The impact of Using Trampoline Apparatus on Some Physical Abilities and Level of Performance of Gumps in Rhythmic Technical Exercises for Female Students of the Faculty of Physical Education in Mansoura

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Introduction and problem of research:

The tremendous expansion in the scope of scientific and human knowledge and the revolution in the field of information have spread to all branches and fields of science. This has made us cope with this expansion and development and we live with it and emulate it so that we become an integral part of the life of modern societies. Physical education is an important educational field as an image through which the extent of progress is reflected. Many scientific researches discussed itin their fields, especially the field of exercises, which was interested by many scholars and contributed to its advancement and development.

Fathy Ibrahim, 2008 pointed out that in modern times, many scholars have interested in developing the methods and bases for achieving the purposes of exercise as the basis and origin of all physical movements. (8: 3).

The provision of assistive tools and devices is one of the basic elements underlying any training or educational program, because it is not possible to raise the level of female students without providing them. The tools and aids that are necessary for training and education and their existence have great value in motivating female students to participate positively and transmitting the spirit of enthusiasm, happiness and the desire to learn.

There are many modern techniques and methods in which we can design an effective training program that can improve athletic performance and they are

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exercises by using the trampoline Apparatus for fitness and through which we can develop the elements of general fitness and special sports skills, which can be integrated into various training and educational programs such as technical exercises. The performance on the trampoline Apparatus also works to develop the sense of change of body in the air by moving from one movement to another, and helps to strengthen the legs, and develop the sense of time, rhythm and compatibility of movement, coupled with a sense of confidence from through the performance in an enjoyable and desirable manner. (14:15).

The trampoline has many benefits that may develop the performance and help to sense the place, and the many skills that are practiced in the air show a significant development in timing and neuromuscular balance and harmony,so jumping on trampoline develops confidence and self-reliance and the development and completion of the elements of fitness and sense of motor skills as a result of the height that an individual gains during performance. (2: 49).

Mohamed SobhyHassanein (2001), notes that physical abilities are one of the factors on which the success of performance in reaching the highest sports level is based and the promotion of these physical abilities is closely related to the process of development of motor skills, as the athlete cannot master the basic skills of the type of sports activity in which he specializes in the case of lack of necessary physical abilities for this particular type of sports activity. (18: 81).

EmanAbd El Hady(2012) notes that rhythmic exercises in which the body expresses the distinguished and normal motor performance of different kinetic patterns. It develops new creative abilities for the individual based on his personal abilities, so that these abilities reach a more sensitive and expressive efficiency and skill. (5:15).

AttiyatKhattab (1997) adds that they are done using or without manual tools, and not only that, but also to invent and use appropriate new tools. (3: 239).

EnayatFarag and Faten Al-Batal(2004) and Samia Al-Hagrasi (2004) agreed with **AttiyatKhattab (1997)** that rhythmic exercises contain basic skills: walking, running, jumping, balancing, spin, and swinging. (7: 9) (24: 240) (3: 79).

The jumps and gaps are a major element of the basic body movements that are contained in the motions in the rhythmic exercises. **Enayat Ali Labib and PeriksanOsman Hussein (2001)**emphasize the importance of the jumps and gaps in the rhythmic exercises, whether they are individual or group exercise, free or using tools and they are important and basic groups which requires extreme accuracy in perfecting the positions of the feet and legs and the ability of the body to rise and fly in the air in different forms. (6:24).

EnayatFarag and FatenAl-Batal(2004) indicate that the elements of fitness are closely related to rhythmic exercises. The walk needs harmony, flexibility and agility, and the running needs harmony, agility, speed and strength. The jumps need strength, agility, balance and harmony, and swinging need flexibility, harmony and balance.

The turn is characterized by speed, harmony, balance, flexibility, and balance needs to be consistent, accurate, agile and strong. (7: 8-12)

The rhythmic technical exercises are one of the applied curricula assigned for female students in the training curricula of the faculties of physical education. They are one of the sports that are characterized by the artistic and rhythmic aesthetic character because of their distinguished motor skills and the various physical and skillful elements of the basic and rhythmic exercises as indicated by **EnayatFarag and Faten Al-Batal**(2004): (7: 7)

Through the work of the researcher in the field of teaching and supervision of the exercise curricula for the female students of the first and second years of the Faculty of Physical Education Mansoura University, she found that the level of technical performance of the jumps (Split Leap – Star Jump – Arch Jump - Scissors Jump – Gallop.Commat), which are the basic skills of

rhythmic exercises,aren't satisfactory despite of the efforts exerted with them when using various teaching methods and techniques, and the use of the appropriate tools and demonstration tools, which motivated**the researcher** to use the scientific method to identify the level of performance of these skills, and this necessitated a pilot study of the percentages of grades of their level to judge them objectively through the analysis of the results of the first-year female students in the exercises curriculum of the first semester for the academic year 2015/2016AD. The results are summarized in Table (1) below:

Table (1)

Result of the first-year female students for the academic year 2015/2016 in the exercises curriculum

Grade	Very weak	Weak	Pass	Good	Very good	Excellent	Total
Female students	٩٨	-	٢٢	٨٥	٣٠	٤	٢٣٩
Percentage	%٤١.٢	-	%٩.٢	%٣٥.٥	%١٢.٥	%١.٦	%١٠٠

In the analysis of the results, there were percentages of (1.6%) Excellent, (12.5%) Very good, (35.5%) Good, (9.2%) Pass and there was no percentage for weak and (41.2%) for very weak.

The researcher attributed the disparity in the results of this study to the deficiencies in some physical variables associated with the performance of some basic skills, which led to work on finding a method to raise the level of the range of physical variables that contribute to the performance of these skills with the female students, which may be the method of exercises using the trampoline Apparatus and as an attempt to identify the impact of the exercises program using the trampoline apparatus on the performance of some basic skills in the rhythmictechnical exercises (Star jump-Arch jump-Split Leap-Scissors jump-Gallop.Commat) for female students of the Faculty of Physical Education- Mansoura University.

Research Objectives:

The aim of this study is to identify the impact of the

assistive device(trampoline) on the development of some basic jumps in the rhythmictechnical exercises of the female students of the Faculty of Physical Education.

Research hypotheses:

1- There are statistically significant differences between the post and pre measurements of the experimental group in the level of performance of the basic jumps in the rhythmic exercises (star jump-Arch jump-Split Leap-scissors jump-Gallop.Commat) in favor of the post measurement.

2- There are statistically significant differences between the pre and post measurements of the control group in the level of performance of the basic jumps in the rhythmic technical exercises (star jump-Arch jump-Split leap-scissors jump-Gallop.Commat) in favor of the post measurement.

3- There are statistically significant differences between the post measurements of the experimental group and the control group in the level of performance of the basic jumps in the rhythmic technical exercises (star jump-arch jump-split leap-scissors jump-gallop.commat) in favor of the post measurement of the experimental group.

