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## The impact of (TRX) exercises on developing certain physical abilities for performing various attacks in the foil fencing sport for female players under 20 years' old

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### Abstract

The issue of learning and continuously and effectively training skills has become very challenging, especially for individuals under the age of (20). Therefore, the researchers decided to diagnose specific problems based on their expertise in the field. It led them to use (TRX) ropes, which can be easily used anywhere, to physically train the players to address the research problem, which is the weakness of physical abilities that directly affect their performance in various attacks. The study aimed to prepare (TRX) exercises for the research sample and explore the impact of (TRX) exercises on significant certain physical abilities and the performance of various attacks for the research sample. The research community consisted of female players under the age of (20) from the Armenian Club for Fencing sport. The research sample, consisting of (6) players, was deliberately selected. The experimental design with a single group and pretest-posttest was used. Two players were chosen for the survey experiment. The percentage of the sample represented (100%) of the players in the club. The researchers applied the exercises they prepared to the players, beginning on Saturday, 13/8/2022, in the hall of the Armenian Club. The total number of units reached (24), at a rate of (3) units per week on the days (Saturday, Monday, Wednesday) over a duration of two months, equivalent to (8) weeks. It is a sufficient duration for the effects of training to emerge on the research group. The number of exercises used in a single unit were five varied exercises, a total of (15) exercises. The duration of the units ranged between (20-35) minutes. The researchers applied the exercises using the repetitive method in the main section of the training unit, as shown in Annex (1). The exercises were implemented with the assistance of the support team and under the supervision of the researchers. The completion of the training units was on 10/10/2022, Monday. It was found that the (TRX) exercises had a significant and effective impact on the physical research variables and improved the players' levels. Furthermore, the selected exercises by the researchers indirectly influenced the development of the investigated skills, as evidenced by the improvement in their skill levels in the post-tests. and this achieves one of the sustainable development goals of the United Nations in Iraq which is (Good Health). The researchers recommended using (TRX), due to its advantages, as it requires minimal space, is easy to use, lightweight, and easy to store. They also highlighted its potential for enabling the implement of a wide range of exercises without the numerous and varied equipment.

### Keywords

TRX, certain physical abilities

### Introduction

Iraqi sport is undergoing many changes recently due to the current circumstances the world is experiencing as a result of the pandemic and the

changes we observe in everyday life and work. As a result, there is a growing need to focus on many fundamental aspects, given the current

circumstances that require a reassessment of the training process across all sports, including fencing. Fencing is considered one of the ancient and noble sports, and it has become a prominent sport in international competitions and events. Fencing has evolved with a diverse range of weapons and skills, making it accessible to participants of various age and genders. Numerous training methods have been developed to enhance this sport, catering to all abilities and skills. However, women's fencing faces several training challenges. Therefore, various approaches are being implemented to tackle these challenges, and one of them involves utilizing training tools to target specific areas of weakness. Assistance tools contribute significantly and effectively to accelerating their training process and developing their capabilities, enabling them to use weapons more effectively during competition. Various tools are used, for example, (TRX) exercises, which are important in developing physical abilities due to their properties that aid in building strength, endurance, and other benefits associated with these exercises. Using tools for resistance exercises is considered one of the most successful methods, and among these tools, (TRX) stands out due to its numerous advantages that allow its users to exercise anywhere. It is user-friendly and does not require large spaces or specific times for use. Moreover, it even boasts complete safety during use. Everything depends on the body weight, which can be decreased or increased based on the body's angle concerning the ground or the body's orientation with these tools. As a result, (TRX) is a flexible and easy-to-use tool that can be quickly assembled and opened. It has a significant impact on various capabilities, including strength, flexibility, agility, endurance, and others.

Physical abilities are fundamental in developing athletes across various sports, including fencing. Fencing possesses specific characteristics in terms of movement, defense, and attack simultaneously, which places a significant

burden on the athlete. Therefore, it is essential to develop the specific capabilities required for this sport. The player's priority is to focus on the target and prevent the opponent from scoring points through effective attacking and defensive techniques. This focus may falter if the player finds herself in a difficult situation due to poor physical abilities. Most coaches tend to concentrate on the skill aspect because of its diversity and the variety of skills involved. However, acquiring physical capabilities can be challenging, and losing them can happen quickly and easily if continuous training is not maintained during weekly training sessions. The importance of researching the use of TRX exercises lies in their potential to develop crucial physical capabilities required for performing various offensive maneuvers for female fencers under 20 years old in the sport of foil fencing. This research aims to elevate their abilities and advance women's fencing in Iraq.

