THE EFFECT OF SPEED ENDURANCE TRAINING FOR THE EFFECTIVENESS OF RUNNING (800 M) ON SOME PHYSIOLOGICAL INDICATORS AND ACHIEVEMENT FOR PEOPLE WITH PHYSICAL DISABILITIES FOR THE CATEGORY (T46-T47)

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ABSTRACT

The purpose of this paper is to identify the effect of speed endurance training on some physiological indicators of the athletes running (800 m) for people with physical disabilities, the Iraqi national team, the members of the research sample, and to achieve the goal, the researchers used the experimental method with a one-group (experimental) design with two tests, pre-and post-tests, for its relevance to the research procedures. Runners at a distance of (800 m) for the category of applicants with physical disabilities and the sample was chosen intentionally, which numbered (4) runners, who represent (100%) of the community of origin. The researchers concluded that there are significant differences for the research sample in the physical test (800 m). The results also showed that there are significant differences for the research sample in some physiological indicators during rest and after physical effort, and this means that there is a development among the players in the level of some physiological variables during rest and after physical effort for a stage.

Keywords: effect of speed endurance exercise, heart rate, lactic acid, speed endurance exercise test, running effectiveness of (800 m).

I. INTRODUCTION:

The continuous development in achieving the effectiveness of (800 m) requires a reference to the measurement of physical abilities, including endurance of speed for people with physical disabilities, which is characterized by many peculiarities in terms of the distance travelled by the player while jogging, where the physical performance is continuously and of high intensity through rapid and continuous movement over the course of the running time, and this requires continuous performance with no rest periods, as well as the emergence of endurance and speed, which makes endurance performance the most important characteristic for a distinguished and good player than others, and that this endurance of performance depends on the ability of the athlete in physical performance and in the most difficult circumstances and delaying the appearance of symptoms Fatigue on him, especially in the last times of running, where the player must maintain physical abilities.

Among the previous studies that dealt with such a study is the study (Shaker Al-Sheikhly, 2008) (1), which found the effect of standardized training methods of fartlek in developing speed endurance, the concentration of lactic acid in the blood, and the achievement of (400m) and (1500m) runs, and the study (Abbas Ali Laftah, 2009) (2) concluded that the use of distances less than the race distance works to develop special endurance, as well as a study (Karim Abdel-Hussein, 2009) (3) that the weighting method in the track affected the development of the level of special endurance, which led to the development of the level of achievement for the effectiveness of the (1500 m) run.

From the foregoing, the importance of the research appears in preparing a set of speed endurance exercises that aim to improve the physical performance of people with physical disabilities for the category (T46-T47) for men and to identify physiological indicators and try to measure before and after physical exertion, which will enable
trainers and specialists in the field of physical disability to identifying the training status of the athletes and the level they will reach to be of assistance to them in designing their future training programs in the light of the indicators that will be obtained through the results of our current research and employing those results to serve the development of athletics with the effectiveness of running (800 m) for people with physical disabilities.

The problem of the study is summarized by the researchers’ observation and briefing on many sources, research and studies in the field of physical disability, as well as the scarcity of studies and research in the field of training programs to withstand speed and physiological indicators in athletics for people with physical disabilities (T46-T47) for men, which are almost non-existent. This prompted the researchers to delve into this field after several meetings and interviews conducted by the researchers with the coach of the national team, as well as the national team athletes qualified to participate in the Tokyo Olympics (2020-2021) on this site. On the other hand, standing on the state of physical preparation and physiological indicators of the national team in the light of the research results in an effort to plan future programs.

Research objective:
Identifying the effect of speed endurance training on some physiological indicators of the players who ran (800 m) for people with physical disabilities, members of the research sample.

II. RESEARCH METHODOLOGY AND FIELD PROCEDURES:

Research Methodology:
The researchers used the experimental method with a one-group (experimental) design with two pre- and post-tests for its relevance to the research procedures.

Community and sample research:
The research community was included and the research sample was chosen in a deliberate way by (4) of the national team players who ran (800 m) for people with physical disabilities, category (T46-T47) category T46 single amputation above the elbow and their number of players _ Category T47 single amputation below the elbow and their number of players becomes The total number of four players and they can run together according to the tests of the International Paralympic Committee) and qualified for the Tokyo Paralympics (2020-2021), who represent (100%) of the original research community.