Reference studies:

First: Arabic Studies:

1- Study of Mohamed Mohamed Sayed (2015) (19) entitled "The impact of the diving exercises using the trampoline Apparatus on the effectiveness of turn for the front crawl strake swimmers". The study aims at improving some of the physical variables associated with turn in the front crawl strake, improving the turn time in the front crawl strake, improving the time of turn in the front crawl strakeas well as improving the digital level of the front crawl strake 100m. The researcher used the experimental method of the two groups (experimental-control) and the research's population included the students-major inswimming-fourth year, Minia University and they are (36) students. The most important result is that the training program proposed for diving using the trampoline Apparatus has a positive impact on improving the time and speed of turn and the digital level of the front crawl strake 100m.

2- Study of Hala Masoud Al-Barouni, FadwaKamel El-

Sayyad, Nadia Abdullah Al-Mabsout, 2015 (11) entitled "The impact of using the assistive device (trampoline) to learn the skill of front roll on the beam in the technical gymnastics". The study aims at learning the skill of front roll on the beam by using the trampoline Apparatus in the technical gymnastics. The researchers used the experimental method of two groups, one of which is an experimental group and the other is control group. Each group consists of (6) female students. One of the most important results is the superiority of the trampoline Apparatus device as an assistive devicein the development of learning the skill of front roll on the beam.

3- Study of Maha Mohamed Fekry (2000) (13) entitled "The impact of using jump ladder and trampoline Apparatus on the development of the relative muscle strength and the ability of vertical jump work and the level of performance of some jumps in the technical exercises. The study aims to identify the effect of using the jump ladder and trampoline Apparatus on each of thedevelopment of the relative muscle strength, the development of the ability of vertical jump "work" and the raise of performance level of the female students in each of the gap jump and the arch jump. The researcher used the experimental approach through the experimental design of the two experimental and control groups and their number is (40) female students of the first year, each group consists of (20) female students, and the most important results refer that the use of two jump ladder and trampoline Apparatus helped to develop the relative muscle strength and the development of the ability to jump and they helped to raise the level of performance of the two gap and arch jumps.

Second: Foreign Studies:

1- Study of SandersHir 1995 (26) entitled ". The study aims to know the impact of the ability on the method of turnperformance around the longitudinal axis of the frontal air turn on the trampoline, and he used the experimental methodfor one group of (11) elite trampoline players and he used a program for purposive exercises on the trampoline device, the period of program was (8) weeks by 5 units per week. The trampoline has a positive impact on the ability to perform turn around the longitudinal axis.

Search procedures:

Research Methodology:

The researcher used the experimental method using the experimental design method, which has post and pre

measurement for two groups, one of which is an experimental group and the other is a control group.

Research population and sample:

The research's population represents the female students of the first year in the Faculty of Physical Education at Mansoura University for the academic year (2016-2017AD).

The sample was randomly selected and thebasic sample number was (30) female students. They were divided into two groups, one of which is experimental group and it consists of (15) female students. The proposed program was applied using trampoline and a control group of (15) female students and the program followed by the faculty has been applied. A pilot sample of (20) female students has been chosen randomly from the research's population from outside the basic sample to find scientific coefficients and pilot experiments on them.

Homogeneity and equivalence between the research groups are shown in the basic, physical and skill variables.

Table (2)

Homogeneity of the research's sample in the basic variables (Age-Height-Weight-Intelligence) n=30

Variables	Unit of measurement	Mean	Median	Standard deviation	Coefficient of skewness
Age	Year	١٨.١٣	١٨	٠.٦٨١	٠.٥٣٠
Height	Cm	١٦٠.٥٣	١٦٠	٤.١٤١	١.٧٩١
Weight	Kg	٦٠.٧٢٦	٦٠.٣٥	٤.٤٤٣	٠.١٧٧
Intelligence	grade	٣٢.٤٣	٣٢.٥	٥.٧٣٩	٠.٠٦٣

It is clear from Table (2) that all the values of the calculated coefficients of skewness for the measurements of the basic variables (age, height, weight, intelligence) of the respondents of the research sample ranged from (0.177: 1.791). All of these values are limited to ±3 indicating homogeneity of the respondents of the research sample in those variables.

Table (3)

The homogeneity of the research sample in the measurements of physical and skill variables n = 30

Physical and skill variables		Unit of measurement	Mean	Median	Standard deviation	Coefficient of skewness
Physical variables	Muscle power of the two legs "vertical jump"	Cm	٢٧.٢	٢٥.٥	٥.٤٧٣	١.٦٣٩
	Muscle strength of the two legs "dynamometer"	Kg	٤٧.٤	٤٧.٥	٣.٩٤٤	٠.٣٣٤-
	The strength of the abdominal muscles"Sit-up 20 s"	Number/s	١١.٨٣٣	١٢	١.٦٢٠	٠.٩١٣
	Pelvic flexibility "Caliper slot"	Cm	٢١.٣	٢٢	٤.٧١٣	٠.٢٩٤-
	Balance "Tip toe"	Number/s	٣.٤١٠	٣.٠٣	٠.٧٤٣	١.١٦٥
	Harmony of arms and legs "jumping rope"	Number	١.٧	٢	٠.٧٠٢	٠.٤٩٩
Skill variables	Star jump	Score	٠.٦١٣	٠.٦	٠.١٢٥	٠.٠٤٢-
	Arch jump	Score	٠.٥٧٣	٠.٦	٠.٢٠١	٠.٣١١-
	Split Leap	Score	٠.٣٤٦	٠.٣	٠.١٨٥	٠.٦٨٤
	Scissors jump	Score	٠.٣٦٦	٠.٣	٠.١٢٩	٠.٥٧٤
	Gallop-Commat	Score	٠.٥١٦	٠.٥	٠.١٣٩	٠.٣١٨-

It is clear from Table (3) that all the values of the calculated coefficients of skewness for the measurements of the basic variables (age, height, weight, intelligence) of the respondents of the research sample ranged from (-0.334-1.639). All of these values are limited to ±3 indicating homogeneity of the respondents of the research sample in those variables.

Table (4)

Equivalence between the two research groups (experimental-control) in the basic variables (age-height-weight-intelligence) n 1 = n 2 = 15

Variables	Unit of measurement	Experimental group		Control group		T
		Mean	Standard deviation	Mean	Standard	
Age	Year	١٨.٠٦٦	٠.٧٩٨	١٨.٢٠	٠.٥٦٠	-٠.٥٢٩
Height	Cm	١.٦٠٤	٤.٣٥٥	١.٦٠٦	٤.٠٦٤	-٠.١٧٣
Weight	Kg	٦٠.٦٦	٥.٠٣٧	٦٠.٧٩	٣.٩٣٨	-٠.٠٨١
Intelligence	grade	٣٢.٢٦	٥.٨١٢	٣٢.٦٠	٥.٨٦٥	-٠.١٥٦

Tabulated value of(T) at significance level of 0.05 = 2.145degree of freedom (7) * = significant

Table (4) shows that all calculated T values for the basic variables (age, height, weight) of the two groups (experimental-control) ranged from (-0.529: -0.173). These values are less than the tabulatedT value of 2.145 which reached 2.145 at significance level 0.05 indicating the equivalence of the two groups of research in those variables.

