

## **The effect of hypoxic training using an altitude mask for 3000m runners**

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### **Abstract**

Hypoxic exercises have an effective impact in achieving achievement in the long-distance race, so the researchers were interested in knowing the impact of hypoxic training using a highland mask on the players of the 3000m running race. The researchers used the experimental method by designing two groups, one controlled and the other experimental in a measurement (tribal and remote) manner.

The search sample was selected in the intentional manner of the players (3000) m from the Cairo Athletics Area under (20) years and was composed of (21) players. The program was applied for 60 days by (3) units per week with a total of (24) unit time units (90) S.

### **Some of the results were as follows:**

There are statistically significant differences between the two dimensions of the control and experimental groups in the physical and physiological indicators of the body and the digital level of the players of 3000m running

### **The researchers also recommended several recommendations, including:**

The application of the proposed training program, attention to training in which the highland mask is used because of its positive impact in the development of physiological devices and the physical ability of players.

**Keywords:** hypoxic, Elevation Training Mask,

### **Introduction and search problem:**

The current levels and figures recorded by the world champions have become amazing, after this qualitative progress in the sciences associated with applications in the field of sports, particularly sports training science and sports physiology, and hypoxic exercises have an effective impact in achieving achievement in the (3000) meter/running race if used correctly.u

Larry Kenney et all believes that by taking advantage of the various studies and theories of the principles and foundations of physiology and sports training, the study of the functional status of the respiratory and periodic systems is of the utmost importance for assessing and tracking the training situation of long-distance racers (endurance) in general

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and racing (3000 meters) Special running, which requires a long physical effort in addition to its influential role in the level of racers where these two devices work to provide the necessary oxygen in the various vital processes of the working muscles and the heart muscle and complete metabolism and supplement the nutrients needed to rebuild the energy compounds of the body where the breaths follow between inhaling and exhalation to provide oxygen used in many metabolisms (30:164)

Mohammed Shehata (2005) explains that the development of both the TSA and the periodic system depends on training used to develop the endurance element, which also indicates the importance of directing the training process to the development of the work of the lungs and heart and increased sizes and pulmonary capacities. (18 :16)

Emad Badrawi (2016) points out that the 3000m/running requires a certain amount of special endurance such as periodic respiratory endurance, strength tolerance and speed tolerance, which affects the level of long-distance racers, and special endurance is always time-bound and varies from effectiveness to efficiency. (16 :3)

Abdul Moneim Badir et al. (2012) adds that special endurance means the ability of the rider to cope with fatigue to achieve the highest level of functional efficiency of different devices according to the nature and characteristics of each

sports activity and since the special endurance varies according to the nature of this activity. (15 : 100)

Bastwissi Ahmed (2014 AD) believes that the special endurance is of medium time and whose performance does not exceed (8-30) minutes, in which the level of endurance affects the improvement of the body's ability to consume oxygen as well as the level of endurance affects the efficiency of the heart where the pulse rate in comfort decreases and the pulse rate increases immediately after exertion as a result of increased blood paid in each pulse. (2:183, 184)

Both "Raisan Khuraibet" and "Abu Al-Ela Abdel Fattah" (2016 AD) indicate that training at heights now has training tools used to simulate many changes in the body by changing the partial pressure of oxygen using an altitude mask and modified training tents. (8:673, 674)

Porcari JP, Probst(2016) adds that the Highland Mask is a modern sports tool used as a tool that simulates training on the highlands, consisting of different design valves that control the entry and exit of air from the nose and mouth at different heights starting from (3000) feet (918 meters) and (6,000) feet (1828 meters) and height(9000) feet(2743 meters)and (12,000) feet (3658 meters) to (18,000) feet (5486 meters) above sea level (29:87), figure no. (1), (2) and (3) shows the shape of the mask and the way it is worn.



Shape Number 1



Shape Number (2)



Shape Number(3)

This is confirmed by” Saadeddine Chernoubi”, “Abdul Moneim Ibrahim (2001) that the hipoxic exercises have contributed strongly and clearly to the digital achievement of enemy competitions. (10 : 27)

According to "Dagnosh Aqaba" (2018) that the subject of training in the Highlands is one of the topics still under study and follow-up by specialists in this field in order to develop and deliver players to the highest levels before the competition, but the coach must follow every small and large in order to make the training process successful and not to fail talented players in particular, who have a genetic ability that needs to develop and refine talent in order to succeed. (5 :82)

"Mufti Ibrahim" (2001) points out that sports training is a physical and educational process aimed at achieving high results it is necessary to

take care of the process of selecting training loads in order to make the required adjustment process either physically or physiologically in order to avoid reaching the stage of stress or fatigue, and since one of the most important objectives of training is to improve Players' abilities are as physical as possible, so when trying to develop the level of players, sports workers need the necessary knowledge of the information associated with the methods and means of training because of their impact on the development of physical qualities in general and special physical and physiological requirements in addition to its positive impact At the level of the player skill.(19:31)

Sports training is an organized educational process that is scientific and practical, relying on scientific laws aimed at fully preparing the athlete from all sides to the world

level through the use of legalized physical pregnancy, which is commensurate with the individual abilities of athletes.

Sports training is "a complex practical plan aimed mainly at elevating or decreasing the level of sport and landing it (in case of retirement) and biologically medically is a group of targeted kinetic triggers that go beyond our intensity and aim to create organic and functional changes to adapt to the new situation." (9 : 330) Mohammed Osman (2008) also explains that "sports training is a well-thought-out planned process carried out through repetitive muscular action) physical pregnancy (aimed at improving the physical, tactical and technical level, psychological and mental in a neighborhood where the severity of the pregnancy used exceeds a limit with us that varies from individual to individual." (20 :205)

Sports training is a stand-alone science based on many other sciences, whether scientific or human, such as anatomy, sports physiology, biomechanics and psychology, all of which are sciences associated with sports training science.