Most teams and clubs work on preparing and training young fencing athletes, starting with teaching basic skills before moving on to more challenging aspects of the sport, which often become decisive factors in matches. However, this process requires a considerable amount of time and continuous training. The appearance of coronavirus over the past two years has isolated these athletes from their training facilities, making the continuous and effective learning and training on these skills extremely challenging, especially for those under 20 years. Recognizing these difficulties, the researchers decided to diagnose some of the issues through direct observation and their expertise in the field. They proposed utilizing TRX ropes, which can be conveniently used in any location, for the physical training of the athletes. This approach aims to address the primary issue identified in the research, which is the lack of physical abilities that directly affect the skillful performance of their various attack strategies. The research aimed to prepare TRX exercises for the research sample and examine the impact of

these exercises on crucial physical abilities required for performing various offensive maneuvers in foil fencing for the research sample.

The researchers hypothesized that there would be statistically significant differences between the pre-test and post-test results in some physical capabilities for the research sample, favoring the post-test. They also assumed that there are statistically significant differences between the pre and post-test results for some attack varieties in the research sample, favoring the post-test results.

The human population of the study included female fencers under the age of 20 from the Armenian Club for foil fencing. The timeframe of the study was from 2/2/2022 to 17/10/2022. The locations for the study were the indoor hall of the Armenian Club and the Post and Communications Sports Club.

### **Method and Procedures:**

The nature of the problem is the means through which the researcher achieves the research objectives sought to be accomplished. The methodology is "a style of thinking and action adopted by the researcher to organize, analyze,

and present ideas to arrive at acceptable results and facts about the phenomenon under investigation" (1).

Therefore, the researchers employed the experimental method due to its suitability for the nature of the problem and its proximity to the study's objectives. They followed "the experimental method with the one-group pretest-posttest design" to achieve the desired research goals.

The research community consisted of female fencers under 20 years from the Armenian Club for foil fencing, and a sample of six players from the Armenian club has been deliberately selected using the experimental design of the one-group pretest-posttest. Moreover, two players were selected for the survey experiment, representing 100% of the club's female fencers.

To ensure the homogeneity and equality of the sample members and the validity of the normal distribution among them, the researchers used the mean, standard deviation, and skewness coefficients to assess homogeneity for the field survey results regarding measurements of biological age, training age, weight, and height.

**Table (1)**

**shows the homogeneity of the research sample with the skewness coefficient in the variables of height, weight, chronological age, and training age**

Variables	Measurement Unit	Arithmetic mean	Median	Standard Deviation	Skewness Coefficient
Height	cm	157.5	158	0.600	0.830
Weight	kg	53.6	54	0.454	-0.758
Chronological Age	Year	18.3	18	0.895	0.824
Training Age	Year	5.4	5	0.848	0.763

The results indicated that all variables fall under the verification of the normal distribution, which suggests a good distribution and homogeneity of the sample in the research variables. It is because one of the characteristics of the typical normal distribution is that the skewness coefficient is confined between the two values (+1) (10).

Physical tests:

- Explosive strength of the arms: - Medical ball throw test with a weight of (3) kg (2).
- Explosive strength of the legs: - The forward jump test from the on-guard position (one attempt) (3).

- Distinctive force characterized by speed for the arms:

Arm Flexion and Extension Test from the front leaning rest position (push-ups) (10 sec) (14).

- Distinctive force characterized by speed for the legs:

Triple jump forward test with both legs together from the on-guard position (3).

- Endurance strength of the arm's performance: -

The arm's movement, solely from a state of stability on an axis, occurs over a period of 60 seconds (3).

- Endurance of the performance strength for the legs: -

Performing the full lunge movement from the on-guard position during (60 sec) (3).

Skill tests:

A specialized form was prepared to evaluate the skill performance of experts and specialists in the field of the sport.