Devices used in the research:
The two researchers used the following devices and tools (athletics stadium, Lactate pro device for measuring the concentration of lactic acid in the blood of Japanese origin, (katat) strips for measurement purposes (lactic acid), smartwatch (k5) to measure heart rate and its number (4) accessories, Manual micropipr for serum extraction from French origin, (EDTA) free plan tubes, syringe for drawing blood, cool box, compressor belt It is attached to the upper arm area, an electronic device for measuring weight and height of English origin, model (CMS-5000), a firing pistol (1), a mercury pressure measuring device, made in Korea, number (1), and cotton with a non-alcoholic sterilization solution with a medical palm, And a video camera, type (sony), number (1), stopwatch, type (Casio), number (2), computer, type (hp), number (1), and information registration form.

Exploratory experiment:
The two researchers conducted the exploratory experiment on the stadium of the National Center for the Care of Athletic Talent Athletics in Baghdad affiliated with the Ministry of Youth Sports. The aim was to ascertain the necessary number of members of the auxiliary work team, as well as to identify the validity of the tools used in the research, and in addition to that, to identify the most important obstacles that researchers may encounter during the testing process.

The test used in the study:
First test:
- Test name: A test that ran 800 meters. (Hussein Ali Al-Ali, AmerFakherShaghati, 2010)
- Purpose of the test: To measure the endurance of speed (achievement).
- Tools used: athletics stadium, assistants, stopwatch, registration form, whistle.
Description of the test: The test begins and when the instruction is heard on the line, the tester stands behind the specified starting line from the high starting position. The test begins when the start signal is heard. The tester sets off to travel the prescribed distance for the test, which is two rounds around the field in the shortest possible time stop the clock.

Recording: The recorder records the time that the timekeeper informs him of from the moment the test starts signal until reaching the finish line and records the time in minutes and seconds and to the nearest fraction of a second according to the International Athletics Law.

Second test:
- Test name: 600m running test (Adel Awad, 2010)\(^{(5)}\)
- Purpose of the test: To measure the endurance of performance speed with effectiveness.
- Tools used: athletics track, stopwatches, assistants, registration form, whistle.
- Description of the test: The entire sample stands behind the specified starting line (high standing position) and at the start signal, the sample sets off to cross the test distance one and a half rounds, and upon reaching the finish line, the recording hours are stopped.
- Recording: The recorder records the time that the timekeeper informs him of from the moment the test starts signal until reaching the finish line and records the time in minutes and seconds to the nearest tenth of a second.

III. RESULTS AND DISCUSSION:

Table (1) shows the arithmetic means, standard deviations, arithmetic mean difference, a standard deviation of differences, the calculated (T) value, the significance of the differences and the percentage of development between the results of the pre and post-tests in the physical tests and achievement for the individuals of the research sample.

<table>
<thead>
<tr>
<th>Physical tests</th>
<th>Pre-test</th>
<th>Post-test</th>
<th>arithmetic mean difference</th>
<th>differences of standard deviation</th>
<th>T calculated</th>
<th>Sig level</th>
<th>Type Sig</th>
<th>Evolution ratio %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Running Test 800m</td>
<td>2.05  0.01</td>
<td>2.00  0.00</td>
<td>0.05</td>
<td>0.01</td>
<td>5.54</td>
<td>0.01</td>
<td>Sig</td>
<td>2.50 %</td>
</tr>
<tr>
<td>Running Test 600m</td>
<td>1.35  0.03</td>
<td>1.33  0.03</td>
<td>0.02</td>
<td>0.00</td>
<td>7.00</td>
<td>0.00</td>
<td>Sig</td>
<td>1.50 %</td>
</tr>
</tbody>
</table>

Table (2) shows the arithmetic means, standard deviations, arithmetic mean difference, a standard deviation of differences, the calculated (T) value, the significance of the differences, and the percentage of development between the results of the pre and post-tests in the cardiac variables (heart rate) for the research sample members.

