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The Effect of Some Dietary Supplements Accompanied by Exercises According to the Biological Rhythm in its Physical Cycle for the Negative Phase on Some Biochemical Variables and Body Mass Index (BMI) of Female Trainees in Gyms.

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Abstract

Many individuals strive to achieve their health and fitness goals by regularly exercising. With dietary supplements being one of the modern technological advancements, the importance and role of dietary supplements in athletic achievement and attaining advanced levels of physical performance are growing every day. The research problem emerged as the two researchers worked in fitness centers, leading them to question whether dietary supplements play a role in enhancing the functional efficiency of the body's organs when used in conjunction with exercises based on the negative circadian rhythm. The research aimed to investigate the impact of dietary supplements and their role in enhancing the functional efficiency of the body's organs when used in conjunction with exercises based on the negative circadian rhythm. The study involved a sample of seven female athletes, and the researchers utilized statistical methods through a statistical toolkit. The findings indicated that the adoption of dietary supplements alongside exercises following the negative circadian rhythm contributed to the improvement of certain biochemical variables and body mass index (BMI) for female trainees in fitness centers, and this achieves one of the sustainable development goals of the United Nations in Iraq which is (Good Health). The researchers recommended the adoption of dietary supplements in conjunction with exercise programs aligned with the negative circadian rhythm for female trainees in fitness centers.

Keywords | **Dietary Supplements, Biological Rhythm, BMI**

Introduction:

Having good health and high physical fitness means that an individual's potential knows no bounds. Proper nutrition plays a vital role in enhancing an individual's good health and making the most of it. Engaging in physical exercises is a fundamental part of a healthy lifestyle and physical activity. Many individuals strive to achieve their health and fitness goals through regular exercise. Scientific research shows that the impact of physical activity extends beyond just improving physical fitness and muscular strength. It also affects the biochemical aspects of the body and contributes to overall health. As nutritional supplements are one of the modern technological advancements, their importance and role in achieving high levels of accomplishment and athletic performance continue to increase every day, especially in advanced countries that place significant emphasis on sports development and promotion. More scientific research is being conducted to test the effects and benefits of nutritional supplements and to develop new types of supplements. Dietary supplements designed to enhance sports performance represent effective tools for achieving this goal. They do so by increasing energy levels, improving performance, and

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replenishing muscle energy stores. They also contribute to boosting physical motivation during exercises, enhancing muscle recovery, and reducing the harmful effects of free radicals that form during strenuous physical activities. This effect contributes to improving the muscle recovery process and reducing fatigue and stress resulting from strenuous exercises. Additionally, protein supplements, especially dairy-based proteins, play a crucial role in promoting muscle growth and enhancing physical performance. They aid in repairing damaged muscle fibres during physical activities and support the muscle-building process. However, individuals in general, and athletes in particular, experience the influence of natural biological phenomena and both positive and negative changes that directly impact their lives and athletic performance. These phenomena are not random; each has a structured and advanced form. The biological rhythm is a significant and influential factor for both athletes and non-athletes, as it is closely linked to circadian cycles that affect their daily behaviour in a balanced and continuous manner. The concept of rhythm took on new dimensions when it became associated with human movements, whether they were daily natural movements or athletic skills. Rhythm is not limited to external appearances but extends to the functioning of physiological systems within the body. Biological rhythm encompasses various aspects of an individual's life and behaviour, both internally and externally, and it plays a significant role in regulating and coordinating bodily functions and activities. The study conducted by Hassanein Mohammed highlights that "biological rhythm refers to the regular and rhythmic biological changes, both short-term and long-term, during which physical, emotional, and mental activities in humans increase or decrease. In this context, all physiological functions within the human body operate under a specific and consistent timing system, characterized by oscillations that occur in various body systems, involving periods of highs and lows" (14). As for the physical circadian rhythm, Ali Al-Bayati indicated that "it is the cycle responsible for the physical condition of humans, with a duration of 23 days. The physical condition of humans is divided into two phases within the duration of this cycle: a positive phase and a negative phase, with each phase lasting 11.5 days" (15). The critical day, as indicated by Suzan Ahmed's study, is defined as "the day when the cycle crosses the zero line from the positive phase to the negative phase" (16). This concept served as a significant motivation for studying these phenomena, elucidating their impact on the research sample, and highlighting the influence of nutritional supplements accompanying exercises on the negative circadian rhythm in some of the trainees' biochemical variables. Through their role as fitness and health club practitioners, along with their interactions with fellow practitioners in fitness centers, as well as their review of previous studies and research, and personal interviews with experts and specialists in exercise physiology, the two researchers aimed to find answers to the following questions: Do nutritional supplements play a role in enhancing the efficiency of the functional systems in the trainee's body when used in conjunction with exercises following the negative circadian rhythm?

