

# The effectiveness of physical and skill exercises in a hot atmosphere and its effect on the response of some physiological indicators and the level of achievement of the air rifle competition juniors

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**Abstract:**

*The importance of preparing training programs and medical examinations for the players periodically and this is what makes them at the required level and training the players in different atmospheres on a regular basis in the training units to obtain the important physiological adaptations that contributed to the development and codification of the training loads so that it is appropriate to the ability of the body and benefit from its positive effects and avoid negative effects in The state of health, that the formation of a training load without studying its physiological effects in the body sometimes leads to a lot of burden on the body's organs according to the regulation of training loads, which gives physiological adaptations to the internal load whose results are reflected in the high level of athletic performance, which leads to the efficiency of the functional devices that increase The effectiveness of muscular work, and the goal of the research is to:*

- 1. Preparing skillful physical exercises in hot climates and their effect on response to some physiological indicators and the level of achievement in the effectiveness of air rifle shooting.*
- 2. Identify the effectiveness of skillful physical exercises in hot climates and their effect in response to some physiological indicators and the level of achievement in the effectiveness of air rifle shooting between the pre and post tests of the research group.*
- 3. Identify the differences between the control and experimental groups in the telemetry tests in response to some physiological indicators and the level of achievement of air rifle shooting buddies.*

*As for the research hypotheses:*

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1. *There are statistically significant differences between the pre and post tests in the physiological indicators and the level of achievement in the effectiveness of air rifle shooting and in favor of the post tests for members of the experimental and control groups.*

2. *There are statistically significant differences between the experimental and control groups in the dimensional tests in physiological indicators and the level of achievement in the effectiveness of air rifle shooting in favor of the experimental group.*

*The two researchers adopted the experimental approach with equal groups and determined the research community for the Air Rifle Competition for junior girls with (10) players aged 15-16 years. Physical and skill exercises were applied in a hot atmosphere to the experimental group for a period of eight weeks and at three training units per week. The two researchers used the latest version of ( IBM SPSS Statistics Version25) to process data and the two researchers reached the most important conclusions that physical and skill training has positively affected the response to some physiological indicators and the level of achievement of the female air rifle competition juniors. Achievement.*

**Key words:** *physical and skill training, physiological indicators, level of achievement, air rifle competition.*

## **I. Introduction:**

Sports competition and obtaining advanced positions has become an important criterion for most developed countries, as sport has become a cultural interface that reflects the extent of progress and development of countries through correct work based on the scientific foundations on which the sports sciences are based and work on solving all obstacles that may be encountered to reach the higher levels. Researchers and coaches in all sports spend a lot of effort in order to come up with scientific concepts that support the training process, find appropriate scientific explanations for it, and research the most important effects resulting from physical effort and the associated physiological changes through which training loads can be codified in line with the type of game to obtain Functional adaptations during physical effort and bearing the burdens of training, and air rifle shooting is one of the sports that are popular both internationally and locally, it is one of the interesting and beautiful sports that need high physical and functional requirements that are reflected in the aesthetics of performance during the competition by the correct connection between The level of physical and skillful performance of the junior players, in a hot atmosphere Training in a hot atmosphere has a clear effect on the response of physiological indicators, which generates physical and functional coordination; its effects are clearly reflected in the performance and achieving the best levels in the response of physiological indicators, which generates physical coordination with the aim of obtaining victory in the competition and achieving the best level of achievement and the importance of research lies in the peculiarity of the shooting sport With the air rifle and its needs for physical requirements, its effects are clearly reflected in the performance, level of achievement and the functional aspect, so the researchers decided to prepare exercises commensurate with that particularity and in a hot atmosphere and to identify the functional changes and adaptations accompanying the training in that atmosphere.