- Exploratory experiments:

The exploratory experiments are a preliminary experimental study conducted by the researchers on a small sample before conducting their primary research. Its purpose is to select research methods and tools. Additionally, the researchers can identify any obstacles they might encounter during the practical research procedures. The exploratory experiments serve as "a practical training for the researcher to understand the negatives and positives encountered during the tests to avoid them" (22). The researchers conducted several exploratory experiments, which are:

- The first exploratory experiment for TRX exercises used in the Research:

The researchers conducted the first exploratory experiment on 2/8/2022, which was a Tuesday. The purpose of this experiment was as follows:

- The second exploratory experiment for the testing Used in the Research:

The researchers conducted the second exploratory experiment on 4/8/2022, which was

a Thursday. The purpose of this experiment was as follows:

The researchers conducted the pre-tests over two days, where the first day was dedicated to physical abilities tests, and the second day focused on skill tests. It took place on 7-8/8/2022, corresponding to Sunday and Monday, in the sports hall of the Armenian Club at 3:00 PM. The results were recorded according to the test conditions and specifications in lists prepared by the researchers. They carefully considered the circumstances related to timing, location, tools, equipment utilized, execution methods, and the assisting team, ensuring that these conditions were replicated in the subsequent post-tests.

This is the main experiment that the researchers will implement to solve or arrive at the methods that help address the problem of the entitled research.

- The main experiment:

The researchers applied the prepared exercises to the players on 13/8/2022, which fell on a Saturday, at the Armenian Club sports hall. The total number of training units was (24), with (3) units per week on Saturdays, Mondays, and Wednesdays, spanning two months (8 weeks). The research group observed for a duration that was deemed sufficient to see the effects of the training. Each training unit consisted of 5 diverse exercises, totaling 15 exercises. The length of each training unit ranged from 20 to 35 minutes. The researchers conducted the exercises primarily in the main section of the training unit, as detailed in Annex (1). The exercises were carried out with the help of the assistant team under the supervision of the two researchers, and the training sessions were concluded on 10/10/2022, which was a Monday.

- Description of the exercises used:

The exercises varied in number and type according to the muscles involved in the performance and their relevance to the researched skills, focusing on strengthening muscle work and physical abilities involved in

the performance of fencers. Some of these exercises are designed to develop explosive strength for both arms and legs, explosive strength for the armed arm, explosive strength for both legs and endurance for both arms and legs. The exercises prepared by the researchers are distinguished by their ease of performance as they are applied on a TRX, which can be used in both open and narrow spaces, provided there is a place to attach it. These exercises are also characterized by being bodyweight-dependent, so there is no need to add weights or other tools to perform them. As (Al-Sajjad and Mohammed) mentioned, quoting (Ameen and Diao), "It is a good and economical training tool that aligns with the nature of training duties while simultaneously developing physical traits such as strength, endurance, elongation, and flexibility" (5).

**Exercises Application:**

The components of the exercise load have been prepared according to references and sources and summarized as follows:

- The repetitions range from (3 to 10) according to the type of exercise; this is because some exercises require steadiness for a certain duration while others require quick repetitions. The sets are (2), with a rest period between the sets of (180 sec.). Each unit takes between (20-35 minutes). The intensity has been determined according to the goal of each training unit and the difficulty of the chosen exercises in that unit, and it ranged between (65%-85%). The intensity was differentiated for each specific physical ability through the exploratory trial and the adoption of exercises of comparable intensity in the same unit for different abilities. The load wave was applied at a ratio of (1:1) - (1:2). The researchers used the repetitive method in training to achieve the desired goals.

**Table(2)**

**Distribution of weekly intensities for the research methodology**

Weeks	1st week	2nd week	3rd week	4th week	5th week	6th week	7th week	8th week
Intensity	%70- %65	%75 - %70	%80-%75	%85-%75	%85-%80	%85-%75	%85-%80	%85-%80

**Post-Tests:**

The researchers conducted the post-tests on the research sample on 16-17/10/2022, which corresponded to Sunday and Monday. They administered the test for the chosen abilities and

skills and recorded the data. The researchers followed the same procedures as in the pre-tests.