The research aimed to design exercises (aerobics, HIIT, Zumba) according to the circadian rhythm in its negative phase. It aimed to investigate the effects of these exercises and dietary supplements (Centrum, Glovit, Vitamin D3, Vitamin C) on various biochemical variables (Vitamin D3, triglycerides, High-Density Lipoprotein - HDL, Low-Density Lipoprotein - LDL, Hemoglobin Hp) for the research sample. Additionally, the study sought to measure the Body Mass Index (BMI) as an indicator of body mass. The researchers hypothesized that there would be statistically significant differences between the pre-test and post-test results in favour of the post-test in some biochemical variables among female athletes. The human sample consisted of (7) female athletes, and the study was conducted

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from 19/06/2022 to 18/09/2022, at Al-Sayyidia Fitness Center in Baghdad.

Method and Procedures:

As Nouri Al-Shawk noted, "the scientific approach that a researcher follows in solving the problem of their research is determined by the nature of the problem and dictates a specific methodology to arrive at the truth" (2). Therefore, the researchers chose an experimental design for a single experimental group with pre-test and post-test to align with the research problem and objectives. Jaber and Ahmed pointed out, "the objectives set by the researcher for their research and the procedures they use will determine the nature of the sample they choose" (3). Therefore, the researchers defined the research population as women in fitness centers aged between 25-35 years who engage in sports activities. The total number of participants was 21 women out of 32 who met the criteria for inclusion. The participants were selected based on their adherence to the rhythmic cycle, and a random selection method was used to choose 7 participants who were willing to participate in the experiment and commit to the training sessions. These participants were part of a group that shared a similar rhythmic cycle. The data collection methods used in the research included Arabic and foreign sources, literature review, observation, personal interviews, tests, and measurements. The research also employed various devices and tools, including a treadmill (Treadmill), a stationary bike, eight boxes with a height of 50 cm each, a medical scale (Sartorius) of German origin, a measuring tape, two-timing watches, a laptop computer (HP), and a handheld electronic calculator (Casio).

Field Research Procedures:

Biochemical Variables Measurements:

Test Objective: To measure biochemical variables in the blood.

Tools Used: Laboratory medical equipment.

Procedure: The participant sits in a chair, and the test administrator withdraws 5cc of blood, which is then analyzed inside the laboratory to obtain a blood profile and results.

Recording: The results of the variables, after laboratory processing, are recorded in a resting state as follows:

Vitamin D3
Triglycerides (T.G)
High-Density Lipoprotein (H.D.L)
Low-Density Lipoprotein (L.D.L)
Hemoglobin Hp

Measuring Body Mass Index (BMI) (1):

Measuring Height:

Body height is measured to the nearest centimeter using a height scale. The height measurement must be conducted with the examinee in an upright position. Care should be taken to apply pressure to the examinee's head using the scale's board, especially when the examinee has thick hair. The researchers further emphasize the need to apply pressure on the heads of female examinees, especially when they are wearing a hijab.

Measuring Weight:

The body weight is measured to the nearest 100 grams (0.1 kg) using a calibrated scale, preferably digital. The measurement process should be conducted without shoes and with the least amount of clothing possible on the body of the examinee. It is essential to ensure that the scale is not placed on a soft surface (like a carpet or sponge mattress) when conducting the measurement.

Body Mass Index (BMI):

- Body Mass Index (BMI): Calculated by dividing the weight (in kilograms) by the square of the height (in meters).

$$\text{Body Mass Index (BMI)} = \frac{\text{Weight (kg)}}{\text{Height (m)} \times \text{Height (m)}}$$

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The pre-tests were conducted as follows:

The researchers, along with the assistant research team members selected by the researchers, conducted the pre-tests on the research sample on Sunday and Monday, dated (19-20/6/2022), using the tests adopted in the study, as follows:

All measurements were taken at 9:00 AM, including height, weight, and age, to minimize the impact of daily rhythms, which are natural internal hourglasses that regulate the sleep-wake cycle and occur approximately every 24 hours. The research participants were instructed not to have breakfast before the measurements. Specialized medical staff (protein lab) took all the necessary scientific precautions for accurate measurements. During blood withdrawal, the examinee sat at a 90-degree angle. All blood tests were performed using single-use syringes and were transferred to the device. The blood serum samples were chemically treated by the protein lab using specific chemical substances to extract the biochemical variables.