Table (5)

Equivalence between the two groups of research (experimental-control) in the measurements of physical and skill variables

n1=n2=15

Physical and skill variables		Unit of measurement	Experimental group		Control group		T value
			Mean	Standard deviation	Mean	Standard deviation	
Physical variables	Muscle power of the two legs "vertical jump"	Cm	٢٧.٢٦	٦.٤٦	٢٧.١٣	٤.٥٠	٠.٠٦٦
	Muscle strength of the two legs "dynamometer"	Kg	٤٧.٢٠	٣.٥٤	٤٧.٦٠	٤.٤٢٠	-٠.٢٧٣
	The strength of the abdominal muscles"Sit-up 20 s"	Number/s	١١.٩٣	١.٩٤٤	١١.٧٣	١.٢٧٩	٠.٣٣٣

Follow Table (5)

Equivalence between the two groups of research (experimental-control) in the measurements of physical and skill variables n1=n2=15

Physical and skill variables		Unit of measurement	Experimental group		Control group		T value
			Mean	Standard deviation	Mean	Standard deviation	
	Pelvic flexibility "Caliper slot"	Cm	٢١.٤٠	٢.٨٤٨	٢١.٢٠	٦.١٥٥	٠.١١٤
	Balance "Tip toe"	Number/s	٣.٤٤	٠.٧٦٨	٣.٣٧٥	٠.٧٤٣	٠.٢٥٦
	Harmony of arms and legs "jumping rope"	Number	١.٧٣	٠.٧٠٣	١.٦٦	٠.٧٢٣	٠.٢٥٤
Skill variables	Star jump	Score	٠.٦٢٠	٠.١٣٢	٠.٦٠٦	٠.١٢٢	٠.٢٨٧
	Arch jump	Score	٠.٥٦	٠.٢١٦	٠.٥٨	٠.١٩٢	٠.٣٥٧-
	Split Leap	Score	٠.٣٦	٠.١٨٨	٠.٣٣	٠.١٨٧	٠.٣٨٩
	Scissors jump	Score	٠.٣٦	٠.١٣٥	٠.٣٧	٠.١٢٧	٠.٢٧٧-
	Gallot-Commat	Score	٠.٥٢	٠.١٦٩	٠.٥١	٠.١٠٦	٠.١٢٩

Tabulated value of T at 0.05 = 2.145 and the degree of **freedom (7) * = Significant**

Table (5) shows that all T values of the measurements of the two groups (experimental-control) ranged from (0.357: 0.389) and these values are lower than the tabulated value of T, which reached 2.145 at a significant level of 0.05 indicating the equivalence of the two groups of research in those variables.

Data collection tools and methods:

The **researcher** relied on the following tools to collect data and information related to the variables under research:

Personal forms and interviews:

1- A questionnaire to determine the physical abilities associated with the skills under research. Annex (2)

1. A questionnaire to determine the physical abilities tests associated with the skills under research. Annex (4)
2. A questionnaire to identify exercises using the appropriate trampoline for the skills under research. Annex (3)

Measurements and tests for the variables under research:

Measurements of basic variables

The basic variables (age, height, weight, intelligence) were measured for the

respondents of the research groups (experimental and control). The results of the measurements were tabulated in their specified form. Annex (5)

Measurement of physical abilities under research:

The following were used:

- Measuring the Muscle power of the two legs using the "vertical jump test".
- Measuring the muscle strength of the two legs by using dynamometer.
- MeasuringThe strength of the abdominal muscles using the "sit up test 20 seconds."
- Measuring the flexibility of the pelvis using the "Lateral caliper Slot Test".
- Measuring the fixed balance using the "tip toe test".
- Measuring the ability of harmony using the "jumping rope test". Annex (4)

Devices and tools:

Devices:

- Rest meter for measuring height and weight/cm.- Stopwatch / 1. S.
- Graduated ruler/cm.
- Digital Camera. - Sponge mattresses.

Tools:

- Trampoline as shown in the following form: - Annex (1)

Evaluation of skill level performance:

The evaluation was carried out by a tripartite committee of (faculty members of the rhythmic technical exercises curriculum at the Faculty of Physical Education) according to objective criteria as follows:

- Design of a form with the technical variables under research (Split Leap-Arch jump-star jump-scissors jump-Gallot.Commat). Annex (6)
- The score is placed below each skill of 5: 1 degrees.
- Taking photos for thefemale students in their performance of the skills under research and distributing them to experts to determine the appropriate score.

Survey studies:

A number of (2) two pilot studies were conducted in the period from 19/9/2017 to 27/9/2017:

First survey study:

This study was conducted in the period from 19/9/2017 to 23/9/2017 and aims at:

- Ensuring the validity of the hall applied to the experiment in terms of (ventilation - lighting).
- Ensuring the validity and calibration of the devices and tools used under research.
- Train the assistants on the methods of testing procedures under consideration and how to record the results in the forms prepared for this purpose.
- Testing the exercises using the proposed trampoline in search and find out the

suitability of the students of the college in question.

- Determining and standardizing the variables of the training load of the group of exercises using the proposed trampoline and know the average time of exercise performance, in light of the strong agreement of the results of the reference study from (65%: 80%). (13) (27)

Result: All the objectives of this study have been achieved.

Second survey study:

The study was conducted in the period from 24/9/2017 to 27/9/2017 on a pilot sample of (20) students, and aims at:

calculating the validity of the tests of the physical variables in the study using the discriminant validity method. The measurements of a group of the outstanding female students and the measurements of another group of less outstandingfemale students were compared. The tests were carried out on 26/9/2017 as shown in Table (6).