**Results:**

**Table (3)**

**The arithmetic means, standard deviations, the difference in means and deviations, and the calculated (T) values for pre and post-tests of the biomechanical abilities' variables for the experimental group.**

Variables	Unit of measurement	The experimental group Pre-test		The experimental group Post-test		D	MD	Calculated (t) value	Significance
		Arithmetic mean	±Standard deviations	Arithmetic mean	±Standard deviations				
Throwing a ball	Meter	2.61	0.118	2.93	0.145	0.313	0.048	15.980	Significant
Forward leap	cm	81.83	5.456	98.17	7.139	16.333	4.131	9.684	Significant
Front leaning rest position	Repetition	6.67	0.816	11.33	0.816	4.667	1.033	11.068	Significant
Three forward leaps	cm	229.50	10.578	266.83	8.305	37.333	9.266	9.869	Significant
Arm movement	Repetition	30.83	2.787	45.83	3.764	15.000	4.472	8.216	Significant
Full lunge from the on-guard position	Repetition	21.33	3.204	34.17	1.602	12.833	3.710	8.472	Significant

At a significance level of (0.05) and with degrees of freedom (5)

Table (4)

The arithmetic means, standard deviations, differences in means and standard deviations, and the calculated (T) values for pre- and post-tests for attack variables in the experimental group

Variables	Unit of measurement	The experimental group Pre-test		The experimental group Post-test		D	MD	Calculated (t) value	Significance
		Arithmetic mean	±Standard deviations	Arithmetic mean	±Standard deviations				
Complement	Score	4.83	0.753	8.00	0.632	3.167	0.753	10.304	Significant
Recovery	Score	4.50	0.548	8.17	0.408	3.667	0.516	17.393	Significant
Repetition	Score	4.67	0.816	8.19	0.753	3.500	0.548	15.652	Significant

At a significance level of (0.05) and with degrees of freedom (5)

**Discussion:**

Upon reviewing Table (2), we observe significant results in the research for the physical abilities tests between the pre-tests and post-tests, favoring the post-tests. The researchers attribute these results to the use of the TRX activities, as they prepared a varied range of physical activities, that are relevant to the physical abilities used in the fencing skills. The focus on training units specific to the exercises performed on TRX has had a significant impact. These exercises concentrate on the common muscle groups used in fencing performance, and the unique nature of the activities executed on TRX contributes to their effectiveness on these muscles. Indeed, the use of bodyweight resistance helped engage a larger number of muscles in a single training unit. Working at specific angles allowed us to ensure the application of the exercise's effect on the targeted abilities, and this could only be achieved through the utilization of TRX. (Amanda Komasta) states "that total resistance training (TRX) is one of the best modern exercises that coaches can rely on to enhance athletes' physical and functional abilities" (7). Moreover, the researchers' interest in utilizing physical abilities that align with the selected movements aimed to enhance the athletes' performance to the fullest extent. The existing

correlation between skills and abilities can be positively exploited. The cumulative effect of working on improving physical abilities will benefit the skills since they are directly influenced by the development of these abilities, as confirmed by (Mahmoud Al-Shati and others), who stated that "there is a close relationship between motor skills and physical attributes acquired by the player during the training process" (14).

The researchers also prepared a series of standardized exercises on TRX and judiciously employed these exercises by organizing them within each training unit, weekly, or throughout the experiment. This approach allowed for improved performance and the development of physical abilities, as evident from the research results presented in the previous table. Mohamed Ali Al-Qut (1999) noted that "professionals in the field of sports training agree that achieving physical and physiological adaptations is the result of individuals subjecting themselves to regular and standardized exercises, which are scientifically designed to elevate the individual's training status and help them achieve notable accomplishments" (13).

The researchers developed a proposed training program based on scientific sources and references, incorporating the concept of training load. They carefully studied the exercises that

can be performed on TRX, considering appropriate work and rest timings, increasing the intensity, and efficiently managing the training unit. Additionally, they emphasized the importance of error correction by observing the results of the survey experiments they conducted. As mentioned by (Suha and Abeer), "modern exercises used in the sports field enhance performance efficiency" (20).

By examining Table (3), we observe the statistical significance of the post-tests for various attacks in foil fencing among female fencers. The researchers attribute these results to the careful selection and preparation of exercises that are suitable for the research sample, the nature of the sport, and the gender of the participants being females, who have specific training requirements. Moreover, the researchers highlight the versatility of TRX, which allowed them to choose a wide range of diverse exercises that align with the skill level of the participants. As mentioned by (Liqaa and Nada), "setting a specific time frame for performing exercises led to an increase in speed and accuracy during exercise performance in a consistent manner" (12).

The researchers also paid attention to the time duration and number of training units per week, as well as the overall training program. The training process is long-term. If we need to develop a specific ability or skill, we require a period of no less than eight weeks for changes to appear among the trainees. Moreover, the researchers meticulously chose the time frame to align with the players' abilities, and the determination of the duration and frequency of training units was based on a thorough examination and consultation concerning the players' levels.

