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The effect of Tabata exercises on the development of stamina and achievement for female athletes running 100m hurdles under the age of 18 years

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Abstract

The science of modern sports training is a scientific educational process based on sound foundations, and its goal is for the players to reach integration in the technical performance. And devices to achieve high sporting achievements, and the two researchers used a modern method of sports training methods in order to develop strength endurance and achievement for the 100m hurdles event female players under 18 years old. The importance of the study lies in the use of Tabata exercises, which are among the modern exercises that are characterized by suspense and excitement, and their application according to specific times in performance within the training curriculum for the 100m/hurdles event female athletes under 18 years old. In order to avoid the element of boredom and create something of suspense, excitement and competition within the training unit to achieve the goals of the unit set at the highest levels, for this reason the two researchers decided to prepare exercises in the Tabata style and employ them to develop strength endurance and achievement among the 100m hurdles event players under 18 years old. The study aimed to: Preparing Tabata-style exercises, and identifying the effect of Tabata exercises on developing strength endurance among female players, and identifying the effect of these exercises on the achievement of female players in the 100m hurdles event under 18 years old, and identifying the differences between the post-tests of the research group in the physical characteristics and the digital level of female players in the 100m running event Hurdles under 18 years old. The study imposes: There are statistically significant differences between the pre and post-tests in the endurance tests of strength and achievement for the effectiveness of running 100 m / hurdles. The two researchers used the experimental approach in their current study due to its suitability to the nature of the research problem. Female players who were subjected to tests, and the training curriculum was applied for (8) weeks, implemented at the rate of (3) units per week, and the duration of the exercises was (50) minutes using the Tabata method, and after conducting the pre and post-tests, the results of the tests were presented, analyzed and discussed through data processing in the system Statistical spss Through these results, the two researchers reached the following conclusions: The exercises that were applied in the Tabata style helped to develop strength endurance for the members of the research sample, and that the duration of the independent variable represented by the number of training units was appropriate in creating adaptations that reflect the extent of the development of the members of the research sample to achieve the achievement of the effectiveness of running 100m hurdles, and that the development of strength endurance reflected positively on the achievement of the 100m hurdles event. and this achieves one of the sustainable development goals of the United Nations in Iraq which is (Good Health). As a result, the recommendations are: Concerning the use of (Tabata) style exercises according to scientific training foundations to raise the efficiency of short race runners during training and competitions, and adopting the exercises prepared by the two researchers as basic data when training runners for the effectiveness of 100m hurdles, the need to ration the training load for exercises in the (Tabata) style In a manner appropriate to the type of practitioners in terms of gender, biological age, and training; Because it has a high impact on the body during performance, and similar studies were conducted on other individual and group activities, and on different age groups.

Keywords

Tabata exercises, carrying strength

Introduction:

The importance of the study focuses on the continuous interest in sporting achievements and the continuation of the process of developing them, and the importance of using modern and influential methods in the effectiveness of running 100m hurdles, as mentioned (Ruaa and Bushra) in their study, "Athletics is one of the individual, competitive, interesting and widespread games, and it is characterized by its multiplicity and diversity Its activities and competitions" (14) and that the problem of the study centered on moving away from the usual and traditional exercises used in the training units for all activities, especially the event of running 100m hurdles and searching for exercises that are characterized by excitement and suspense and their suitability for the level of capabilities of the female players; To work on a remarkable development in the strength endurance and achievement of the 100m hurdles event, after searching on the Internet and previous studies.