<table>
<thead>
<tr>
<th>Variables heart</th>
<th>Pre-test</th>
<th>Post-test</th>
<th>arithmetic mean difference</th>
<th>differences of standard deviation</th>
<th>T calculated</th>
<th>Sig level</th>
<th>Type Sig</th>
<th>Evolution ratio ratio %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>standard deviation</td>
<td>Mean</td>
<td>standard deviation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 3 shows the arithmetic means, standard deviations, arithmetic mean difference, the standard deviation of differences, the calculated (T) value, and the significance of the differences between the results of the pre and post-tests in the lactic acid variable for the members of the research sample before and after the physical effort for 5 minutes.

<table>
<thead>
<tr>
<th>Lactic Acid Variables</th>
<th>Pre-test</th>
<th>Post-test</th>
<th>Arithmetic Mean Difference</th>
<th>Differences of Standard Deviation</th>
<th>T Calculated</th>
<th>Sig Level</th>
<th>Type</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>Standard Deviation</td>
<td>Mean</td>
<td>Standard Deviation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Before Physical Exertion</td>
<td>2.70 0.53</td>
<td>1.70 0.29</td>
<td>1.00</td>
<td>0.62</td>
<td>3.12</td>
<td>0.04</td>
<td>Sig</td>
<td></td>
</tr>
<tr>
<td>After Physical Exertion</td>
<td>10.87 0.68</td>
<td>12.35 0.33</td>
<td>1.47</td>
<td>0.89</td>
<td>3.27</td>
<td>0.04</td>
<td>Sig</td>
<td></td>
</tr>
</tbody>
</table>

Significant at the error level (0.05) if the error level is less than (0.05)
endurance of special speed, which was linked to the development of special speed, as the exercises included various distances (200m, 250m, 300m, 400m, 500m, 600m, 800m and 1000m) of the race distance, respectively, performed according to an intensity that changes with the change of distance and speed.

Therefore, the development in the results of the special speed endurance test less than the racing distance (600 m) for the research sample indicates the effect of these exercises in developing the endurance of special speed, which expresses the ability of the runner to make the highest speed rates represented by the decrease in the time of the test distance, which expresses the special speed that a runner achieves while running his true distance.

(Mufti Ibrahim Hammad) (6) believes that “one of the conditions for training endurance of special speed as one of the physical capabilities of anaerobic endurance, whose training requires the use of exercises characterized by high intensity using the method of high-intensity interval training for specific periods of time interspersed with positive rest (incomplete) between repetitions, provided that those The exercises are characterized by a gradual increase in speed while also reducing the distance gradually, which will improve the speed endurance capacity.

Shaker Al-Daraa states (7), "The results are better whenever the intensity is close to the maximum intensity. The researcher attributes the development in endurance to speed through the use of the training curriculum according to the prevailing energy system through the overlap of training special abilities during the training unit with the use of aids, which led to the development the ability to withstand the special speed and its impact on achievement, the results are better the closer the intensity is to the maximum intensity. The researcher attributes the development in the endurance of speed through the use of the training curriculum according to the prevailing energy system through the overlap of training of special abilities during the training unit with the use of auxiliary means, which led to the development of the ability to bear special speed and its impact on achievement.

Through table (2), after the researchers reviewed the results that were reached for the physiological variables during rest and after physical exertion, the reasons behind them must be discussed, as the results of all functions indicated that there were significant differences in the research sample.

The researchers attribute the reason for this to the optimal use of rest and recovery means in sports training and its synchronization with the biological adaptation process to training requirements and the correct alternation between effort and rest and access to a state of overcompensation.

Also (Foran 2001) (7) confirmed, “The process of reaching the state of overcompensation is better and the working capacity of the functional body systems of the athlete increases significantly when rest and recovery exercises are performed (6-9) hours after the end of very hard training or after participating in a race tired.”

Therefore, coaches should continue to search for effective ways and means that contribute to the return of these devices to their normal state quickly after completing the implementation of high training requirements or after participating in stressful races complementing the training process.

Whereas (Yakovlev 1968) (8) emphasized, “The treatment through movement or the use of positive rest exercises is one of the important means used in restoring the recovery and comfort of the athletes’ organic organs. Also, athletes can perform muscle stretching exercises alone or with the performance of positive rest exercises, and that the tired muscle can increase the rate of The speed of recovering her, and then increasing her work capacity if the athlete uses another muscle group, preferably (the opposing muscle group) by performing a motor work with a low intensity during the rest period instead of being motionless “.