According to Aladdin Mohamed Aliwa (2006), training science and sports physiology are important sciences, and scientists have been interested in physical effort since the past centuries when they studied how the body functions when performing physical exertion and observing, recording and studying changes, especially the positive effects of daily exercise. (17 : 155)

According to Safaa Abdul Wahab and others (2014), the goal of sports training specialists is to race

between scientific and technological development and the innovation of methods and training methods used to improve the achievement and improve it for the better by using all the sciences to provoke the components of the athlete and exploit his potential with the least possible energy to delay the appearance of fatigue and finish the game with minimal effort, so the training is used in order to continue the motor performance as much as possible throughout the period without changing, whether in training or match, including this training. The development of special endurance (speed, strength) is resistance training of all kinds as well as training heights and slopes benefiting from body weight as ascent is the basis for the development of strength tolerance and descent based on the development of speed tolerance, and despite scientific development in the field of sports training, further research and studies to reach many scientific facts may contribute to the detection of the best methods and methods developed that contribute to the development of all sports events optimally in an attempt to draw the fruits of the energy of the human body to the fullest extent (12 :2)

Bahaa Salameh (2000) and Nasser Al-Suwayfi (2010) agree that the study of sports physiology is useful in describing and interpreting physiological responses and adaptations that have helped develop the methods of education and training for sports activities, and that not regular training brings about functional change. In the efficiency of the body organs, where physical exercise plays

its role in preparing games and sports competitions, it is an essential part of the numbers of sports in general numbers and especially for all sports events if committed to practicing them in an orderly manner according to scientific foundations specifically designed to suit the type of work practiced by the trainee. (3: 25(22:259) According to Aroussen (2006), the study in the highlands under lack of oxygen is useful (especially long-distance runner), this type of study and adaptation improves, stimulates and brings beneficial changes at the level of muscle cells that have the ability to use energy and withstand effort and this adaptation improves red blood cells, which in turn improve the ability of the athlete's air performance. (25 :71)

Robach's study (2006), conducted on 11 runners in mid-distance races through results after the end of the 18-day training period, proved that the principle of "living in the highlands and training at sea level" is the best way to raise and improve air performance (by increasing the proportion of red blood balls and increasing the maximum speed of oxygen consumption when landing at sea level). (32 :81)

Bertin, Michau (2011) also believes that life and training in the highlands under hypoxia conditions creates many adaptations several weeks after returning to sea level, especially the concentration of blood cells and increased blood cell production, which helps to increase the amount of oxygen it transmits to muscles, and also reduces heart pulse and lack of heart impulses compared to

what it was before when landing at sea level, thus making these adjustments the most important with continuity and improving the level of air performance when returning to sea level and figure 4 shows blood components.) 26 :183)

"Hara Diteron" (2010) defines the exercise as "every structured learning whose goal is to advance rapidly both physically and mentally and to increase the learning of man's tactical mobility."

Highland training is one of the methods of exercise adopted in recent years because of a scientific process that has a positive impact on many sports activities due to the change in gravity and weight of the body and which has caused physiological and chemical changes as a result of these effects. (132: 7)

Amer Ibrahim Fakher (2013) points out that "running on the heights for the athlete is a general tolerance and is a special method of developing the physical capacity of the athlete as it depends on the change of speeds depending on the nature of the earth and makes a speed and increase the effort when climbing to High where muscles work against gravity and when the athlete falls from high speed increases and effort decreases and the muscles work with gravity as this type of training is a strong exercise as a result of difficulty performing so it is a free exercise that does not adhere to a special and specific training program, It is recommended that the ground be earthy or grassy and unhindered when training so that no injury occurs to players such as tension and muscle tears, and the coach can

determine the distance and intensity of the training and according to the physical goal he seeks (13:140)

Abdul Rahman Abdul Hamid Zaher (2000) points out that scientific studies have shown that the formation of a training pregnancy without studying its physiological effects on the body often leads to injuries that appear during the training season and that the mere identification of the mechanics of the body's physiological responses helps to improve the body's responses and control them in order to effectively improve them (14:12)

Training in the highlands depends mainly on the knowledge of the physical and climatic variables that distinguish high areas from the sea surface and their impact on the physiological functions of the body's organs.

Shining Ismail Nasser (2005) indicates that gravity decreases from the equator to the poles by up to 53 percent. For these reasons, the process of holding tournaments and competitions in high places in some sports of all kinds is one of the reasons for the improvement in the numbers of these competitions as a result of dealing with physical variables found in the highlands. (11 :124)

According to Bahauddin Salameh (2000 AD), the effects of gravity lie in influencing the weight of the body as well as reduced pressure within the capillaries at the heart level, high pressure inside the capillaries below the heart level, and the

temperature drops about one degree Celsius as we rise. About 150 m below sea level, and the decrease in temperatures in this way may lead to a lot of health risks per capita, where humidity decreases, dehydration increases and the body loses a lot of water during breathing and also lower breathing rate (3:258)

Khaled Haddadi (2014) also explains that many studies have dealt with the topic of education in the highlands, and discuss the impact of physiological adjustments resulting on different organs of the body, both physiologically and functionally and their important and positive role in raising the level of aerobic performance, especially in The competitions are half long and long, as shown by the digital level and the outstanding achievements of Theopian and Kenyan athletes in the competitions, and we cannot explain their high level from countries more advanced and technological in terms of father hath and devices other than their superiority in the environment in which they live and train and distinguished by lack of oxygen. (4 :5) As a result of the great disparity between the world and regional digital levels from the Egyptian national levels in the World Athletics Championships, which were held as described in schedule No. 1 also the Olympic Athletics Championships, the researchers conducted research as a way to raise the level of athletes (3000) meters/running.

Table (1)

عدد الرياضيين	عدد المنافسات	مكان	تاريخ	البلد	المدينة	السنة	الدورة
1,355	41	ملعب هسنكي الأولمبي	7 أغسطس – 14 أغسطس	 فنلندا	هلسنكي	1983 (فواصل)	الأولى
1,451	43	ملعب الأولمبيكو	28 أغسطس – 6 سبتمبر	 إيطاليا	روما	1987 (فواصل)	الثانية
1,517	43	الملعب الأولمبي الوطني	23 أغسطس – 1 سبتمبر	 اليابان	توكيو	1991 (فواصل)	الثالثة
1,689	44	مرسيدس بنز أرينا	13 أغسطس – 22 أغسطس	 ألمانيا	شتوتغارت	1993 (فواصل)	الرابعة
1,804	44	ملعب ألعاب القوى	5 أغسطس – 13 أغسطس	 السويد	غوتنبرغ	1995 (فواصل)	الخامسة
1,882	44	ملعب أتينا الأولمبي	1 أغسطس – 10 أغسطس	 اليونان	أتينا	1997 (فواصل)	السادسة
1,821	46	ملعب الكارتوخا	20 أغسطس – 29 أغسطس	 إسبانيا	إشبيلية	1999 (فواصل)	السابعة
1,677	46	ملعب الكومنولث	3 أغسطس – 12 أغسطس	 كندا	إدمنتون	2001 (فواصل)	الثامنة
1,679	46	ملعب فرنسا	23 أغسطس – 31 أغسطس	 فرنسا	سان دوني	2003 (فواصل)	التاسعة
1,688	47	ملعب هسنكي الأولمبي	6 أغسطس – 14 أغسطس	 فنلندا	هلسنكي	2005 (فواصل)	العاشرة
1,800	47	ملعب ناغاي	24 أغسطس – 2 سبتمبر	 اليابان	أوساكا	2007 (فواصل)	الحادية عشر
1,895	47	الملعب الأولمبي	15 أغسطس – 23 أغسطس	 ألمانيا	برلين	2009 (فواصل)	الثانية عشر
1,867	47	ملعب ديغو	27 أغسطس – 4 سبتمبر	 كوريا الجنوبية	ديغو	2011 (فواصل)	الثالثة عشر
		ملعب لوزنيكي	10 أغسطس – 18 أغسطس	 روسيا	موسكو	2013 (فواصل)	الرابعة عشر
		ملعب بكين الوطني		 الصين	بيكين	2015 (فواصل)	الخامسة عشر
		ملعب لندن الأولمبي		 المملكة المتحدة	لندن	2017 (فواصل)	السادسة عشر