Therefore, the two researchers decided to delve into this problem by finding modern exercises that have an impact on the development of stamina and achievement for the female players in the 100m hurdles event, so the Tabata exercises mentioned by (Ahmed Mahrous) were chosen. The exercises aim to make the body exert the maximum possible effort, and reach its muscles to the maximum extent possible to provide performance, by relying on the internal effort and energy of the body without external effort and heavy weights, so that after the end of the exercise it returns with a large and long energy charge for hours" (1) and it was mentioned (Ali Abdel-Hussein) "The TABATA method contains different forms of exercises that are performed during 10:20 seconds, where the time period is 20 seconds is the time of performing the exercise and 10 seconds is the rest period before performing the next exercise, and these exercises are performed depending on doing intense exercises And fast and repetitive in

a short time" (2) Therefore, working with modern training methods has a great impact on raising the level of performance of the players, and then the training process becomes more effective in achieving its goals and reaching the highest level of athletic achievement, and the research aims to: Preparing Tabata style exercises , and to identify the effect of Tabata exercises in developing strength endurance, and to identify the effect of Tabata exercises on the achievement of the 100m hurdles event for under 18 year old female players, and on the differences between the posttests of the research group in the strength endurance and achievement for the 100m hurdles event female under 18 year old female players, and the research assumed: There are statistically significant differences between the pre and post-tests in the tests of strength endurance and achievement of the effectiveness of running 100 m / hurdles.

Research fields:

The human field is represented by the players of Al-Bayaa Club for the event of running 100m hurdles, and it represents **the temporal field:** from Saturday 10/15/2022 to Saturday 1/7/2023, while **the spatial field:** The Scouts Stadium near the College of Physical Education and Sports Sciences for women.

Method and procedures:

The two researchers used the experimental approach with the one-group design system with two pre- and post-tests, as stated by (Hassan Ahmed) "due to its suitability to the nature of the problem for the purpose of reaching the results of the research." (6). Their number is (10), and the research sample is part of the original community, their number is (6) players, and they were deliberately identified, and homogenization was made for the research sample as shown in Table No. (1), then the group performs the pre-tests, then Tabata-style exercises are applied, and then the post-tests are performed. The two

researchers used a set of tools, devices, means of collecting information, scientific sources, the international information network, and personal interviews, through which questions were asked and answered, through which the Tabata tests and exercises for the players were also determined. Observation, tests and measurement related to force endurance. The two researchers designed a form to solicit the opinions of experts about the most important force endurance tests related to the research. This is to determine the

tests needed by the study sample, and among these tests: the vertical jump test from a squatting position for a period of (30) seconds and completion according to the opinions of experts. The tests were nominated in a form and presented to the same experts. As shown in Table 2, and also the percentage of tests was calculated as shown in Table (2), meaning agreement of (3) experts out of (5), and thus the tests shown in the table below were accepted.

Table (1)
Shows the statistical parameters of the research sample for extraneous variables

.Seq	Variables	Asthmatic mean	Standered deviation	torsion modulus
1	Long	159.8	1.47	0.02
2	weight	56.6	1.36	0.22
3	Age	17.6	0.34	1.7

Table (2)
Shows the percentages supporting the opinions of experts about the validity of the tests

.Seq	Selected tests	The purpose of the test	The number of agreed opinions	Percentage
1	Vertical jump from a squatting position for 30 seconds	Measurement of force tolerance	3	%100
2	100 m hurdles achievement test	Achievement measurement	5	%100

Means of collecting information, equipment and tools used:

Methods of collecting information: Arabic and foreign scientific references and sources. World Wide Web (Internet), observation, testing and measurement, personal interviews, committees of experts and specialists, assistant work team, measurement registration form, virtual library, questionnaire form

Used tools: (10) barriers, a metal tape measure, pens, a stopwatch, a whistle, a medical scale, an electronic calculator (hp), a (canon) camera,

(Excel) program for data dumping and storage, (spss) program) Issuance (22) to analyze the results

Used tests

First: vertical jump from a squatting position for (30) seconds, (Haider Faeq) (7)

Second : Achievement test

Training program

The two researchers conducted the exploratory experiment on Thursday (10/13/2022) for the purpose of identifying the obstacles and

difficulties that may arise when implementing the main experiment, as stated by (Marwan Abdel-Mageed) as "practical training for the two researchers to find out the negatives and positives that they face while conducting the tests to avoid them." (9) by preparing and organizing exercises in the Tabata style, based on personal experience, and the application of the exercises in the Tabata style began on the research sample on 10/15/2022 until 12/18/2022,

i.e. (8) weeks, implemented by (3) units in The week, and the duration of the exercise was (50) minutes, in which the components of the training load were taken into account, and the two researchers rationed the exercises on a scientific training basis, as well as the physical ability of the research sample, the tools used, and the training method, as in Table No. (3); To be able to withstand the strength and achievement of the 100m hurdles event.

