

## **The effect of using TRX resistance training on some physiological and skill variables in the Kung Fu Sanda team**

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### **Abstract**

The research aims to identify the effect of using TRX resistance training on some physiological and skill variables for Kung Fu-Sanda players, by identifying the effect of using TRX resistance training on some physiological variables for Kung Fu-Sanda players. The researcher used the experimental method, which is represented in the use of pre and post measurements for two groups, one experimental and the other control. The research community included the Kung Fu-Sanda players in the Magousa Youth Center in Minya, and their number is (24) players in the age stage of (20:22) years. The researcher selected (16) sixteen players for the basic sample and (8) players for the exploratory sample, and the most important conclusions were that the use of TRX resistance training contributed to the positive effect in improving some physiological and skill variables among the Kung Fu Sanda juniors under study.

**Keywords:** (resistance training - kung fu - TRX)

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### **Introduction and research problem:-**

The importance of modern technologies in sports training is clear in sports, Olympic and global achievements. The facts related to sports training get a great attention by workers in the field of training, especially in swimming, because of its significant impact on the vital functions of athletes. Training methods are a goal sought by world teams, and there has been a development in the physical and technical level of the swimmers, which must work hard to keep pace with this development.

In this regard, **Ali Al-Baik (2009)** refers to planning for sports training as one of the most important factors required and necessary to ensure the success of the training process. As training planning is to visualize training conditions and use the means and methods to achieve the specific goals, which athletes must achieve. **(6:7)**

Recently, TRX (Total Body Resistance Exercise) has appeared in the field of exercise. It is a type of exercise that uses body weight against gravity to build strength, balance, coordination and flexibility, and to develop muscular endurance, agility and strength endurance. It can be used for all without distinction of age or gender and in a variety of ways, and it can also be modified according to the individual differences of practitioners **(15th)**.

**Koprince (2009)** indicates the importance of using modern equipment for training in order to improve physical preparation to develop special abilities in different sports. Suspension training (TRX) refers to a physical fitness training approach that uses a system of ropes and ligaments called hanging exercises, which allow the player to work against his full weight in training. **(13:51)**

As "**Issam Abdel-Khalek (1996)**" sees that muscular ability is linked to maximum strength and is developed by similar training methods that depend on resistance, and an increase in strength or speed will lead to an increase in muscular ability that contributes to improve and develop athletic performance in less time. **(5:68)**

**Li & Cao (2010)** also mentioned "TRX"; "Total body resistance exercise" is suitable for beginners and those with higher levels, and its intensity can be graded by changing in body posture to the hanging point. **(10:541)**

**Martin Tuma (2010) and Lukas Slama (2011)** indicated that the most important characteristics of TRX exercises are that they lead to better results in a shorter time than traditional programs of 30 minutes or less, and that they develop flexibility, static and dynamic balance. It is considered the best and optimal tool for training as it

can be used anywhere, anytime and for anyone, and the basis for its use differs from traditional exercises where the tool and the body are as one mass, the beginning of which is to install the tool at the top and the other part is the body's contact with the ground based on the center of gravity, which works to activate the muscles Working in each exercise .(12:8) (11:45)

**Vojtech Dvorak (2014)** sees that " TRX exercises" are one of the simple exercises, as there is a big difference between the simple and the easy, and this shows that they are exercises characterized by simplicity and can be graded in intensity from weak to maximum intensity, and it aims to improve physical and physiological abilities related to performance in various sports activity . (14: 17)

Through the researcher's work in the field of teaching kung fu to students of the Faculty of Physical Education, he noticed that kung fu students are affected by muscle fatigue resulting from training before the end of the training unit, which affects the performance of kung fu skills. Thus, The researcher reviewed previous studies that dealt with the effect of using modern methods in training, which can contribute to improving the functional and physiological responses of kung fu players, such as the study of **Ehab Abdel Rahman (2022) (2), Hossam El Din Abdel Hamid, Gehad Mohamed;**

**Mahmoud Hassan (2022) (4), Muhammad Shamandi (2020) (7), Najwa Mahmoud (2020) (8), Vojtech Dvorak (2014) (14).** This prompted the researcher to conduct this study, which deals with improving the physiological and skill variables of kung fu players using TRX resistance training.