Table .1 It illustrates the homogeneity of the sample in anthropometric measurements and biochemical variables

Seq.	Tests	Measurement Unit	Mean	Median	Standard Deviation	Skewness Coefficient
1	Body Mass Index (BMI)	kg/meter	33.69	33.9	1.835	-0.265
2	Vitamin D3	mg/100 milliliters	9.381	9	1.883	-0.912
3	Triglyceride (T.G)	mg/100 milliliters	213.71	213	5.866	0.227
4	High-Density Lipoprotein (H.D.L)	mg/100 milliliters	35.857	36	2.851	-0.170
5	Low-Density Lipoprotein (L.D.L)	mg/100 milliliters	107.14	107	2.329	-0.112
6	Hemoglobin Hp	grams per 100 milliliters	10.431	10.33	0.572	0.480

The sample size is 7 with a significance level of 0.05.

From Table (1), it is evident that the values of the skewness coefficient for all the variables, including the physical measurements, kinetic variables, and biochemical variables, fall between (+1 and -1), indicating that their distribution follows a normal distribution. This means that all individuals in the research sample are homogeneous. As for the main experiment:

The researchers prepared cardio exercises (aerobic exercises that primarily depend on burning oxygen and blood sugar in the body to produce energy), HIIT exercises (high-intensity workouts in a short time, which are highly beneficial for quick fat burning), and Zumba exercises (a type of physical fitness exercise designed for its practitioners). These exercises are closely related to the body's biological rhythm as they eliminate lethargy and laziness and boost morale among the trainees, which helps to alleviate the negative phase in the trainees, accompanied by dietary supplements (Centrum, Glovit, Vitamin D3, Vitamin C). The dietary supplements were in capsule form, while Vitamin C was in water-soluble tablet form, given to the trainees on training days half an hour before starting the exercise. The dosages were determined based on each trainee's need during the week, after conducting medical analyses with the help of a specialist doctor (Doctor Basel Haqi Nafea, the family medicine specialist responsible for the nutrition clinic at Yarmouk Teaching

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Hospital), taking into account the physical cycle, as they are given on the days of the negative cycle. The exercise program commenced on Sunday 26/06/2022, and continued until Thursday 15/09/2022, with a total program duration of 12 weeks. The total number of training sessions was 36, with 3 training sessions per week. The training days were on Sundays, Tuesdays, and Thursdays. The exercise program included a combination of aerobic exercises, high-intensity interval training (HIIT), and Zumba. Specifically, on Sundays, Zumba exercises were performed, on Tuesdays, aerobic exercises and planks were part of the routine, and on Thursdays, HIIT exercises were incorporated. The researchers adopted the physical cycle to divide the biological rhythm. As described by Yarub Khayoun, "These cycles start together for the first time from the point of birth, gradually rise to their peak, and then descend to the critical day, which occurs on day 11.5 of the physical cycle" (5). Subsequently, these cycles begin to gradually descend to their lowest point. Afterwards, the negative phase starts decreasing gradually, reaching the starting point or zero line. Supplements were administered after the doctor determined the daily dosage during the negative phase. This physical cycle is responsible for the individual's physical condition and lasts for 23 days, divided into two phases: a positive phase and a negative phase, with each phase lasting 11.5 days. During the positive phase, the individual is in their best physical condition. The nutritional supplements were used during the negative phase in the second 10 days of the physical cycle for this sample. The researchers, along with their support team, conducted tests on the research sample on Sunday, dated (18/9/2022), using the same method as the preliminary tests. The researchers utilized statistical tools through the Statistical Package for the Social Sciences (SPSS), and by employing relevant statistical laws, which are:
Presenting the differences between the pre-test and post-test in functional variables and discussing them.

Table .2 It illustrates the differences in the arithmetic means, their standard deviations, the calculated (t) values, and the significance of the differences between the pre-test and post-test results in the functional tests for all three groups.