Table #1 Hence the idea of research, which is to use highland training for its ability to develop a balance in the strength of the muscles of running players (3000) meters/run, thus enabling the development of a new method of training that can benefit trainers in the training process.

According to the researchers, the importance of the research lies in the fact that it is an attempt to simulate highland training through the use of the TederYP mask to reduce the proportion of inhaled air and thus reduce the oxygen ratio used in breathing to develop physiological and functional abilities and improve the level of athletic performance, and the researchers suggested the use of the training mask Within the training program in a codified manner, through whatthe researchers saw that from

previousstudies, which indicated the importance of using anaerobic modus operandi (lackofoxygen) in improving the physical and physiological qualities of a racing player (3000) meters/running.

**Research objective:** The research aims to identify the impact of hippyxic exercises using a highland mask in:

1. Development of some physical functional indicators such as (men's ability,muscular endurance),
2. Development of some physiological indicators (vital capacity, maximum oxygen consumption VO2max),
- 3- Improving the digital level of players (running 3000 m) in the search sample.

**Research hypothes:**

- 1- There are statistically significant differences between the tribal and

remote measurements of the control group in (capacity for soft tremor-muscular endurance - biosurgery - maximum oxygen consumption - digital running level of 3000 m).

2- There are statistically significant differences between the tribal and remote measurements of the experimental group in (man's capacity-muscular endurance- biosurgery- maximum oxygen consumption- a digital level of running 3000 m).

3- There are statistically significant differences between the two dimension measurements of the "controlled, experimental" groups in (capacity for men - muscular endurance - biosurgery - maximum oxygen consumption - digital running level of 3000 m).

#### **Previous studies:**

1- **"Dufour (2005) (28)** conducted a study entitled "Access to Optimal Aerobic Performance" (hypoxic intermittent) and the study aimed at identifying the impact of training in the highlands and the researcher used the experimental method using tribal and remote measurement and the research sample was selected in the intentional manner and number of (18) long-distance runners, and the results concluded that training in the highlands has a positive and effective role in improving aerobic performance.

2- **(2013) (6)** A study entitled "The impact of the use of highland masks on some aspects of neural processes in the runners of the arena and the field" and the study aimed to know the impact of the use of highland mask at different heights with different difficulties in the flexibility of some

The two researchers used the experimental method, and the research sample was selected in the blind way of 20 advanced-level players in the 15 km run, and the results reached a development in some aspects of neurological processes due to the effect of using highland masks.

3- **"Shmitt" (2014)** conducted a study entitled "Training in the Highlands" and aimed at analyzing the impact of training methods when staying and training in the highlands when exposed to hypotension, and the researcher used the experimental method by applying a training program for a period of at least (1) 15) On the day the number of samples (20) athletes was selected in the intentional way among the sport of skiing, swimming and enemy and were assigned to (6) skating athletes, (9) swimming athletes and (5) runners in the field of speed and the results indicated that aerobic exercises are the most appropriate, The increase in  $VO_2$  MAX shows several physiological variables, the most important of which is an increase in the volume of maximum oxygen and an increase in the concentration of hemoglobin, P.M. A) Increased aerobic speed, (V.M.A) and aerobic capacity.

4- **Yasser Abedin Suleiman (2016) (24)** conducted a study entitled "The effectiveness of hippyxi training in the development of some special functional capabilities and the level of digital achievement of the contestants (1500) meters conducted", and the study aimed to identify the impact of hipbox training on the functional abilities of Race (1500) running

meters, digital level of racers (1500) running meters, and the researcher used the experimental method on a sample of (6) players of racers (1500) running meters in the team of the University of Banya Athletics (Middle Distance), The most important research tools were: functional measurements - measurement of the digital level of racers (1500) meters/running and training program using hipbox training, and the most important results: the effectiveness of the proposed training program using hipbox training in improving functional capabilities) maximum to start absolute oxygen The relative - co<sub>2</sub> consumption - maximum heart rate - breathing rate per minute - pulmonary ventilation - biosphere - time of silence (for racers (1500) meters/running and led to an improvement in the digital level of racers (1500) meters/running.

**5- Emad Faraj Badrawi** (2010) (16) conducted a study entitled "Special Endurance Training Program and its impact on some biochemical and physiological variables and physical effort of players (5000) meters/running in Iraq", and the study aimed to identify the impact of a training program for the race (5000) meters/running on some biochemical variables. The researcher used the experimental method, and the research sample reached (8) players, and the most important conclusions were that there was a positive impact of the proposed training program for the development of speed tolerance and strength tolerance and statistically indicative of biochemical variables (Pyramid One Beta Androvin - Lactic Acid) in racers (5000) meters/running.

**6- "Mohamed Zakaria Isles"** (2005) (21) carried out a study entitled "The impact of heboxic training on the efficiency of the respiratory league and the level of performance in the youth of boxing", the study aimed at identifying the impact of hipbox training on the efficiency of the respiratory league and the level of performance in the young boxing, and the researcher used the experimental method on a sample of 20 boxers. One of the most important research tools of the proposed program, which lasted (8) weeks, is the testing of the physical - physiological measurements, and the most important results are the effectiveness of the proposed training program using hipbox training in the development of the efficiency of the respiratory league and the level of performance of the boxing originator.