#### **Aim of Research:**

The current research aims to identify the effect of using TRX resistance training on some physiological and skill variables among Kung Fu Sanda players, by identifying:

- The effect of using TRX resistance training on some physiological variables of Kung Fu Sanda players.
- The effect of using TRX resistance training on some skill variables for Kung Fu Sanda players.

#### **Research hypotheses:**

- 1- There are statistically significant differences between the two measurements (pre- and post-) for the experimental group in some physiological and skill variables under study for the post-measurement.
- 2- There are statistically significant differences between the two measurements (pre- and post-) for the experimental group in some physiological and skill variables under study for post-measurement.
- 3- There are statistically significant differences between the two post-measurements of the experimental and control groups in some physiological

and skill variables under study for the post-measurement of the experimental group.

**Search terms:**

**TRX resistance training:**

**Christian Thompson & Leigh Cre (2012)** defines it as a type of exercise, called "hanging exercises", that uses body weight against gravity to build strength, balance, compatibility and flexibility and to develop muscular ability, agility and endurance, and depends on its performance on the abdominal, back and pelvic muscles using a set of different exercises, and can be used by everyone without distinction of age or gender and in a variety of ways, which can be modified according to the individual differences of the practitioners (9:29).

**Research Methodology:**

The experimental method was used to design two groups, one experimental and the other control, by following the pre and post measurements for both groups.

**Research sample and community:**

The research community included (24) of Kung Fu Sanda players at the Maqousa Youth Center .

The researcher selected (16) players for the basic study, and they were divided into two equal groups, each group consisted of (8) players, and (8) players were chosen for the survey sample.

**Conditions for selecting a research sample:**

- The consent of the player and his guardian to apply the experiment.
- The player is free from any diseases or injuries that prevent him from applying the experiment.
- The player must be registered with the Egyptian Wushu Kung Fu Federation during the year 2021-2022 .

**The average distribution of the research sample:**

The researcher made sure of the extent of the moderation of the distribution of the research sample members through the growth tests and tests of the physiological and skill variables under study. ( $\pm 3$ ), which indicates the moderation and homogeneity of the sample in the variables under study before application.

**The equivalence between the two research groups:**

To calculate the equivalence between the two groups of the researcher, the researcher calculated the significance of the differences between the mean scores of the two pre-measurements for the two experimental and control groups in the variables (age, height and weight) and the physiological and skill variables under study for the research sample as a whole and their number (24) players, and it was found that there are no statistically significant differences between the

members of the two experimental groups. And the control group in the variables of age, height, weight, physiological and skill variables under study, where the calculated (Z) value was less than the tabular (Z) value at the 0.05 level, which indicates the equality of the two research groups in those variables.

#### **Data collection methods and tools:**

- Building the theoretical framework for the research objective
- Determining the physiological variables under research.
- Setting up a performance evaluation form for the skill variables (the semi-circular piano kick, Sanda Kung Fu, the side kick).

#### **2- Measurements and Tests for the Variables under Research:**

##### **- Physiological variables under investigation**

To identify the physiological variables of Kung Fu Sanda players, the research sample used the following tests:

- resting pulse, exertion pulse, vital capacity, lactic before exertion, lactic after exertion.

##### **Skill tests under consideration:-**

The researcher used a survey form for the experts to evaluate the performance of (the semi-circular beantoi kick skill Sanda Kung Fu - the side kick skill for Kung Fu players - Sanda), by sending a video to (3) expert

In collecting data and information related to the variables under research, the researcher relied on the following tools:

#### **1- Reference survey:**

The researcher reviewed scientific literature (1), (3), (14), Arab and foreign reference studies (2), (7) and contacted the International Information Network (15) with the aim of achieving the following:

arbitrators, containing the player's performance of the two skills from the beginning of it until returning to the original position, and each arbitrator evaluates the player's performance of the two skills and evaluates it with a score of (1: 10), then the average score of the arbitrators is extracted on the player's form.