Variables	Unit of Measurement	The pre-test		The post-test		Difference	Deviation of Differences	T-value	Error Level	Significance
		Arithmetic Mean	Standard Deviation	Arithmetic Mean	Standard Deviation					
Vitamin D	Milligram/100 Milliliter	9.857	1.772	18.142	1.951	8.285	2.627	8.343	0.000	Significant
Triglycerides (T.G)	Milligram/100 Milliliter	213.14	5.814	175.28	7.499	37.857	6.491	15.429	0.000	Significant
High-Density Lipoprotein (H.D.L)	Milligram/100 Milliliter	37.71	2.690	43	2.380	5.285	2.058	6.793	0.000	Significant
Low-Density Lipoprotein (L.D.L)	Milligram/100 Milliliter	106.42	2.935	86.714	2.497	19.714	2.811	18.552	0.000	Significant
Hemoglobin (Hp)	Grams/ 100 Milliliter	10.545	0.679	12.63	0.346	2.084	0.587	9.380	0.000	Significant
Body Mass Index (BMI)	Kilograms/ meter	32.95	2.11	30.56	1.049	2.086	0.875	6.305	0.001	Significant

At 6 degrees of freedom and a significance level of (0.05).

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Discussion of the results of the differences between the pre-test and post-test for the experimental group:

The table shows statistically significant differences in favor of the post-test after comparing the values of (T) for vitamin D3, triglycerides (T.G), high-density lipoprotein (H.D.L), low-density lipoprotein (L.D.L), and hemoglobin (Hp). Exercises and dietary supplements based on the negative physical cycle have been used. A study by Shaimaa Al-Aaraji and Inaam Ibraheem indicated that "there is an important and logical relationship between biochemical variables and body mass index with the lifestyle, nutrition, training status, and the level of physical and motor abilities of the trainees" (10). A study by Rania and Mona pointed out that "training over a considerable period of time helped balance the muscular work in the trainees' bodies by diversifying the involvement of muscle groups, resulting in the activation of dormant and weak muscles" (11). The researchers also emphasized that "the reasons for improvement are related to the quality of the exercises," as stated by a study by Nahida Ibraheem (6). Additionally, a study by Hasnaa Al-Zuhairi emphasized that "during physical rhythm cycles, along with the use of dietary supplements and the associated increase in physiological functions and energy levels, which is of utmost importance for improving adaptations and enhancing functional capacity building" (13). Another study by Aya and Abeer pointed out that "physical rhythm cycles are associated with increased hormone activity and physiological functions" (7). This hormonal environment supports biological balance, reduces stress, and improves mood by adopting positive circadian rhythms while using dietary supplements. This leads to an improvement in energy balance and enhances energy levels, which is reflected in the adaptation of biochemical variables as a response to exercise. This was confirmed by a study by Rasha Al-Maghazji, which stated that "the lack of physical activity leads to a decrease in muscle strength and muscular endurance, especially abdominal muscles. Women have a special and essential need for muscle strength to maintain their toned physique and prevent deterioration, which accelerates after the age of thirty" (8). The impact of this increase in energy requirements, as indicated by Muthaffer Shafeeq, is that "the first of these devices that play a role in providing this system is the circulatory system (heart, blood vessels, blood). Then comes the respiratory system, which works in very high coordination with the circulatory system. The heart's function is to pump oxygenated blood received from the lungs to the arteries, and this function adapts to physical training" (4). This was further supported by a study by Naseer and Ahmed, which stated that "the adaptations of biochemical variables are directly and positively associated with increased muscle work due to the use of exercises and dietary supplements according to the circadian physical cycle, leading to many positive effects" (9). This had an impact on (Vitamin D, Triglycerides (T.G), High-Density Lipoprotein (H.D.L), Low-Density Lipoprotein (L.D.L), and Hemoglobin (Hp)). Furthermore, dietary supplements complement the dietary regimen and are not a substitute for it. Some dietary supplements may help enhance the weight loss process by increasing metabolism and, consequently, aiding in burning calories faster. However, a study by Ruaa and Israa pointed out that "the effect of these supplements is not significant and may have a minimal impact on weight loss without engaging in physical activity and following a suitable dietary regimen" (12). Additionally, some dietary supplements can reduce appetite and curb the desire to eat, leading to the consumption of fewer calories. The results showed that the use of dietary supplements alongside exercise according to the negative circadian rhythm had an impact on reducing body fat percentage and body composition. The results were logical, and based on these findings, we can conclude that adopting dietary supplements alongside exercise according to the negative

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circadian rhythm can improve some biochemical variables and the body mass index of female trainees in sports facilities. Moreover, it was found that the use of dietary supplements alongside exercise according to the negative circadian rhythm increases the level of vitamin D3, reduces triglyceride (T.G) levels, increases high-density lipoprotein (H.D.L) levels, decreases low-density lipoprotein (L.D.L) levels, and increases hemoglobin (Hp) levels in the blood of female trainees in sports facilities. Recommendations and suggestions included emphasizing the adoption of dietary supplements alongside exercise according to the circadian rhythm for female trainees in sports facilities and focusing on incorporating diverse and varied exercises using different tools.