**7- Daniel Pierce** (2013) (27) carried out a study entitled "The impact of the repetition of pre-competition hipbox training at the level of rugby players' performance", where the study aimed to identify the impact of wearing a training mask frequently in training and to know the impact on the level of players during Rugby competitions in England included (42) players trained with mask for (4) weeks by (3) units per week and the most important results were improved metabolism of anaerobic and anaerobic energy, increased breathing depth and increased players' fatigue tolerance.

#### **Search procedures:**

#### **Research approach:**

In order to achieve the objectives and duties of the research, the two researchers used the experimental method by designing a skull and two instruments, one officer

and the other experimental in the method of measurement (tribal and remote) due to its suitability of the nature of the research sample.

#### Research community:

The research community included players in the 3,000m/under-20s competition registered in the Cairo Athletics Area of the Egyptian Athletics Federation for the training season(2019-2020).

#### Research sample:

The search sample was selected in the intentional manner of the players (3000) meters/ran from the Cairo Athletics Area under (20) years of age and consisted of (21) players.

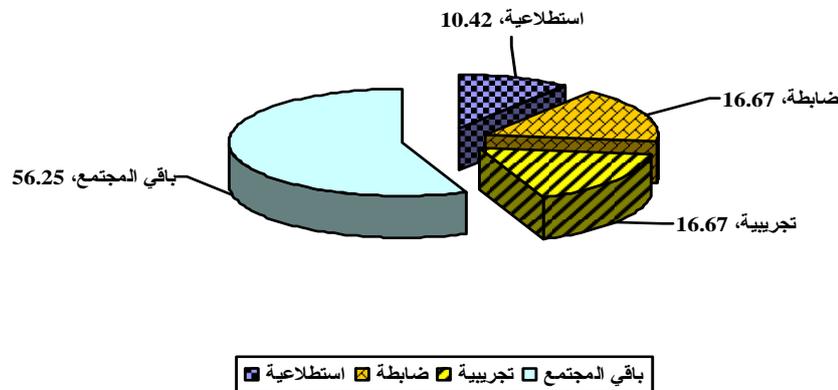
It was divided as follows:

- (5) Exploratory sample players.
- (8) Officers group players.
- (8) Experimental group players.

The following table shows the distribution of the research sample and the research community.

**Table (2)**  
**Description of the study community and research sample**

Statement		Number	Percentage
The totality of society		48	100.00%
Sample study	Reconnaissance sample	5	10.42%
	Officer Group	8	16.67%
	Core group	8	16.67%
	Total sample	21	43.75%



#### Shape Number (5)

**Explains the characterization of the study community and the research sample**

- The researchers used 5 players (Republic Champions) as a special

sample to conduct scientific transactions for research tools.

#### Homogenization of the research sample:

**Table (3)**  
**Statistical description of individuals of a sample of variables under investigation**  
**N= 21**

Variables	Unit of measurement	Average Arithmetic	Broker	Deviation Normative	coefficient Convolution
Age	year	18.667	19.000	0.483	-0.763
Length	poison	172.524	171.000	7.561	0.122
Weight	kg	66.333	67.000	2.763	-0.132
Training age	year	4.524	5.000	0.512	-0.103
The broad jump of stability	poison	221.857	224.000	8.714	-0.487
The oblique ness of standing	number	30.190	30.000	2.482	-0.219
Pulmonary capacity	degree	4.947	4.950	0.105	-0.147
Cooper Test Distance "Running 12q"	meter	2076.952	2073.000	13.548	0.175
VO2 MAX	Milliliter/kg/s	35.146	35.060	0.303	0.177
The digital level of running 3000 m	second	501.944	502.130	2.362	-0.447

**Parity between experimental and controlled research groups:** (experimental, controlling) in the variables under consideration.

The researchers found parity between the two research groups

**Table (4)**  
**Indication of the differences between the experimental and controlled research groups N1=N2=8**

Variables	Groups	Average grades	Total ranks	Mann-Whitney U	Indication
Age	Experimental	8.00	64.00	28.000	0.602
	The officer.	9.00	72.00		
Length	Experimental	8.31	66.50	30.500	0.874
	The officer.	8.69	69.50		
Weight	Experimental	8.88	71.00	29.000	0.752
	The officer.	8.13	65.00		
Training age	Experimental	7.50	60.00	24.000	0.333
	The officer.	9.50	76.00		
The broad jump of stability	Experimental	8.81	70.50	29.500	0.793
	The officer.	8.19	65.50		
The oblique ness of standing	Experimental	8.94	71.50	28.500	0.711
	The officer.	8.06	64.50		

**Follow Table (4)**  
**Indication of the differences between the experimental and controlled research groups N1=N2=8**

Variables	Groups	Average grades	Total ranks	Mann-Whitney U	Indication
Pulmonary capacity	Experimental	9.25	74.00	26.000	0.528
	The officer.	7.75	62.00		
Cooper Test Distance "Running 12q"	Experimental	8.94	71.50	28.500	0.713
	The officer.	8.06	64.50		
VO2 MAX	Experimental	8.94	71.50	28.500	0.713
	The officer.	8.06	64.50		
The digital level of running 3000 m	Experimental	9.50	76.00	24.000	0.401
	The officer.	7.50	60.00		

\* الدلالة < 0.05

Table (4) shows that there are no statistically significant differences between the experimental and controlled research groups in the variables under consideration, indicating the parity of the two groups.

**Data collection tools:**

**1- A survey of specialized scientific references in accordance with the study (6) (16) (21) (24) (27) (28) (33) with the aim of:**

- Determine the appropriate measurement method for search objectives.
- The design and preparation of the heboxic training program using a highland mask for 3000m players took place.

**2- Interview:**

The researchers conducted an interview with specialist experts facility(1) in the field of training using the highland training mask, field competition professors and the track of faculty members of the Faculties of Sports Education to survey the experts in the tests used to measure research

variables attached(2), the content of the proposed pilot program (duration of the program, time allocated to the program as a whole and time alone).Attached.3

**3- Data collection forms:**

- A group registration form for collecting sample data includes (name, height, weight, age best time achieved) (Annex 5)
- A confirmation form from the player to approve the regularity of the proposed training program (Annex 6)
- This research was done in accordance with the Helsinki Declaration.

**4- Tests used:**

The researchers conducted a survey of previous and similar studies and researches and numbered(7) and some of the scientific references and their number (24) as well as access to foreign scientific articles and researches (9) and on the Internet (2), in order to reach the appropriate tests to measure research variables. Annex (4)

- Testing the broad jump of stability.