The researchers worked on diversifying the difficulties and intensity over the course of the experiment. They began with a medium level of intensity, then gradually increased the intensity until it matched the strength of the exercises. They also worked on providing specific

exercises for the legs and arms, following the fundamental principles that align with the development of this variable, as well as the appropriate repetitions that coincide with the capabilities of the research sample. They also incorporated appropriate rest intervals, allowing players enough time to regain their normal state. As (Saad Mohsen) states that "organized training results in an increase in an individual's performance capacity as a result of performing physical exercises for several days, weeks, or months. This is achieved by conditioning the body's systems to perform these exercises optimally. In other words, the impact of physical exercises stimulates muscle cells to adapt and to become more efficient in performing intense work" (19).

According to (Naseer and Reem), citing (Fatima Abd Maleh and Dhafer Namoos) in another article, "fencing players must confront themselves with the ability to plan and interact according to the situations they encounter during training. These exercises serve as additional or complementary components to fencing lessons. Players should attempt to apply what they have learned and practiced in offensive and defensive movements, creating suitable opportunities through striking, pressing with the foil, or binding to execute the planned actions before the training match" (15).

The utilization of TRX in training has led to the development of specialized motor abilities through the scientific principles used in organizing the training load. (Fadel Kamel and Aws), citing (Risan Kharibet) stated that "regular and programmed training, along with the use of structured intensities and optimal rest periods between repetitions, results in skill improvement" (9).

They also focused on appropriate repetitions and balanced progression from easy to difficult. (Ruaa and Bushra), citing (Sareeh Alfadhli), mentioned that "there are training exercises, some of which are difficult and some are easy,

and the step's characteristics can be developed using the easy conditions" (18).

Widad also pointed out that "the development and enhancement of explosive power and speed lead to the improvement of agility, as power, is an essential element of agility. In case of a lack of power, the body loses a significant part of its agility in motor performance." (21).

Alyaa indicated, "Various resistance exercises have helped improve the explosive strength of the arms and leg muscles" (6). Raghda, citing Aber, also mentioned that "this type of muscle resistance training is effective when forced to perform at its highest capacity at each point of the range of motion. Contrasting resistance training may have positive effects on developing speed, strength, and other elements of physical fitness" (16). Aqeel mentioned, "training that relies on plyometric exercises should closely resemble skillful and tactical performance" (8).

Hadi emphasized the importance of muscular strength, stating that "muscular strength is one of the essential physical attributes due to its effectiveness in everyday life" (11). Raheeq also mentioned that the proficiency of players directly reflects on an individual's skill performance (17). The study of (Zaineb and others) confirmed that "There is a significant correlation between testing the motor speed of the armed arm and some skills of the foil weapon (circular attack, time counterattack, horizontal defence). The female players of the College of Physical Education and Sports Sciences for Girls, University of Baghdad" (4)

### **Conclusions:**

Based on the presented research results, the researchers reached the following conclusions:

1. That body weight resistance exercises effectively influenced the physical research variables and improved the level of the players.
2. The exercises chosen by the researchers had an indirect effect on the development of the skills under study due to their improved skill level in the post tests.

3. The use of TRX had a significant advantage in enabling the players to focus on training due to its versatility in offering diverse exercises in terms of form and difficulty, all within a single location.

4. The players displayed a positive willingness and eagerness to utilize (TRX), given its suitability for seamless use across all age groups and for both sexes.

### **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 (April /2023)

### **Author's contributions:**

All contributions of this study were done by the researchers (R.M. and I.F.) who get the main idea and work on writing and concluding also with number of experts, Reem Mohammed in Statistics, Huda Shihab in revision, Inaam Ghalib in translating, Mazin Hadi in proofreading

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**(Unit Objective)**  
**Develop Biomechanical Abilities**  
**Intensity: 65%**