Table (3)
Shows the training program for the research sample

total units training	number of units Weekly training	Training days	Training time	Used intensity
unit 24	unit per week 3	Sunday, Tuesday, Thursday	minute(50-45)	utmost %100

Results

Table (4)

Shows the arithmetic mean and standard deviations, the value of (T) calculated for the sample, the level of test significance and the significance of the difference for the pre and post-tests of the research sample in the variables under study

Statistical parameters for variables surveyed	Meas urement unit	Pre		Post		medial difference	value of (T)	Value of sig	Significa nce type
		A	SD	A	SD				
bear force	Num ber of times	29.07	2.50	23.64	1,47	5.43	5.10	0.002	Sign
achievement	.Sec	23.23	0.399	21.896	0.742	6.462	16.859	0.0001	Sign

Table (5)

Shows the arithmetic mean and standard deviations, the value of (T) calculated for the sample, the level of test significance and the significance of the posttests for the research sample in the variables under study.

Statistical parameters for the researched variables	Measurement unit	Post test		medial difference	value of (T)	Valuesig	Significance type
		A	SD				
bear force	Number of times	23.64	1,47	5.43	5.10	0.002	Sign
Achievement	.Sec	21.896	0.742	6.462	16.859	0.0001	Sign

Discussion:

Through what we observe from the results presented in the tables indicating the existence of significant differences between the pre and post-tests of the research sample and in favor of the post tests of the (strength endurance, achievement) tests, the researchers see that the cause of the moral difference for the members of the research sample is as a result of their use of exercises that were prepared in a scientific manner in line with the Tabata style literature, which contributed to increasing the level of strength endurance for the muscles of the two legs and the achievement of the 100m / hurdles players as a result of this compatibility through various exercises, and as mentioned (Adel Hamid) "as the practice of athletics requires raising the level of these elements. And one of these methods that helps in That is overcoming the difficulties that the trainee or contestant receives in the process of teaching and training skills, recognizing and deepening them" (4), and that Tabata-style exercises worked on developing some physical attributes, and (Miller) and others emphasize "the need to use Tabata-style exercises in the training curricula Because it achieves a clear development in abilities and skills, and this can be done by adhering to the timing of the exercises in the training units, and

with the exercises in the Tabata style, there is no single action for one muscle, instead the whole body will be created, and this is the essence of increasing some physical capabilities through neuromuscular compatibility. (10), and that the exercises prepared by the two researchers for the individuals of the research sample, which are characterized by high intensity, helped to develop the physical capabilities and strength endurance of the muscles of the two legs, as the runners of the 100m hurdles race need, during their performance of the race, rapid and frequent muscle contractions that serve the specialized activity; Therefore, the correlation of strength and endurance and the resulting strength endurance, and when this connection is at its highest intensity, whether it is strength or endurance, it will have an effective effect on the player's motor performance, and what helped in that is the researcher's use in the training units of the compound specialized exercises that were working On the development of strength and speed, such as hurdles exercises, and agility ladder with partridge exercises at an appropriate height and distances, in a way that serves the development of strength and endurance for the muscles of the legs, and the results also showed, and as confirmed by (Olson) "that the group that uses the new Tabata method increased its aerobic and anaerobic levels more than the other group,