Conclusions:

Through the presentation, analysis, and discussion of the results from the pre and post-tests, the researchers concluded the following:

1. Adopting dietary supplements alongside exercises according to the negative circadian rhythm of the body's physical cycle for the negative phase works to improve some biochemical variables and the body mass index of female trainees in sports facilities.
2. The use of dietary supplements alongside exercises according to the negative circadian rhythm for the negative phase increases the level of vitamin D3 and reduces triglyceride (T.G) levels.
3. It increases the level of high-density lipoprotein (H.D.L) and reduces the level of low-density lipoprotein (L.D.L) while also increasing hemoglobin (Hp) levels in the blood of female trainees in sports facilities.

Recommendation:

The researchers recommend the adoption of dietary supplements alongside exercises according to the negative circadian rhythm for female trainees in sports facilities. They also emphasize the importance of incorporating diverse and varied exercises.

Author's declaration:

Conflicts of interest: None

We confirm that all tables and figures in this article are ours and written by the researchers themselves.

Ethical-Clearance: this manuscript approved by local ethical committee of physical education and sport sciences college for women on (November /2023)

Author's contributions:

All contributions of this study were done by the researchers (S.M. and M.T.) who get the main idea and work on writing and concluding also with number of experts, Haider Nawar (Ministry of Education) in Statistics, Manal Bayat in revision, Inaam Ghalib in translating, Nasser Yasser in proofreading

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References:

1. Du'aa A'id Shemkhi. (2018). Establishing Standard Degrees and Levels for Obesity and Health-Related Physical Fitness Factors for Middle School Girls in Baghdad (Al-Karkh). Doctoral Dissertation. University of Baghdad. College of Physical Education and Sport Science. p.88.
2. Rafe' Saleh Al-Kubaisi. (2004). A Researcher's Guide to Writing Research in Physical Education. Baghdad, Iraq. p.51.
3. Jaber Abdul Hameed, Ahmed Khairy. (1986). Research Methodologies in Education and Psychology. Dar Al-Nahda Al-Arabia, Cairo, Egypt. p.41.
4. Muthaffer Abdullah Shafeeq. (1983). Cardiac and Circulatory Fitness in Athletes in General and Football in Particular. Arab Football Union Magazine. Issue (10). Page 75.
5. Yarub Khayoun. (2002). Motor Learning: Theory and Application. Al-Sakhra Office for Printing. p.148.
6. Nahida Abd Ibraheem. (2017). An Analytical Study of Health Fitness Components

According to Aerobic Exercises in the Dissertations and Theses of Some Iraqi Universities in the Middle Euphrates and North for the Period from (2000 to 2014). *Modern Sport*. Volume 16, Issue 1, p.7. https://jcopew.uobaghdad.edu.iq/index.php/sport/article/view/83