### **Research problem:**

Through the field experience of the two researchers in the scientific and practical field of training air rifle shooting, they noticed that the nature of its performance depends on fixed muscular work for long periods, especially the training camps that are often held in the summer and whose time ranges from 2-3 hours and with repeated attempts reaching more than 60 Repetition of the shooting performance in the center of the target in addition to requiring the player to wear legal clothes to shoot a rifle weighing 6 kg to increase stability. They noticed early signs of fatigue for young women during the training units that appear clearly after the first hour of training or competition, and this may be due to the increased heat generated Of the energy consumed in the frequent muscle contraction and the effort that falls on the nervous system to focus on the target center and aiming in addition to the air temperature and that this leads to an imbalance between the body's internal temperature and the temperature of the external environment, which leads to different responses according to the ability of the player physically or functionally Therefore, the two researchers sought to search for training solutions and bring about development at the level of emerging players, and then try and keep up Internationally advanced level in it.

### **research aims :**

1. Preparing skillful physical exercises in hot climates and their effect on the response to physiological indicators and the level of achievement in the air rifle shooting activity.
2. Identify the effectiveness of skillful physical exercises in a hot climate and its effect in response to some physiological indicators and the level of achievement of air rifle shooting juniors between the pre -and post- tests of the research group.
3. Identify the differences between the control and experimental groups in the telemetry tests in response to some physiological indicators and the level of achievement of air rifle shooting buddies.

### **Research hypotheses:**

3. There are statistically significant differences between the pre and post -tests in the physiological indicators and the level of achievement in the effectiveness of air rifle shooting and in favor of the post tests for members of the experimental and control groups.
4. There are statistically significant differences between the experimental and control groups in the dimensional tests in physiological indicators and the level of achievement in the effectiveness of air rifle shooting in favor of the experimental group.

### **Research areas:**

- The human field: Air rifle shooting youngsters in Iraq, aged (15-16) years for the 2019-2020 sports season, their number is (10) young women for shooting air rifles.
- The temporal domain: the period from 1/7/2019 to 7/9/2019.

- Spatial domain: the training center for shooting air weapons (Khawla Bint Al-Azwar Square) / Baghdad governorate

## **II. Research Methodology:**

The two researchers used the experimental research method by designing the equivalent groups of pre and post-test to suit the nature of the research.

### **Research community and sample:**

The research community was identified among the female youth of Iraq in air rifle shooting, which included (Baghdad Club, Adhamiya Club, and Al-Kadhimiya Club), which is the total community of female shooters throughout Iraq and the participation in training camps and local and international championships at ages (14-16) years for the 2019 training season. 10 female students, and the research sample was selected using a comprehensive inventory method, and the sample was divided into two groups (control and experimental), with five girls per group.

### **Tools:**

Observation, tests and measurements, personal interviews, a mercury device for measuring pulse and blood pressure, a stethoscope, a box with a height of 41.3 cm, electronic stopwatches type F1, number (10), an air rifle, a legal throw field, legal targets, number (12), legal shots 4.5 mm caliber, (1) HP computer, syringes to draw blood].

### **Determine physiological tests and measurements:**

1. Salt analysis test (calcium, potassium, sodium).
2. Hemoglobin blood test
3. Measuring the pulse while at rest.
4. Systolic blood pressure measurement at rest.
5. Measurement of diastolic blood pressure at rest.
6. Fully bending the knees from standing position (20) times within (30 seconds) / to measure the pulse and systolic and diastolic blood pressure after exertion (Abu Al-Ela Abdel Fattah and Muhammad Subhi: 1997: 73-76).
7. The vertical jump test (work) / for measuring short anaerobic capacity (Muhammad Nasreddin: 1998: 122-129).
8. Barash Energy Index / to measure the functional efficiency of the heart and the circulatory system (Abdel-Rahman Abdel-Hamid: 2011: 309-311).
9. Queens' total step test / to measure the maximum oxygen consumption (Kazem Jaber: 1999: 157-159).