as it increased anaerobic fitness by 28%, indicating that a shorter overall exercise period at a higher intensity was more beneficial" (11). The two researchers, in agreement with what was mentioned by the studies (Ula Issa and Israa Fouad), attribute that "this development by achievement is due to the exercises used by the research sample, which aimed at developing the physical capabilities required by the effectiveness, which led to the development of strength endurance, which was reflected positively on the level of achievement" (16). As mentioned by two studies (Rania Moayad and Mona Talib) "The commitment of the research sample and their regular training helped in improving cardiac fitness" (12). And that my studies (Aseel Jalil and Diana Ghanem) were important in "preparing special exercises in order to raise the level of performance of this important event in athletics" (5). The exercises are a kind of special strength and length in which the body weight was used, as it was developed scientifically and appropriately with the level and capabilities of the research sample, which led to the development of the main muscles that serve the muscles of the legs, as well as their ability to produce an appropriate force to perform the work performed during the exercises that were repeated through the training program Which was characterized by the rapid nature and similar to the different physical exercises for the muscles of the two legs, and this is consistent with what was stated by (Abu El-Ala Ahmed Abdel-Fattah) that the physical characteristics are related to the degree of skillful performance. (3). The two researchers agreed with what they came up with (Sumaya Riyadh and Widad Kadhim) "On the other hand, the quality of the training unit used in the methodology developed by the two researchers is in agreement with the coach's point of view in the days of applying the proposed exercises. It has an effective contribution to the development of skillful performance" (15). (Rasha and Khaled) mentioned that "the exercises during the training

curriculum aimed at developing the absolute muscle capacity of the two men by fixing the resistances and expelling this force as quickly as possible" (13) and (Iman Sabeih) mentioned that "what is related to the achievement of running the 100m hurdles is A positive outcome for the development of strength, and one of the reasons for the focus of coaches on developing muscular strength, due to its importance in achieving athletic achievement" (8).

Conclusions:

Based on the research results that were reached within the limits of the research community, the following conclusions could be reached:

1. The exercises that were applied in the Tabata style helped to develop the strength endurance of the legs of the research sample members.
2. The duration of the independent variable, represented by the number of training units, was appropriate in creating adaptations that reflect the extent of development of the research sample to accomplish the 100m hurdles.
3. The development of the strength endurance of the legs reflected positively on the development of the achievement of the 100m hurdles.

Recommendations:

In light of the findings of the research, the researchers recommend the following:

1. Interest in using Tabata style exercises according to scientific training bases to raise the efficiency of short race runners during training and competitions.
2. Adopting the exercises prepared by the researchers as basic data when training runners for the effectiveness of the 100m hurdles.
3. The need to ration the training load for exercises in the style of (Tabata) in a way that suits the type of practitioners in terms of gender, biological age and training; They have a high impact on the body during performance.
4. similar studies on other individual and group activities, and on different age groups.

Author's declaration:

Conflicts of interest: None

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

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

Author's contributions:

All contributions of this study were done by the researchers (L.A. and Z.Q.) who get the main idea and work on writing and concluding also with number of experts, Zaineb Muneib in Statistics, Huda Shihab in revision, Nour Riadh in translating, Oliver Stoll in proofreading

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تأثير تمارينات التاباتا في تطوير تحمل القوة والانجاز للاعبات فعالية ركض 100م حواجز تحت عمر 18 سنة