- Oblique slanting test of standing.
- Pulmonary amplitude test.
- Testing the maximum oxygen consumption.
- Cooper tested running and walking for 12q to measure and estimate maximum aerobic capacity VO<sub>2</sub> MAX (25:15,16)
- Digital level test for running (3000) m.

### **The foundations of the program mode:**

In the light of the training programs available to the two researchers, whether from previous studies or the international information network, and after being guided by instructions to use the training mask and hyperoxy training caveats, the two researchers took into account the following foundations when developing the training program:

- 1- Achieving the main goal for which the program was set.
- 2- The time of hippyxi training does not exceed (20) minutes in unity.
- 3- The number of training units does not exceed (4) training units per week.
- 4- Taking into account the gradient with the openings of the training mask from three to two to one.
- 5- It is not preferable to continue for long periods of training by partially blocking breathing because it has high intensity loads where it affects the functional organs of the body.
6. It is preferable not to use a training mask for young people and is used for adults only.

7- Before starting the training units take into account the work of the protocol of using the mask in preparation and breathing training.

Taking into account security and safety factors.

In this regard, Bastoissi Ahmed (1999) and Abu Ala Abdel Fattah (2003) point out the need to follow the following conditions when using hippyxi training for the training program:

1. When hyperoxyk training is increased by the training programme, the principle of gradualism must be taken into account slowly.
- 2- Do not use hypoxic exercises for long periods with the speed of stop when you notice the player feeling difficult to breathe, fatigue or headaches.
3. Hippyxi exercises do not have a negative impact on the technical performance of skills.
- 4- Take into account the non-use of hippyxi training during the competition period.
- 5- Consider not using hippyxi exercises with pregnant women. (2: 325) (1 :137)

### **First survey:**

The aim was to survey the opinion of a number of (9) experts, annex 1:

- Tests used to measure search variables.
- The content of the proposed programme (duration of the programme, time allocated to the rehabilitation programme as a whole and time of each unit) is attached(3)

The result of the expert survey was as follows:

**Table (5)**  
**Percentage of expert agreement on tests used to measure research variables**  
**N=9**

Candidate test	Iteration	Percentage
The broad jump of stability	7	77.78%
The oblique ness of standing	8	88.89%
Pulmonary capacity	9	100.00%
Calculation of maximum oxygen consumption VO2 MAX Using Cooper's "Running 12Q" test	9	100.00%
The digital level of running 3000 m	9	100.00%

The percentage of expert approval of the tests used to measure research variables was determined by the percentage of the Expert Gentlemen's Agreement (100.00%)

This is through the results of the expert survey form, and the two researchers accepted at least (75%) A minimum limit for determining the tests used in Q-Qsearch variables.

**Table (6)**  
**Percentage of expert agreement on the contents of the proposed training programme N=9**

M	The content of the program	Repeat approval	Percentage
1	2 Cities	1	11.11%
	Two months	7	77.78%
	A month and a half.	1	11.11%
2	4 units	0	0.00%
	3 units	8	88.89%
	Units	1	11.11%
3	120 minutes	0	0.00%
	90 minutes	9	100.00%
	60 minutes	0	0.00%

The percentage of expert approval of the contents of the proposed training programme was determined by the percentage of the Expert Gentlemen's Agreement (0.00% -100.00%) This is through the results of the expert survey form, and the two researchers accepted at least (75%) As a minimum to determine the contents of the proposed training

program, the duration of the program will be two months, the number of weekly units (3 units), unit time (90dq).

**Second survey:**

The researchers conducted a reconnaissance study with the aim of:  
- Identify (the appropriateness and appropriateness of the proposed training program - discovering the

difficulties that may face the final application process - excluding some exercises because of the difficulty of performing them - determining the number of exercises and the severity of the appropriate pregnancy).

- Ensure scientific transactions (honesty, stability) of research variable measurement tools.

#### Scientific transactions of research tools:

##### Believe the tests:

The sincerity of the tests was calculated by calculating the sincerity of discrimination by applying them to

two groups, representing the initial group "Special Group" (Champions Republic) and its strength (5) players, while the second group (non-distinctive group) represents players (3000) meters/ran in the Cairo area Athletics "Reconnaissance Sample" and its strength (5) players from the same research community and outside the basic research sample, on Sunday, September 20, 2020, and the following table shows the significance of the differences between the two groups in the tests.

**Table (7)**  
**Test honesty labs under consideration N1=N2=5**

auditions	Groups	Average grades	Total ranks	Mann-Whitney U	Indication
The broad jump of stability	the distinctive	3.00	15.00	0.000*	0.009
	Unmarked	8.00	40.00		
The oblique ness of standing	the distinctive	3.00	15.00	0.000*	0.008
	Unmarked	8.00	40.00		
Pulmonary capacity	the distinctive	3.00	15.00	0.000*	0.009
	Unmarked	8.00	40.00		
Cooper Test Distance "Running 12q"	the distinctive	3.00	15.00	0.000*	0.009
	Unmarked	8.00	40.00		
VO2 MAX	the distinctive	3.00	15.00	0.000*	0.009
	Unmarked	8.00	40.00		
The digital level of running 3000 m	the distinctive	8.00	40.00	0.000*	0.009
	Unmarked	3.00	15.00		

\* الدلالة < 0.05

Table 7 shows that there are statistically significant differences between the "distinctive- non-

distinctive" groups in the tests in question and in favor of the distinct group, indicating their sincerity.

**Test stability:**

The test stability laboratory was found using the method of applying the test and retest on a sample of 5 players (3000 m) in the Cairo Athletics Area "reconnaissance sample" from the same research community and outside the basic research sample (non-distinctive group), the researchers considered the results Tests for honesty

for (non-featured group) serve as the first application, and then the tests were reapplied under the same circumstances and with the same instructions after (7) days of the first application on Sunday, September 27, 2020, and the following table shows the correlation transactions between the first and second applications.

