

**The effect of using the two methods of Retroactive and repetitive training for developing the Characteristics of bearing strength of 400 meter's runners  
(A field study on the national military team)**

أثر استخدام طريقتي التّدريب الفترّي والتكراري في تطوير صفة تحمّل القوّة لدى عدائيّ 400 متر، فئة ذكور صنف أكابر. (دراسة ميدانية على المنتخب الوطني العسكري)

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**Abstract:**

Two studies aim to identify the effect of integrating interval and repetitive training methods in developing the strength endurance of the 400-meter runners in the special physical preparation stage, starting from the following problem: "What is the effect of the interval and repetition training methods in developing the strength endurance of the 400-meter runners? On this basis, the training program was applied for a period of 08 weeks of training in the period of special physical preparation on the sample of the National Military Athletics Team for Athletics Specialization 400 meters of 08 runners, as it was divided into two homogeneous samples (control and experimental), The study was conducted at the Military Sports Teams Gathering and Preparation Center in Ben Aknoun in the capital from July 20 to September 20, 2015. Prior to this, the exploratory study was conducted on 06 military regional teams (04 runners from each side). We relied on the experimental method by applying a set of physiological and physical tests, Finally, we found the effectiveness and positivity of combining interval and repetition training methods in developing the strength endurance of the 400-meter runners.

**Key words:** interval training, repetitive training, strength endurance, 400-meter runner, training program.

ملخص:

تهدف دراستنا إلى التّعرف على مدى تأثير دمج طريقتي التّدريب الفترّي والتكراري في تطوير صفة تحمّل القوّة لدى عدائيّ 400 متر في مرحلة التحضير البدني الخاص، منطلقين من الإشكال الآتي: "ما مدى تأثير طريقتي التّدريب الفترّي والتكراري في تطوير صفة تحمّل القوّة لدى عدائيّ 400 متر؟ وعلى هذا الأساس تمّ تطبيق البرنامج التّدريبي لمدة 08 أسابيع تدريبيّة في فترة التحضير البدني الخاص على عينة المنتخب الوطني العسكري لألعاب القوى اختصاص 400 متر البالغة 08 عدائين، إذ قسّمت إلى عيّنتين متجانستين (ضابطة وتجريبية)، وقد أجريت الدراسة بمركز تجمع وتحضير الفرق الرياضية العسكرية بين عكنون بالعاصمة من 20 جويلية إلى 20 سبتمبر 2015، وقبل هذا جرت الدراسة الاستطلاعية على 06 منتخبات جهوية عسكرية (04 عدائين من كل ناحية)، وقد اعتمدنا على المنهج التجريبي بتطبيق مجموعة من الاختبارات الفسيولوجية والبدنية، أخيرا توصلنا إلى فعالية وإيجابية دمج طريقتي التّدريب الفترّي والتكراري في تطوير صفة تحمّل القوّة لدى عدائيّ 400 متر.

الكلمات الدالة: التّدريب الفترّي، التّدريب التكراري، تحمّل القوّة، عدائيّ 400 متر، البرنامج التّدريبي.

## 01. Introduction and the Problematic:

Modern sports training has passed several stages, until its features are crystallized in its modern scientific form, it's branched to several specialties we mention Athletics sport, which takes a good deal of development around the world in the last years, Thanks to the harnessing of developed countries of most of its potentials to get up of the technical and physical sport's level with the good planning.

From all the Athletics 400 meters race which described as "men killer" that because the runner cant complete the race in the same speed that's why he must develop his Characteristics of bearing strength and energetic system of this race, this race is located within the mixed system with the predominance of the anaerobic system, bearing strength is plays an important role, because this stage of the race starts from the 80 meters to the last 100 meters, this needs a resistance of the fatigue from the runner with by increasing the length of his steps to the maximum he can to the end this is what confirmed by (HART. G, 1981, P66) that the bearing strength is the most important element in the training of 400 meters race, with the Carrying speed to maintain the required intensity.