**Total Unit Time: 21.33 Minutes**  
**Saturday / Date: 13/8/2022**

Seq.	Training Exercises on TRX	Repetition	Duration of Each Exercise	Number of groups	Rest Time		Total Exercise Performance Time	Total Rest Time	Total Time
					Between the groups	Between the exercises			
1	Exercise Number (11)	10	5 sec.	2	180 sec.	50 sec.	100 sec.	100 sec.	200
2	Exercise Number (7)	2×10	5 sec.			50 sec.	200 sec.	100 sec.	300
3	Exercise Number (4)	2×10	5 sec.			50 sec.	200 sec.	100 sec.	300
4	Exercise Number (1)	10	5 sec.			50 sec.	100 sec.	100 sec.	200
5	Exercise Number (15)	10	5 sec.			-	100 sec.	-	100
<b>Total Score for the Training Unit</b>									<b>21.33 min</b>

- Note: Rest time between sets is added to the total time.
- The repetitions (2x10) mean that the exercise is applied to both the right and left sides. For example, (right leg - completes the exercise, then starts with the left leg).

## تأثير تمرينات (TRX) في تطوير بعض القدرات البدنية الخاصة لاداء متنوعات الهجوم في سلاح الشيش للاعبات تحت ٢٠ سنة

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2&1 جامعة بغداد/ كلية التربية البدنية و علوم الرياضة للبنات

مستخلص البحث

اصبحت مسألة تعلم المهارات والتدريب عليها بشكل مستمر وفعال صعب جداً وخصوصاً لمن هن دون سن (20) ولهذا ارتأت الباحثتان الى تشخيص بعض المشاكل عيناً وخبرة في مجالها وتلخصت الى استخدام حبال (TRX) التي يمكن استخدامها بسهولة في اي مكان وتدريب اللاعبات عليها بديناً محاولة لحل مشكلة البحث الا وهي ضعف القدرات البدنية والتي تؤثر بشكل مباشر على الاداء المهاري لمتنوعات الهجوم لديهن. هدفت الدراسة الى اعداد تمرينات (TRX) لعينة البحث والتعرف على تأثير تمرينات (TRX) في اهم القدرات البدنية الخاصة واداء متنوعات الهجوم لعينة البحث حيث تحدد مجتمع البحث بلاعبات نادي الأرمي تحت (20) سنة لسلاح الشيش ، وتم اختيار عينة البحث والبالغ عددهن (6) لاعبات بالطريقة العمدية وباستخدام التصميم التجريبي ذو المجموعة الواحدة ذات الاختبار القبلي والبعدي ، وتم اخذ (2) لاعبة من اجل إجراء التجربة الاستطلاعية عليهن وبلغت النسبة المئوية للعينة (100%) من لاعبات النادي قامت الباحثتان بتطبيق التمرينات التي تم اعدادها على اللاعبات وذلك بتاريخ 2022/8/13 الموافق يوم السبت ، في القاعة الخاصة بنادي الارمن إذ بلغت عدد الوحدات (24) وحدة وبواقع (3) وحدات أسبوعية في أيام ( السبت ، الاثنين ، الاربعاء) ولمدة شهرين بواقع (8) اسابيع وهي مدة كافية لظهور تأثير التدريب، على مجموعة البحث ، وبلغ عدد التمارين المستخدمة في الوحدة الواحدة (5) تمارين متنوعة بمجمل (15) تمريناً ، وتراوحت مدة الوحدات بين (20-35 دقيقة) إذ قامت الباحثتان بتطبيق التمارين بالأسلوب التكراري في الجزء الرئيس من الوحدة التدريبية كما موضح في ملحق (1) ، وتم تطبيق التمارين ذلك بمساعدة الفريق المساعد وبإشراف الباحثتان وتم الانتهاء من الوحدات التدريبية بتاريخ (2022/10/10) يوم الاثنين ، وقد وجد ان تمارين (TRX) قد اثرت وبشكل فعال في متغيرات البحث البدنية وطورت من مستوى اللاعبات. كما وجد ان التمارين التي انتقتها الباحثتان ذات تأثير غير مباشر على تطوير المهارات المبحوثة نظراً لتحسن مستواهن المهاري في الاختبارات البعدية، وهذا ما يحقق احد اهداف التنمية المستدامة للأمم المتحدة في العراق (الصحة الجيدة). واوصت الباحثتان بالعمل على TRX لكونه لا يحتاج إلى مساحة كبيرة وسهل الاستخدام خفيف الحمل والتخزين ،وبالعمل على (TRX) لأمكانية تطبيقه على التمارين عليه دون الحاجة الى ادوات كثيرة ومتنوعة

TRX ، القدرات البدنية الخاصة

الكلمات المفتاحية