#### **3- Hardware and Tools:**

During his measurements of the various variables under study, the researcher used the following devices and tools:

- 1- A "Rista-meter" for measuring length/cm .
- 2- Medical scale/kg .
- 3- Electronic stopwatch to measure time/sec .
- 4- A tape measure to determine the distance/cm .
- 5- A spirometer to measure vital capacity .
- 6- A device for measuring lactic acid in the blood .
- 7- Video camera .

8- A computer

9- CDs .

10- Forms to unload results .

### **Scientific coefficients for the tests in question:**

The researcher carried out the scientific transactions of the tests under study on a sample of the same research community and outside the original sample, consisting of (8) eight players, in the period from January 15th, 2021 to January 22nd, 2021, as follows:

#### **A-honesty:**

Validity was calculated by extracting the validity of differentiation by applying tests on (4) of the kung fu players "Sanda" in the City Youth Center Club (A) from the research community and outside the research sample (representing the undistinguished sample) and (4) of the kung fu players "Sanda" In Minya Sports Club, they represent the (distinguished sample) and from outside the research community in the physiological variables under study, and in the skill variables, the sample performance videos for the skills under research were shown to (3) three experts to evaluate performance and extract the average expert scores for each individual in the sample. Statistically significant differences between the distinguished and undistinguished group in the tests under discussion and in the direction of the distinguished group, as the values of the

probability of error are a function at the level of significance (0.05), which indicates the validity of those tests and their ability to distinguish between groups.

#### **b- Stability:**

To calculate the stability, the correlation coefficient between the first application and re-application in the tests under study was extracted with a time difference of one week from the first application on a sample (8) players from outside the basic sample and from within the research community. Videos were shown to (3) experts to evaluate performance and extract the average scores of experts for each individual in the sample. The correlation coefficients between application and re-application of the test under consideration ranged between (0.79: 0.92), all of which are statistically significant correlation coefficients, as the calculated (t) values are greater than the value of (t) tabular at the significance level (0.05), which indicates that the tests have an acceptable degree of stability.

### **Time distribution of the training unit TRX resistance training on some physiological and skill variables for Kung Fu Sanda players:**

The application of the training units took about (8) eight weeks, with (3) units per week, with a total of (24)

training units, the unit time (60) minutes, distributed as follows:

Table (7)  
The time distribution of the unit

T	Activity	Time
1	warm up	(5) m
2	General physical preparation	(5) m
3	special physical preparation	(10) m
4	The main part TRX resistance training	(35) minutes
5	Conclusion and recovery	(5) minutes

#### **Research seps:**

#### **Tribal measurement:**

The pre- measurement of the variables in question was applied to the (16) Kung Fu Sanda players from 01/24/2021 to 01/26/2021.

#### **Dimensional measurements:**

After completing the basic research experiment, the researcher made dimensional measurements of the research sample in the variables under study from 25/3/2021 to 27/3/2021.

#### **Statistical manipulations:**

The data were processed using statistical methods (arithmetic mean, standard deviation, median, skew coefficient, correlation coefficient, (Z)

test for the significance of differences between means, Mann-Whitney labarometric test), and the researcher satisfied the significance level (0.05) to ensure the significance of the statistical results of the research. The researcher also used the SPSS program to calculate the statistical coefficients.