**Table (8)**  
**Test stability coefficient under consideration N=5**

auditions	unit scaling	The first application		The second application		value "R."
		Q/	±	Q/	±	
The broad jump of stability	poison	227.000	4.690	228.400	5.030	0.996*
The oblique ness of standing	number	31.600	1.673	32.400	1.673	0.964*
Pulmonary capacity	degree	4.992	0.083	5.032	0.071	0.957*
Cooper Test Distance "Running 12q"	meter	2060.800	4.604	2064.200	5.891	0.988*
VO2 MAX	Milliliter/kg/s	34.786	0.104	34.860	0.133	0.989*
The digital level of running 3000 m	second	501.484	2.960	501.116	2.939	0.999*

\* Table "t" value at degree of freedom (3) and indicative level (0.05) = (0.878)

Table 8 shows that the value of correlation transactions between the first and second applications of tests has statistically functioning values at a indicative level (0.05), indicating the stability of tests.

**Basic study:****1- Tribal measurement:**

The two researchers conducted tribal measurement of the research to measure the variables under consideration on September 27, 2020.

**2- Application of the program:**

The two researchers applied the training program to the basic research sample from Sunday, 4/10/2020 to Friday 4/12/2020 for a period of (60) days by (3) Units per week with a total

(24) units, each unit had a time of 90 minutes with a total time of (2,160) minutes, of which 20% of the hipbox exercises had a total time of (432) minutes.

**3- Remote measurement:**

The remote measurements of the research variables under study were carried out on the research group according to what was done in tribal measurements on Sunday, 6 December 2020.

**Statistical treatments:**

The researchers used the statistical program (SPSS) to process the data statistically and used an account:

- Mean Arithmetic.

- Standard Deviation.
- Test the significance of the differences Man and Whitney Mann-Whitney (U).
- Coefficient (Person) Simple correlation.
- Improvement rate (%).

**View results:**

**View and discuss the results of the first imposition:**

**View the results of the first imposition:**

It states: "There are statistically significant differences between the tribal and remote measurements of the controlling group in (capacity for men - muscular endurance - vital capacity - maximum oxygen consumption - the digital level of running 3000 m)."

**Table (9)**

**Indication of the differences between the tribal and remote records of the control group in the variables under consideration N=8**

	Type of signals	Number	Average grades	Total ranks	Z قيمة	Level of significance
The broad jump of stability	Negative grades	0	0.00	0.00	2.527*	0.012
	Positive grades	8	4.50	36.00		
	Equally	0				
The obliqueness of standing	Negative grades	0	0.00	0.00	2.714*	0.007
	Positive grades	8	4.50	36.00		
	Equally	0				
Pulmonary capacity	Negative grades	0	0.00	0.00	2.536*	0.011
	Positive grades	8	4.50	36.00		
	Equally	0				
Cooper Test Distance "Running 12q"	Negative grades	0	0.00	0.00	2.527*	0.012
	Positive grades	8	4.50	36.00		
	Equally	0				
VO2 MAX	Negative grades	0	0.00	0.00	2.521*	0.012
	Positive grades	8	4.50	36.00		
	Equally	0				
The digital level of running 3000 m	Negative grades	0	0.00	0.00	2.521*	0.012
	Positive grades	8	4.50	36.00		
	Equally	0				

\* الدلالة < 0.05

Table (9) shows statistically significant differences between the tribal and remote records of the controlled group in the variables in question and in favor of remote measurement.

#### Shape Number (6)

The level of significance of the differences between the tribal and remote records of the control group

**Table (10)**  
**Rate of improvement between the tribal and remote records of the control group in the variables under consideration N=8**

Variables	unit scaling	Average tribal measurement	Average distance measurement	Rate of improvement %
The broad jump of stability	poison	219.875	240.125	9.210
The oblique ness of standing	number	29.500	32.625	10.593
Pulmonary capacity	degree	4.918	5.168	5.084
Cooper Test Distance "Running 12q"	meter	2081.375	2185.250	4.991
VO2 MAX	Milliliter/kg/s	35.245	37.566	6.586
The digital level of running 3000 m	second	501.518	471.456	5.994

The rate of improvement between the tribal and remote records of the controlled group in the variables in question and in favor of remote measurement is shown in table 10, with the improvement rate ranging from (4.991% to 10,593%).

#### Shape Number (7)

The rate of improvement between the tribal and remote standards of the control group

#### Discuss the results of the first imposition:

**Abu Ala Ahmed Abdel Fattah (2003) (1) and Shining Ismail Nasser (2005) (11)** agree that codified training programs always have a positive impact on trainees.

**Rafi Saleh, Abdul Razeq al-Majdi (2013) (6)** also agrees that the differences between tribal and remote measurements in the control group as a result of the application of the exercises used in the training program

in the traditional way have a positive result on the improved condition of athletes in the control group.

This is what **Osama Ahmed Hassan, Shorouk Mahdi Kazem (2004) (5)** points out that training programs have always had a positive impact on the development of athletes' physical and physiological abilities.

This is consistent with the findings of the researchers and the previous presentation in my schedule (9,10) which indicates statistically significant differences between the tribal and remote records of the control group in the variables in question and in favor of remote measurement as a result of the application of the program to them despite not using the highland training mask during the program, which indicates a positive impact of exercise exercise on the physical elements under consideration as we note a change in the rate of

improvement by up to 9.21% In the broad jump test of stability and an improvement of 10.59% in the oblique desperation test of standing, a 5.08% improvement in pulmonary capacity measurement and a 4.99% improvement in cooper's test, we also note an improvement of 6.58% in the VO2MAX test as well as progress in the digital level of the (3000) m/run race has reached 5.99%.

**Thus, the first imposition, which states:**

"There are statistically significant differences between the two measurements of the dome of me and

the dimension of the control group in (man's ability - muscular endurance - biosurgery - maximum oxygen consumption - digital level of running 3000 m)"

**View and discuss the results of the second imposition:**

**View the results of the second imposition:**

It states: "There are statistically significant differences between the tribal and remote measurements of the experimental group in (capacity for men - muscular endurance - biosurgery - maximum oxygen consumption - digital level of running 3000 m)."

**Table (11)**

**Indication of the differences between the tribal and remote records of the experimental group in the variables under consideration N=8**

	Type of signalT	N	Average grades	Total ranks	Z قيمة	Level of significance
The broad jump of stability	Negative grades	0	0.00	0.00	2.524*	0.012
	Positive grades	8	4.50	36.00		
	Equally	0				
The oblique ness of standing	Negative grades	0	0.00	0.00	2.565*	0.010
	Positive grades	8	4.50	36.00		
	Equally	0				
Pulmonary capacity	Negative grades	0	0.00	0.00	2.527*	0.012
	Positive grades	8	4.50	36.00		
	Equally	0				
Cooper Test Distance "Running 12q"	Negative grades	0	0.00	0.00	2.524*	0.012
	Positive grades	8	4.50	36.00		
	Equally	0				
VO2 MAX	Negative grades	0	0.00	0.00	2.521*	0.012
	Positive grades	8	4.50	36.00		
	Equally	0				
The digital level of running 3000 m	Negative grades	0	0.00	0.00	2.521*	0.012
	Positive grades	8	4.50	36.00		
	Equally	0				

\* الدلالة < 0.05

Table (11) shows statistically significant differences between the

tribal and remote records of the experimental group in the variables in

question and in favor of remote measurement.