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يعد علم التدريب الرياضي الحديث عملية تربوية علمية مبنية على اساس صحيحة هدفها وصول اللاعبين الى التكامل في الاداء الفني وهذا يتم عن طريق التأثير المنظم والدقيق بواسطة استعمال التمارين البدنية التي تحدث تغيرات خاصة في عمل اعضاء واجهزة جسم الرياضي والتي بدورها تؤدي الى رفع كفاءة الاعضاء والاجهزة لتحقيق الانجازات الرياضية العالية ولقد استعملت الباحثتان اسلوب حديث من اساليب التدريب الرياضي من اجل تطوير تحمل القوة والانجاز للاعبات فعالية ركض 100م حواجز تحت 18 سنة وتكمن اهمية الدراسة في استخدام تمارينات التاباتا التي تعتبر من التمارينات الحديثة التي تتميز بالتشويق والاثارة وتطبيقها وفقا لأوقات محددة في الاداء ضمن المنهج التدريبي للاعبات فعالية ركض 100م حواجز تحت 18 سنة فعلى المدربين البحث عن احدث الاساليب واعتمادها في المنهج التدريبي للاعبات لتفادي عنصر الملل واحداث شيئا من التشويق والاثارة والمنافسة داخل الوحدة التدريبية لتحقيق اهداف الوحدة الموضوعية بأعلى الدرجات لهذا ارتأت الباحثتان اعداد تمارينات بأسلوب التاباتا وتوظيفها لتطوير تحمل القوة والانجاز لدى لاعبات فعالية 100م حواجز تحت 18 سنة. وهدفت الدراسة : اعداد تمارينات بأسلوب تاباتا , والتعرف على تأثير تمارينات التاباتا في تطوير تحمل القوة لدى اللاعبات, والتعرف على تأثير تمارينات التاباتا في الانجاز للاعبات فعالية 100م حواجز تحت 18 سنة , والتعرف على الفروقات بين الاختبارات البعيدة لمجموعة البحث في الصفات البدنية والمستوى الرقمي للاعبات فعالية ركض 100م حواجز تحت 18 سنة وتفرض الدراسة: هناك فروق ذات دلالة احصائية بين الاختبارات القبلية والبعدية في اختبارات تحمل القوة والانجاز لفاعلية ركض 100م حواجز واستخدمت الباحثتان المنهج التجريبي في دراستهما الحالية لملائمته طبيعة مشكلة البحث وكانت العينة لاعبات نادي البياع البالغ عددهن (6) لاعبات من مجتمع الاصل (10) لاعبات اجري عليهم الاختبارات وتطبق المنهج التدريبي (8) اسابيع نفذت بواقع (3) وحدة في الاسبوع وكان زمن المدة لتنفيذ التمارين (50) دقيقة باستخدام اسلوب التاباتا وبعد اجراء الاختبارات القبلية والبعدية تم عرض نتائج الاختبارات وتحليلها ومناقشتها من خلال معالجة البيانات بالنظام الاحصائي spss من خلال هذه النتائج توصلت الباحثتان الى الاستنتاجات الاتية : ان التمارينات التي طبقت بأسلوب تاباتا ساعدت على تطور تحمل القوة لأفراد عينة البحث , وان مدة المتغير المستقل المتمثلة بعدد الوحدات التدريبية , كانت مناسبة في خلق تكيفات تعبر عن مدى تطور افراد عينة البحث لتحقيق الانجاز لفاعلية ركض 100م حواجز , وان تطور تحمل القوة انعكس ايجابياً على تطور الانجاز لفاعلية ركض 100م حواجز , وهذا ما يحقق احد اهداف التنمية المستدامة للامم المتحدة في العراق (الصحة الجيدة). ومنها جاءت التوصيات: في الاهتمام باستخدام التمارينات بأسلوب (تاباتا) وفق اساس تدريبية علمية لرفع كفاءة عدائي السباقات القصيرة أثناء التدريب والمنافسات , واعتماد التمارينات المعدة من قبل الباحثتان كمعطيات اساسية عند تدريب عدائي فعالية 100م حواجز , ضرورة تقنين حمل التدريب للتمارين بأسلوب (تاباتا) بما يناسب نوعية الممارسين من حيث الجنس والعمر البيولوجي والتدريبي , لما لها تأثير عال على الجسم أثناء الاداء , واجراء دراسات مشابهة على فعاليات فردية وجماعية أخرى , وعلى فئات عمرية مختلفة

تمارين التاباتا، تحمل القوة

الكلمات المفتاحية