Through table (3), there are significant differences for the pre and post-test for the lactic acid variable, and the researchers attribute that the reason for developing the results of the lactic acid measurement test is that the exercises prepared by the researcher scientifically applied to the research sample affected the ability to tolerate the concentration of lactic acid in the blood, As the anaerobic effort on the basis of which work was carried out in the training units of its main section, the latest development (chemical changes) in bearing the increase in the concentration of lactic acid in the muscles and blood that occurs in particular for the working muscles to produce the energy needed to perform physical exertion with insufficient air oxygen, Chemical changes in the muscles working to produce energy using the lactic acid system for a duration of activities ranging from (30 sec to 3min), This was confirmed by (Abu ZaidImad) (9) “The anaerobic work leads to an increase in the accumulation and accumulation of lactic acid as a result of anaerobic glycolysis, which leads to rapid fatigue, slow performance of the player and a decrease in his ability carry around".
As a result of sports training with the anaerobic energy system (lactic), the player can withstand a high percentage of the concentration of lactic acid in the blood. This was confirmed by (Rayes Khouribet, Ali Turki) (10) that “an increase in the concentration of lactic acid in the blood after physical exertion indicates an improvement in the physiological condition of the athletes.” And their ability to continue to perform despite the concentration of lactic acid in the blood. An increase in the concentration of lactic acid in the blood indicates an improvement in the athlete's ability to tolerate lactic acid, and it also indicates an improvement in the ability to produce energy through the anaerobic effect of glycogen.

The researchers believe that the accumulation of large amounts of lactic acid concentration after regular performance of high-intensity lactic performance exercises by the players increases the efficiency of the internal organs from energy extraction during gluconeogenesis with a large amount of glycogen to produce ATP compound inside the muscle cell through the anaerobic glucose breakdown process, which leads to the accumulation of large quantities of lactic acid, which is the final product of the lactic energy system, i.e. an increase in the amount of lactic acid produced increases due to an increase in the duration of the performance of the effort using high stresses (anaerobic work), which in turn leads to an increase in the oxygen debt and then an increase in the accumulation concentration of lactic acid during training.

Also, (Mohammed Reda Ibrahim Ismail 2009) (11) confirmed that performing exercises that carry the speed of performance improves the capacity of the muscle to resist the accumulation of lactic acid resulting from the energy system in force in working muscles through the intensity and time of performing exercises quickly so that it is a motive to resist the emergence of fatigue due to the effects of physiological adaptations in reducing the damage of high lactic acid, the acidity in the muscles and blood is increased, that is, there is a strengthening of the defensive line for the functional body systems, where the increase in acidity affects a decrease in the value of (PH), which in turn affects the change of enzymes and hormones involved in the reactions of gluconeogenesis, as well as the difficulty of transmitting nerve impulses from the end of the nerves to the muscle due to this acidity, as the continuation of training on the lactic energy system leads to an increase in the vital components by 50% if the training period is (10) weeks, and the more the anaerobic endurance improves and the efficiency of endurance the level of lactic concentration in the blood improves.

IV. CONCLUSIONS AND RECOMMENDATIONS:

Conclusions:

• The results showed that there are significant differences for the research sample in the physical tests (800-600) m.

• The results showed that there were significant differences for the research sample in the variable (heart rate) during rest and immediately after physical exertion and after (1-3-6) minutes, and this means that there is a development among the players in the level of some cardiac functions, including (heart rate). During rest and after physical exertion for the recovery phase.

• The results showed that there are significant differences for the research sample in the biochemical variables during rest and after physical exertion by (5) minutes, which means that there is a development among the players in the level of the lactic acid variable during rest and after physical exertion.

• The effect of the exercises prepared by the researcher on the research sample during rest and after physical effort, for physical tests and physiological indicators.

Recommendations:

• Using the (Lactat Pro) device to measure the concentration of lactic acid in the blood and the smartwatch (k5), because they proved very effective in knowing some physiological indicators among the members of the research sample.

• The use of such training curricula so that it is not limited to individual games, but also expands the scope of its currency to team games for the disabled as well.

• Conducting similar studies on other age groups, whether males or females from the national teams.
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