### **Pre-tests:**

The two researchers conducted the pre-tests on the experimental and control groups on Saturday and Sunday 6-7 / 7/2019 in (Khawla Bint Al-Azwar Square) Baghdad Governorate, and before starting the statistical treatments, the two researchers performed a (normal distribution) test in my test (Kolmogorov-Smirnov) And (Shapiro-Wilk) for tests (calcium, potassium, sodium, hemoglobin, blood pulse measurement at rest, measurement of systolic blood pressure at rest, measurement of diastolic blood pressure during rest, pulse measurement and systolic and diastolic blood pressure after exertion, jump test Perpendicular (workpiece), Barash Power Pointer, Coins' Total Step Test, Achievement Level in Air Rifle Shooting Effectiveness).

### **Main experience:**

Upon implementing the main experiment, the two researchers developed a plan to implement the proposed training curriculum and adhered to the main lines of the plan. The main section included physical and skill exercises that were prepared in line with the effectiveness requirements and their level to improve the physiological indicators and the level of achievement with the air rifle. Exercises began on the experimental research sample on 13 / 7/2019 until 4/9/2019, as the prepared exercises were conducted on the experimental research sample in the firing field for air weapons in hot climates where the temperature could be raised (manufactured heat) 48 degrees Celsius and a degree of humidity of 60%. To measure the temperature and humidity, as for the control sample, the traditional training curriculum followed by the trainer was implemented in natural atmospheres at a temperature of 25 degrees Celsius, which is the natural atmosphere in the throwing hall, and the curriculum for prepared exercises was applied by:

The exercises prepared by the two researchers were applied during the preparation period for a hot atmosphere,

The time of the training unit is 60 minutes

- The duration of the exercises set in weeks: (8) weeks.

- The total number of training units is (12) training units.

The number of training units per week is (3) units.

Weekly training days: (Saturday - Monday - Wednesday).

The training method used: low intensity interval training.

- The number of exercises ranges between (8-10) exercises with (4-5) repetitions

The rest was calculated by returning the pulse from (110-120) pulses

- The intensity was calculated by extracting the maximum pulse, as the researcher calculated the maximum pulse immediately after the test, considering this maximum pulse for the player. The pulse of each intensity was extracted on the basis of this maximum pulse as in the following equation:

(Maximum pulse x intensity) / 100.

**Post-tests:**

After completing the implementation of the special exercises within the specified period, then conducting the research tests on Saturday and Monday corresponding to 5-7 / 9/2019 in (Khawla Bint Al-Azwar Square), Baghdad Governorate, with the same conditions similar to the pre-tests in terms of (time, place and tools used) The method of carrying out the tests).

**III. Presenting, analyzing and discussing results:**

Table (1) the arithmetic mean, standard deviations and (t) values calculated for the control group in the pre- and post- tests in the study variables									
Significance	Sig	T	DH	D	Post-test		Pre-test		Processors for a statistic tests
					STD	A	STD	A	
Non-Sign	0.704	0.408	0.004	0.002	0.015	2.116	0.017	2.118	Calcium
Non-Sign	0.178	1.633	0.024	0.040-	0.251	3.960	0.277	3.920	potassium
Non-Sign	0.208	1.500	0.400	0.600-	3.420	140.80	3.492	140.20	sodium
Non-Sign	0.266	1.291	0.015	0.020	0.032	16.280	0.057	16.300	Hemoglobin blood
Sign	0.001	1.833	1.200	2.200-	2.167	75.200	0.707	73.00	Take your pulse at rest
Sign	0.041	2.579	1.240	3.200-	3.271	125.20	0.707	122.00	Systolic blood pressure measurement while at rest
Non-Sign	0.127	1.922	1.240	2.400-	2.387	81.200	0.836	78.800	Measurement of diastolic blood pressure at rest
Sign	0.024	3.539	0.678	2.400-	1.140	79.600	1.303	77.200	Measuring the pulse immediately after the voltage
Sign	0.003	4.811	1.122	5.400-	3.049	130.60	0.836	125.20	Systolic blood pressure measurement after exertion

