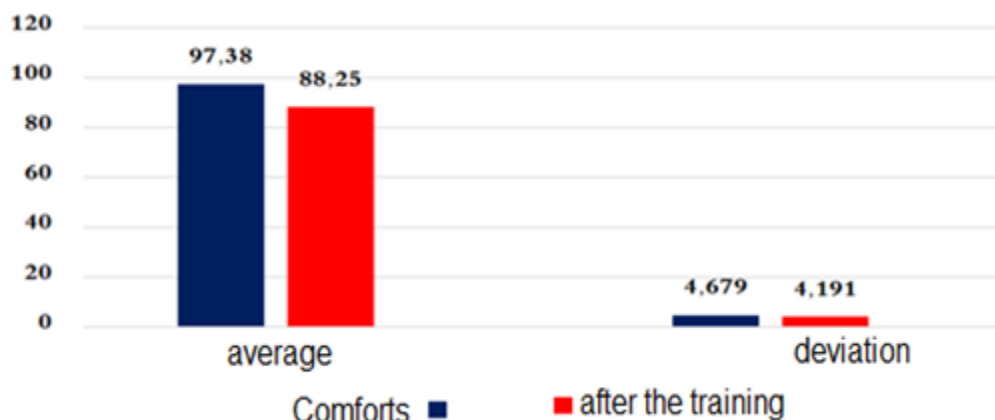
Note:

The existing and significant differences are in favor of the state of rest, which is the opposite of what we found in males subject to high-intensity exercise.

10-02-02- Presentation and analysis of the results of low-intensity physical exercise (20') on the glycemic index of females:

Table (05): Effect of low-intensity physical exercise on the glycemic index of females:

Statistical milestones	Comfort		After high-intensity exercise		Statistical significance
	\bar{X}	S	\bar{X}	S	
Mg/dl	97,38	4,679	88,25	4,191	**



From Table No. 05 and its graphic curve, we notice the following: The arithmetic mean of the blood sugar index at rest: (Mg/dl 97.38) with a standard deviation of (± 4.679), but after low-intensity effort, the arithmetic mean of the blood sugar index was (Mg /dl 88.25) and a standard deviation of ($4.191 \pm$), as for the difference value for t - students, it is a function at the level of 0.01.

Note: The existing differences and function are in favor of the state of rest, which is the opposite of what we found in males subject to high-intensity exercise.

11 - Discussing the results of the study:

11-01 - The results of the study are:

- There are significant differences at the level of 0.01 in the value of the blood sugar index in favor of the post-exercise measurement of high intensity among male football players in the research sample.
- There are significant differences at the level of 0.01 in the value of the blood sugar index in favor of post-exercise measurement of low intensity among male soccer players in the research sample.
- There are significant differences at the level of 0.01 in the value of the blood sugar index in favor of the measurement at rest among the female football players in the research sample, the case of exposure to the high-intensity effort.
- There are significant differences at the level of 0.01 in the value of the blood sugar index in favor of measurement at rest among female soccer players in the research sample, the case of exposure to the low-intensity effort.

11-02 - Discussing the results of the study:

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Through the obtained results, which confirmed the existence of statistically significant and positive differences among the research sample, male football players, which agrees with the results of the studies mentioned in item No. 08 of our research:

8 - 1: A study (Abdul Hamid, 2010) entitled: The effect of increasing physical effort on biochemical variables in the blood and some basic football skills.

8 - 2 - A study (Mahmoud and Al-Hiti, 2012) entitled: The effect of high-intensity physical effort on the enzyme creatinephospho-kinase, glucose sugar, and the energy spent on the heart, and its relationship to endurance speed for soccer players.

8 - 3 - A study (Al-Faqih, 2012) entitled: The effectiveness of an aerobic exercise program on some biochemical variables for young soccer players.

8 - 4 - A study (Mahmoud, Awwad and Khaled, 2016) entitled Studying the immediate responses to some biochemical blood variables as a result of an escalating intensity aerobic physical effort and its correlation with the scoring skill of stability in football.

However, the research sample was female soccer players, the differences were negatively significant, as there was a decline and decrease in blood sugar between the resting phase and the post-exercise phase, whether for low-intensity or high-intensity exercise, which distinguishes our research from the rest of the aforementioned research.

We can explain the reason for this decline by the need to know the state of recovery that the females were in compared to the rations that preceded the test ration, as confirmed by (Hostmark, 2006, p. 42. Høstmark) by studying a sample of females who ate sugars to the point of saturation, then we underwent an effort and noticed a decrease in sugar the blood.

From the foregoing, we rule in principle that the behavior of blood sugar in females differs inversely with the behavior prevailing in males, pending randomized studies.

12- Suggestions:

1. Re-studying in different human, spatial and temporal domains.
2. Adopting similar studies with stratified random sampling (of both sexes and of different age groups).
3. Taking into account the experimental control by observing the physical condition of the research sample.

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