7. Aya Nassir Muhsin, & Abeer Dakhil Hatim. (2022). The Effect of a Physical Program On Some Physiological Variables To Reduce The Polycystic Ovaries In Women Aged (20-25) Years . *Modern Sport*, *21*(2), P102. https://doi.org/10.54702/msj.2022.21.2.0101
8. Rasha Raed Hameed Al-Maghazji. (2014). The Effect of Zumba Exercises on Structural Fitness and Psychological Endurance in Women Participating in Fitness Centers Aged (25-35) Years. *Modern Sport*. Volume 14. (2). Page 50. https://jcopew.uobaghdad.edu.iq/index.php/sport/article/view/206
9. Naseer Safaa Mohammed Ali, Ahmed Mohammed Farhan. (2012). Biological Rhythm in its Physical and Emotional Cycles and its Relation to Some Elements of Physical Fitness and Achievement in 50m Freestyle Swimmers. *Modern Sport*. Volume 11, Issue 16, p. 243. https://jcopew.uobaghdad.edu.iq/index.php/sport/article/view/440
10. Shaimaa Ridha Ali Al-Aaraji, Inaam Jaleel Ibraheem. (2017) Therapeutic-Nutritional Program and Its Effect on Patients with Lumbar Disc Herniation with Overweight. *Modern Sport*. Volume 16, Issue 4, p12. https://jcopew.uobaghdad.edu.iq/index.php/sport/article/view/25
11. Rania Muaid Ibraheem, & Muna Talib Al-badry. (2022). Effect of Aero planks Exercises (With The Opposite Effort Between Movement and Stability) On The Components Indicators for Female Student Aged (18-22) Years. Modern Sport, 21(4), p. 33. https://doi.org/10.54702/ms.2022.21.4.0029
12. Ruaa Mahmoud, Israa Fouad. (2021). The Effect of Plank Exercises on the Fat Component and Basal Metabolic Rate (BMR) in Female Students of the Higher Institute for Security and Administrative Development, *Modern Sport*. Volume 20, Issue 3, p. 53. https://doi.org/10.54702/msj.2021.20.3.0046
13. Hasnaa Sattar Jabbar Al-Zuhairi. (2006). Biological Rhythm in its Physical, Mental, and Emotional Cycles and its Relation to the Match Outcome of Female Tennis Players. *Modern Sport*. Volume 5, Issue 5, p. 14. https://jcopew.uobaghdad.edu.iq/index.php/sport/article/view/310
14. Hassanein Mohammed. (2000). Biological Rhythm of Young Swimmers and its Relation to the Numerical Achievement in 100 Meter Breaststroke. Unpublished Doctoral Dissertation. Suez Canal University. Port Said. p. 44.
15. Ali Yousif Hussein Al-Bayati. (2014). Advanced Studies in Sports Psychology. 1st Edition. *Dar Al-Dhiyaa for Printing*. Najaf Al-Ashraf. p.143.
16. Suzan Sadiq Ahmed. (2010). A Proposed Training Methodology According to Biological Rhythm and Control of Psychological Energy and its Impact on Some Functional, Psychological, and Physical Variables in Female Fencing Players. University of Baghdad. Baghdad, Iraq. p.40.

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تأثير بعض المكملات الغذائية بمصاحبة تمرينات على وفق الإيقاع الحيوي بدورته البدنية للمرحلة السلبية في بعض المتغيرات البيو كيميائية ومؤشر كتلة الجسم للمتدربات في الصالات الرياضية

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مستخلص البحث

يسعى الكثير من الأفراد إلى تحقيق أهدافهم الصحية والبدنية من خلال ممارسة التمارين الرياضية بانتظام. ولكون المكملات الغذائية هي احدى ثورات التطور التكنولوجي الحديث لذا تزداد كل يوم أهمية ودور المكملات الغذائية في الإنجاز الرياضي وفي تحقيق مستويات متقدمة من الأداء الرياضي وبرزت مشكلة البحث من خلال عمل الباحثتان في مراكز الرشاقة تبادر لهما السؤال الاتي هل للمكملات الغذائية دور في رفع كفاءة عمل الأجهزة الوظيفية في جسم المتدربة إذا ما استعملت مع التمرينات على وفق الإيقاع الحيوي السلبي؟ وهدف البحث الى التعرف على تأثير المكملات الغذائية ودورها في رفع كفاءة عمل الأجهزة الوظيفية في جسم المتدربة إذا ما استعملت مع التمرينات على وفق الإيقاع الحيوي السلبي وعملت مع عينة من اللاعبات عددهم سبعة. استخدمت الباحثتان الوسائل الإحصائية من خلال الحقيبة الإحصائية واستنتجت الباحثتان إنّ اعتماد مكملات غذائية مصاحبة لتمرينات على وفق الإيقاع الحيوي السلبي تعمل على تطوير بعض المتغيرات البيو كيميائية ومؤشر كتلة الجسم للمتدربات في الصالات الرياضية، وهذا ما يحقق احد اهداف التنمية المستدامة للامم المتحدة في العراق (الصحة الجيدة). واوصت الباحثتان بضرورة اعتماد مكملات غذائية مصاحبة لتمرينات على وفق الإيقاع الحيوي للمتدربات في الصالات الرياضية.

الكلمات المفتاحية | **المكملات الغذائية ، الإيقاع البيولوجي ، مؤشر كتلة الجسم.**