Table (6)

Calculation of validity coefficient for physical variables tests n1=n 2= 10

Physical variables Tests	Unit of measurement	Featured Group		Unfeatured Group		The difference between the two averages	T value
		Mean	Standard deviation	Mean	Standard deviation		
Muscle power of the two legs "vertical jump"	Cm	٤١.٢٠	١٠.٧٣	٢٥.٢٠	٢.٣٩	١٦	*٤.٥٩٩
Muscle strength of the two legs "dynamometer"	Kg	٨٢.٧٠	٦.٠٩	٤٤.٤٠	٤.٠٥	٣٨.٣٠	*١٦.٦١
The strength of the abdominal muscles"Sit-up 20 s"	Number/s	١٤.٧٠	١.٦٣	٩.٩٠	١.٥٩	٤.٨٠	*٦.٦٤
Pelvic flexibility "Caliper slot"	Cm	١٧.٢٠	٢.٣٤	٢٤.٣٠	١.٦٣	٧.١٠-	*٧.٨٤-
Balance "Tip toe"	Number/s	٧.٨٢	١.٣٨٨	٢.٧٩	٠.٥٦٠	٥.٠٢	*١٠.٦١
Harmony of arms and legs "jumping rope"	Number	٣.٤٠	١.٠٧٤	١.٢٠	٠.٤٢١	٢.٢٠	*٦.٠٢٥

The tabulated value of (T) at significance level of 0.05 = 2.145 and the degree of freedom (9) * = Significant

Table (6) shows that all calculated T values for the physical tests under research ranged from (-7.84:16.61). These values are greater than the tabulated T, which reached 2.262 at significance level of 0.05, indicating that there are statistically significant differences between the outstanding female students and the less outstanding female students. This indicates the validity of the tests under research in measuring what was set for them.

The calculation of reliability coefficient for the tests of physical variables by using test-retest method- The first application of the tests was carried out on 24/9/2017 and the second application was completed on 27/9/2017 at a time interval of three days as shown in Table (7).

Table (7)

Calculation of reliability coefficient for physical abilities tests n= 10

Physical and skill variables	Unit of measurement	First application		Second application		(R) value	(T) value
		Mean	Standard deviation	Mean	Standard deviation		
Muscle power of the two legs "vertical jump"	Cm	٢٧.٣٠	٢.٧٥٠	٢٦.٦٠	٣.٠٢٥	*٠.٧٣٧	١.٠٤٩
Muscle strength of the two legs "dynamometer"	Kg	٤٧.٩٠	٣.٨١٣	٤٧.٦٠	٢.٩٠٧	*٠.٨٨٩	٠.٣٤٩
The strength of the abdominal muscles"Sit-up 20 s"	Number/s	١١.٩٠	١.٨٥٢	١٢	٢.٠٠	*٠.٨٩٩	٠.٣٦١-
Pelvic flexibility "Caliper slot"	cm	٢٠.٦٠	٢.٦٧٤	٢١.٩	٣.٢٨١	*٠.٧٦٧	١.٩٤٨-
Balance "Tip toe"	Number/s	٣.٦٣٨	٠.٥٤١	٣.٣٨١	٠.٨٣٩	*٠.٧٥٣	١.٤٥٤
Harmony of arms and legs "jumping rope"	Number	٣.٤٠	٠.٧٨٨	١.٧٠	٠.٨٢٣	*٠.٩٢٤	١.٠٠

The tabulated value of R at significance level of 0.05 = 0.549 and the degree of freedom (8) * = Significant.

The tabulated value of T at significance level of 0.05 = 2.145 and the degree of freedom (9)* = Significant.

Table (7) shows that all values of correlation coefficients calculated for the physical abilities tests under research ranged from (0.939: 0.939). These values are higher than the tabulated value of R which reached 0.549 at significance level of 0.05. All coefficients values of test "T" calculated for the physical abilities under research ranged between (-1.152: 1.765) and these values are lower than the tabulated value of 1.833 at significance level of 0.05 indicating the reliability of the tests used in the research.

Procedures for implementing the experiment:

Post measurements:

Post measurements of experimental and control groups were carried out in all (physical-skill) variables under research during the period 1/10/2017 to 2/10/2017.

Basic experiment:

The program followed in the faculty was implemented on the control group, whereas the exercises program using the trampoline were applied on the experimental group, annex (9) for a period of (6 weeks) with 3 training units per week (Sunday - Tuesday - Thursday) from 1.30: 3 p.m., in the period from Thursday corresponding to26/11/2017 to Tuesday corresponding to 3/10/2017 as shown in the schedule of the program schedule (8).

Table (8)
Time distribution for the proposed trampoline program

S	Statement	Time distribution of the program
1	Number of weeks	(6) weeks
2	Number of educational weeks	(18) educational units
3	Number of educational units per week	(3) educational units
4	Time of application in the one unit	(60) minutes
5	Time of application per week	(180) minutes
6	Total time for program application	(1080) minutes

* The two programs were implemented for the two groups so that the warm up part, the skill part and the closing part are the same for each and the difference in the physical part only. The program under research was implemented for the experimental group and the applicable unit was implemented for the control group only shown in Table(9).

Table (9)

Unit parts		Experimental group	Control group
Warm-up		A part of applicable warm-up is applied in the same manner.	A part of applicable warm-up is applied in the same manner.
	Physical	The exercises using the trampoline are implemented in the proposed program.	The exercises are implemented with the applicable traditional program.
	Skill	It is educated by the applicable method.	It is educated by the applicable method
Closing		A part of applicable warm-up is applied in the same manner.	A part of applicable warm-up is applied in the same manner.

Post measurements:

The post measurements of the experimental and control groups were carried out in all (physical-skill) variables under research and with the same conditions and arrangement of the pre measurements during the period from 27/11/2017 to 28/11/2017.

Statistical Treatments:

The Statistical Program (SPSS) and (EXCEL) were used to obtain the following statistical treatments: "Mean-Median-Standard deviation-Coefficient of skewness-(T) test-correlation coefficient-percentage of change (improvement)".

Presentation of results and their discussion:

Presentation of results:

The statistical significance of the (pre-post) measurements of the level of performance of the skills under research and the percentages of improvement of the experimental group:

Table (10)
Significance of the differences between the (pre-post) measurements of the experimental group in the measurements of physical and skillful performance level under research n=15

Physical and skill variables	Unit of measurement	Pre measurement		Post measurement		T value
		Mean	Standard deviation	Mean	Standard deviation	
Muscle power of the two legs "vertical jump"	cm	٢٧.٢٦	٦.٤٦٣	٤٢.٣	١١.١٩٧	*٥.٥٥٨-
Muscle strength of the two legs "dynamometer"	kg	٤٧.٢٠	٣.٥٤٩	٨٣.٨٦	٥.٤٦٢	-*٢١.٠٨٠
The strength of the abdominal muscles"Sit-up 20 s"	Number/s	١١.٩٣	١.٩٤٤	١٥.٢٦	١.٧٥١	*٤.٧٠٧-
Pelvic flexibility "Caliper slot"	cm	٢١.٤٠	٢.٨٤٨	١٦.٧٣	٢.٤٠٤	*٤.١٠٥
Balance "Tip toe"	Number/s	٣.٤٤	٠.٧٦٨	٨.٤٧	١.٤٩٣	*١٩.٥٥-
Harmony of arms and legs "jumping rope"	Number	١.٧٣	٠.٧٠٣	٣.٨٦	٠.٨٣٣	*٩.٩٠٩-
Star jump	Score	٠.٦٢٠	٠.١٣٢	٤.٤١٣	٠.٤٩٤	*٢٨.٣٨-
Arch jump	Score	٠.٥٦	٠.٢١٦	٤.٤٦	٠.٤٣٦	*٣٥.٨٨-
Split Leap	Score	٠.٣٦	٠.١٨٨	٤.٠٢	٠.٥٩٣	*٢٥.٠١-
Scissors jump	Score	٠.٣٥	٠.١٣٥	٤.٢٦	٠.٤٧٧	*٣١.٩٩-
Gallot-Commat	Score	٠.٥٢	٠.١٦٩	٤.٤٠٦	٠.٤٥٢	*٣٢.٥٣-