#### **Presentation and discussion of results.**

First, presenting the results and discussing the first hypothesis, which states:

- There are statistically significant differences between the two measurements (pre- and post-test) for the experimental group in some physiological and skill variables under study and for the post-measurement

Table (1)

The (z) value of the significance of the differences between the two measurements (pre- and post-test) for the experimental group in the physiological variables under study (n = 8)

SKILL VARIABLES	MEASURING UNIT	MEASUREMENT		NUMBER OF PLAYERS	TOTAL RANKS	AVERAGE RANK	SIGNIFICANCE OF THE DIFFERENCES		
							(Z) VALUE	THE LOWEST VALUE OF THE SIGN	INDICATION LEVEL
comfort pulse	pulse/min	PRE MEASUREMENT	POSITIVE RANKS	∧	36,00	4,50	2,036	0,01	SIGNIFICANT
		POST MEASUREMENT	NEGATIVE RANKS	•	0,00	0,00			
effort pulse	pulse/min	PRE MEASUREMENT	POSITIVE RANKS	∧	36,00	4,50	2,030	0,01	SIGNIFICANT
		POST MEASUREMENT	NEGATIVE RANKS	•	0,00	0,00			
vital capacity	Milliliter	PRE MEASUREMENT	POSITIVE RANKS	•	0,00	0,00	2,021	0,01	SIGNIFICANT
		POST MEASUREMENT	NEGATIVE RANKS	∧	36,00	4,50			
Lactic before exertion	milli/mol	PRE MEASUREMENT	POSITIVE RANKS	∧	36,00	4,50	2,021	0,01	SIGNIFICANT
		POST MEASUREMENT	NEGATIVE RANKS	•	0,00	0,00			
Lactic after exertion	milli/mol	PRE MEASUREMENT	POSITIVE RANKS	∧	36,00	4,50	2,021	0,01	SIGNIFICANT
		POST MEASUREMENT	NEGATIVE RANKS	•	0,00	0,00			

The tabular (Z) value at the degree of freedom (7) and the level of significance (0.05) = 2

It is clear from Table (1) that there are statistically significant differences between the measurement (pre- and post-test) for the experimental group in the physiological variables and for the post-measurement, as the calculated (Z) value is greater than the tabular (Z) value at the (0.05) level.

This result agrees with the results of the study of Muhammad Shamandi Yassin (2020), Vojtech Dvorak (2014), whose results supported the improvement of physiological variables under their studies as a result of TRX resistance training.



Table (2)

The (z) value of the significance of the differences between the two measurements (pre- and post-test) for the experimental group in the skill variables under study (n = 8)

SKILL VARIABLES	MEASURING UNIT	MEASUREMENT		NUMBER OF PLAYERS	TOTAL RANKS	AVERAGE RANK	SIGNIFICANCE OF THE DIFFERENCES		
							(Z) VALUE	THE LOWEST VALUE OF THE SIGN	INDICATION LEVEL
semicircular beantoi kick sanda kung fu	pulse/min	PRE MEASUREMENT	POSITIVE RANKS	8	1,00	1,00	2,036	1,01	SIGNIFICANT
		POST MEASUREMENT	NEGATIVE RANKS	1	36,00	4,00			
Side kick	milli/mol	PRE MEASUREMENT	POSITIVE RANKS	8	1,00	1,00	2,021	1,01	SIGNIFICANT
		post measurement	Negative ranks	1	36,00	4,00			

The tabular (Z) value at the degree of freedom (7) and the level of significance (0.05) = 2

It is clear from Table (2) that there are statistically significant differences between the measurement (pre- and post-test) for the experimental group in the skill variables and in favor of the post-measurement, as the calculated (Z) value is greater than the tabular (Z) value at the (0.05) level.

The researcher attributes the significance of the differences between the measurement (pre- and post-test) of the experimental group in the skill variable for the dimensional measurement to the use of TRX resistance training in the training units and the keenness of the experimental group to apply all training units.

These results are in agreement with the study of Ehab Abdel Rahman Ibrahim

(2022), Hussam Eddin Abdel Hamid Qutb and others (2022), Muhammad Shamandi Yassin (2020), Najwa Mahmoud Abed (2020), Vojtech Dvorak (2014), which demonstrated the positive effect of training TRX resistance to improving skill performance is under investigation.

Thus, the first hypothesis has been verified, which states: There are statistically significant differences between the two measurements (pre- and post-test) for the experimental group in some physiological and skill variables under study for the post-measurement.