The researcher has note the volatility in the level of national achievement of the 400 meter's race compared to global titles and he dues it to poor programs planning and the training methods that's makes him research in several references of the most useful methods which targeted the developing of bearing strength of 400 meter's runners, that's why the combined the two methods of Retroactive and repetitive training is the most useful methods to develop this characteristic to exchange the voltage and convenience, if the researcher makes a training program will applied in the period of the special physical preparation looking of the nature of this stage symmetry of intensity of with competition intensity and that what distinguishes the selected of the two methods (Retroactive and repetitive).

From here the study problem was evident that to know the real level of development the characteristic of bearing strength of 400 meters for effectiveness is the use of the two methods of Retroactive and repetitive for the special importance they have in the stage special physical preparation, and the development of the characteristic of bearing strength in 400 meters race needs a special attention from the sports trainer in all the phases of training unites to the athlete, that's for the development of the characteristic of bearing strength to this effectiveness represent the goal of principal goals to the good achievement, we note that the runner is not able to complete the race to the end with the required level, that's which prove a deficiency of runners of the bearing strength which be necessary to solve the problem with asking of the next the fundamental question: : how effective the application of two methods of Retroactive and repetitive training for the developing the Characteristics of bearing strength of 400 meter's runners?

## 2. The hypothesis of the Study:

### 2. 1. General Hypothesis:

- The use of two methods of Retroactive and repetitive training have a positive effect for developing the Characteristics of bearing strength of 400 meter's runners.

### 2. 2. Partial Hypotheses:

## **The effect of using the two methods of Retroactive and repetitive training for developing the Characteristics of bearing strength of 400 meter's runners**

- There are statistically significant differences between the tribal and remote measurement for remote one of the control group using the two methods of Retroactive and repetitive training;
- There are statistically significant differences between the tribal and remote measurement for remote one of the experimental group using the two methods of Retroactive and repetitive training;
- There are statistically significant in the improvement rate of the experimental group and the control one to the experimental group using the two methods of Retroactive and repetitive training.

### **3. Researching Goals:**

- The principal goal of this study is identify the effect of using the two methods of Retroactive and repetitive training the developing the Characteristics of bearing strength of 400 meter's runners in the two phases of special physical preparation;
- Comparison and evaluation of the rates between the tribal and remote test of variables of the study in using the two methods of Retroactive and repetitive training;
- Comparison and evaluation between the methods used from the last years (method of repetitive training) represented here by the witness sample (the control one) and the two methods of Retroactive and repetitive training (the combine of the two methods) which represented of the experimental group.

### **4. Search Terms:**

#### **4. 1. Training Program:**

“The search indicates the maximum performance of a looking to the long term, that anybody modification requires will be important work, that's why it is important to organize it in accordance with simple but fundamental principles, and the non-compliance in one of this principals regularly reduces expected performance.” (Jean-Luc Cayla, Lacrampe, 2007, p. 226).

It is the comprehensive executive template of the training plan, which contains the various approved methods, methods, means and training content, which are represented in the exercises and the time allocated for each stage of the training (Bin Shabha Tariq, 2020, p. 65).

So when taking care of a high level athlete, will be necessary in fact to put on a practical and very accurate goals, for simple reasons: In most cases, the necessities of competition and healing makes the obtainable time to training very narrow (Briefly, there is always a lack of time) programming to the training

#### **4. 2. The Retroactive training method:**

The Retroactive training method is one of training methods which characterized by successive exchange of effort and rest; the label refers to the period of rest phase between one training time and other. (Clark, M., 2006, P163)

The Retroactive training method characterized with the speed which approaching of the speed of the competition or more, and in the distance of the running competition a bit smaller because it don't pass the half in the real competition, and the endurance Degree is a bit smaller, the repetitions and the small rests between them (45-180 seconds) with the rotation between The Retroactive training least severe and repetitive one.