Tabulated value of (T) at significance level of 0.05 = 2.145 degree of freedom (7) * = significant

Table (10) shows that there are statistically significant differences between the pre measurement and the post measurement for the experimental group in the

measurements of the skillful performance level for the skills under research in favor of the post measurement, as the tabulated value of T ranged between (-35.88:-25.01). It is greater than its tabulated value which reached 2.145 at significance level 0.05.

Table (11)

Percentages of improvement for the experimental group in the measurements of skills performance level under researchn=15

Skill name	Unit of measurement	Mean of Pre measurement	Mean of Post measurement	Difference between the two means	Percentage of improvement
Muscle power of the two legs "vertical jump"	cm	٤٢.٣	٢٧.٢٦	١٥.٠٤	%٥٥.١٧
Muscle strength of the two legs "dynamometer"	kg	٨٣.٨٦	٤٧.٢٠	٣٦.٦٦	%٧٧.٦
The strength of the abdominal muscles"Sit-up 20 s"	Number/s	١٥.٢٦	١١.٩٣	٣.٣٣	%٢٧.٩
Pelvic flexibility "Caliper slot"	cm	١٦.٧٣	٢١.٤٠	٤.٦٧	%٢١.٨٢
Balance "Tip toe"	Number/s	٨.٤٧	٣.٤٤	٥.٠٣	%١٤٦.٢
Harmony of arms and legs "jumping rope"	Number	٣.٨٦	١.٧٣	٢.١٣	%١٢٣.١٢
Star jump	Score	٤.٤١٣	٠.٦٢٠	٣.٧٩	%٦١١.٧
Ach jump	Score	٤.٤٦	٠.٥٦	٣.٩٠	%٦٩٦
Split Leap	Score	٤.٠٢	٠.٣٦	٣.٦٦	%٩٦٨
Scissors jump	Score	٤.٢٦	٠.٣٥	٣.٩٠	%٩٧٧
Gallop-Commat	Score	٤.٤٠٦	٠.٥٢	٣.٨٨	%٧٤٧

Table (11) shows that all measurements of skills performance level under research were improved with respondents of the experimental group as the percentage of improvement ranges between (611.7%:977%).

Presentation of statistical significances for (pre-post) measurements of the skills performance level under research and percentages of improvement for the control group

Table (12)
Significance of the differences between the (pre-post) measurements of the control group in the measurements of physical and skillful performance level under research n=15

Physical and skill variables	Unit of measurement	Pre measurement		Post measurement		T value
		Mean	Standard deviation	Mean	Standard deviation	
Muscle power of the two legs "vertical jump"	cm	٢٧.١٣	٤.٥٠١	٣٠.٣٣	٤.٤٦	١.٨٣٢-
Muscle strength of the two legs "dynamometer"	kg	٤٧.٦٠	٤.٤٢٠	٥٣.٠٦	٤.٤٩٥	-*٢.٩٦٥
The strength of the abdominal muscles"Sit-up 20 s"	Number/s	١١.٧٣	١.٢٧٩	١٢.٨٦	٢.٠٣٠	١.٩١٣
Pelvic flexibility "Caliper slot"	cm	٢١.٢٠	٦.١٥٥	٢٠.٣	٢.٤١٦	٠.٦٤٥
Balance "Tip toe"	Number/s	٣.٣٧٥	٠.٧٤٣	٥.٣٧٦	١.٣٤٥	*٧.٥٠٥-
Harmony of arms and legs "jumping rope"	Number	١.٦٦	٠.٧٢٣	٢.٦٦	٠.٧٥٣	*٣.٦٢٣-
Star jump	Score	٠.٦٠٦	٠.١٢٢	٢.٦١٣	٠.٤٨٠	*١٦.٥٤-
Arch jump	Score	٠.٥٨٦	٠.١٩٢	٢.٥٨	٠.٤٩٨	*١٤.٨٣-
Split Leap	Score	٠.٣٣٣	٠.١٨٧	٢.١٣٣	٠.٥٧٦	*١٠.٥٢٧-
Scissors jump	Score	٠.٣٧٣	٠.١٢٧	٢.١٠	٠.٤٨٩	-*١٢.٥٩١
Gallop-Commat	Score	٠.٥١٣	٠.١٠٦	٢.٥٦	٠.٤٩٥	*١٦.٠٩-

Tabulated value of (T) at significance level of 0.05 = 2.145 degree of freedom (7) * = significant

Table (12) shows that there are statistically significant differences between the pre measurement and the post measurement for the experimental group in the measurements of the skillful performance level for the skills under research in favor of the post measurement, as the tabulated value of T ranged between(-16.54:-10.527). It is greater than its tabulated value which reached 2.145 at significance level 0.05.

Table (13)
Percentages of improvement for the control group in the measurements of physical and skillful performance level under researchn=15

Skill name	Unit of measurement	Mean of Pre measurement	Mean of Post measurement	Difference between the two means	Percentage of improvement
Muscle power of the two legs "vertical jump"	cm	٣٠.٣٣	٢٧.١٣	٣.٢٠	%١١.٧٩
Muscle strength of the two legs "dynamometer"	kg	٥٣.٠٦	٤٧.٦٠	٥.٤٦	%١١.٤٧
The strength of the abdominal muscles"Sit-up 20 s"	Number/s	١٢.٨٦	١١.٧٣	١.١٣	%٩.٦٣
Pelvic flexibility "Caliper slot"	cm	٢٠.٣	٢١.٢٠	١.٠٦	%٥.٠٤
Balance "Tip toe"	Number/s	٥.٣٧٦	٣.٣٧٥	٢	%٥٩.٢
Harmony of arms and legs "jumping rope"	Number	٢.٦٦	١.٦٦	١	%٦٠.٢٤
Star jump	Score	٢.٦١٣	٠.٦٠٦	٢.٠٦	%٣٣٣.١
Arch jump	Score	٢.٥٨	٠.٥٨٦	١.٩	%٣٤٠.٢
Split Leap	Score	٢.١٣٣	٠.٣٣٣	١.٨٠	%٥٤٦.٣
Scissors jump	Score	٢.١٠	٠.٣٧٣	١.٧٢	%٤٦٣
Gallop-Commat	Score	٢.٥٦	٠.٥١٣	٢.٠٥	%٣٩٩