**Secondly, the results of the second hypothesis are presented, which states:**

- There are statistically significant differences between the two measurements (pre- and post-test) for

the experimental group in some physiological and skill variables under study for the post-measurement.

**Table (3)**

The (z) value of the significance of the differences between the two measurements (pre- and post-test) for the control group in the physiological variables under study (n = 8)

SKILL VARIABLES	MEASURING UNIT	MEASUREMENT		NUMBER OF PLAYERS	TOTAL RANKS	AVERAGE RANK	SIGNIFICANCE OF THE DIFFERENCES		
							(Z) VALUE	THE LOWEST VALUE OF THE SIGN	INDICATION LEVEL
comfort pulse	pulse/min	PRE MEASUREMENT	POSITIVE RANKS	8	36,00	4,50	2,030	0,01	SIGNIFICANT
		POST MEASUREMENT	NEGATIVE RANKS	0	0,00	0,00			
effort pulse	pulse/min	PRE MEASUREMENT	POSITIVE RANKS	8	36,00	4,50	2,024	0,01	SIGNIFICANT
		POST MEASUREMENT	NEGATIVE RANKS	0	0,00	0,00			
vital capacity	Milliliter	PRE MEASUREMENT	POSITIVE RANKS	0	0,00	0,00	2,024	0,01	SIGNIFICANT
		POST MEASUREMENT	NEGATIVE RANKS	8	36,00	4,50			
Lactic before exertion	milli/mol	PRE MEASUREMENT	POSITIVE RANKS	8	36,00	4,50	2,021	0,01	SIGNIFICANT
		POST MEASUREMENT	NEGATIVE RANKS	0	0,00	0,00			
Lactic after exertion	milli/mol	PRE MEASUREMENT	POSITIVE RANKS	8	36,00	4,50	2,021	0,01	SIGNIFICANT
		POST MEASUREMENT	NEGATIVE RANKS	0	0,00	0,00			

It is clear from Table (3) that there are statistically significant differences between the measurement (pre- and post-test) for the control group in the physiological variables for the post-measurement, as the calculated (Z) value is greater than the tabular (Z) value at the (0.05) level.

The researcher attributes the differences between the (pre- and post-) measurement of the control group in physiological variables in favor of the dimensional measurement to the traditional exercises used by the members of the experimental group, which in turn contributed to the development of functional responses

and physiological variables among the members of the control group.

**Bastawisi Ahmed (1999)** indicates that athletes can be trained to perform continuous physical exertion

while reducing the amount of oxygen needed by using various exercises that depend on anaerobic effort and withhold the necessary amounts of oxygen, and this is done by developing special programs . (3: 73)

**Table (4)**

The (z) value of the significance of the differences between the two measurements (pre- and post-test) for the control group in the skill variables under study (n = 8)

SKILL VARIABLES	MEASURING UNIT	MEASUREMENT		NUMBER OF PLAYERS	TOTAL RANKS	AVERAGE RANK	SIGNIFICANCE OF THE DIFFERENCES		
							(Z) VALUE	THE LOWEST VALUE OF THE SIGN	INDICATION LEVEL
semicircular beantoi kick sanda kung fu	Degree	PRE MEASUREMENT	POSITIVE RANKS	∧	∞,∞∞	∞,∞∞	∫,∫∫∫	∞,∞∫	SIGNIFICANT
		POST MEASUREMENT	NEGATIVE RANKS	∞	∫∫,∞∞	∫,∞∞			
side kick	Degree	PRE MEASUREMENT	POSITIVE RANKS	∧	∞,∞∞	∞,∞∞	∫,∞∞∧	∞,∞∫	SIGNIFICANT
		POST MEASUREMENT	NEGATIVE RANKS	∞	∫∫,∞∞	∫,∞∞			

It is clear from Table (4) that there are statistically significant differences between the measurement (pre- and post-test) for the control group in the skill variables and in favor of the post-measurement, as the calculated (Z) value is greater than the tabular (Z) value at the (0.05) level.