Sign	0.001	4.332	0.969	4.200-	1.303	84.200	1.000	80.00	Diastolic blood pressure measurement after exertion
Sign	0.002	7.203	0.583	4.200-	1.224	95.00	0.830	90.800	Vertical jump (workpiece) test
Sign	0.001	9.021	0.509	4.600-	1.643	166.80	1.483	162.20	Barash Energy Indicator
Sign	0.003	4.221	0.663	2.800-	1.51	43.600	0.836	40.800	Queens' total step test
Sign	0.000	7.060	2.549	18.00-	5.700	328.00	10.00	310.00	Achievement level in Air Rifle Shooting Event

The two researchers attributed the presence of significant differences in the physiological tests and the level of achievement in the effectiveness of air rifle shooting for the control group and in favor of the post -test to use the training curriculum for players followed by the trainer and to the role of traditional physical exercises in shooting exercises within the training units, which led to the development of some physiological tests and the level of Achievement in air rifle shooting effectiveness is limited compared to experimental group.

Table (2) the arithmetic mean, standard deviations, and (t) values calculated for the experimental group in the pre and post -tests in the study variables									
Significance	Sig	T	DH	D	Post-test		Pre-test		Processors for a statistic tests
					STD	A	STD	A	
Non-Sign	0.178	1.633	0.002	0.004-	0.011	2.114	0.014	2.110	Calcium
Non-Sign	0.208	1.500	0.020	0.030-	0.274	3.990	0.251	3.960	potassium
Non-Sign	0.178	1.633	0.244	0.400-	3.082	140.00	2.966	139.60	sodium
Non-Sign	0.284	1.238	0.009	0.012	0.016	16.308	0.035	16.320	Hemoglobin blood
معنوي	0.000	11.00	0.600	6.600	0.836	73.200	0.836	79.800	Take your pulse at rest
Sign	0.001	8.773	1.208	10.600	0.547	122.60	2.387	133.20	Systolic blood pressure measurement while at rest

Sign	0.002	3.651	0.547	2.000-	1.000	81.00	0.707	79.00	Measurement of diastolic blood pressure at rest
Sign	0.004	2.814	1.208	3.400-	1.732	81.00	1.140	77.600	Measuring the pulse immediately after the voltage
Sign	0.000	18.28	0.678	12.40-	1.870	138.00	0.547	125.60	Systolic blood pressure measurement after exertion
Sign	0.001	10.23	0.860	8.800-	2.387	89.200	1.140	80.400	Diastolic blood pressure measurement after exertion
Sign	0.000	15.92	0.489	7.800-	0.547	99.400	1.140	91.600	Vertical jump (workpiece) test
Sign	0.003	3.040	1.907	5.800-	3.674	169.00	2.167	163.20	Barash Energy Indicator
Sign	0.001	8.232	0.583	4.800-	1.303	46.200	0.547	41.400	Queens' total step test
Sign	0.000	8.552	7.483	64.00-	17.88	378.00	8.944	314.00	Achievement level in Air Rifle Shooting Event

The two researchers attributed the presence of significant differences in all physiological tests and the level of achievement in the effectiveness of air rifle shooting and in favor of the post-test of the proposed training curriculum, which includes the use of scientifically developed physical and skill exercises within the training units according to specific proportions and time, which are consistent with each period of training periods, As the physical and skill exercises put in place contributed to the development of the necessary physiological tests and the level of achievement with the air rifle, and this result is consistent with what was indicated by (Muhammad Mahmoud: 1985: 136), "The regulated and regular training programs according to scientific foundations work to develop the physical and skill level of the players ". And he also agrees with what he said (Talha Husam al-Din and others: 1997: 146-147): "When training in hot climates, the body loses large quantities of water and contrasting salts, and the most important of these different salts is sodium and chlorine, and their concentration in sweat is about half of what it is in plasma.

(Abu Al-Ela Abdel Fattah and Muhammad Subhi: 1997: 64) confirms that the amount of blood pressure is determined by several factors, the most important of which is the relationship between the heart's pushing of blood into the arteries and the resistance to the flow of blood in these arteries. Blood pressure is not normal, meaning either the blood pressure is high or low.