Table (13) shows that all measurements of skills performance level under research were improved with respondents of the control group as the percentage of improvement ranges between **(333.1%:546.3%)**

Presentation of differences significance of the two post measurements between the two (experimental-control) groups:

Table (14)
Significance of the differences between the post measurements of the two (experimental-control) groups in the measurements of skills performance level under research n1=n2=15

Physical and skill variables	Unit of measurement	Experimental group		Control group		T value
		Mean	Standard deviation	Mean	Standard deviation	
Muscle power of the two legs "vertical jump"	Cm	٤٢.٣٣	١١.١٩٧	٣٠.٣٣	٤.٤٦٦	*٣.٨٥٥
Muscle strength of the two legs "dynamometer"	Kg	٨٣.٨٦	٥.٤٦	٥٣.٠٦	٤.٤٩	*١٦.٨٦٢
The strength of the abdominal muscles"Sit-up 20 s"	Number/s	١٥.٢٦	١.٧٥١	١٢.٨٦	٢.٠٣٠	*٣.٤٦٦
Pelvic flexibility "Caliper slot"	Cm	١٦.٧٣	٢.٤٠٤	٢٠.١٣	٢.٤١٦	*٣.٨٦٣-
Balance "Tip toe"	Number/s	٨.٤٧	١.٤٩٣	٥.٣٧	١.٣٤٥	*٥.٩٧٧
Harmony of arms and legs "jumping rope"	Number	٣.٨٦	٠.٨٣٣	٢.٦٦	٠.٧٢٣	*٤.٢٠٩
Star jump	Score	٤.٤١٣	٠.٤٩٤	٢.٦١٣	٠.٤٨٠	*١٠.١١٢
Arch jump	Score	٤.٤٦	٠.٤٣٦	٢.٥٨	٠.٤٩٨	*١١.٠١٨
Split Leap	Score	٤.٠٢٦	٠.٤٧٧	٢.١٣	٠.٤٨٩	*٨.٨٦٣
Scissors jump	Score	٤.٢٦	٠.٤٧٧	٢.١٠	٠.٤٨٩	*١٢.٢٢٥
Gallot-Commat	Score	٤.٤٠٦	٠.٤٥٢	٢.٥٦٦	٠.٤٩٥	*١٠.٦٢١

Tabulated value of (T) at significance level of 0.05 = 2.145 degree of freedom (7) * = significant

Table (14) shows that there are statistically significant differences between the post measurements of the experimental and control groups in the measurements of skills performance level under research in favor of the experimental group, as the tabulated value of T ranged between(8.863:12.225). It is greater than its tabulated value which reached 2.365 at significance level 0.05.

Table (15)
Comparison of improvement percentages in the skills performance level under research for the two (experimental-control) groups n1=n2=15

Physical and skill variables	Unit of measurement	Experimental group			Control group			Difference of percentage of improvement%
		Pre mean	Post mean	Percentage of improvement	Mean	Standard deviation	Percentage of improvement	
Muscle power of the two legs "vertical jump"	Cm	٢٧.٢٦	٤٢.٣	%٥٥.١٧	٢٧.١٣	٣٠.٣٣	%١١.٧٩	%٤٣.٣٨
Muscle strength of the two legs "dynamometer"	kg	٤٧.٢٠	٨٣.٨٦	%٧٧.٦	٤٧.٦٠	٥٣.٠٦	%١١.٤٧	%٦٦.١٣
The strength of the abdominal muscles"Sit-up 20 s"	Number/s	١١.٩٣	١٥.٢٦	%٢٧.٩	١١.٧٣	١٢.٨٦	%٩.٦٣	%١٨.٢٧
Pelvic flexibility "Caliper slot"	Cm	٢١.٤٠	١٦.٧٣	%٢١.٨٢	٢١.٢٠	٢٠.٣	%٥.٠٤	%١٦.٧٨
Balance "Tip toe"	Number/s	٣.٤٤	٨.٤٧	%١٤٦.٢	٣.٣٧٥	٥.٣٧٦	%٥٩.٢	%٨٧
Harmony of arms and legs "jumping rope"	Number	١.٧٣	٣.٨٦	%١٢٣.١٢	١.٦٦	٢.٦٦	%٦٠.٢٤	%٦٢.٨٨
Star jump	Score	٠.٦٢٠	٤.٤١٣	%٦١١.٧	٠.٦٠٦	٢.٦١٣	%٣٣٣.١	%٢٧٨.٦
Arch jump	Score	٠.٥٦٠	٤.٤٦	%٦٩٦	٠.٥٨٦	٢.٥٨	%٣٤٠.٢	%٣٥٥.٨
Split Leap	Score	٠.٣٦٠	٤.٠٢	%٩٦٨	٠.٣٣٣	٢.١٣٣	%٥٤٦.٣	%٤٢١.٧
Scissors jump	Score	٠.٣٥٠	٤.٢٦	%٩٧٧	٠.٣٧٣	٢.١٠	%٤٦٣	%٤١٥
Gallot-Commat	Score	٠.٥٢٠	٤.٤٠٦	%٧٤٧	٠.٥١٣	٢.٥٦	%٣٩٩	%٣٤٨

Table (15) shows the percentages of improvement between the post and pre measurements for the two experimental and control groups in the measurements of skillful performance levels under research and there are also differences in the percentages of improvement between the experimental group and he control group in the skillful performance levels as these differences are ranged between the lowest difference (927.6%) for the performance of star jump skill to the highest difference (415%) for the performance skill of scissors jump skill.

Discussion of results:

The researcher presented the results of the statistical analysis of the research data for each of the two groups (experimental-control) separately, in order to find out the significance of the differences between the measurement of pre and post measurements of skillful performance (under research):

Discussion of the results of the presentation of statistical significances forthe (pre-post) measurements ofthe level of performance of the skills under research and the percentages of improvement for the experimental group

Table (10) shows statistically significant differences between the mean of the two (pre-post) measurements for the experimental group in the measurements of the levels of skillful performance for the skills under research (star jump-arch jump-split leap-scissors jump-gallop.commat) in favor of the post measurement. The tabulated value of T ranged between (-5.01: -35.88), which is higher than the tabulated value which reached 2.145 at significance level of 0.05.

Table (11) shows that all measurements of skillful performance levels under research were improved in the female students of the experimental group. The highest percentage of improvement was in the scissors jump, with an improvement percentage of 977% and the lowest improvement was in the star jump, with an improvement percentage of 611.7%.

The **researcher** attributed the statistically significant differences and the percentages of improvement among the female students of the experimental group students in the skillful performance levels under research to the positive effect of the exercise program using the proposed trampoline, which included the exercises of harmony, ability, agility, flexibility, balance and strength, which in turn helped to raise the skill level of female students in the jumps under research.