#### **4. 3. The repetitive training method:**

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This method is characterized of high speed of the training, and it is similar as the retroactive training in the exchanging performance an rest but they are deferent with it in the length of the during of practicing the training and its hard, and the number of times to repeat and the during of healing, (Malfois, C., 2009, P111), this method is characterized of the Maximum intensity during the operation which done in similar as in the competition in all characteristics ... (Harre, D., 1979, P165), and it must to give an long phases of rest between the small repetition to get good intensity with high level. (Weineck, J., 1997, P133)

The repetitive training method is characterized of a bit small speed comparing of the real competition, and the distance in it represent two thirds of the one in the real competition, and the degree endurance is higher than the Retroactive training (3 to 45 minutes) It is a distinctive way to rotate with the retroactive training method.

#### 4. 4. Bearing Strength:

The bearing is the component and the element which includes two deferent elements but they are much linked together which are “Periodic respiratory endurance and muscular endurance” and each one of them contributes directly to endurance, adding to that each one of them is deferent from the other in its importance and its degree like the deferent between the athletes and the deferent between the sport types (Jean-Luc Cayla, Rémy Lacrampe, 2007, P292)

We conclude from the above that the endurance in the cases of sport means “the Periodic respiratory fortitude”, and it is considerate one of the important physical and physiological of the principal elements like the power, speed, flexibility and fitness, and it have a strong link of all this capacities, such as its link with the speed and the power and what its causes the special elements like power endurance, and the endurance of in all times (short, medium or long term) and the speed endurance like an important characteristics, all of them plied an important role in the phase of the training and in the sports games and the events, that’s why the endurance with all its types and deferent divides is linked with all those sports games and the events in deferent degrees which appears in every one of them.

### 5. Methodology of field research and procedures:

#### 5. 1. Scientific Method:

To find a solvation to the study problematic we used the Experimental approach, is the most accurate types of research methods which have an effect on the Independent variable and the dependent one in the experiment, and we have experience of two groups; control and experimental group; and this with the using of the tribal and remote measuring to each one of the groups.

#### 5. 2. Researching community:

The principal community of the study is composed of 400 meters runner’s juniors’ male class belong to the national ministry of defense, there number is 24 runner, represent the six military regions, each region have 04 runner adding to that 08 runners of the national military team at the center for gathering and preparing military sports teams BEN AKNOUN represented A and B teams in total of 32 runner composed the community of the study.

#### 5.3. Researching simple:

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The researching sample was selected with the intentional way, because it's included all the national military team runners of the 400 meters race, of males' class genre juniors at BEN AKNOUN, its number was 08 runners, which means 25% of the study community and the reason of this selection is the approaching of the national military team runners 'levels in comparison the others team of the other regions (the best choice).

### 5.4. Tools and techniques used in the research:

#### 5.4.1. Physical tests:

- Test the hopper for a minute (Rotation of the two legs), take a look at the next book: Isabelle. Gaubert, Olivier, Beraguas, Véronique. Brauret et Emmanuel. Bannaventure, 2014, P249;
- Running test of distance of 400 meters.

#### 5.4.2. Physiological tests:

- Lactate test in the blood before running 400 meters;
- Lactate test in the blood after running 400 meters.

#### 5.4.3. Using Tools:

- The (LACTATE+) device and all the special tools to detect lactic acid in in the blood;
- The camera photo finish.

#### 5.4.4. The Statistic methods used:

To getting exact results we use most appropriated statistic method: percentage, Arithmetic mean, standard deviation, Calculate the percentage of improvement between the two groups the control and experimental one.