The findings of the two researchers agree with what (Muhammad Sobhi and Hamdi Abdel Moneim: 1997: 100) indicated, "The importance of pulse and blood pressure at rest."

The two researchers also believe that there is a very close relationship between blood pressure and heart rate (pulse), so that if the heart rate increases, the blood pressure rate increases, and this result is consistent with what was mentioned by (Gerard & Nicholas: 1984: 487) "The increase in heart rate and the strength of its contraction It increases blood pressure, and conversely, any decrease in the heart rate will lower blood pressure. " Also, the physical and skill exercises included in the curriculum have led to an increase in the jumping force of the player while ascending to the top, and this is consistent with what she indicated (Elham Abd al-Rahman: 1997: 245) that the explosive power of the two leg muscles is one of the most important physical abilities that must be essential. Its presence in sports activities. "

Also, physical and skill exercises have led to an increase in the efficiency of the emerging target through increasing the strength or increasing the work of phosphogenic enzymes, as the curriculum included in the performance of training on anaerobic methods, which led to an increase in the ability of ATP and creatine phosphate PC to produce energy, and this is consistent with what he indicated To him (Farouk El-Sayed: 1983: 460), noting that "the method of low-intensity interval training leads to the development of the ability of the muscles to adapt to the exerted physical exertion and delay the onset of fatigue." "High intensity interval training improves the energy production efficiency of the anaerobic system and under conditions of hypoxia."

Also, the lower the resting pulse rate, which was in favor of the experimental group, it contributes to the improvement of the level of achievement with the air rifle because the functional state of the heart, which is expressed by the pulse, plays an important and effective role from the functional point of view, and that the increase in the ability of the heart muscle to contract and relax with an increase The size of the heart muscle leads to an increase in the volume of the cardiac impulse and thus the number of beats decreases due to the increased work of the parasympathetic nerve, which works to slow the heart rate, and this is consistent with what (Adnan Muhammad: 2010: 178) indicated that there is a significant relationship between the number of heartbeats and blood pressure Systolic and diastolic level of achievement.

#### **IV. Conclusions and recommendations**

##### **Conclusions:**

1. The presence of non-significant differences between the control and experimental groups in the results of the pre-test for the physical tests and the level of achievement in the effectiveness of air rifle shooting, which indicates the parity of the two groups before applying the proposed training curriculum, which includes physical and skill training.

2. The presence of significant differences between the results of the pre and post tests and in favor of the post test for the control group in all physiological tests and the level of achievement in the effectiveness of air rifle

shooting, with the exception of variables (calcium, potassium, sodium, hemoglobin blood, diastolic blood pressure at rest).

3. The presence of significant differences between the results of the pre and post tests and in favor of the post test of the experimental group in all physiological tests and the level of achievement in the effectiveness of air rifle shooting, with the exception of variables (calcium, potassium, sodium, hemoglobin blood).

4. The presence of significant differences between the results of the post-tests and in favor of the experimental group in all physiological tests and the level of achievement in the effectiveness of air rifle shooting, with the exception of the variables (calcium, potassium, sodium, hemoglobin blood, diastolic blood pressure at rest) were not significant.

5. That training in a hot climate has a clear positive impact on the indicators under consideration.

6. The physical and skill exercises prepared by the two researchers have a clear positive effect on the physiological indicators and the level of achievement in the effectiveness of air rifle shooting.

7. Training in hot climates leads to adaptation of functional devices and the ability to withstand changes in weather in competitions.

#### **Recommendations:**

1. The use of physiological tests approved by the researchers in the study by trainers periodically as a reliable indicator to know the extent of development of physiological capabilities and the level of achievement in the effectiveness of air rifle shooting.

2. Reuse of physical and skill exercises with different proportions of volume and stress commensurate with the studies that will be conducted in the future on samples that differ in terms of level, age, gender and both sexes.

3. Re-use physical and skill training on other shooting activities that were not studied for both sexes.

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