### Shape Number (8)

The level of significance of the differences between the tribal and remote records of the experimental group

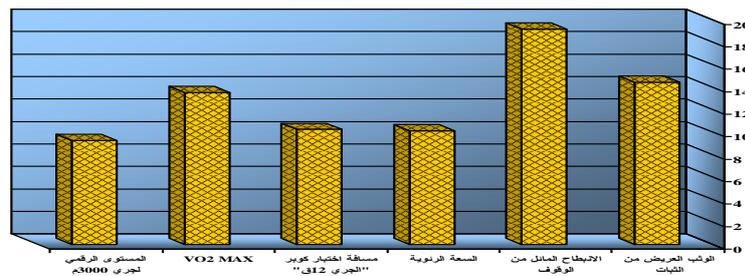
Table (12)

Rate of improvement between the tribal and remote records of the experimental group in the variables under consideration N=8

Variables	unit scaling	Average tribal measurement	Average distance measurement	Rate of improvement %
The broad jump of stability	poison	220.625	252.500	14.448
The oblique ness of standing	number	30.000	35.750	19.167
Pulmonary capacity	degree	4.948	5.449	10.131
Cooper Test Distance "Running 12q"	meter	2082.625	2296.000	10.245
VO2 MAX	Milliliter/kg/s	35.273	40.043	13.523
The digital level of running 3000 m	second	502.659	456.049	9.273

The rate of improvement between the tribal and remote records of the experimental group in the variables under consideration and in

favour of remote measurement is shown in table 12, with the improvement rate ranging from (9.273% -19.167%).



### Shape Number (9)

Rate of improvement between the tribal and remote records of the experimental group

Discuss the results of the second imposition:

Imad Faraj **Badrawi** (2010) (16) and **Yasser Abidin Suleiman**

(2016) (24) agree that hipoxic training has a positive impact on physical and physiological qualities if used in a codified manner within the training program.

This is also indicated by Dufour(2005) (28) and **Shmitt** (2014) (33) that heboxic training has a

clear effect on the development of physical and physiological traits when used in a scientific way codified by various training programs.

This is consistent with the findings of the researchers and the previous presentation in my schedule (11,12) which indicates statistically significant differences between the tribal and remote records of the experimental group in the variables in question and in favor of remote measurement as a result of the application of the program to them using the highland training mask during the program, which indicates a positive effect of exercise on the physical elements under research using hipbox training as we note and Joe D changed in the result of the wide jump test of stability by an improvement of 14.4. 44% improved by 19.16% in the oblique dent test, 10.13% improvement in pulmonary amplitude measurement, 10.24% improvement in Cooper's test,

13.52% improvement in VO2MAX testing, 3,000 m/run digital level of 9.27%.

Thus, the second imposition, which states:

"There are statistically significant differences between the tribal and remote measurements of the experimental group in (capacity for men - muscular endurance - vital capacity - maximum consumption of oxygen - digital level of running 3000 m)"

**View and discuss the results of the third imposition:**

**View the results of the third imposition:**

It states: "There are statistically significant differences between the two dimension measurements of the "controlled, experimental" groups in (capacity for men- muscular endurance- vital capacity- maximum oxygen consumption- digital running level of 3000 m)."

**Table (13)**

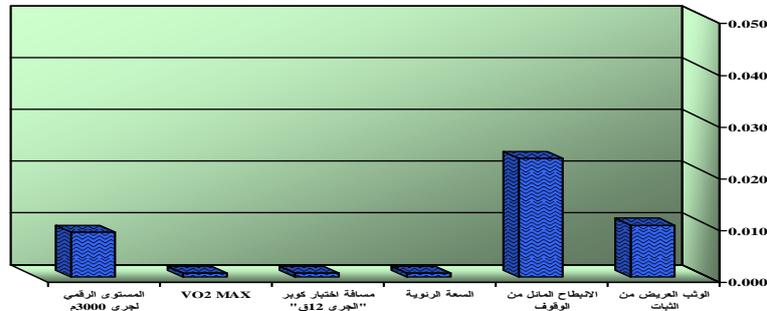
**Indication of the differences between the two dimensions of the controlling and experimental groups In the variables under consideration N1=N2=8**

Variables	Groups	Average grades	Total ranks	Mann-Whitney U	Indication
The broad jump of stability	Experimental	11.56	92.50	7.500*	0.010
	The officer.	5.44	43.50		
The oblique ness of standing	Experimental	11.19	89.50	10.500*	0.023
	The officer.	5.81	46.50		
Pulmonary capacity	Experimental	12.50	100.00	0.000*	0.001
	The officer.	4.50	36.00		
Cooper Test Distance "Running 12q"	Experimental	12.50	100.00	0.000*	0.001
	The officer.	4.50	36.00		
VO2 MAX	Experimental	12.50	100.00	0.000*	0.001
	The officer.	4.50	36.00		
The digital level of running 3000 m	Experimental	5.38	43.00	7.000*	0.009
	The officer.	11.63	93.00		

\*  $\alpha < 0.05$

Table (13) shows statistically significant differences between the controlled and experimental groups in

the variables in question and in favor of the experimental group.



### Shape Number (10)

The level of significance of the differences between the two dimensions of the control and experimental groups

#### Discuss the results of the third imposition:

Daniel Pierce (2013) (27) and Mohamed Zakaria Jazira (2005) (21) agreed that heboxic exercises, which are carried out using a highland training mask, always have more positive results than those practiced without the use of the mask.

Nasser Mustafa Al-Suwaifi, Mohsen Ibrahim Ahmed (2010) (22) also agreed that exercise using a highland training mask (heboxic) excels in its results from exercise without using the highland training mask by up to twice the impact.

This is consistent with the findings of the two researchers of the meta and the previous presentation in the table (13) and the previous results presented in my schedule (11,12) which indicate statistically significant differences between the two distant records of the control group and the

dimension of the experimental group in the variables under Research and in favor of the remote measurement of the experimental group as a result of the application of the landnamg to them using the highland training mask during the program, which indicates a positive effect of exercise practice on the physical elements in question using hipbox training for them in training without the use of the highland training mask, which is as shown in Table 13.