The **researcher** also attributed this development to the impact of exercises program using the trampoline under research, which helped to raise the level of physical abilities of the students of the experimental group, which in turn led to increase the performance of the jumps of these female students. The regular and programmed training and the use of the types of rated intensity in training and the use of types of optimum comfort between repetitions leads to the

development of achievement through the proposed program.

Sanders Hir(1995) confirms that the use of trampoline exercises in the training module gives significant statistical differences in the development of the fitness elements (strength-endurance-flexibility-balance- ability-agility in females and gives better results than traditional exercises. (26)

These results are consistent with the results of the study of **NajwaSuleimanBayoumi(1994), Wafaa El-Sayed Mahmoud (1998), Maha Mohamed Fikry(2000),** which confirms that the use of trampoline exercises has a positive effect in the development and improvement of the fitness elements markedly, their results refer to the existence of statistically significant differences between the pre and post measurements of the experimental group in favor of the post measurement. (21) (27) (13)

Thus, the results of the study in Table (10), (11) achieve the validity of the first hypothesis, which states: -
There are statistically significant differences between the pre and post measurements of the experimental group in the level of performance of the basic jumps in the rhythmic technical exercises under research in favor of the post measurement.

Discussion of the results of the statistical significances of the (pre-post) measurements for the performance level of skills under researchin favor of the control group

Table (12) shows statistically significant differences between the mean of the (pre-post) measurements for the control group in the measurements of the skillful performance levels of the skills under research (star jump-arch jump-split leap-scissors jump-gallop.commat) in favor of the post measurement, as the tabulated value of T ranged between (-10.527: -16.54), which is higher than its tabulated value which reached 2.145 at significance level of 0.05.

Table (13) shows that all measurements of skillful performance levelsunder research were improved in the female students of the control group. The highest percentage of improvement was found in

the Lip jump, with an improvement percentage of 546.3%. The lowest improvement was in star jump, with an improvement percentage of 333.1%.

Mohamed SobhiHassanein(2001) indicates that training seeks to develop and improve physical fitness that contributes to the development of the level of performance and the motor skills of the player and try to direct them towards achieving the highest level of performance (18:37).

The researcher attributed that the positive effect that occurred in the performance level of the control group was the reason for the continuity and regularity of the control group within the training program, which led to the adjustment in training and thus the high level of physical and skillful performance.

This is in line with the results of studies of **RehamHamed Ahmed (1997), Wafaa El Sayed Mahmoud (1998), Sherine Ahmed Taha (2009)** pointed out that the programs applied to the members of the control group have a positive effect on improving the skill level in different sports. (23) (27) (25)

This is consistent with the results of the studies of **Sherine Ahmed Taha(2009), Heba Mohamed Saeed(2004), HalaHamadSaeed(1996), NajwaSuleimanBayoumi(1994),** to the training programs for exercises to raise the physical efficiency and the role of raising the performance of jumps in rhythmic exercises. (25) (12) (10) (21)

The **researcher** explains the progress the female students of the control group in the post measurement levels compared to the pre measurement levels in the performance level of jumps under research to the effect of the traditional training program. Thus, the amount of improvement between the two groups in the results of the post measurement is to determine the progress of the level and in favor of the experimental group for the effect of the proposed program using trampoline.

According to the above, the validity of the second hypothesis of research has been achieved, which states that there are statistically significant differences between

the pre and post measurements of the control group in the performance level of the basic jumps in the rhythmic technical exercises under research in favor of the post measurement.

Discussion of the results of the presentation of the significance of differences between the two post measurements of the two(experimental-control) groups

Table (14) shows statistically significant differences between the mean of the two post measurements between the control group and the experimental group in the measurements of the skillful performance levels of the skills under research (star jump-arch jump-spilt leap-scissors jump-gallop.commat) in favor of post measurements, The tabulated value of T ranged between (8.863: 12.225), which is higher than its tabulated value which reached 2.145 at significance level of 0.05.

Table (15) shows that all the measurements of skillful performance levels under study were improved among the female students of the experimental group and the female students of the control group. The highest percentage for the differences of improvement between the two groups in the scissors jump, and the difference of percentage of improvement reached 415% and the lowest percentage for the differences of percentages of improvement between the two groups in the star jump and the difference of percentage of improvement reached 278.6%.

Thus, the results shown in Table (15) of percentage of improvement for experimental and control group measurements showed an improvement in the percentage of improvement of the performance of jumps for the experimental group better than the percentage of improvement for the control group.

This improvement in the performance level of the experimental group in the performance of jumps is attributed the impact of the exercises program using the proposed trampoline and this was demonstrated by the following results:

The performance level of star jump:The percentage of improvement was 611.7% in the experimental group while

in the control group, it was 333.1%. The results showed that there is an improvement difference between the two groups of 278.6% in favor of the experimental group.

The performance level of arch jump, the percentage of improvement was 696% while in the control group, it was 340.2% and the results showed that there isan improvement difference between the two groups of 335.8% in favor of the experimental group.

The performance level of split leap, the percentage of improvement was 968% while in the control group, it was 564.3% and the results showed that there isan improvement difference between the two groups of 421.7% in favor of the experimental group.

The performance level of scissors jump, the percentage of improvement was 977% while in the control group, it was 463% and the results showed that there isan improvement difference between the two groups of 415% in favor of the experimental group.

The performance level of gallop-commat, the percentage of improvement was 747% while in the control group, it was 399% and the results showed that there isan improvement difference between the two groups of 348% in favor of the experimental group.

The researcher ascribes the reason for the improvement in the experimental group compared to the control group in the skillful performance measurements (under research) to the training program using trampoline exercises which has had an effective effect on these variables. The physical exercises using the trampoline instrument under research has contributed to the perfection and improvement of theskillful performance level of the skills under research, where the trampoline exercise program took into account the diversity in terms of dynamic construction and its impact on the muscles working in the performance of jumps and the development of the physical abilities of these jumps. This weren't available for the female students of the control group who relied on traditional exercises.

These results are consistent with the results of the studies

of **Sanders Hir (1995), Millman (1996), Maha Mohamed Fikry(2000), HalaMasoud El-Baroni, FadwaiKamelEl-Sayyad and Nadia Abdullah Al-Mabout(2015)**that trampoline exercises have a positive effect on the development and improvement of the skillful performance of the jumps under research significantly (26) (13) (11).

From the previous results, the validity of the third hypothesis, which provides that there are statistically significant differences between the experimental group and the control group in the performance of the basic jumps in the rhythmic technical exercises under research in favor of the post measurement of the experimental group, was achieved.