## **6. Show of, analysis, discussion and interpretation of search results:**

6.1. Show of, analysis, discussion and interpretation the results of the first theory (the control group):

**Table1. Show of, analysis, discussion and interpretation the results of the first theory (the control group)**

The study' simple	Executed tests	Measuring unit	Tribal test		Post test		The difference between the two	The value Y of the tabular	The value Y of the Calculated	Significance
			Arithmetic average	standard deviation	Arithmetic average	Standard deviation				
the control group	<b>Physical test</b>									
	Test the hopper for a minute (Rotation of the two legs)	Meter	240.00	0.157	273.43	0.280	33.43	3.710	10.327	signified
	Running test of distance of 400 meters	second	50.781	1.959	49.358	1.152	1.422		2.964	Not signified
<b>Physiological tests</b>										

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Lactate test in the blood before running 400 meters	MI mule/L	2.628	0.596	2.285	0.527	0.343	3.710	8.000	signified
		14.671	2.098	13.028	1.987	1.643		5.101	signified

The results of the control group is agree with the results of the next study:

From this we conclude that there is a link between the bearing strength training and the study variables because of the nature of the performance of the 400 meters race requires a high speed on the beginning of the race and a bearing strength in the middle and a special bearing in its end, that's why we must concentrate in the training of this affectivity in the exercises of high endurance, and this is what we result from the post-test to develop the study variables, Which indicates how much this variables have effects on the 400 meters race if it well used;

- The study of the searcher: ABDEGANI M'TAHER 2012, who's confirm of the importance of using of the repetitive training from the coaches for improving the anaerobic threshold to the runners of the long distances.

From the show, the analyses, discussion and explanation of the first theory in light of the listed tests which applied on the control group, and in application of the executive program in the way of the repetitive training and with this evaluation in all the results of the tests with deferent percentages, looking at all the told circumstances which contributed to the embodiment of the validity of the assumption we can from it confirm the validity of the first theory which says that it exist statistics signified defenses between the Tribal measurement and the post one, for the post measurement of the control group in application of the repetitive training method in the training program.

6.2. Show of, analysis, discussion and interpretation the results of the second theory (the experimental group):

**Table2. Show of, analysis, discussion and interpretation the results of the second theory (the experimental group):**

The study' simple	Executed tests	Measuring unit	Tribal test		Post test		The difference between the two	The value Y of the tabular	The value Y of the Calculated	Significance
			Arithmetic average	standard deviation	Arithmetic average	Standard deviation				
the experimental group	<b>Physical test</b>									
	Test the hopper for a minute (Rotation of the two legs)	Meter	245.00	0.186	320.49	0.343	75.49	3.710	16.696	signified
	Running test of distance of 400 meters	second	52.874	2.510	46.000	0.140	6.874		7.334	signified
<b>Physiological tests</b>										

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Lactate test in the blood before running 400 meters	MI mule/L	2.600	0.420	1.628	0.298	0.972	3.710	14.283	signifi
		12.70	1.031	8.528	1.168	4172		14.283	ied

The results of the control group is approach to the results of this next study

- The study of the searcher (NIHOVE. S: 1978) of the way which can develop the anaerobic capacity in the 400 meters race, and he result that's important to exposed The body to stress and extra bearing during the training to know how to dealing with it, and it is important to increase the speed in the repetitive exercises with advanced types, and maybe it is important in the physiological and psychological aspects to do the maximum of repetitive exercises in early period, and it is important to repeat running 400 meters during training, and speeds of running must be deferent according the time of session and the case of the runner, and the training must be specific to get used to the body in the 400 meters race;
- The study of the searcher MOHAMED MOUAIAD and others, 2005 and the result was the effective of the two methods of the retroactive training with high endurance and the repetitive training to develop the muscle of the legs;
- The study of the searcher RAHIM ROUAI AH HABIB, 2006, he result of the training endurance of the LACTATE had a positive aspect in development of the bearing strength which cause the endurance to the augmentation of the LACTATE acid in blood for a long time during the exercises, and it developed the result of running 800 meters.

From this show, the analyses, discussion and explanation of the second theory in light of the listed tests which applied on the experimental group, and in application of the executive program in the way of the repetitive training and with this evaluation in all the results of the tests with deferent percentages, looking at all the told circumstances which contributed to the embodiment of the validity of the assumption we can from it confirm the validity of the second theory which says that it exist statistics signified defenses between the Tribal measurement and the post one, for the post measurement of the experimental group in application of the repetitive training method in the training program.