The researcher attributes this result to the continuity of the members of the control group in applying the training units, as this continuity led to the development of their ability to perform the skills under study and the

improvement of their performance level.

Thus, the second hypothesis has been verified, which states: There are statistically significant differences between the two measurements (pre- and post-test) for the control group in some of the physiological and skill variables under study and in the direction of the post-measurement.

**Third, presenting the results of the third hypothesis, which states:**

- **There are statistically significant differences between the two post-measurements of the experimental**

and control groups in some measurement of the experimental physiological and skill variables under study for the post- group.

**Table (5)**

The (z) value of the significance of the differences between the two dimensional measurements of the experimental and control groups in the physiological variables under study (n = 8)

Statistical description skill variables	Measurement Unit	post measurement of the experimental group N=8		post measurement of the control group N= 8		U	w	(Z) value	Error probability	
		total ranks	average rank	total ranks	average rank					
physiological variables	comfort pulse	pulse/min	36,..	4,0.	10,..	12,0.	0	36	3,393	0,..01
	effort pulse	pulse/min	36,..	4,0.	10,..	12,0.	0	36	3,386	0,..01
	vital capacity	Milliliters	10,..	12,0.	36,..	4,0.	.	36	3,378	0,..01
	Lactic before exertion	milli/mol	36,..	4,0.	10,..	12,0.	.	36	3,361	0,..01
	Lactic after exertion	milli/mol	36,..	4,0.	10,..	12,0.	.	36	3,361	0,..01

The tabular (Z) value at the degree of freedom (7) and the level of significance (0.05) = 2

It is clear from Table (5) that there are statistically significant differences between the post-measurement of the experimental and control groups in the physiological variables and in favor of the post-measurement of the experimental group, as the calculated (Z) value is greater than the tabular (Z) value at the (0.05) level.

The researcher attributed the improvement of physiological variables in the members of the experimental

group compared to the members of the control group to the use of TRX resistance training and the planning of the training load that is appropriate for the Kung Fu Sanda players under study.

These results agree with the study of **Muhammad Shamandi Yassin (2020)**, **Vojtech Dvorak (2014)**, which supported the effect of TRX resistance training on physiological variables compared to traditional exercises in the samples under their research.

**Table (6)**

The (z) value of the significance of the differences between the two post-measurements of the experimental and control groups in the skill variables under study (n = 8)

Statistical description skill variables	Measuring unit	experimental group 8=N		control group 8=N		U	W	(Z) Value	Error probability	
		total ranks	average rank	total ranks	average rank					
skill variables	The semicircular beantoi kick sanda kung fu	Degree	١٠٠,٠	١٢,٥٠	٣٦,٠٠	٤,٥٠	صفر	٣٦	٣,٤٣٢	٠,٠٠١
	side kick	Degree	١٠٠,٠	١٢,٥٠	٣٦,٠٠	٤,٥٠	صفر	٣٦	٣,٥٠٨	٠,٠٠٠

The tabular (Z) value at the degree of freedom (7) and the level of significance (0.05) = 2

It is clear from Table (5) that there are statistically significant differences between the two post-measurements of the experimental and control groups in the skill variables and in favor of the post-measurement of the experimental group, as the calculated (Z) value is greater than the tabular (Z) value at the (0.05) level.

The researcher attributed the differences between the two post-measurements of the experimental and control groups in the skill variables in favor of the post-measurement of the

### **Conclusions and Recommendations:**

#### **First the conclusions:**

**In light of the research results, the researcher reached the following conclusions:**

experimental group to the use of TRX resistance training in which the researcher was interested in diversity and comprehensiveness.

**Thus, the third hypothesis has been verified, which states: There are statistically significant differences between the two post-measurements of the experimental and control groups in some physiological and skill variables under study for the post-measurement of the experimental group.**

1- The use of TRX resistance training contributed to the improvement of some physiological variables among the Kung Fu Sanda players under study.