#### The third imposition, which states:

"There are statistically significant differences between the two dimension measurements of the "controlled, experimental" groups in (capacity for men - muscular endurance - biosurgy - maximum oxygen consumption - digital running level of 3000 m)"

#### Interpretation of results::

It is clear from the previous results presented in my schedule (9,10) that there are statistically significant differences between the tribal and remote records of the control group in the variables in question and in favor of remote measurement, as a result of

the application of the program to them, although they did not use the highland training mask during the program, which indicates a positive effect of exercise on the elements in question as we note a change in the rate of improvement by up to 9.21% in the test of wide jump of stability He improved by 10.59% in the oblique scab test and improved by 5.08% in pulmonary capacity measurement and 4.99% improvement in cooper's test, and we note an improvement of 6.58% in the VO2MAX test, as well as progress in the digital level of the 3000m/m/run race, which has reached 5.99%.

This is agreed by **Abu Ala Ahmed Abdel Fattah (2003) (1) and Shining Ismail Nasser (2005) (11)** that codified training programs always have a positive impact on trainees.

**Rafi Saleh, Abdul Razeq al-Majdi (2013) (6)** also agrees that the differences between tribal and remote measurements in the control group as a result of the application of the exercises used in the training program in the traditional way have a positive result on the improved condition of athletes in the control group.

This is what **Osama Ahmed Hassan, Shorouk Mahdi Kazem (2004) (5)** points out that training programs have always had a positive impact on the development of athletes' physical and physiological abilities.

The researchers attributed this finding to a positive impact on the physical and physiological traits under consideration for the training program applied to the control group.

According to the researchers, the reason for the statistically significant differences is due to the effectiveness of the training program, which is based on the improvement of the qualities under consideration as a result of the use of the exercises included in the training program, and this is consistent with **Munib Abdullah Fathi (2007) (16)**.

The previous results presented in my schedule (11,12) show statistically significant differences between the tribal and remote records of the experimental group in the variables in question and in favor of remote measurement, as a result of the application of the program to them using the highland training mask during the program, indicating a positive effect of exercise on the physical elements in question using heboxic training, as we note a change in the tone of the broad jump test of stability by an improvement of 14.44% and improvement with 19.16% in the stand-down test, a 10.13% improvement in pulmonary capacity measurement, a 10.24% improvement in cooper's test, an improvement of 13.52% in the VO2MAX test, as well as progress in the 3,000m/m digital standard, has reached 9.27%.

This was agreed by **Imad Faraj Badrawi (2010), (16) and Yasser Abedin Suleiman (2016) (24), Dufour (2000), (28) and "Shmitt" (2014) (33)** in that heboxic training has a positive impact on physical and physiological qualities if used in a codified manner within the training program.

The researchers attributed this finding to the fact that the application of the proposed program led to statistically significant differences between the tribal and remote records of the experimental group in the variables in question and in favor of remote measurement as a result of the application of the program to them using the highland training mask during the program, indicating a positive effect of exercise on the physical elements under consideration using hipboxtraining.

As evidenced by the previous results presented in table (13) and extracted from those previous results in my schedule (11,12), which indicate statistically significant differences between the two dimensions of the control group and the remoteness of the experimental group in the variables under Research and in favor of the remote measurement of the experimental group as a result of the application of the program to them using the highland training mask during the program, which indicates a positive effect of exercise on the physical elements in question using hipbox training training for them in training without the use of the highland training mask, which is as shown in table 13.

Daniel **Pierce** (2013) (27) and Mohamed Zakaria **Jazira** (2005) (21) agreed that heboxic exercises, which are used in a highland training mask, always have more positive results than those practiced without the use of the mask.

**Nasser Mustafa Al-Suwaifi, Mohsen Ibrahim Ahmed**

(2010m) (22) also agreed that exercises using a highland training mask always outperform their results from training without using the mask by up to twice the impact.

The researchers attributed this result to a statistically significant positive effect on the physical and physiological qualities under consideration of the training program applied to the experimental group as a result of the use of the highland training mask, which is greater than the impact on the control group as a result of the application of the training program in the traditional way, as explained by Table 13.

#### **Conclusions and recommendations:**

In the light of the research objectives, duties, approach used, within the research sample and the reference framework of studies and researches, and through statistical analysis, the following conclusions have been reached:

#### **First-Conclusions:**

1- There are statistically significant differences between the tribal and remote measurements of the control group in (man's ability - muscular endurance - biosurgy - maximum oxygen consumption - digital running level of 3000 m).

2- There are statistically significant differences between the tribal and remote measurements of the experimental group in (man's ability - muscular endurance - vital capacity - maximum oxygen consumption - the digital level of running 3000 m).

3- There are statistically significant differences between the two dimension measurements of the "controlling,

experimental" groups in (man's ability - muscular endurance - biosurgery - maximum oxygen consumption - digital running level of 3000 m).

4- The proposed training program, which contains training using a highland mask, has a positive impact on the development of (man-muscle endurance- biosurgery- maximum oxygen consumption- digital level of running 3000) in favor of remote measurements.

5- Heboxic training is an effective alternative to highland training.

6- The method of training heboxic is often accompanied by an improvement in the general condition.

7- The results are positively consistent with other studies conducted in the Highlands.

#### **Recommendations:**

1- Implementation of the proposed program to train players of competitions (3000) meters/run.

2- Wear a highland mask while applying training programs for racing (3000) meters/running.

3- Wear a highland mask while working to increase the trainee's pulmonary capacity because of its positive impact on the development of periodic and respiratory performance.

4- Do more research on wearing a highland mask with different methods and training programs as well as with other sports for different age stages.

5- Training programs need to be prepared in the general and private preparation stages using the Highland Training Mask to develop different physical and physiological variables for athletes.

6- Do more research on wearing a highland training mask and find out its effects on different physiological variables.

7- Physical and physiological tests are needed as an indicator of the adaptation of functional equipment and evaluation of the training situation as a result of the use of the highland training mask as an alternative to highland training.

8- To educate players of various athletics competitions on the importance of using a high mask in parts of training periods and to inform them of its positive impact on improving vital and physiological functions and improving their digital level.

9- Take care of the rationing of periods of use of the highland mask during training.

10- Organizing training courses related to breathing control training for field and track trainers.

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