6.3. Show of, analysis, discussion and interpretation the results of the third theory (the improvement rate between the two groups):

**Table3. Show of, analysis, discussion and interpretation the results of the third theory (the improvement rate between the two groups):**

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The study' simple	Executed tests	Measuring unit	Arithmetic average		The improvement rate	Average improvement rate
			Tribal test	Post test		
the control group	Test the hopper for a minute (Rotation of the two legs)	meters	240	273.43	13.93	10.30
	Running test of distance of 400 meters	Second	50.78	49.36	2.80	
	Lactate test in the blood before running 400 meters	MI mule/L	2.63	2.28	13.31	
	Lactate test in the blood after running 400 meters	MI mule/L	14.76	13.03	11.18	
the experimental group	Test the hopper for a minute (Rotation of the two legs)	meters	245	320.49	30.81	28.48
	Running test of distance of 400 meters	Second	52.87	46.00	12.99	
	Lactate test in the blood before running 400 meters	MI mule/L	2.60	1.63	37.31	
	Lactate test in the blood after running 400 meters	MI mule/L	12.70	8.53	21.83	

The results is approach to the results of this next study

- Study of searcher (OUISSAL SABIH KARIM, 2006) who confirmed that during the training of characteristic of the endurance of the special speed we must increase the number of the repetitive times with the augmentation of the endurance of force, which will be improved with the volume of training or the repetitions, that's why the endurance will be between less than the maximum to the maximum, as (25 to 95%) or (90 to 100%) from the maximum of the athlete which contribute in the development of endurance of speed. And she confirmed of the importation of all the elements of the training especially the characteristic of the will in the operation of the special endurance training;
- Study of searcher (ELMOUSSRI ALI and others, 2006), he result that the retroactive training method had an effective with signification more than the repetitive training



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method to develop the distinctive force of arms muscles, but the repetitive training method had an effective with signification more than the retroactive training method to develop the distinctive force of legs muscles;

- Study of the searcher (GAVENI. S, 2006) who confirmed in it the obligation to base the special training to achieve a highly exemplary performance to develop the anaerobic energy system, The power generation system is anaerobic from the LACTECE is one of the most power generation in 400 meters race, that's why the special ability of endurance and the speed endurance and the special bearing is the most important element which must develop to achieve the highest performance this components in the opinion of the searcher it represent the elements of preparation which have an effective on the 400 meters race. Adding to that it must not oversight the principal elements like the speed, general endurance and general strength, although there is no direct effect from it on the 400 meters race it have a relationship to the general preparation to training program, although there is no direct effective on the 400 meters because it have a relationship to the general preparation to training programs of the 400 meters runner of the yearly and the long term programs.

From this show, the analyses, discussion and explanation of the third theory in light of the listed the groups the control group and the experimental one, in the development of all the results of the tests in deferent rates, from all the Circumstances which contributed to the embodiment of the validity of the assumption we can from it confirm the validity of the third theory and we can confirm the validity of the third theory which says that it exist statistics signified deference between the improvement rate experimental group and the control one to the experimental group in using the retroactive an repetitive training method.

### **4. Conclusions and suggestions:**

The 400 meters race is one of the hard races which demand a high speed in the beginning and special endurance in it middle and special endurance very important in the end, that's why the searcher put on a training program with the two retroactive an repetitive training method to develop the characteristic of the bearing strength of the 400 meters runners, that's why this two methods featured of practical endurance –in the point of view of the searcher- appropriate to develop the characteristic of the bearing strength of the runners class, Based on that of a group of theories and doctrines (theory of Black of characterize the 400 meters experienced runners, and the new doctrines in the sports preparation to Platonov) and They put on the training program outline and give it to the view of the experts and the specialists for arbitration of the development of the characteristic of the bearing strength of the 400 meters runners.