Conclusions and Recommendations:

Conclusions:

Within the limitations of this study and guided by its objectives and the steps taken to verify the validity of the hypotheses. In light of the measurements used and within the limits of the research sample and statistical method used, the following conclusions were reached:

The use of trampoline exercises achieved better results for the sample of the experimental group compared to the use of the traditional exercises of the control group in the performance level of the jumps (star jump-arch jump-split leap-scissors jump-gallop.commat) in the rhythmic technical exercises for the female students of the faculty of physical education, sample of research, at Mansoura University.

An exercise program using the proposed trampoline resulted in a marked improvement in the skillful performance levels (star jump-arch jump-split leap-scissors jump-gallop.commat) for the experimental group.

An exercise program using the proposed trampoline resulted in statistically significant differences in favor of the experimental group compared to the results of the control group of the traditional program in the skillful performance levels(star jump-arch jump-split leap-scissors jump-gallop.commat).

Recommendations:

In the light of research conclusions, we can recommend the following:

To work on the implementation of an exercise program using the trampoline under research of on all the female students of different teams in the Faculty of Physical Education, Mansoura University and other female students of the faculties of physical education, because of the impact of positive and clear in improving the performance of jumps under research.

To conduct further research on the implementation of exercises program using trampoline on the rest of the various sports activities.

To work on the implementation of exercises program using trampoline to develop different elements of fitness on the other basic and technical skills in rhythmic exercises.

To attempt to integrate methods and programs of exercises using trampoline with other methods and programs of modern exercises in training programs to reach the best and highest results of the physical and skillfulvariables in rhythmic exercises and other sports activities.

References:

First: Arabic references:

1- Abd El-Fatah Lotfy: Al-Waseet in Teaching Methods of Physical Education, Dar Al-Kotob Al-Jami'iyah, Alexandria, 1986.

2- Amr Mohamed Abd El-RazekBassyoni: The effect of trampoline and mental perception on raising the level of performance of some of the complex motor movements on the beam for young female players of gymnastics, Master Thesis, Alexandria University, Faculty of Physical Education Girls, 2000.

3- Attiyat Mohamed Khattab: Exercise for Girls, Ed. 8, Dar Al Ma'areffor Publishing, Alexandria, 1997.

4- Buckland&Joseph: the Effect of Shoulder Stability Exercise On Bench Presss one-repetition maximum resuxaslt ,texas state university –san marcose, dept. of healt h and human performance,2013

5- EmanAbd El-HadyTolba: The impact of a program using different musical rhythms on learning some basic skills in rhythmic exercises, unpublished PhD thesis,

Faculty of Physical Education, Mansoura University, 2012.

6- Enayat Ali Labib&Periksan Osman Hussein: Exercise and rhythmic gymnastics, Faculty of Physical Education for Girls, Helwan University, 2001.

7- Enayat Mohamed Farag&FatenTaha El-Batal: Rhythmic exercises (Rhythmic gymnastics) and sports performances, Dar Al-Fikr Al-Arabi for Publishing, Cairo, 2004.

8- Fathy Ahmed Ibrahim: Scientific principles and foundations of physical exercises and sports performances, Dar Al-Wafaafor Publishing, Alexandria, 2008.

9- Freed turoff: Artistic gymnastics unitedof American by wmc ,brown pubisherstarde direct group,1991.

10- Hala Mohamed Saeed: A proposed program for the development of flexibility and muscle strength and its impact on the level of performance of some jumps in modern exercises, unpublished Master thesis, Faculty of Physical Education for Girls, Zagazig University, 1996.

11- HalaMasoud El-Baroni, FadwaKamel El-Sayyad& Nadia Abdullah Al-Mabsout: The impact of using the assistive device (trampoline) to learn the skill of front roll on the beam in the technical gymnastics, International Conference of Sports and Health Sciences, Faculty of Physical Education, Assiut University, Egypt, Issue 1, March 2015.

12- Heba Mohamed Saeed: A proposed program using rubber cords to improve physical variables and the level of performance of some jumps in rhythmic exercises, unpublished Master thesis, Faculty of Physical Education for Girls, Zagazig University, 2004.

13- Maha Mohamed Fekry: The impact of the use of jump ladder and trampoline on the development of relative muscle strength and verticaljump capacity and the performance level of some jumps in exercises, published research, Comprehensive Educational Researches Journal, Egypt, ed.1, 2000AD.

14- Loken Newton c and Willowghby: The complete look of gymnastic 3rdeductionpentice hall inc,usa,1987.

15- Millman,d: trampoline training for body , mind and sprit: progressive instruction,1996

16- Mohamed Ibrahim Al-Ayeshi: Evaluation of the classification of weights of wrestlers in the light of the body style fitness, PhD thesis, unpublished, Faculty of

Physical Education for Boys Zagazig, 1991.

17- Mohamed Hassan Alawi & Mohamed Nasr El-Din Radwan: Tests of motor performance, Ed.3, Dar Al-Fikr Al-Arabi, Cairo, 2001.

18- Mohamed SobhyHassanien: Measurement and Evaluation in Physical Education and Sports, Ed.4, Part I, Dar Al-Fikr Al-Arabi, Cairo, 2001.

19- Mohamed MohamedSayed: The impact of a program for diving exercises using trampoline on the effectiveness of turn of front crawl swimmers, Master Thesis, Faculty of Physical Education, Minia University, 2015.

20- Mostafa El-Sayeh Mohammed & Salah Anas Mohamed: European Fitness Test, Eurovite, Al-Esha'aa Technical Press, Alexandria, 2000.

21- Nagwa Suleiman Bayomi: The impact of two programs using trampolines and plyometric training on the level of performance of some jumps of rhythmic exercises and associated fitness elements, Journal of Science and Sports Arts, Vol.6 . Issue. 3, Faculty of Physical Education for Girls, Helwan University,

22- Reeves,j: trampoline for preschool children,2002

23- Reham Hamed Ahmed Abd El-Khalik: The impact of a training program on the development of special physical characteristics and the skillful level of the gap and loop jumps, unpublished master thesis, Faculty of Physical Education for Girls, Helwan University, 1997.

24- Samia Ahmed Kamel Al-Hagrasi: Introduction to rhythmic exercises and rhythmic gymnastics (scientific and technical concepts),Al-Ghadlibrary and printing, Cairo, 2004.

25- Sherine Ahmed Taha Hassan: The impact of a training using the method of Ischemia and Hyperemia on the variables associated with the level of performance of some jumps in exercises, PhD thesis, Faculty of Physical Education for Girls, Zagazig University, 2009.

26- Sanders Hir: Effect of Ability on TwisingTeehnique in forward Somersaults on the Trampoline 1995.

27- Wafaa El-Sayed Mahmoud: The impact of a program using different devices at the skillful level according to the stages of optimal movement performance for some jumps in exercises, unpublished doctoral thesis, Faculty of Physical Education for Girls, Zagazig University, 1998.