2- The use of TRX resistance training contributed to improving the skill variables of the Kung Fu Sanda players under study.

### **Second, recommendations:**

**In light of the research results, the researcher recommends the following:**

1. Using TRX resistance training to improve the physiological and skill variables of Kung Fu Sanda teams.
2. The use of the TRX resistance training under consideration to develop the skillful performance of the Kung Fu-Sanda teams.
3. Be guided by the TRX tool in training kung fu for kung fu teams, and for athletes in general because of its positive impact on the development of functional and skill variables.
4. Utilizing TRX resistance training to improve the physical abilities of kung-fu teams.
5. Conducting more studies dealing with the effect of using TRX resistance training on the physiological and skill variables of kung-fu teams, and fights and individual sports in general .

### **List of references**

#### **First, the Arabic references:**

1- Abu El-Ala Ahmed Abdel-Fattah (2012): Contemporary sports training, physiological foundations, training

plans, training young people, long-term training, training load errors, Dar El-fekr Alarby, 2012.

2- Ehab Abdel Rahman Ibrahim (2022): The effect of (TRX, Battle Rope) training on the development of some special physical abilities and the level of performance of punch groups for adult boxers, published research, Journal of Physical Education Research, Vol. 71, No. 139, College of Physical Education for Boys, Zagazig University, April 2022, page 39-64.

3- Bastawisi Ahmed (1999 AD): Foundations and Theories of Sports Training, Cairo, Dar El-fekr Elarby.

4- Hossam El Din Abdel Hamid Qutb, Jihad Mohamed Taha Ibrahim; Mahmoud Hassan Mohamed Ibrahim (2022): The effect of using TRX training on some physical abilities and the level of circular defense performance among fencing players, published research, Volume 6, P6, New Valley Journal of Sports Sciences, College of Physical Education, New Valley University.

5- Essam Abdel-Khaleq (2005): Sports Training (Theories - Applications), 12th edition, Manshaat Al-Maaref, Alexandria.

6- Ali Fahmy Al-Baik (2009): Training download, 6th edition, Al-Shorouk Press, Cairo.

7- Muhammad Shamandi Yassin (2020 AD): The effect of using TRX training on some physical and physiological variables for junior footballers, published research, p. 1, Journal of Comprehensive Education Research, College of Physical Education for Girls, Zagazig University.

8- Nagwa Mahmoud Abed Mansour (2020 AD): The effect of a program using total body resistance training (TRX) on some physical, skill and physiological variables for female handball players, published research, Volume 33, Part 1, Part 33, Journal of Sports Sciences, Faculty of Physical Education, Minia University.

**Second, foreign references:**

1. Christian Thompson & Leigh Crews (2012): Introducing you (And YOUR Novice/Older Clients) to the TRX, ACSM Health & Fitness Summit, March 29,2012.

2. LI Weijun, CAO Jie (2010): Discussion on Suspension Training in Application to Basketball, Journal of

Hubei Sports Science, Issue 5, Page 543-544.2010

3. Lukas Slama (2011): Vyuziti TRX – zavesneho treninku u hrace ledního hokeje, Bakalarska prace,masarykova univerzita, Fakulta sportovnich studii,Brno,2011. (45)

4. Martin Tuma (2014): Vyuziti TRX v treninku juda, Bakalarska prace, masarykova univerzita, Fakulta sportovnich studii, Brno, 2014.

5. Koprince, Susan (2009): “Domestic Violence in A Streetcar Named Desire”. Bloom’s Modem Critical interpretations: Tennessee William’s A Streetcar Named Desire. Ed. Harold Bloom. New York: InfoBase Publishing, 2009. 49-60. Print.

6. Vojtech Dvorak (2014): Vyuziti TRX v thajskem boxu, Balaskas prace, masarykova univerzita, Fakulta sportovnich studii, Brno, 2014.

**Third, web references:**

1. <http://seattlehralthandfitness.blogspot.com/2010/07what-is-TRX-suspension-training.html>