The development of the characteristic of the bearing strength makes the runner able to keep his speed with great endurance during all the race and resist the fatigue which is the result of the gathering of quantities of the LACTECE acid in the muscles and it concentrate in the blood, that's why the development of this characteristic have a relationship with the specify the distance and the training endurance appropriate in running 400 meters.

After the executing the training program on the experimental simple we note the development is achieved in the saved time on the running of 400 meters, and this development is achieved in result of elements, the using of the scientific tools In the training is one of them, in case to regularization of the training endurances (intensity, volume, rest) As well as dependence on the physiological variables as an indicator to the use of training endurances and to regularization of rest phases, and especially the concentration of the Lactic acid in the blood with the work on the development of its special systems of power.

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In the light of the subjects, theories and variables of the study which based on the information of the theory the study was directed to the practical search to answer the questions, and from the results which after conducting necessary statistical treatments of the data and analyzed its component methodologically the searcher result the next:

- The deference in the rate of developing between the two simples (control and experimental) in the variables of the study;
- The training program in using the repetitive training method have a positive effect to the development of the characteristic of the bearing strength of the 400 meters runners but in rate of 10.30%;
- The training program using the repetitive training method and retroactive one is achieved the greatest results of the development on the characteristic of the bearing strength of the 400 meters runners but in rate of 28.48%;
- The simple of the study (control and experimental) achieved the on the characteristic of the bearing strength but the experimental group was the best;
- The training program of the experimental group contributed to increasing the ability of the concentration of lactic acid in the blood for the longest period during performance than the training program of the control group;
- The training program of the experimental group led to the development of a 400 meter achievement.

From the above, a direct answer to the main question of the study can be that in fact my methods and repetition have the positive effect in the development of the trait of the runners 400 meters, Based on the results achieved in the study, the researcher recommends the following:

- The need to formulate training programs based on modern training trends;
- Emphasis on the use of more than one training method in the development of physical attributes, both public and private, during the various physical préparations;
- Training methods should also be included in training programs;
- The need to combine the methods and training methods in preparing the runners;
- The level of speed bearing and force bearing should be developed due to the close relationship between them in the completion of the 400 meter run;
- When performing a strength training exercise, it is important to ensure that the frequency of repetitions increases with the appropriate load level for the training volume;
- The 400-meter trainers need to pay attention to the lactic acid to increase the ability of the athlete to tolerate the concentration of lactic acid in the muscles for as long as possible during performance.

## 5. Referrals and Quotations:

### books

- Clark.M., Optimum performance training : Basketball .Ed : Regan Books, USA. (2006)
- Harre, D.(Red) :Training Sleher,6.Aufl.Sportverlag,Berlin. ,(1976)
- Hart, G.,400 mete taininig, in v . Gambettaced, West point leisure press. (1981)
- Iabelle. Gaubert, Oliver. Bberaguas, Véronique. Bauret et Emmanuel. Bonaventure. Les Fondamentaux du Sport santé. Ed : @mphora, paris. (2014)

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- Jean-Luc Clayla, Rémy Lacrampe, , Manuel Pratique de l'entraînement, Ed : @mphora, Paris. (2007)
- Mafois. C., Entraînement des jeunes. Ed : @mphora, paris. (2009)
- Weineck, J., Manuel d'entraînement (physiologie de la performance sportive et de son développement dan l'entraînement de l'enfant e de l'adolescent)(éd.4). paris : Vigot. (1997).

**scientific journal**

- Bin Shabha Tariq, A proposed training program for the high intensity interval training method affected someimmune variables among soccer players under 17 years of age, the challenge magazine. Volume12, Issue02, Year2020, Page65.
- Gaffney, S., The modern rider and trainer in athletics, Adelaide, 29.4 pages 39-41(1991)
- Newhof S., The development of aerobic capacity in the 400-meter race Quarerly Review of Athletics, Kalamazoo, (Michigan), 78 (autumn), (1978), 3 pages (48-50)

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